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[00:00:00] **Josh Farley:** We have an economy geared towards giving us in your language, these little microliters of dopamine, which creates cravings. It doesn't give you satisfaction. Human interaction gives us a deep fulfillment of life, and we have a crisis right now of loneliness and isolation as we all work longer and longer hours to get more and more money to just buy more and more crap.

[00:00:22] And there's an epidemic of anxiety and depression among the young generation that's consuming an average twice as much as we did at their age, and they're less happy. So there's no empirical evidence that this pursuit of consumption actually does make us better off.

[00:00:41] **Nate Hagens:** A few weeks ago, I released a, frankly, the 10 myths still taught in business schools, which covered some of the deepest held misconceptions underpinning economic theory today. Building off that episode, I am joined by a real economist, Josh Farley, to dig deeper into these myths and share a few more of his own.

[00:01:03] Josh Farley is a professor in community development and applied economics and public administration at the University of Vermont. Additionally, he is a fellow in the Gun Institute, for the environment. Additionally, he was the chairman of my PhD, committee back in the day. Josh's current research focuses on the economics of essential resources, the democratization of monetary and financial systems, the evolution of cooperation, the economics of information, and the commons.

[00:01:38] Every time I talk with Josh, I learn something new, and this time was no exception. We covered everything from the faulty way, economics accounts for

human behavior, to how complex systems theory and fractals might inform more accurate models in the future. Ultimately, this episode was about clarifying the mismatch between our economic theories and the way the world actually works.

[00:02:02] But as Josh points out, if we're able to better understand the fundamentals, perhaps we can begin to imagine and maybe implement a better economic system in the future. If you are enjoying this podcast, I additionally invite you to subscribe to our substack newsletter where you can read more of the system science underpinning the human predicament, where my team and I post special announcements related to our work on The Great Simplification.

[00:02:29] You can find the link to subscribe in the show description. With that, please welcome my friend and PhD advisor, Josh Farley. Josh Farley, welcome back to the program. Thanks, Nate. Always a pleasure. This is your third or fourth time? I'm not sure. Would you believe my friend? 20 years ago, this was my first semester of my PhD program with you as my PhD chair.

[00:02:58] Time flies. Wow. Time flies. No shit. We were so young. And, the things we're gonna discuss today, the myths that are still taught in business, schools and economic classes around the world. You and I were talking about most of these things 20 years ago, so I don't know what that says about us or about the world.

[00:03:22] or about the, Economic power structure, that, serves the, Superorganism. but I'm happy to have you back. I've wanted to have you back for lots of reasons. and this is a good topic. You watched my recent, frankly, titled, the 10 Myths Still Being Taught in Business Schools.

[00:03:47] and I wanted to actually have a real economist, you, to help me kind of drill deep in, in these myths and realities and, why they're important. so let's have that as an outline. I'm just gonna get started. The first one still taught in

economics classes is that. Humans are self-interested, rational, consistent utility maximizers, also known as homo economicus.

[00:04:17] So what, is this myth? And then ultimately I'm gonna ask you, what is the reality and why is, the, the delta between the myth and reality important to our lives and our futures? It's basically, it's a little bit even more

[00:04:30] **Josh Farley:** than what you say. So we're self-interested, we're insatiable, we're rational.

[00:04:36] And, and all our choices. Then it's very interesting in eec in economics, they'll give you these fancy calculus problems so you can figure out the optimal point. And then supposedly the actual consumer just goes in and does all that calculus in their brains and forms the, you know, makes the optimal decisions.

[00:04:53] And, and so there's, I mean, there's so many problems with this myth. I would say, first of all, I would like to say that, there is evidence that simply studying economics makes people conform more to that myth. So, and I watched my friends kinda world views change during the PhD program to conform more to that rational, you know, that rational analysis.

[00:05:19] I look at things and you feel free to enteric because I have a few things I would like to say here. I look at things, I'm a, you know, really big evolutionary theory and. Humans are among the most social animals. You cannot survive apart from the group. So from an evolutionary perspective, the most rational thing you can do is to be part of a group.

[00:05:39] And the more you're identified with a group, the more you can cooperate with others in that group. Trust others, and you know, together achieve much more than individuals can. And what identifies you more strongly as part of

a group is many times believing crazy ideas that your group also believes. So it might be perfectly rational to believe totally crazy things if it shows that you are a member of this group and you need this group to survive.

[00:06:06] like economists, and you know, and if you don't, I mean, you know, when I was doing my PhD, my advisors told me, if you wanna finish, you have to believe what you have to write, what we believe, not what you believe. So there's, you know, it's been like five wasted years of my life. Yeah.

[00:06:20] **Nate Hagens:** Well, you told me the same thing when I was writing my PhD paper.

[00:06:25] I hope. So why is that, why is that fundamentally important that humans are not only self-interested, but from an evolutionary perspective? We are other regarding, so the other regarding that we care about what people think of us and we care about the welfare of others. That's not in our system and it's not in our values, our prices, our incentives at all.

[00:06:48] Right? Yeah. Right. Not, it's not there. It's not

[00:06:51] **Josh Farley:** part of the pro. yeah. It's totally outside the way we dev, model our economy. But I'm gonna take a little bit of a step back here to go into the, you know, evolutionary ideas of why we depend so much on each other. And I'll start, this is a little bit about aggression, but I'm gonna start with this idea of major evolutionary transitions, which is when two organisms become so interdependent, they can only survive as a collective, no longer as single individuals.

[00:07:19] And this is at the heart of all evolution that you and I are ucar. We have nuclei, we all complex life has nuclei. And the eukaryotic, cell with a nucleus was the merger of AAN and bacteria. Two domains of life more distinct from each

other than we are from mushrooms. And these became so interdependent they could only survive as a collective cell in which the AAN provided the membrane and the, bacteria provided the organelles, the mitochondria.

[00:07:51] And then those first eukaryotic cells, as individual cells came to become so interdependent with each other, they merged to form multicellular animals, and those multicellular animals along certain lineages became so interdependent. They merged to become social animals. And at any of these levels, if the, Well, I, should actually, I'll go first. I'll talk about multilevel selection theory basically says that for any organism, the selfish individual out competes other individuals within a group. But the group with the fewest selfish individuals out competes other groups. And what this means is that selfishness at one level undermines welfare at the next highest level.

[00:08:39] And you do not want your mitochondria to be selfish and proliferate in your cells. You'll get like cellular disease and you'll die. You do not want your cell to, behave selfishly. in which case it'd be a cancerous cell, you know, to the, Cost of your body and as an individual who only focuses on their own self-interest, will outcompete other individuals, but at the expense of the group and what makes humans, we are probably the most group centric species to ever evolve.

[00:09:10] We can't survive a weak. Apart from other humans and their technologies and ideas. So if we have all the artifacts that were made by, you know, huge numbers of humans with knowledge accumulated over, you know, a measurable time, we can survive for a brief time. But we are absolutely dependent on each other's.

[00:09:27] So we have an economic system which is modeled on the self-interest of the individual, claiming that leads to the benefit of all. And yet, in evolutionary terms, The individuals that do that, they destroy the collective and the

relationship of the human individual to society should be the same as the relationship of the individual cell to the human body.

[00:09:53] **Nate Hagens:** So is the analog there, like cancer cells per outproduced and they win, but they ultimately kill the host. And that's the problem. Which is them. Is them themselves. Yep.

[00:10:05] **Josh Farley:** And so the, deal is that I, find this so interesting that natural selection acts connect on the level of the selfish individual, in which case it's genetic selection, basically.

[00:10:14] Or it can act on the level of the group, which for humans is the cultural group. And. Evolu culture

[00:10:22] **Nate Hagens:** evolved just like genes. the problem is that in there's a time horizon because what you're saying is absolutely true in the intermediate and longer term, but in the short run power, those cultures that maximize power are out competing the more indigenous, wiser, slower cultures.

[00:10:40] And that's what's happened.

[00:10:41] **Josh Farley:** Right? Right.

[00:10:42] and this is what happened. So, and this goes at many scales. So it's the, the culture that focuses on its own welfare over that of others, often harms humanity. So the colonialist powers, the, you know, those who expand really rapidly through capitalism, consuming all the planet's resources and spewing out these waste and degrading the whole.

[00:11:02] So it, again, it's this problem of. The individual society that puts its interests ahead of other societies tends to harm humanity. And this whole time these species were evolving, they, each species was interacting with the

environment to create an environment. So species evolved to be codependent on each other.

[00:11:21] And no species can survive apart from the ecosystem any more than your shell can survive apart from your body.

[00:11:28] **Nate Hagens:** So we have at least 10 myths to cover. So I don't wanna go too far down this rabbit hole, but I will, ask this. Do people, do economists, do business school teachers and professors today?

[00:11:42] Truly believe that humans are rational, consistent, insatiable economic calculators like ho homo economicus, or is it just a hand wavy thing away to, gather more power and status and credibility and money? I mean, almost

[00:12:00] **Josh Farley:** always the economists will acknowledge, well, this is just a Simplification.

[00:12:03] It's not really true. But if we act as if it is true, then that gives us a better insight into how the economy works. And so

[00:12:10] **Nate Hagens:** if it's, if we can prove, and I think we can, that it's not true. Yeah. What does that tell us about our current state of the world and the future?

[00:12:20] **Josh Farley:** Yeah, so, I mean, it it, tells us that the only thing we can strive for, the only thing that really matters is ever increasing consumption.

