

Future Direction Sections

Committee

Proposal Part I

Description

This study will look at the impacts of bitcoin as the first language of communication that all 8 billion can natively speak. Tentatively titled “Bitcoin: 21 Million Tools for the 21st Century,” it will explore Bitcoin as the first “language” to:

- 1) win both the “language game” and “money game” by enabling 100% error-free transactions and preserving wealth
- 2) be universally verifiable
- 3) be accessible to (spoken by) all 8 billion people globally.

The 21 million bitcoin, by extension, will act as tools to help us understand and shape an evolving world.

Description of preparatory coursework or experience

In short, I’ve lived this topic for the past 4 years, and honestly, I still feel like I barely know anything.

In the context of Bitcoin, over the past 4 years, independently, I’ve spent between 5,000-6,000 hours falling down the Bitcoin rabbit hole. To me, the true wealth you gain in Bitcoin is knowledge.

My journey began my senior year of high school in 2020. The impetus is not relevant.

One piece of context that is relevant is that through February 2021 - October 2022 (senior spring of high school to my sophomore fall of college), I worked at IBM as their STEM for Girls program manager and on their learning platform, IBM SkillsBuild and there was quite a bit of “Blockchain” conversation.

In high school, I elected to pursue my school’s Technology, Innovation, and Entrepreneurship Certificate, which was a 3-year program in which you selected a distribution area (I chose innovation) to take classes under and then culminated in a capstone project your senior year. One of these courses was titled *Blockchain Technologies*, and my project was a financial literacy website called Asset. Concurrently, I took Gary Gensler’s MIT Blockchain & Money Course from 2018, which was published on YouTube in 2020.

Then, the learning continued as my freshman year at college when I lived by myself as my freshman year at NYU Shanghai moved entirely online and that meant I took classes from 5am to 2am. Natalie Brunell’s Coin Stories was often breakfast, Preston Pysh’s Bitcoin Fundamentals was lunch and Peter McCormack’s What Bitcoin Did was dinner time.

In my freshman spring of college at NYU Shanghai, in a class called Creativity Considered, taught by former Cornell President Jeffrey S. Lehman, we did a semester-long project studying a creator of our choice (I chose Cathie Wood) with applications to our class topics.

Then, that Summer, I attended the Human Rights Foundation's Oslo Freedom Forum, which was my tipping point and then I fell down the rabbit hole. Since then, I've read countless books, articles, tweets (there's a lot of knowledge on Twitter!), listened to just as many podcasts, Twitter spaces, panels/conferences, and had wonderful and thought-provoking conversations.

However, my interest in language precedes Bitcoin. My junior year of high school, I decided to study abroad in Beijing, having no prior knowledge of Chinese. When I landed, the only way I could express myself was through facial expressions or Bing translate (no Google), and I felt a huge part of my personality and ability was missing.

On a more serious note, imagine if you can't open your mouth to speak because of your social credit score. Or, you are a child that was not supposed to be born, so you cannot receive a hukou and are literally referred to as a "ghost person" in the eyes of the state. This means that you cannot "secure a national-identification card, attend school, access basic medical services, find a place to live, board a bus or train, open a bank account, get a job, and secure a passport" ([source](#)). "In 2010, China estimated that 13 million people had not been properly registered" ([source](#)). And, this also doesn't include the Uyghur population. This is just in China; many people worldwide can't economically speak.

Now this brings us today, I am working with Professor Sarah Kreps at the Cornell Brooks Tech Policy Institute, looking at Bitcoin Adoption and financial freedom in 25 countries, which will give me insight into Bitcoin's status as a form of expression.

Now for my academic journey at NYU and Cornell. Given my proposed title and study, these courses all support the inquiry into language and game theory's impact on how humans perceive information, retain information, make decisions, come to an understanding of how the world works, think about the future, and are influenced by external factors.

I'll make a note that there are more, but I feel these are the most relevant because I've written about concepts related to bitcoin in all of them.

Courses:

- Fall '21
 - CCSF-SHU 101L-014: Global Perspectives on Society
- Spring '22
 - CCST-SHU 132-001: Creativity Considered
 - WRIT-SHU 102-013: Writing as Inquiry: WII
 - INTM-SHU 205-002: What is New Media?
- Fall '22
 - COGST 2415: Introduction to Moral Psychology
 - INFO 2040: Networks I

- GOVT 1101: Global Governance
- Spring '23
 - COGST 2150: The Psychology of Language
- Fall '23
 - COGST 1101: Introduction to Cognitive Science
 - ILRID 1700: Introduction to Organizations and Management
 - COGST 3801: Introduction to Game Theory and Strategic Thinking
 - PSYCH 1101: Introduction to Psychology
- Spring '24
 - PHIL 2810: Introduction to Philosophy of Science
 - COLLS 3001: College Scholar Seminar
 - COGST 4350: Mind, Self & Emotion
 - LING 3150: Language & Power
- Fall '24
 - COLLS 4990: Honors Thesis
 - COGST 4331: Event Cognition: How Minds, Brains and Bodies Experience Events
 - INFO 4500: Language and Technology
 - COGST 4270: Evolution of Language
- Spring '25
 - COLLS 4991: Honors Thesis 2
 - INFO 4360: Communication Networks and Social Capital

I've also had the immense gift of attending and speaking at conferences and on podcasts across 17 countries, showing me how Bitcoin is being spoken worldwide.

Conferences:

1)Norway

- Oslo Freedom Forum 2022
- Oslo Freedom Forum 2024

2)USA

- Pacific Bitcoin 2022
- Global Bitcoin Summit 2023 - Invite Only
- Pacific Bitcoin 2023
- AIER x BPI 2024 - Invite Only
- Bitcoin Policy Summit 2024
- BitBlockBoom 2024
- Bitcoin 2024 (USA) - Speaker

3)Czech Republic

- Bitcoin Prague 2023 - Speaker

4)Ghana

- Africa Bitcoin Conference 2023 (Ghana) - Speaker

5)Portugal

- Bitcoin Atlantis 2024 (Portugal) - Speaker

6)Latvia

- Baltic Honey Badger (Latvia) - Speaker

7)Brazil

- Satsconf (Brazil) - Speaker

8)Kenya

- Africa Bitcoin Conference 2024 (Kenya) - Speaker

Podcasts:

USA

- Hard Money with Natalie Brunell
- The Café Bitcoin Podcast
- The Progressive Bitcoiner
- Orange Hatter Podcast
- #Bitcoin Fixes This by Jimmy Song x2
- The Bitcoin Source
- Coin Stories with Natalie Brunell
- The Bitcoin Veterans Podcast
- Zoom Out
- Blockchain @ CSUN
- The Bitcoin Daily Show

9)Canada

- Why Are We Bullish
- Life with Bitcoin Podcast

10)UK

- Rabbit Hole Stories Podcast
- Access Tribe Podcast

Kenya

- The Core
- ABC

11)Netherlands

- Bitcoin for Millennials

12)Austria

- The Bitcoin Path

13)El Salvador

- BitCorner Podcast

14)Ireland

- The LarPar Show

15)India

- Study Bitcoin with Aditya

16&17) Finland & Norway

- The Freedom Footprint Show

Statement of the importance of your project within its field

The field is the world.

The study of Bitcoin sits at the intersection of math, physics, computer science, cognitive science, philosophy, biology, game theory, linguistics, engineering, monetary theory, economics, finance, morality, etc. Furthermore, most people, given “coin” in the name, diminish Bitcoin to only a monetary asset. They never consider it a technology, a liberating, freedom and privacy-protecting, digital energy savings technology. Additionally, Bitcoin is fundamentally different from any other cryptocurrency. “Broader” cryptocurrency will be labeled, at best, an intranet technology and, at worst, an unregistered security bordering on fraud.

Spending means that you value something more today than in the future. While there is nuance here, savings, on the other hand, is a vote of confidence in the future.

Because Bitcoin provides a censorship-resistant way to save that cannot be debased, it will be transformational. There is a humanitarian imperative affecting generations, present and future, to study all aspects of Bitcoin and Students need to think outside our current systems and build a more inclusive, truthful, and honest world.

There can be verbal and non-verbal methods of communication. Bitcoin is a non-verbal method of communicating value verifiably, winning the language game. There can be finite and infinite games. Bitcoin is an infinite game, allowing for the preservation of wealth and winning the money game. In terms of linguistics and game theory, evaluating Bitcoin might expand the concept of what is normally considered a language and what constitutes communication. Further, bitcoin might model a real-life impactful infinite game unlike ever before.