[00:12:29] So we have an economy geared towards that. And in my view, what's happened is we have an economy geared towards ever increasing consumption. We're insatiable for consumer goods, is the idea. And we get only pleasure from consuming. So we have an economy that is geared towards giving us, in your language, these little microliters of dopamine, which does not, you know, it creates cravings.

[00:12:52] It doesn't give you satisfaction. What really we have is, we're deeply social animals, and this is the reductionist approach. We have an economy geared towards, dopamine fixes and. Human interaction creates the, a neurotransmitter of oxytocin, which is bonding with friendship and sex and brotherhood and stimulates cooperation, but gives us a deep fulfillment of life.

[00:13:19] It gives us so much more. And we have a crisis right now of loneliness and isolation as we all work longer and longer hours to get more and more money to just buy more and more crap. And we're lonelier than ever. And we're lonelier than ever. And you could, there's an epidemic of anxiety and depression among the young generation that's consuming an average twice as much as we did at their age, and they're less happy.

[00:13:42] So there's no empirical evidence that this pursuit of consumption actually does make us better off.

[00:13:47] **Nate Hagens:** Aren't there, like if I was a 20-year-old taking Econ 1 0 1 or some macro econ class in business school at the age of 24, don't in the first week, they just raise their hands and say, wait a minute here.

[00:14:03] I mean, what, I mean you would think that decades of demonstrable proof to the contrary would have shaken this up in the assumptions a little bit. Or is it just a yes, this is a Simplification, but it doesn't really matter. what's the story there?

[00:14:17] **Josh Farley:** So it's interesting. I'll have to send you the email.

[00:14:19] One of my former students, was went on to do a Master's in economics and she told me in the first day of class, you know, she was basically told All we care about is more that we only respond to self-interest. And said that, you know,

if I didn't. If I didn't grade you, you wouldn't do your work. And the student was like, no, I have an intrinsic motivation to learn this stuff.

[00:14:39] I'm not here for the grade. and the idea being that, you know, we're only care about these individualistic rewards is she, actually quit the program and sent me an email saying, you know, referring to this exchange of saying how ridiculous it was, how could they be telling her that all she cares about is her self-interest when, you know, she's very interested in ecological economics.

[00:15:00] So they do challenge it, but it continues to be taught.

[00:15:03] **Nate Hagens:** Okay. When I invited you, I, thought we'd talk about each of these 10, 10 myths that I had in my, frankly, we actually could spend the entire hour plus talking about just this one. But let's, move on. and, hopefully by the time this airs, you can share some resources and papers for further, digging for the, viewers.

[00:15:27] Okay. Second myth is, what is something worth value and price? and the economics teaches us that whatever the market says the price is, that is its value. Can you, unpack the logic there and why that's incorrect? And it goes beyond that? Because

[00:15:48] **Josh Farley:** basically what it says is that there's the, you know, there's this, supply curve, which supposed to measure the marginal cost of producing things.

[00:15:56] And the demand curve is the marginal benefit. And where they intersect, there's a price, that determines that the quantity of goods produced, meets the demand and allocates the resources to those who, value them most. And this is, Then we take that value, that monetary value to be, you know, the, maximizing monetary value maximizes human welfare.

[00:16:21] So price is the single feedback loop that drives this complex system to a welfare maximizing equilibrium. But

[00:16:28] **Nate Hagens:** price, if, I had, I think the example I did in my, frankly, is if there's a painting and someone's willing to spend a hundred dollars on it, but I don't have any money and I'm only willing to pay $7 for it, the market treats its value at a hundred dollars.

[00:16:46] And so it has much more to do with the ability to pay then it's actually intrinsic worth. And so,

[00:16:52] **Josh Farley:** you know, you, said that this is not taught in med, in MBA programs. Interestingly, in the 1940s, 48, Paul Samuel sends kind of first textbook in modern economics said, you may be aware that, JD Rockefeller gives his dog milk every day while there are children in New York suffering from rickets.

[00:17:14] Is that a market failure? Says no. That's markets doing what they're meant to do, allocating resources to those who have the most money. So he recognized back then that of course, that is not welfare maximizing or any way optimal. And a few economists do admit that the goal of markets is to maximize monetary value, which means selling the loaf of bread to the overfed American who's gonna throw 40% into the garbage instead of the destitute mother trying to keep her children from being malnourished.

[00:17:44] And so. In an unequal economy where some people have immense purchasing power, because as you pointed out, you know, market demand is preferences weighted by purchasing power and purchasing power dominates. So in an unequal economy, resources are allocated to those who really get the least value from them.

[00:18:04] **Nate Hagens:** And not only the people, but the ecosystem functions and stability. Right.

[00:18:10] **Josh Farley:** Well, and the e and I would argue that's a bit of a different issue in that, with ecosystems, you know, if you chopped on a tree, and goes to me, it, the value is determined by the individual is willing to pay the most for it.

[00:18:24] 'cause when I use that tree to build my house, you can't use it. Only one of us gets it. Value is determined by who pays the most, but when that tree is part of a forest and sequestering carbon and stabilizing the climate, and, you know, filtering water and regulating against floods, those benefits, no matter how much I benefit from a stable climate to grow, my garden in Vermont doesn't leave any less stability for you to grow yours in.

[00:18:46] in Minnesota. So the value of that is the sum of values across all individuals and markets can't figure that out. So what they do is they. Put the private property right on the tree, bought by me to build my house, degrades the, you know, calls all these other costs that are just completely ignored. So we just simply ignore the ecological benefits 'cause they don't fit into the market model.

[00:19:14] **Nate Hagens:** They're not, they don't go to individuals. This isn't a rip on not including negative externalities in the prices like, like pollution or ocean acidification. This is not including the positive externalities in the prices. No. But even then,

[00:19:28] **Josh Farley:** including things in prices, you know, we have this idea that, you know, if we put the rate price on every, environmental asset and incorporated that price into markets, the market would solve the problem.

[00:19:41] But if you think about it, you and I, you know, we're fair compared to a complex ecological economy. We're simple little individuals, and yet the number

of feedback loops in our body to maintain homeostasis is uncountable. And then economists assume that a single feedback of price is sufficient to bring the entire ecological economy into some welfare maximizing equilibrium.

[00:20:04] That's just kind of fantastical thinking, totally out of sync with modern science of

[00:20:10] **Nate Hagens:** complexity. I was gonna ask you this later, but it's just too pressing in my mind and my body to, to not ask at least repetitively and start here. I just increasingly get this feeling that the entire economics curriculum in the world and the business school curriculum that lies on top of it.

[00:20:35] Was never intended to be based on the truth and the science. So this

[00:20:40] **Josh Farley:** always getting back to your first myth, which is that we always act in our own rational self-interest. Why would the economists be interested in truth to begin with? If they were consistent with their model, they would be trying to convince you to engage in behaviors that benefit them.

[00:20:56] So there's not even any, you know, within their own theory, there's no reason they should be trying to. So is it just they grab the reins of the global economic system and never look back? Well, so I, mean, I think these things evolve. I think economic systems continually evolve a lot of these myths that are total myths now used to be more true perhaps in the past, not the one we've gone over so far.

[00:21:16] But as the system changes, you know, are, it's, like in any. As the environment changes, the members of that, the species in that environment have to adapt to the changes.

[00:21:25] **Nate Hagens:** So the, problem here is, and we should save this for the conclusion maybe, but every one of these myths is demonstrably, Intermediate to extremely false. But the conversation we're having about eventually humans having a new reality based economic system, that's a separate question than what do we do now? Yeah. Because we are the, earth economic Superorganism ship just hit an iceberg. Yeah. And you can't just say, well, all these myths are false.

[00:22:03] So deal with the truth. Because the truth would be a radically different system. So I wanna make sure our viewers understand where I am on this. There's the reality and the truth, which I deeply care about. And then there's a separate question of what do we do today in 2025 to get from here to a, softer landing?

[00:22:23] That's a, different discussion. So for now, I just wanna understand the actual myths and realities. Okay. Anything else you wanna say on value and price? I

[00:22:32] **Josh Farley:** guess value in price would work better if we were in a highly equal economy. So when like, you know, Paul Samuelson talks about Rockefeller versus the kid with rickets, those, somebody with a mens wealth, somebody with very little, if we were all fairly equal, then resources probably would be allocated to those who value them the most.

[00:22:54] but, you know, that would require,

[00:22:58] **Nate Hagens:** an entirely different economy. Yeah. Okay. staying in microeconomics. here's a myth that, I talked about that I learned from you, that the economic textbooks continue to teach that supply curves are upwardly sloping. explain what that means and the reality and why it's important.

[00:23:20] **Josh Farley:** So first of all, a supply curve in economics is supposed to be the marginal cost, the cost of producing an additional unit, by the. Producer and what it says is upward sloping supply curve means that each additional unit costs more to produce than the previous unit. And and I start out my economics class by asking students how many think when firms produce more, the price per unit goes up, and how many think it goes down?

[00:23:47] A hundred percent of my students who have not had economics before say it goes down. And actually virtually 100% of the studies on this where they actually empirically ask firms what happens to your prices, your costs, when you. Increase output, they always go down. And, you know, I think as you point out in your, frankly, Alan Blinder, very famous economist, did a study on this.

[00:24:09] And interestingly showed in his study, he only found that 89% of firms face downward sloping supply curves. I think it's much higher than that. but in his textbook, he still models upward sloping supply curves. And why this is really important is the whole story of the market economy is there's huge numbers of nearly identical firms competing with each other to sell you products at the, lowest possible cost.

[00:24:36] And the deal is if supply curves slope upwards, as firms get larger and larger, become less efficient and they can't compete. So you want huge numbers of small firms, but. On the other hand, if prices go down, then it's empirically technically more efficient to have very few producers of huge numbers. And this is empirically the case in our economy.

[00:24:59] But if that's the case. Maybe you really don't wanna leave the control over vital industries like oil or food or, you know, media in the hands of profit, maximizing capitalists who would,

[00:25:14] who

[00:25:15] **Nate Hagens:** are really only in one or two or three firms by the end of the day. Because, that's what the math ends up being.

[00:25:24] **Josh Farley:** Yep. So the math ends up being with downward sloping supply curves. What you would expect is an economy, very much like ours, where you have a huge, a few giant firms with comparative, you know, with, advantages over the smaller ones. Nobody can compete. Somebody tries to compete with Amazon, they'll underprice you, they'll squeeze you outta the market.

[00:25:42] And so what you would end up with is a handful of firms with a huge amounts of economic power and theoretically providing us with cheaper goods and services because of that technical efficiency, unless their profit maximizes, in which case they can charge whatever they damn pleases. So what

[00:25:56] **Nate Hagens:** if.

[00:25:57] Suddenly in the world's business schools and econ textbooks, the reality was, taught correctly that the vast majority of firms face downwards. Yeah. marginal costs in the supply curve. What, would be the implications of that? So

[00:26:15] **Josh Farley:** the first implication is that competitive markets are stupid because they're gonna, they're just being way more expensive.

[00:26:22] If you have economies of scale, then you want a few firms producing a lot instead of a few producing a little. So competition is stupid. And then that raises this really big question. So if you're not gonna have competition, do you want. The private sector to control production, or do you wanna regulate it or do you wanna have, you know, workers controlling the production?

[00:26:43] I mean, it, it raises huge questions and I really liken your, frankly, you stay away from the ideological, partisan issues, but it, this almost automatically

raises those questions and however you might answer them. It would at least force people to ask them. and these are big questions about who controls, you know, our

[00:27:03] **Nate Hagens:** economy.

[00:27:04] Are people asking them like, I, this I haven't, other than you, I haven't heard about this. supply curves are, downward sloping and the implications of that. Economists have always

[00:27:14] **Josh Farley:** recognized this idea of natural monopolies and a natural monopoly. There's a big fixed cost to do something like build a reservoir and build water mains, and they're really small, marginal cost.

[00:27:27] Hook up another house to the water main. So it'd be insane to have like 10 reservoirs and 10 water mains. You could choose which water is cheapest that day. So economists recognize these natural monopolies, but we live in an information economy, and information is the biggest natural monopoly. It takes an awful lot of work to develop an idea and to develop a new operating system to develop a new technology for capturing solar energy.

[00:27:53] But once the idea is there, you can spread it virtually for free via the internet. So we have had, you know, we're not people weaving in their living rooms, you know, in 18th century England. We have capital that can be invested to expand our productive capacity and and allow these firms to get economies of scale and especially an information economy.

[00:28:17] So, and the other big thing that this might not even be so bad, except that. You know, economic power now translates into political power. So we see these people whose sole criteria for kind of guiding our country is the fact they

were good at making money, which often meant they were lucky at honing in on a monopoly before others could.

[00:28:35] Okay.

[00:28:37] **Nate Hagens:** we're just warming up here, my friend. Those were, microeconomic, myths. Let's, let's move on to macro. This is something that I did my PhD thesis on, and I, know quite well, but I've, talked about it a lot on my podcast and my, frankly, so I'd kind of like to just let you tell the story.

[00:28:57] but the fact that energy is, treated as just like any other tradable, substitutable, input into our economic system and that capital and labor, largely describe our wealth and productivity. what, is the conventional view here? what is the reality and why is it important? It's a law of

[00:29:20] **Josh Farley:** physics.

[00:29:21] You can't do work without energy. Every single economic product requires inputs of energy. Most of that energy is fossil fuels, and we burn it. It generates waste. So the economics ignores energy, input, ignores the waste output. but it's also, it goes way beyond that. So I thought your description on, frankly was really solid, but it's also the same with materials.

[00:29:42] And I googled this just outta curiosity. I googled production function for a pizzeria and, and shows it to make a pizza you need. Ovens, which is capital and cooks, which are labor. And to make more pizza, you need bigger cooks and bigger ovens, and meaning that, you know, there's no energy inputs, no waste outputs, and no raw ingredient inputs.

[00:30:05] If you look harder, you can find production functions that include raw ingredients, so the, you know, the, dough and the cheese and the sauce. But in

those, everything is substitutable. So if you have enough ingredients to make 50 pizzas and a hundred people show up to your pizzeria, no problem. Hire more cooks and more labor.

[00:30:24] So because we have removed energy and natural resources and waste absorption capacity from the equation, we don't care about those. There's no concern about resource depletion or energy depletion. It's magical

[00:30:39] **Nate Hagens:** thinking, but put on the hat of a conventional, Orthodox economist. Yeah. They, truly believe and continue to teach that those two variables, capital and labor, which is basically humans, combining money and technology and innovation.

[00:30:59] Describe everything that's sufficient to describe what's happened the last couple hundred years. Yep. And the, deal here and, you know, there is,

[00:31:08] **Josh Farley:** There's, it ultimately boils down to a belief that as a resource becomes scarce, the price increases, leading people to develop substitutes or to consume less.

[00:31:18] And so the idea is there's no specific resource we need. We have, you know, and we have this huge planet, and so one resource becomes scarce, we'll develop another. Of course, there are no substitutes for energy. It's there's other,

[00:31:33] **Nate Hagens:** than other

[00:31:33] **Josh Farley:** energy. Other, energy. Yeah. And it's the same with food.

[00:31:36] There's no substitutes for food other than other food.

[00:31:38] **Nate Hagens:** But didn't someones recently say, oh, we could get by without food 'cause it's only 3% of our, gp, or something like that? So the whole

[00:31:46] **Josh Farley:** quote is Thomas shelling Nobel Laureate in a article you can still find on greenhouse gas economics, who he says that, climate change is not really a problem because it primarily affects agriculture, which only accounts for 3% of our GDP.

[00:31:59] So if we lose 30% by 2050, we'll achieve our GDP goals in 2051 that we otherwise would've achieved in 2050. No harm done. Yeah. But that we lose a third of our food in the process and people starve in mass. But we could just go see more movies or dematerialization, we'll just read recipe books. I mean, you know, if we want to dematerialize the economy, I'll read the recipe instead of eating the meal.

[00:32:21] **Nate Hagens:** So in my, frankly, I challenge any business, school or economics professor watching it when there'll probably be very few to just spend three minutes and Google how much energy is in a barrel of oil, how that compares to a human doing, trying to generate that amount of power, manually. And look at the fact that we're paying pennies for something that gives us tens of thousands of dollars worth of benefit.

[00:32:52] If an economist, cart carrying economist were to do that, how, would they debunk, this view or what, would be a, a. A rebuttal to, what I just said.

[00:33:07] **Josh Farley:** So their rebuttal would basically be that. so I wanna point out one thing really first, that, wealth of Nations, Adam Smith, you know, Magna.

[00:33:17] We misinterpret him very often, but it forms the basis of the modern economy that came out in 1776. That was the same time the improvement on James Watt steam engine came out and the steam engines were used to pump water out of coal mines. And the basic point being that the modern market economy and the fossil fuel economy began at the same time and have always been together.

[00:33:37] And we attribute everything to the magic of the market where you and I would attribute it to the magic of fossil fuels. And so, but they would say though, if you look back, then we were using steam engines to pump water outta coal mines. And, VIN, a famous economist of the time, he said that, well, there's no substitutes for coal.

[00:33:54] We have this finite amount of coal, there are no possible substitutes. Therefore, we have to look at how, what's happening as we, you know, how it's being used up. And famously he just, he found that the more efficiently we learned to use coal, the more we used. But what the economists would say, since then, we have discovered so many other sources of energy, which is true.

[00:34:16] We discovered natural gas, and oil and, uranium and, you know, all these other things that Yeah. And, you know, and so their assumption is all of those are also finite, but keep going. Right? Right. And as you know though, that, you know, there's the methane cloth rates at the bottom of the ocean.

[00:34:33] There's all these other possible sources that economists just say, when the price is right, when the other ones get scarce enough, we'll just develop these new technologies. And for those technological optimists, I'd like to introduce them all to Thomas Midgley Jr. I'm not sure if you know who Thomas Midgley Jr is.

[00:34:49] I don't. So he. He invented Tetraethyl lead so that we put in less, leaded gasoline, which, the estimate is that you and I, our IQs are about 7% lower than they would've been because we grew in up, we grew up huffing lead all the time as we walked down the streets. Wow. Thomas Ley Jr. Also did Har got lead poisoning, did harm to himself.

[00:35:12] He then went on to invent chlorofluorocarbons and which at the time were considered just the safest stuff ever compared to the horrible ammonia that

would blow up. And, you know, it was, it. Even James Gaia gave a presentation saying there's no possible harm chloral Fluorocarbons could do. And it turns out we almost wiped out life on earth.

[00:35:33] And had we developed promo fluorocarbons first, they're even worse. Things would've been much worse. and then Midgley went on to, a. Due to damage to his health from the lead. he was bedridden. So they developed a device to get him outta bed in the morning that killed him. So technological solutions do not always work.