Timetable of relevant research

September 2024: Topic Selection & Proposal

- Week 1: Explore potential thesis topics; conduct preliminary readings in linguistics, cognitive science, game theory, and Bitcoin.
- Week 2: Finalize my research question and specific thesis topic.
- Week 3: Draft my thesis proposal, outlining objectives and significance.
- Week 4: Review and refine my proposal; submit it for approval. Finalize committee.

October 2024: Literature Review Part 1

- Week 1 - 2 : Conduct an extensive literature search; compile academic articles and books relevant to my topic.
- Week 2 - 4: Read and annotate key literature in my areas of focus.

November 2024: Literature Review Part 2

- Week 1 -2: Start writing the literature review section, integrating insights from my readings.
- Week 3 - 4: Finalize the literature review; seek feedback from my committee.

December 2024: Theoretical Framework & Concepts

- Week 1: Identify and outline the key theories and concepts from linguistics and cognitive science relevant to my thesis.
- Week 2: Draft a section on the theoretical framework, discussing its relevance to my topic.
- Week 3: Review and refine this section; incorporate additional literature as needed.
- Week 4: N/a
- Continue developing my theoretical framework and ensure clarity in my arguments.

January 2025: Drafting Core Sections

- Week 1: N/a Write the introduction, framing my research question and context.
- Week 2: Continue developing my theoretical framework and ensure clarity in my arguments.
- Week 3: Draft sections on game theory applications in the context of Bitcoin and cognitive science.
- Week 4: Explore linguistic implications of Bitcoin discourse; draft that section.

February 2025: Continued Writing

- Week 1: Integrate all drafted sections into a cohesive draft & Revise the introduction and ensure all sections are connected logically.
- Week 2: Draft the discussion section, focusing on the implications of my findings.
- Week 3: Write the conclusions and any recommendations for future research.
- Week 4: Review and refine all sections; compile into a comprehensive first draft.

March 2025: First Draft Completion

**Maybe by this time will have learnings from CBTPi Study*

- Week 1: Self-edit and review the entire draft for coherence and clarity.
- Week 2: Take a break from the draft to gain perspective.
- Week 3: Share the draft with peers or my advisor for feedback.
- Week 4: Incorporate feedback and revise the draft accordingly.

April 2025: Final Revisions

- Week 1: Finalize the literature review and theoretical framework sections.
- Week 2: Polish writing, check formatting, and ensure proper citation.
- Week 3: Proofread for grammar, clarity, and coherence.
- Week 4: Prepare the final version for submission, ensuring all elements are included & Make last-minute edits based on advisor feedback

May 2025: Submission

- Week 1: Finalize and format the thesis document for submission & ensure everything is in order for submission.
- Week 2: Submit the final thesis & prepare for my thesis defense

Outline of project

[Thesis outline](#)

Working bibliography and list of materials with indication of the availability of sources

Papers

COGST 2415: Dwyer, “How Good is the Linguistic Analogy” just pages 237-242 (CANVAS)

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Language as a Social Cue (Kinzler)

Early Origins of Identity: Infants’ and Children’s Thinking About Language and Culture (Dejesus et al)

The economics of linguistic exchanges (Bourdieu)

Adolescent social structure and the spread of linguistic change (Eckert)

The need for new approaches to social class analysis in sociolinguistics (Rickford)

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Thomas Kuhn, “Objectivity, Value Judgment, and Theory Choice”

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Bitcoin: Everything Divided by 21 Million by Knut Svanholm

Broken Money: Why Our Financial System is Failing Us and How We Can Make it Better by Lyn Alden

Check Your Financial Privilege by Alex Gladstein

Cryptosovereignty: The Encrypted Political Philosophy of Bitcoin by Erik Cason

Gradually, then Suddenly by Parker A. Lewis

Hidden Repression: How The World Bank and IMF Sell Exploitation as Development by Alex Gladstein

Layered Money by Nik Bhatia

Principles of Economics by Saifedean Ammous

Resistance Money: A Philosophical Case for Bitcoin by Andrew M. Bailey, Bradley Rettler, Craig Warmke

The Bitcoin Standard by Saifedean Ammous

The Fiat Standard by Saifedean Ammous

The Price of Tomorrow by Jeff Booth

The Sovereign Individual by William Rees-Mogg and James Dale Davidson

Praxeology by Knut Svanholm

The Genesis Book: The Story of the People and Projects That Inspired Bitcoin by Aaron van Wirdum