[00:35:54] They can have really negative. So this is one guy who did two potentially, you know, existential threats to humans through his technological advances. And we forget about that. And you don't know, you know, they say if he had done bromo fluorocarbons, by the time we realized the harm they did, that they were much worse of chlorofluorocarbons to the

[00:36:17] **Nate Hagens:** ozone layer.

[00:36:18] It'd have been too late. Okay? So I didn't know that. But let's just use that as a hypothetical example. If there is a technology that is invented because. It needs to be to, shore up a shortage of something that's important based on our previous discussions on the microeconomic myths. If the price is high enough and we are insatiable and, all the other things, we will invent such a thing.

[00:36:46] For instance, some terrible, A geoengineering solution once it's obvious that climate is warming. Yeah. And it does actually mitigate warming a little bit, but does something else crazy esoteric that destroys something else. Yeah. So, so the, framework of economic theory just will go for that, right?

[00:37:08] Because we don't price externalities or the true costs. Yeah. But when

[00:37:13] **Josh Farley:** you bring up your other myths as you've been talking about, you know, we are pursuing ever increasing material consumption, and to do that, you would need ever increasing energy use. sadly, that's not actually making us any better off.

[00:37:25] So we're, in my view, we're pursuing the wrong goal. It's like, Yogi Berra once said, we might be lost. We're making great time. And, that's what I see is pursuing consumption. We're lost as hell. We're making good time. Less than it used to be. Can you

[00:37:37] **Nate Hagens:** briefly describe the solo residual and the fact that capital and labor are supposed to describe our wealth and productivity, but there was this little fudge factor called solo residual.

[00:37:49] And why after all this time, haven't people shown credibly that a large part of the solo residual is maybe from the 500 billion, army of fossil helpers that we have? What's going on there? So the economists say the

[00:38:04] **Josh Farley:** solo residual is a result of technological progress and knowledge. And I actually, you know, I do believe that the human mind is collective.

[00:38:13] I think as individuals we're not very bright. Well, certainly 7% less than I should have been. But you and I like, you know, if we studied our entire lives to try to make these glasses the way they're made today to learn all the, you know, you need low metals. You need to know optics, you need to know, I mean all the machinery, extract the resources, bring 'em here.

[00:38:34] No single human in a lifetime could learn how to make our glasses or how to make our shirt. So we have specialized, just as cells in our body specialize. You have your eye, cellular liver cell. We have specialized in the economy. Each

human does a small part of this. Big hole, but our collective knowledge is amazing.

[00:38:55] So economists would say, well, okay, so we developed this energy. But that was just one example of us using our collective knowledge to develop a new resource and we will just develop more and more resources. And the fact is, and you know, and I, am actually a, big believer that we are capable of, you know, doing major breakthroughs.

[00:39:17] Also, as I'm sure you're aware, talk to any physicist what happens if we. Keep increasing our use of energy exponentially for the next thousand years. Well, the worst side effect would be the surface of the planet would be hotter than the surface of the suns. We'd all be dead. But the other element of this is that as we've acquired more and more energy, we've used it to disrupt more and more natural systems.

[00:39:41] And so even if climate change was not a thing, even if energy was infinite and cheap, As we keep using more, we are going to do, you know, destroy more biodiversity, pollute more of our waters do. I mean, we're going to, you know, cause irreplaceable harm and it's all in pursuit of those dopamine hits that you need the energy to generate.

[00:40:05] Whereas if we're looking for the social connectivity and the interconnections that really make lives rich and rewarding, that takes remarkably little energy. You know, we're way past the point where, you know, at this point I think we're using more and more energy to isolate ourselves increasingly, and actually I think it just makes us worse off.

[00:40:24] **Nate Hagens:** And then what about the, fact that we treat. This energy bonanza if we acknowledge it at all as some sort of interest without recognizing that we're drawing down the vault. I mean, it really is. It's the biophysical

equivalent of Charles Ponzi or Bernie Madoff, if you really think about it. Yes. I mean, I always just.

[00:40:48] Put it in the phrase,

[00:40:49] **Josh Farley:** I think you mentioned, might have mentioned that in here, frankly, it's like you inherit a massive trust fund and as long as you live off the interest, you're okay. Your fund generates that much more. but as soon as you start to dive into the capital, then the amount that, fund can generate goes down.

[00:41:05] And we're so for fossil fuels, as you dive into the capital, I mean, there is no interest actually. So, you know, fossil fuels we're just burning up what we have, right? we're depleting it. It's like just burning down your trust fund. But

[00:41:16] **Nate Hagens:** here's the thing is the people that are in charge, well humans have 80 year expected lifespans or less, and the humans that are in charge are, have shorter time horizons like than that.

[00:41:28] So from the behavioral perspective of dopamine and everything else, it's as if. It was interest, even though we really know that we're drawing down the capital, the, principle. But if in a short term horizon we can those who treat it like interest Yeah. Will come

[00:41:47] **Josh Farley:** out ahead. Yeah. If you're 80 years old and you inherit a trust fund, don't worry about living off interest, you know, go for the, you know, deplete the capital.

[00:41:55] **Nate Hagens:** Yeah. Unfortunately, I, think I, I mean that, I think that's what's happening right now in the world. Yeah.

[00:42:02] **Josh Farley:** Yeah. And it gets back to this idea too, that, you know, natural selection does the selfish individual outcompete each other individuals.

it's the group with the fewest selfish individuals that outcompete to other groups, but there are natural selection favoring those selfish individuals.

[00:42:19] and it is, our system does favor those selfish individuals.

[00:42:22] **Nate Hagens:** Well, the cooperative, group of 36 humans somewhere in ER cuts is gonna be doing well in 2093. So. It's a bad, joke. You mean the lasher remaining? Yeah. Let's, let's move on to money. So conventional economics and business schools teach that banks are intermediaries, between savers and those that want funds.

[00:42:53] So un unpack what, and I know this one we could speak for two hours on because you teach this a lot. Yeah. But what is the conventional story taught in business schools and economics classes, and what is the reality and why is it important?

[00:43:06] **Josh Farley:** And there's actually kind of two things. One is where does money come from?

[00:43:09] One is where does credit come from? Okay. And where money comes from. You know, we always tell this story that, well, where does government gets money? The government has to tax us so that it can spend. But where do we get the money that the government is taxing? I mean, you know, so it's a US Federal Reserve note.

[00:43:23] So clearly the. Money has to come from somewhere before it can be taxed. And the correct way of looking at this is that governments actually spend money into existence. You know, they pay their workers, they buy the resources they need, giving money to the people, and the people know they have to pay that money and tax.

[00:43:42] So if they don't accept the government's money, they're gonna go to jail. So you're kind of coerced into accepting that money, but because everybody else accepts it, it's, you know, it makes sense to accept and that money. Even though it was created by the money, but the government, it's backed by the productive capacity of everybody who accepts it.

[00:43:58] The other big issue though is where does, you know, credit come from and finance. And so this, the idea is that when I went to the bank to take out my mortgage, to buy my house, that I was borrowing money that somebody else had deposited. And the fact is this has been very well studied now. And as you point out in your, frankly, it's now acknowledged by the central Bank of the US and by the Central Bank of England.

[00:44:22] **Nate Hagens:** but by the way, when you and I were talking about this 20 years ago, it wasn't, this was viewed as kind of a fringe thing to say, but now totally French, it's understood.

[00:44:31] **Josh Farley:** Keep going. I should say it's, you say it's understood, but still, I constantly have students who learn in my class, then they bring this up in another class in economics and the professors say, no, that's just not true.

[00:44:42] And then I send them the articles from the central banks and they have to acknowledge, oh, maybe it is, But the deal is that banks, so it says in the Constitution that only Congress has the power to coin money, so banks aren't allowed to issue coins. But when I went to that bank to borrow the money from my house, the bank just wrote a check on thin air for that a hundred thousand dollars.

[00:45:07] And for them, what they did was the deposit of a hundred thousand dollars on my account was a liability. My mortgage was an asset. Their book's balanced for me. My mortgage was a liability. The a hundred thousand on my

account was an asset. My book's balanced. Books balance just fine. The deal is though that, because that is how you know well over 90% of the money in our economy is created, it means that collectively, households in the US are paying 10% of their income is interest to banks, which I think is, you know.

[00:45:40] The same as tithing to the church, and the banks are able to capture an enormous amount of wealth. So in the recent decades, the share of GDP going to the financial sector is quadrupled. And I think it was very wise of the f you know, our, the writers of the Constitution to say, only Congress can coin money.

[00:46:00] But it's a pretty big loophole that, oh, they're not coining anything, they're

[00:46:04] **Nate Hagens:** just issuing money. So this is not something I said in my, frankly, or that I've thought about 10% of the, what the disposable income in the United States goes to interest on, bank loans, 10%

[00:46:17] **Josh Farley:** of household income. I looked this because I'd read this somewhere that I looked it up on, it's the.

[00:46:23] One of the federal reserve banks, and they actually,

[00:46:25] **Nate Hagens:** I think it's a little

[00:46:26] **Josh Farley:** more than 10%.

[00:46:27] **Nate Hagens:** But the larger issue is that when your mortgage and, your, asset were balanced, that is an incredibly narrow boundary, accounting of what happened in the world. Yeah. Because as I like to say, the same amount of oil, lithium forests and dolphins and orangutans existed than the few seconds earlier before you got that loan.

[00:46:54] And that money is going to be spent on things that require energy materials and have ecosystem impact.

[00:47:00] **Josh Farley:** And it's, even goes beyond what you say, because I just get this a hundred thousand dollars, let's say to invest in a business or something. I'm gonna burn oil, I'm gonna chop down trees, I'm gonna do whatever.

[00:47:08] It's actually gonna reduce the size of the inherited trust fund from nature. So I'm using borrowing money from the future essentially to. that depletes the energy and raw materials that money lays a claim on. So when it's time in the future, there's less, because of all that borrowing and, yeah, and, you know, and ultimately, you know, we can, you know, we don't have to repay debt.

[00:47:37] Like after World War ii, the European countries had massive debt. So what they did is they had huge inflation. They inflated the debt. And this is interesting that, you know, households in the US people always talk about government debt. So government debt is the terrible thing. government debt's tiny compared to household debt's, well over a hundred percent of GDP.

[00:47:56] And and then there's the business sector

[00:47:58] **Nate Hagens:** debt. Every single financial claim that exists in the world, whether it's household debt, Corporate debt, not financial debt because that offsets government debt, money in your checking account, anything, money in your wallet, it, when it's spent, it's a claim on energy and resources.

[00:48:17] And so we continue to increase because we're insatiable and there's no regulatory limit on this as long as your bank is in good standing. We keep creating more and more claims on the same amount of biophysical reality. Now, an economists might say, ah, but that biophysical reality is in, it's not static because technology will allow us to access more of it.

[00:48:42] Can you unpack that at all, or, I mean, I mean.

[00:48:46] **Josh Farley:** That is what they always say. And it is, you know, I, think it's interesting that, it was, Arthur C. Clark who said that any sufficiently advanced technology is indistinguishable for magic. So basically we're saying magic will happen and in some ways magic has happened.

[00:49:01] I mean, you know, the felt, the fact that you and I are talking from thousands of miles apart. Yeah. you know, previous generations would've said that's magic. Yeah. but the idea that the technologies will appear at the rate we need them and will not have negative side effects and we'll solve the problems, you know, that's a long stretch and.

[00:49:20] If we're gonna rely on technology to solve our problems, most of our problems these days are like, you know, social misery, ecological problems, they're often public goods. So markets will not allocate any resources to technologies that provide public goods. You can't profit from, they won't allocate resources to technologies that help the poor because there's no profit in helping the poor.

[00:49:45] And if you use markets and knowledge, improves through use. But then we try to do it through the market. So we put a price on knowledge, I get a pat. And for a, clean, safe alternative to fossil fuels, I'll charge the highest price of the market will bear. And first of all, other firms can't improve in my technology 'cause I have a patent.

[00:50:05] So I can prevent you from doing that. And second of all, the value of my technology is much less if you have to pay me to use it than it would be if it was free. And so. If you are going to rely on technology to solve all your problems, you know, you want an economic system that develops the right knowledge at the lowest price and then maximizes its value once it exists and markets do none

of that, you know, it's actually, I work at a land grant university that was designed pay professors to develop knowledge that's freely available to all, in fact, pay other professors Extensionist to go out.

[00:50:38] Give that knowledge to

[00:50:39] **Nate Hagens:** people, that's a far more efficient model. Let's move on to debt. so if money is a claim on energy and materials debt, which we keep increasing globally, is a claim on future energy and materials. But the way that business schools. Teach it is if I have a business that I own and is fully paid for and I generate some GDP, the contribution to this society is the same as if someone borrows all the money to build that business and has that contribution to GDP.

[00:51:17] So debt in the way that I learned it, it's an intertemporal transfer of consumption preferences and it's totally agnostic on the impact on the whole system. please, unpack that and, explain. Yeah. So again,

[00:51:32] **Josh Farley:** you know, and this gets back to we were talking about with the way money is created. So it has huge impacts, first of all on the distribution of wealth.

[00:51:38] 'cause we've given some individuals, some, you know, institutions, the right to create money outta thin air and then extract payments from us for doing that. And we have these. And you know, and if you think about it, throughout most of US history, we've always had these bubbles and busts with debt. So we'd build up more debt than there was resources to back that.

[00:51:58] So what would happen is the debt would collapse. So this happened throughout history, but you know, in 1929, the outstanding debt in the US just plunged. And so this was a kind of a normal thing. When you develop too much

debt, you'd had a huge financial crisis and the value of the debt would disappear, and then you would no longer have those unbeatable claims on the future.

[00:52:20] What we've done now though, and this is in an analogy to forests, all of you're probably aware right now the weather quality here, the air quality here is bad because of Canada is burning out where you are. Maybe it's because California or British Columbia are burning. but what happened is. In a forest, you would've this buildup of, dead material and wood that would get to a certain point and then it would ignite, burn down a patch and then that could re but without destroying the whole forest.

[00:52:52] And then you could get seeds and everything and animals from the forest to repopulate that patch. And I think is an analogous to what we're doing with our, our financial system. Now, every time now we're threatened with a financial crisis rather than putting out the, you know, forest fire, we lower interest rates, which prevent, which essentially makes it easier to pay off the debt and to accumulate more debt.

[00:53:15] So I look at this as akin to continually suppressing the fires. Now we have this just more and more debt that used to just burn out without destroying the whole economy. Now we've gotten to the point where, when that. Spire catches, it burns down the whole forest system or when that debt is un when that, yeah, debt is unpayable, it collapses the whole financial system instead of just a few banks.

[00:53:39] **Nate Hagens:** Yeah. The, as you know, this is my view, and this is the fundamental logic underpinning what I call The Great Simplification. I mean, take Japan, they had zero interest rates for the longest time, and now they're up to two and a half, 3%. They don't have any energy to speak of. And the central banks themselves, the ba, the BOJ.

[00:54:03] Owns and is buying over half of their government bonds, which is the thing that they issued, to, you know, maintain their levels of consumption. Yeah. There's no way out in, in, in what we face monetarily either. We have three choices, both Japan, the United States and, everywhere else we, raise taxes.

[00:54:26] So that means we people have less, 'cause they have to pay more to the government or we reduce benefits, which is gonna be really bad for the poor because, it's a regressive thing that we have to cut our consumption or we print more money and temporarily, kick the can a little further. But at some point in 2009, we had a too big to fail situation and the.

[00:54:54] You know, central banks around the world got together and they let, Lehman go and they bailed out. Bear Stearns, at some point, I think in the next decade we're gonna have a too big to, to save situation. The Bank of England and the Fed won't be able to ba bail out the Bank of Japan or France Yeah. Or something because the amount of monetary claims on reality that we've built from prior crises is gargantuan.

[00:55:18] Yeah. And yeah, I mean, I don't want to get too depressing on this, but I, do think that's the end game here for the current system of financial, digital claims on biophysical reality.

[00:55:30] **Josh Farley:** And Yeah. And I, you know, and I think the solution there right now, we rely on the private sec private banking sector. I actually think the value of money is.

[00:55:38] Backed by our productive capacity, you know, all money out there would've no value if we weren't producing things that could buy it. So it's a collectively created benefit. And we have allowed the private sector to capture the lion's rewards. I'm a big advocate of having a public financial sector. It could be public banks.

[00:55:55] and this means that then when the private banking sector collapses right now, there's nothing else we could do. It collapse our whole economy, so we've gotta bail them out. Yeah. But if we had a public alternative, then we could, have a, and it's not gonna be a smooth transition, but perhaps a less painful transition.

[00:56:12] **Nate Hagens:** I'm really interested in that. Maybe, you can come back and, talk about that. Maybe we have a round table with Ellen Brown or, someone else because. Th there this episode, I wanna understand the truth, like, you know, just objective, no values. what, is really going on when we're teaching economics?

[00:56:32] But once we understand this, the question becomes, what the hell do we do? And how do we, land the plane in that direction? So, so let's, move on, to GDP as the goal of our societies, economic textbooks. Treat that more GDP is good. And if GDP is flat or declining that it's bad, give us the, business school, educational component and the reality and why it's important.

[00:57:03] **Josh Farley:** Depending how deep you wanna go on this. I mean, Simon Kuznets developed the idea of GDP back in the thirties. He warned against using it as a measure of economic welfare. So it's a measure of economic activity, not welfare. Yet in 1960, the OECD basically said, let's all pursue, you know, GDP is our measure of welfare.

[00:57:22] And we've been doing that since, and economists acknowledge that it doesn't really measure welfare, but it's a great proxy for it. So they, you know, they recognize the flaws in the measurement, but say it's a really good proxy, let's stick with it. And the one thing I wanna point out too is that, GDP, you know, if, the GDP tells us nothing about the wellbeing of the average person, and I've probably, you probably know this, and I might've said it on your show even in the past, but as I say to my students, you know, let's take the average height in this classroom, say

a hundred people, and we'll be like, 5, 9, 5, 8, add the tallest person in the world, almost no budget, average height.

[00:57:57] Now let's take the average income. And add the richest person in the world. None of you matter. So when you're looking at total quantity, of GDP, average means nothing. Yeah. So talking about, you know, we report on GDP as though per capita, GDP is somehow a good thing, but you know, for the past many years, two thirds of growth of GDP goes to the top 1%.

[00:58:20] **Nate Hagens:** So it's six or nine months since I've said this stat, but I believe that the average GDP per capita in the United States is around 71,000. But the median, which is the midpoint of 50% or above, and 50% are below, is like 54,000 or something like that. So it shows the skew, which is what you're trying to evidence.

[00:58:44] **Josh Farley:** And what that means is that the big number tells us nothing about averages. So why do we talk about it? And then of course, you know, as you point out, you know, when we had, when. Russia invaded Ukraine. They had the breadbasket of Europe. so disrupted the wheat production and wheat prices skyrocketed, and oil prices skyrocketed.