Bitcoin: A Game-Theoretic Analysis by Micah Warren

The Hidden Cost of Money: How Financial Forces Shape Our Lives & the World Around Us by Sebastian Bunnay

Maps of Meaning: The Architecture of Belief by Jordan Peterson

Numbers Don't Lie: 71 Stories to Help Us Understand the Modern World by Vaclav Smil

The Master and His Emissary: The Divided Brain and the Making of the Western World by Iain McGilchrist

The Case Against Reality: Why Evolution Hid the Truth from Our Eyes by Donald Hoffman

Energy and Civilization by Vaclav Smil

Awakening from the Meaning Crisis by John Vervaeke

The Fourth Turning: An American Prophecy - What the Cycles of History Tell Us About America's Next Rendezvous with Destiny by Neil Howe and William Strauss

The Structure of Scientific Revolutions by Thomas S. Kuhn

Number: The Language of Science by Tobias Dantzig & Joseph Mazur

Infinite Powers: How Calculus Reveals the Secrets of the Universe by Steven Strogatz

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The Language Instinct: How the Mind Creates Language by Steven Pinker

Language Unlimited: The Science Behind Our Most Creative Power by David Adger

Grand Transitions: How the Modern World Was Made by Vaclav Smil

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Beau Lotto, "The Neuroscience of Creativity, Perception, and Confirmation Bias," 2017, at <https://www.youtube.com/watch?v=vR2P5vW-nVc>.

Weinstein

Breedlove

Cason

McCormack

Identification of notation style for the project's final version

Given Cognitive Science and Linguistics both follow the APA citation style, so will this thesis.

Proposal Part II

“In the majesty of the quantum world, in the beauty of building blocks, in the tiniest of elements, I
glimpse the privilege of being.

The alertness does not subtract. It adds.

It is not our inheritance merely to abide in this beautiful world.

It is our inheritance to understand it.”

- *Madam Secretary, Season 3 Episode 11*

Rule #67: Ego is the most dangerous word in the human language (The Good Life Guide).

Preamble

“Like physical coins, Bitcoin has two sides. Unlike physical coins each side serves a purpose. One side, like physical coins, is its monetary purpose. The other, unlike physical coins, is as a mirror that shows you aspects of yourself that were previously invisible.” (Tomer Strolight, X, Jan 3, 2024). “[Bitcoin is a Test](#)” (Tomer Strolight, June 11, 2021).

More broadly, I think we find parts of ourselves that were previously invisible when we purposefully take away comfort, familiarity, and truly embrace the unknown.

For me, I’ve done this through language; Language has shown me aspects of myself that were previously invisible. [such as]



The Beijing Guozijian, 北京国子监, the Imperial Academy or Imperial College and Temple of Confucius, November 13, 2019.

In August of 2019, I left for China to begin writing my own story to discover who I was, what I valued, and what I was curious about. When I arrived, I was all I knew, and I'd never been more confused about who I was. I didn't know my classmates, teachers, host family, neighborhood, the culture, or the language.

One of the many incredible parts of my (what was supposed to be) year abroad was my teachers. One day, 李老师 Lǐ lǎoshī, Teacher Li, was explaining to us the construction of the Chinese character 孝顺 xiàoshùn, which means “filial piety.”

For context, all Chinese characters are composed of form, meaning, sound, the morphosyntactic and phonetic elements. And include 1 of 214 radicals to help index the characters. Radicals are those such as roof, woman, child — characters that reappear a lot in other characters. Finally, they are composed with a selection of the 8 strokes. Initially, I thought Chinese was just uncorrelated lines. Again, I was wrong. Learning the art of writing Chinese characters, taught me that the Chinese language is actually a beautifully creative language based in combination and pattern.

Back to class. So, Teacher Li says, “Looking at this character you probably don't know where to begin to learn how to write it and you maybe have no idea what it means, but I'm going to prove you wrong.... What character do you recognize on top?”

Class: The character 老 lǎo for “old.”

Teacher Li: Correct. What do you recognize on the bottom?

Class: The character 子 zǐ for “child.”

Teacher Li: And, what does filial piety mean?

Class: It's one of the 5 basic relationships from Confucius: ruler and subject, father and son, elder brother and younger brother, husband and wife, friend and friend; that parents should care for their children when they are young and children should support their parents when they are older.

Teacher Li: Do you know see how 孝 xiào is really just a combination of the top part of 老 lǎo and 子 zǐ, with 老 lǎo on top visually showing that children should support their parents? This character construction, combination, visualizes a central tenet of Confucianism: the lifelong supporting relationship between parent and child, that children should support their parents when they grow up.

Mandarin, like many other ancient languages, provides a code of behavior.

At the same time I was learning Chinese, I was learning about AI and Singularity (if it actually happens). For context, Singularity is the concept that all combined human intelligence could be overwhelmed by machine intelligence by/in the year 2040. If this were to happen, it is critical its (AI) algorithms allow for

human-like empathy. Its algorithms' code must recognize 孝 xiào encourages a relationship of support and not of squashing. So, I wondered if you could code ethics in a computer language, in AI, just like you could code ethics in a spoken language...I wondered, "How do we embed ethical reference points in algorithms for AI to exhibit empathy?"

Learning Chinese, opened up my mind to the power of language to shape society.

5 years later, in August of 2024, I arrived back in Ithaca to begin truly writing this thesis. Having been reflecting on a conversation with Femi Longe at the Human Rights Foundation's 2024 Oslo Freedom Forum in Norway where he introduced The Johari Window Model, a concept from communication theory.¹ This model is meant to help increase understanding and communication in a group by identifying information across four quadrants:

	Known to Self	Unknown to Self
Known to Others	Known	Blind Spot
Unknown to Others	Hidden	Unknown

Paraphrasing, Femi said, "Ella, in your thesis, you need to get into the 4th quadrant; the unknown, unknown. Resist group-think; Resist dogma."

Bitcoin, being a mirror, chose for me the direction this thesis would take and how I would enter the "Unknown."

For me, it's always been through language.

During my time in China, I was moved, through language, by the 2nd of 5 basic relationships from Confucius: parents are caring and children are respectful (父慈子孝).

During my time in Bitcoin, I have been moved, through language, by the 5th of the 5 basic relationships from Confucius: friends are trustworthy (朋友有信).

Or, should I say: Peer-to-Peer.

Bitcoin is a language. Bitcoin is a peer-to-peer mechanism "to make payments over a communications channel *without a trusted party*."²

When I shared with others I was headed to Beijing for my junior year of high school, the most common response was: "Why are you doing that? It's so far away, and the culture is so different. You should be careful. You should stay home where you are comfortable and recover after your parent's divorce."

¹ <https://www.communicationtheory.org/the-johari-window-model/>

² <https://bitcoin.org/bitcoin.pdf>

On the one hand, before coming to China, I'm embarrassed to admit, but I thought every day would bring new challenges, new foreign situations I couldn't comprehend. I didn't think I was going to Mars, but maybe it was close. On the other hand, while I didn't know any elements of Chinese culture, my classmates, host family, or teachers, I did know China was only an eight-hour rest and three movies away. Departing for Beijing, I was scared. However, bustling through the Beijing airport upon arrival, I realized my fear originated in the unknown, and I decided not to be scared of something I couldn't identify.

You might be feeling this about Bitcoin. As I thought I was going to Mars, you might think Bitcoin is a "pet rock"³ or "rat-poison squared."⁴

This thesis will have the following goals:

1. Enter the "Unknown" - Bitcoin as a linguistic system / language protocol.
2. Attempt to define what B(b)itcoin is. Language is imperfect and so is all the other sides of the coin of Bitcoin. However, bitcoin is clear; it's just money. A means to transfer (financial) information in the most truthful, verifiable, and transparent way.
3. Present bitcoin as a verifiable language for all 8 billion people, grounding our world in truth
4. Propose how Bitcoin wins the language game and wealth games, allowing the 21 million bitcoin to be tools for the 21st century
5. Open up the floodgates of further inquiry on Bitcoin
6. Take the stigma away from Bitcoin - you don't have to learn a new language but your space of possibility is smaller and you just have to be okay with that (and it has generational consequences)

As Confucius' message guided and continues to guide my academic pursuits, this year, his broader message of 孝 xiào, the importance of actively working to strengthen the relationships around oneself, began guiding my personal pursuits. My fascinations in patterns grew into a fascination with how information is processed, presented, and understood across cultures. I enjoy fostering connection amongst people, ideas, and points of view, especially those who otherwise might not meet or intersect. Americans today tend to believe that the Chinese are drastically different from Americans, but going to China, I decided for myself what China was like, and I only felt the world get smaller.