[00:59:03] And the idea is that when something is essential, I need it no matter what. My demand is physiological, not related to price. So I'm going to buy it, whatever the price is, if I can afford it. And this means that small decreases in the supply of anything essential lead to huge increases in price. So that the less we produce, the more it contributes to GDP, which is absolutely idiotic.

[00:59:27] and this idea that, you know, maximizing monetary value is the goal. I would actually argue that GDP is, it's explicitly a measure of how much we pay for things. You know, you add up how much we pay for the things we bought, that's

GDP. So it's explicitly a measure of cost. And if you think about the problems with GD Ps, we.

[00:59:48] You know, as we pump out all our oil that adds to GDP, even though it's depleting our wealth, if we think about as a cost that makes sense as we improve our technologies and the price of really important things like computers falls, that would, you know, each computer could produce to less to GDP, but if you think of it as a cost that makes sense.

[01:00:06] And I look at our healthcare system, you know, we have, the United States spends like 50% more per capita than any other country in the world. 23% of our GDP is healthcare. It's 23 now. Yeah, it's crazy. And, and yet we have worse healthcare outcomes than almost any other country. If I was to tell you that our goal should be maximized expenditures on, healthcare, you see, that's insane.

[01:00:30] Anybody that belongs in the denominator, that's something we wanna minimize.

[01:00:34] **Nate Hagens:** Yeah. So it, it does kind of make sense that we use GDP as a metric for cost, but then we have a, secondary indicator that is the benefit and that we have some formula or rules or policies that integrate the, cost and the benefit into some, more sustainable, more sane, pathway.

[01:00:58] **Josh Farley:** And that's efficiency. You wanna get the most benefit, the least cost. You want an efficient healthcare system. The number of health adjusted life years divided by the 23% of our GDP we spend on it. Yeah. And instead we're trying to maximize that

[01:01:10] **Nate Hagens:** 23%. Yeah, it's, crazy. I know all this stuff and just talking to you again, just re refreshes how crazy it is.

[01:01:20] okay, moving on to the next myth. this is the one that got me and why I left Wall Street to come and study with you. because I read a book by our late, and dearly missed friend Herman Daley that wa, that MBA schools and economists still today teach that the environment is a subset of the economy.

[01:01:43] The economy is the main thing. So what is it exactly that they teach? Why is it wrong? And so

[01:01:49] **Josh Farley:** first of all, it's not just that it's a subset, it's that it's a pretty insignificant subset. so like, you know, as I mentioned, Partha scooped, a very famous economist, wrote a article in 2008 about economics of nature or something, and it was just anecdotal, but he said when he asked his leading economist friends how much nature contributes to human welfare and GDP said not maybe 2%.

[01:02:10] So it's an insignificant subset. And of course, you know, I mean, as you all know, there is, you know, law of physics can't make something from nothing. Everything we make requires raw materials from nature. Those raw materials are otherwise the structural building blocks of our ecosystems. When we convert them into economic products, we degrade these life support functions of our ecosystems.

[01:02:31] And, and of course you can't create nothing from something. So all the energy, all the fossil fuels we burn, all generates waste. That goes back into the ecosystem. And if you acknowledge that, then you would've to acknowledge that the goal of. Exponential growth of the economy, which as you have pointed out, always requires energy.

[01:02:49] Always requires raw materials. That is an impossible goal. and, and instead of, you know, economists say, well, let's get the prices right. We can internalize nature into the economy. We should be trying to internalize our

economy into our finite planet. And it's a totally different set of, you know, institutions and approaches.

[01:03:12] **Nate Hagens:** I'm gonna ask a depressing question right now because you and I for sure had this same conversation 20 years ago. Have things changed in the halls of power in the business schools and economics programs on this point. So one thing

[01:03:30] **Josh Farley:** that people have, become aware of, and this gets back to the point I should have made earlier when we talked about the upward slipping supply curve, is, there are now acknowledging there are real costs to, you know, ecological cost, climate change, and biodiversity loss.

[01:03:47] More and more economists are acknowledging that. But you know, we talked before about, firms face a downward slipping supply curve, but. Society clearly faces a steeply upward sloping supply curve. As our economy expands, we are burning more oil, destabilizing our climate, wiping out more species. And at some point, and this is one of the ideas that is starting to catch on at some point, the ecological costs of additional economic growth come to overwhelm the economic benefits and growth becomes uneconomic.

[01:04:22] And if you look up uneconomic growth, which is a term developed by Herman Daily I remember you'll now find first thing shows up, Investopedia. I mean, they talk about it at Davos now. So this is an awareness and the irony is that this is such fundamental microeconomics as, the more you do of something, you know, The less benefit you get and the more it costs, stop doing it. When the costs exceed the benefits. And yet we refuse to apply that to the economy as a whole. But when we developed, you know, when Adam Smith and these guys were developing this, we were, our populations were so small, our resource use was so small, it was made perfect sense to ignore the fact that we were, yeah.

[01:05:03] Part of a larger system. You know, it's like right now it's perfectly fine to ignore that. the universe may be finite. We don't know if it is, but we can ignore that.

[01:05:12] **Nate Hagens:** That doesn't matter. So let's move on to Adam Smith. and the, next myth that I had in the, frankly, is that the, business schools still teach, and believe that the invisible hand, where everyone acting in their self-interest ensures positive outcomes for, the whole system, and collective welfare increases.

[01:05:35] Is that still taught and, why is that wrong? So it's absolutely still taught, and it, you know, it's a,

[01:05:41] **Josh Farley:** the idea is if a, resource becomes scarce, price goes up, that attracts more resources into production and, and when the price goes up, people demand less. So this, you know, the price mechanism will reallocate resources throughout our economy to produce what, to allocate resources to the producers who value it most is measured by willingness to pay, then to allocate output to the consumers who value most as measured by, What they, what they're willing to pay. And, so this, you know, this, we have this invisible hand that just makes everybody better off. But the economists will acknowledge that there are certain things like social dilemmas or prisoners dilemmas, or tragedies of the commons where this doesn't hold true, and that it's very widely recognized across essentially all the disciplines that a social dilemma occurs when, the individual is better off acting in their own self-interest regardless of what others do.

[01:06:43] But when everybody acts in their own self-interest undermines society. And under those circumstances, tho those circumstances, AKA reality, a k, a reality, all the challenges we face now, and I would argue all the big, you know, obviously climate change, biodiversity loss, even alternative energy, because you know, we're, The fossil fuels are, you know, they're, I can own it privately. my use

leaves less for others, but alternative energy, no matter how much solar energy I use on my house, doesn't leave any less for you. We're not competing for it, you know, so cooperation works better than competition, but the invisible hand idea, is for a small set, a subset of resources, but it ignored and it was okay to think that way when the fossil fuels we were burning were too insignificant to affect the climate.

[01:07:34] But now the, you know, the social dilemmas overwhelm the private benefits. So right now we have is very often when I burn fossil fuels. All the benefits flow to me. The costs are shared. And if you have the invisible hand telling me to maximize my self interest, private benefits, shared costs, that's suicidal.

[01:07:56] **Nate Hagens:** What if, someone is listening to this and they absolutely either don't understand or don't care or don't value anything in the environment, does the invisible hand still, Be a false, in, what you just described, does it still have a tragedy, the commons for, the collective human experience?

[01:08:19] **Josh Farley:** I mean, I would look at it like, you know, maybe in, ancient Greece, they didn't know what oxygen was. Their ignorance of oxygen did not make it less important. It was equally important. There is no species can survive without those life support functions of our ecosystems regulating atmospheric glass grasses, creating the right amount of oxygen, you know, regulating nutrient cycles, stable climate.

[01:08:42] So whether or not you believe it

[01:08:44] **Nate Hagens:** exists, it. It's not gonna, you know, but my, point is, it's not just an environmental tragedy of the commons, it's also a social one.

[01:08:53] **Josh Farley:** Yeah, No, so there's, tons of examples. I mean, even the idea, and this wouldn't be considered a tragedy of the commons, but Americans, you know, we throw about 40% of the food we buy into the garbage.

[01:09:05] And we know that the smaller amount of food, the greater the price is dramatically. So us throwing 40% of food in price in the garbage dramatically increases prices. So poor people can't get the food they need. That wouldn't be considered a, that's actually the market functioning that it's supposed to.

[01:09:22] But the, this idea that, That somehow the single, again, this gets back to the idea, the single feedback loop of price will drive this complex system to some kind of welfare. Maximizing equilibrium shows zero understanding of complex

[01:09:37] **Nate Hagens:** systems. I'm gonna ask a question that I, just thought of, I've never thought of it before.

[01:09:42] If, if economic theory was a human being, could you label it as a sociopath? You,

[01:09:49] **Josh Farley:** well, one thing I do think is you could label home economicus as a sociopath. I mean, you know, is, you know, Kennedy says, ask not what your country can do for you. Ask what you can do for your country. Economic says, you know, ask only what your country can do for you.

[01:10:05] which is a crazy view, and that's a sociopathic view in my, mind. It's like the cancerous cell asks only what you know, what your body can do for it. And the sociopathic human asks only what society can do for you. and, so our economy is, yeah, whether, I mean. It's modeled on a bunch of sociopaths, which I think is really crazy and I've probably mentioned this to you before.

[01:10:33] but I always ask my students, and this comes from ideas from David Sloan Wilson, an evolutionist, you know, what are five characteristics of a good person and five characteristics of an evil person? And across cultures, across age groups, every, different countries. Everywhere I've done this, a good person puts the group ahead of the individual.

[01:10:51] An evil person puts the individual ahead of the group. And it's really weird that, you know, economists basically say we're evil, but it's really weird that our definitions, you know, our self-identify as evil. No, we are mostly, you know, people are good and we have an

[01:11:09] **Nate Hagens:** modeled on evil people. The impact and the result of the economy could be construed as evil.

[01:11:18] But I do think humans are naturally good, but now there's 8 billion of us, and we're following incentives and behaviors and prices and choices and hierarchies and power structures that the aggregate result is having a deleterious impact on impact the future, of our species and others as more people are becoming aware.

[01:11:37] **Josh Farley:** And the, you know, as I said though, the good person puts the group ahead of the individual. But how with other groups, we can do any kind of evil. We want the other groups.

[01:11:44] **Nate Hagens:** You're not part of my group, but that is part of our, evolutionary heritage. Yeah. And that's oxytocin and everything. It's, our ingroup.

[01:11:52] So who, is our ingroup right now? it's. The largely, it's the rich that are alive today is the ingroup that's calling the shots.

[01:12:01] **Josh Farley:** But you know, 5,000 years ago we were groups of like, you know, bands of 200 for the most part. And now we're, you know, I identify, you know, a fellow American, somebody who lives over in California Yeah.

[01:12:11] Of 360 million. You know, we have created cultural norms that allow us to cooperate at larger and larger scales and larger groups. And that's been human progress.

[01:12:22] **Nate Hagens:** So moving on to what I had as my number one or my 10th myth, which is that all the things we're discussing and others that economic laws are timeless and universal, like these things are true.

[01:12:36] Yeah. Irrespective of when humans are looking at them or what scale or whatever. what, is taught and what is the reality? Yeah. So it's really interesting that we

[01:12:47] **Josh Farley:** always, I always, you know, I look at science, so we observe nature, we develop hypotheses. How about how it works? After many observations, then if we test those hypotheses and can't refute them, they become theories.

[01:13:00] And then if over generations we can't refute a theory, it'll become a law. So we talk about the laws of thermodynamics, but the theory of evolution, you know, we really, you know, we're in science, we're very sparing with the use of the word law. Whereas in economics, you know, they'll take one little subset, you know, sayer law, that supply produces its own demand.

[01:13:22] There's, you know, the law of demand, the law of supply, we dub thing laws, based on casual, not even accurate, observations, you know, 'cause the cost of production goes down, not up. And, and I, compare this. As an undergrad, I was

a biologist and I actually believe that biology is the same now, not the field, but the actual biological processes have not changed.

[01:13:49] Yeah. Since the 1980s. Yeah. And yet, when I studied biology, the central dogma of cell biology consider the central dogma. This is just, you gotta accept this is that one cell or one gene code for one protein in a unidirectional flow. We now know that's wrong on every account. One gene can code for multiple proteins.

[01:14:07] genes can create proteins that go back and regulate the expression of genes. So, so the science has advanced the science and, that's one example. There's thousands of examples where. In biology, we have changed our understanding of the system and economics. On the other hand, the core theories have held, been around since the 1870s.

[01:14:29] The system has changed. The theories haven't, and biology like the, the,

[01:14:33] **Nate Hagens:** downward sloping supply curves, which you've shown are demonstrably, false or the, that they're upward sloping. That is a relic of the, small shops and the local production. It used to be the case, but 200 years ago.

[01:14:49] Again, going

[01:14:50] **Josh Farley:** back to complex systems, they have these critical parameters that if their value increases or decreases too much, it shifts the system in a new state. And we are in our economy, ramping up the value of so many critical parameters simultaneously, like, you know, international financial transactions, debt, you know, all of these things.

[01:15:12] And, and you know, so it's gonna shift the system into a new state. And yet our theories, you know, we just. we're so reluctant to change our theories in any meaningful way.

[01:15:23] **Nate Hagens:** Okay. So those were the 10 myths. Still taught at business schools that I came up with. And, we're already past an hour in here, but what, have I forgotten?

[01:15:33] My friend and PhD advisor. I'm sure there's some others. I

[01:15:37] **Josh Farley:** mean, yeah. Yeah. So in the beginning when you said the 10 myths, so I was saying 10 of the myths is far more accurate and some of those, you know, we actually covered. but I think we gotta start thinking very, differently about our economy.

[01:15:51] So for example, right now, you know this myth that the only thing that gives us welfare and utility is consumption. and we were talking before about how no, it's actually social connection. That does this. And so in the mainstream model, the idea is that production is a cost, consumption is a benefit and that's all we care about.

[01:16:12] Whereas in my view, production gives us the chance to interact with others collectively to share. Problems that gives more satisfaction and meaning and

[01:16:23] **Nate Hagens:** cooperation. So you're saying production in, tandem with consumption, not just consumption as the end all.

[01:16:30] **Josh Farley:** Well, in a way, I think with 8 billion people on a finite planet, I don't think consumption can be the variable right now.

[01:16:37] We look at consumption as the variable. If we produce enough, we can consume more and more I kinda look at it, well, gosh, you know, we're depleting the carrying capacity of our planet. We should probably shoot for secure sufficiency, meet all our basic physical material needs, and then for satisfaction, why don't we develop an economy where it's really fun to produce that stuff?

[01:16:57] You know, we're gonna be secure, we got what we need and let's just interact with each other. So that would be, you know, that's kind of a wildly, so the basic idea is, here I would say that, the economy is a continually evolving system and we've gotta accept that and we've gotta develop a new system that.

[01:17:17] You know, meets our current challenges. that would be one of the,

[01:17:22] **Nate Hagens:** One of the myths. Okay. And keep, going. 'cause I, have grow a building very large question that I want to ask you, but I want to give you time to, add any additional myths that you have. And I,

[01:17:34] **Josh Farley:** I,

[01:17:34] have many, but another one is many really, well, you know, economists to textbooks tell us that markets determine who are the winners and losers, and we shouldn't let the government get involved.

[01:17:44] And yet it's our tax laws, our subsidies what? Not what, you know, research, the government invests in our, our, you know, the fact that Trump is so wealthy is because real estate is the lowest tax sec, it's the most favorable tax laws for any sector of the economy. You know, it's not Trump's genius, it's Trump's.

[01:18:04] That the tax laws, the fact that, you know, under, Eisenhower, the highest marginal tax bracket was 90%, and the distribution, you know, the top 1%

had dramatically less of our total income. That, you know. So distribution of wealth is not determined by market forces, is determined by the government. What business sector succeed or fail is determined by the government.

[01:18:26] And this idea that the government should be kept out of it and let markets do that is nonsense. This is another huge flaw in economics that economists assume everything is like a normal distribution. And they assume in any economics textbook, they talk about all our production and consumption. all are, the mathematical formulas are smooth and differentiable and, And Mandel bro actually focused on fractal systems and, and I don't know, I don't, we're not taking too much time. in a calculus, you have a curve, a smooth curve, and you want to estimate the value of that curve. You take a pair of calipers and you measure the length of that curve, and as your calipers get closer and closer together, you, the length increases, asymptotically approaching its real length and increases by a smaller and smaller amount.

[01:19:18] Mandel bro looked at coastlines and he found that as we get more accurate ways to measure them, essentially using smaller and smaller calipers, the distance increased at an increasing rate. It's a radically

[01:19:31] **Nate Hagens:** different type of system. The length of the coastline from Maine to Florida, if, we use a tiny, calipers, is like enormously long, like longer than the planet.

[01:19:43] And every time we shorten the calipers,

[01:19:45] **Josh Farley:** the length grows by more. Wow. And these, so these are fractal distributions.

[01:19:51] **Nate Hagens:** What does that have to do with economics?

[01:19:53] **Josh Farley:** Well, so first of all, they, we model everything as though it's smoothed the French, which it's not. We're dealing with all these chaotic fractal systems and fractal systems.

[01:20:04] They lead to power law distributions. And, you know, smooth differentiable curves tend to lead to normal distributions. So we assume these normal distributions with where the, median or where the average means something. Whereas throughout economics, it's actually power law distributions and these andro nature, these kind of chaotic fractal systems that we, you know, so take a look at, Nord house's climate change model, which is dice, which is, you know, you know the possible outcomes and the probabilities of each.

[01:20:40] And therefore he assumes we know all possible outcomes in fractal systems. That would be a nonsensical thing. The tiniest little difference in starting position in a fractal system leads to totally different outcomes and, And so, you know, and they, learned that from weather reports when they had a machine doing a weather report, they halted it, ran the parameters back in, and you got a totally different outcome because you couldn't run it out to millions of, significant figures.

[01:21:09] **Nate Hagens:** It's funny because if I think back 30 plus years ago when I was getting my MBA at the University of Chicago, there were lots of Nobel Prize winners there, that were my teachers. and, I didn't know any of the things that we're talking about then. I was just trying to get a good job. and it, but it all seemed off to me.

[01:21:33] It seemed like trivia and like a real, even then I felt that it was narrow boundary. I remember I wrote, my honors thesis for Eugene Fama and Ken French. It was called, does the Millionth Monkey Live in Las Vegas? And I looked at the information in, public sports betting markets. It, just goes to show you how my worldview, has widened substantially in, in the last 30 years.

[01:22:03] Yeah. Partially I blame you for that. But, so what other, what other myths are, there that are still taught? I'm sure you think about this all the time by the way. Like, do you, are you still writing papers on all this stuff or. In addition to teaching.

[01:22:18] **Josh Farley:** Yep. In fact, probably writing more papers now.

[01:22:20] and so this year I'm on my sabbatical and I'm gonna dramatically revise the, ecological economics textbook. And, you know, for example, we model economies as an equilibrium system and that the efficient market hypothesis does efficient, or as equilibrium systems are based on negative feedback loops.

[01:22:39] But we know that debt is based on exponential growth, which is a positive feedback loop. Our economy is based on exponential growth. It's a positive feedback loop. So we model, especially at the macroeconomic level, we claim it's an equilibrium system when I would argue it's a wildly disequilibrium system.

[01:22:56] Empirically obvious that we have bubbles and bus all the time, and yet we call those corrections. They're not bubbles. And bus, Hyman Minsky proposes the financial instability hypothesis, which is kind of the exact counterpoint to F'S efficient market hypothesis. So I think that the idea that, It's a, you know, an equilibrium system is crazy. Another myth, if we're going there, you know, we say supply curves are supposed to slope, you know, they show 'em sloping up. Demand curves don't always slope down either. So the idea is use value. If you're buying something to use it, the each additional unit has less value, but.

[01:23:39] We live in a market economy, we buy things for exchange. So when the price of you don't buy stocks, you know, because they have a low price, you buy stocks because the price is rising. And that means, and that's not the price, it's the change in price,

[01:23:54] **Nate Hagens:** but there are like vain goods. The higher the price, the more the demand is for that.

[01:23:58] Right. That's true too. And, what in, a social species, what percentage of our a social species that marketing is one of our most deleterious inventions. What percentage of our consumption is actually some sort of a status signal and a vine? Good.

[01:24:13] **Josh Farley:** A huge amount. Interestingly, like with my students, the Lon good is how much of your food did you grow yourself?

[01:24:18] How many times did you repair your own clothes? How much, you know, how much that's giving

[01:24:23] **Nate Hagens:** them flex and status right

[01:24:24] **Josh Farley:** now. Yeah. Oh yeah. Really? So among in the degrowth movement and these folks. but you know, that's a very narrow population. Yeah. Yeah. Yeah.

[01:24:32] **Nate Hagens:** So, just outta curiosity, how many more myths could you come up with?

[01:24:37] if I was, giving you the time and bandwidth?

[01:24:41] **Josh Farley:** I mean, I, could come up, I could come up with an awful lot more. you know, I, knew I didn't have time to think about it, but, yeah, there's so much that is, and this is why I've become a worse professor because the more I learn, the more I struggle to cram it all in.

[01:24:57] And I can't, I was much better, I think when I was more ignorant here,

[01:25:00] **Nate Hagens:** here on that one. Professor Farley, let me ask you this then. I've just always been under the assumption. Because one of the core values I have in my life is I care about the truth. And I just kind of assumed that the institutions, especially education, is this evolving, real time peer review process.

[01:25:27] And the truth remains. And it's kind of like a sharpening a samurai sword. we get rid of the stuff that's not true. But it seems like in the single most important discipline of our world today, which is economics and finance, it is not based on the truth at all. How do we explain this and

[01:25:53] **Josh Farley:** where do we go from here?

[01:25:55] So I think that's a great question and that really gets at, you know, my philosophy of the social sciences in the natural sciences, we're looking for the truth. So I'm observing a system to try to understand how it operates in the socials sciences. I'm not observing our system. Try to understand how it operates.

[01:26:12] I am trying to change it. And, our theories in economics do change the systems. So I mentioned earlier that simply taking a course in economics gets people to think more like Homo Economicus, but nobody can deny that mark's his theories about the system he was studying changed the system he was studying.

[01:26:33] And that is true for Adam Smith, Marx, Kanes Friedman, hopefully Herman Daley. you know that our theories do, and this is the other thing, you know, and this gets back to your thing where you're talking about the laws of economics. No, we have theories that do change the system and you know, when you tell everybody that.

[01:26:54] Acting in your own individual self-interest is the best thing. Then people do that and it creates a system better tailored to that. But if you create a

system that's focused on social dilemmas and the need for cooperation, which is what I think evolution did, then you get a

[01:27:09] **Nate Hagens:** different system. So is this a distinction between normative and positive thinking?

[01:27:14] that the natural sciences are kind of what is, and the social sciences are, what should be

[01:27:20] **Josh Farley:** my view on this? What normative is values or norms or ethics? Where did those come from? In my view, they evolve. They coach culturally evolve the, bind us together into a collective capable of solving social dilemmas and the good, put the good of the group ahead of the individual.

[01:27:39] We needed very powerful cultural norms to evolve to do that. We created the system we have now, this is what humans do. But if you so norms, and again, this is, you know. Natural selection requires inheritance, mechanism variation, and differential survival. Genes are the inheritance mechanism that we always talk about.

[01:28:00] Variation is the alleles differential survival. We know that if you have a, you know, a. You know, some genes you'll survive better than others, but culture also is inherited. Where did you get your culture from? You know, you inherited it from your parents and your community and they cultures vary wildly.

[01:28:19] In fact, there's more variation between cultures than between individuals in a culture and it, huge impact on our survival. Send some Wall Street executives to the, you know, Inuit territory and see how well they do, or vice versa. Send some Inuit to Wall Street and see how well they do. So culture is every bit as much of natural selection as genes.

[01:28:42] And I believe that our moral values evolved to lead us to, to allow us to cooperate into a society. And when people distinguish, they say, oh, science is about, you know, what's, you know, positive and ethics is about what's normative. I think those are creationists, you know, I think if you're saying. Ethics and normative values are outside the domain of science.

[01:29:07] You're saying They didn't devolve, they didn't, they were somehow, you know, sent from on high. I'm not a creationist. So I think that, that distinguishing between saying normative is not part of science is, you know, no more foundational than saying that genes aren't part of science. You know, we know the mechanisms by which cultures evolve and, and moral

[01:29:29] **Nate Hagens:** values evolve.

[01:29:30] So let me, let me close with a, difficult question. you, we've outlined a dozen plus myths that are being taught in business, schools and economic, courses, presumably. We believe in culture's ability to change, based on understanding the truth. and yet we live in a time where there's massive distrust in Congress and in government.

[01:30:02] And so the question that bubbles up for me is if we're going to change in the direction of truth science and the human potential, the human organism, the human animal living now and in the future, who's gonna lead that charge? And how would that happen?

[01:30:23] **Josh Farley:** And this actually relates to another one of the big myths is that we say the profit motive is gonna push all resources in the right direction.

[01:30:30] Right now, most information that people are, you know, exposed to is driven by social media, by. Buy the profit motive. So if you look at all our biggest firms, you know, Google and, you know, Facebook and Apple, you know, their goal

is to get you to look at ads, to get you to buy stuff. And we've developed, I think social media can communicate with people around the world as tremendous power to shape our cultures.

[01:31:01] And we've decided we'll turn it entirely over to the for-profit sector. It's not pursuing truth, it's pursuing profit. And so why don't you asked me if I was still writing? So a paper I wrote last year was calling for a transnational knowledge commons in which, Universities around the world who form a consortium, all the knowledge they produce that's necessary for a socially just sustainability transition is freely available to all.

[01:31:27] I also think they should be the ones deciding, you know, putting together social media where the, algorithms are not designed to get you to, you know, see more ads and buy more. You could actually develop algorithms that would be designed to reduce teenage depression, to reduce our consumerism, to stimulate the cooperation and, you know, collective, human interaction and anti-consumerism required for the future.

[01:31:56] But we've just decided that almost all the knowledge we get is going to be, determined by the profit motive. And that's just bonkers.

[01:32:05] **Nate Hagens:** The epitaph, homo sapiens truth or profit question mark. it's a, it's an open question. Josh, it's been so good to talk with you again. you're not only my PhD chair, but one of my best friends.

[01:32:22] I'm gonna ask you this question because I know you will enjoy it. if you were to come back in the future on this show, which you probably will, what is one thing that you're super passionate about that you would like to take a deep dive on that's relevant to human futures? I

[01:32:39] **Josh Farley:** mean, I guess what's been really exciting me most is the fact that, you know, when I studied evolution, you know, we were taught about competition.

[01:32:48] Everything is competition. Now we realize that. It's really is about cooperation. You know, that whole little spiel from the, you know, our lans to the Multicellular animals. and I think that has really profound implications for our future. And it actually is what gives me hope because we have managed to cooperate at larger and larger scales and address the challenges we face.

[01:33:12] And I think that, you know, the profit motive, we have an economy right now that is focused on the selfish individual when we need an economy that is focused on the relationship between humans and the rest of nature, which in my view should be the same relationship as between a cell and the body. You know, we should take the minimum we need for our survival so that we can protect the whole without which we can't exist.

[01:33:36] And so, if I was gonna do one thing, I, like to elaborate on those ideas. Which I think are, which are, because largely they're what give me hope that we actually have, ways out of our current dilemma, but not through markets

[01:33:52] **Nate Hagens:** and profit motives. Let's do it. thank you so much, hi to Mrs. Farley and your family and, to be continued, my friend.

[01:34:00] Enjoy your sabbatical and thank you for your important work. Yep. And great to see you, Nate. If you enjoyed or learned from this episode of The Great Simplification, please follow us on your favorite podcast platform. You can also visit The Great Simplification dot com for references and show notes from today's conversation.

[01:34:20] And to connect with fellow listeners of this podcast, check out our Discord channel. This show is hosted by me, Nate Hagens, edited by No Troublemakers Media, and produced by Misty Stinnett, Leslie Balu, Brady Hay, and Lizzie Siri.