Before coming to China, I remember myself responding to others' comments with: "I don't know what I'm getting myself into." I thought there would be some drastic change in my daily life. I realize now how much I had been impacted by this "othering" of China so prevalent in US culture.

Yet, as I did my homework, my eight member host family played country music, they wore their pajamas all day on the weekends, and my two host sisters loved giving their family members hugs. Just as I would race down the stairs to hug my dad as he arrived home, my host sister takes a break from her studying to race to the front door as my host dad comes home. They love cilantro, sweet potatoes, and peaches just as much as I do. We also have a shared love of spice; my love originates from Tex-Mex food in Houston, and their love originates from the Sichuan Province cuisine. I see the relationship I had with my maternal grandmother when I was little in my youngest host sister and her maternal grandmother, a light hearted

³ <https://finance.yahoo.com/news/jamie-dimon-tells-davos-bitcoin-172918767.html>

⁴ <https://finance.yahoo.com/news/warren-buffett-says-wouldnt-pay-175917403.html>

relationship of smiles and fun. I see the relationship I had with my paternal grandmother when I was little in my other host sister and her paternal grandmother, a relationship of obligation, not as much fun. I even developed the same relationship with the guards outside school as I had with one of the security guards at my K-8 school in Houston, Mr. Allen. I agree that I felt victim to the idea that Chinese society is drastically different from American society, and though I concede that Chinese society is different from American society, I still insist that it is not drastically different.

Once you know the causes of a problem, the solution becomes clear. Distance can exaggerate differences, but thoughtful understanding undermines this ability.

Humans all inherently strive for the same things: to find joy in the day, place value on those around them, and succeed for themselves and those they care about. If we can foster understanding, if we can foster empathy, we can strengthen relationships around the world and cultivate cross-cultural collaboration, necessary for protecting and innovating for the future and maybe even creating an empathetic AI. Sometimes we support, and sometimes we need to be supported. The relationship 孝 visualizes can be a global one; we just have to try. Chinese culture has supported me for the past couple of years, but I hope my life's work results in something that supports others. I hope to spend the rest of my life traveling the distances to limit differences, to discover the ethical points of connection in the patterns that make up our cultures. Community is my bedrock, but I discovered it is consistently inconsistent, always there but always evolving through myself and others. By going to China, the world grew smaller. I was able to wrap my arms around something that once seemed and that I was once told was incomprehensible.

Bitcoin is a mirror. Maybe it will show you parts of yourself and your assumptions that you thought were invisible.

Introduction

"The fourth stage of human development is coming...Human cultures have blind spots...only a few heretics have bothered to think about how transitions from one phase of civilization to another actually unfold. How are they triggered? What do they have in common? What patterns can help you tell when they begin and know when they are over?...To see "outside" an existing system...breaches a convention that helps keep the system functioning" (The Sovereign Individual, 54-55).

"...history's great transformations are perceived, or rather, misperceived as they happen...The Romans were reluctant to acknowledge the changes unfolding around them. So are we...The change will be so profound, in fact, that to understand it will require taking almost nothing for granted (The Sovereign Individual, 59).

All the way down to our language, to our communication protocols.

Communication Protocol: Language

You experience advantages and disadvantages in the world depending on what (non-monetary) language (protocol) you speak.

Today, around 7,000 languages are spoken on Earth,⁵ and 44% of all the information in the world is produced in English, followed by 7.6% in German. However, critical to note is that 56% is produced in non-English languages.⁶

Despite Mandarin Chinese having more than 918 million native speakers, English, with around 375 million native speakers, is the dominant language.⁷ For instance, 19/20 top universities in the world are in English-speaking countries.⁸ If you speak English, you can unlock unparalleled opportunities.

Communication Protocol: Money

Similarly, you experience advantages and disadvantages in the world depending on what (monetary) language (protocol) you speak.

Today, there are about 180 currencies on earth;⁹ however, the current global reserve currency is the US dollar, more specifically, US Treasury Bills, cemented at Bretton Woods after World War II.¹⁰ Yet, the US dollar is the native currency for only 4.18% of the global population.¹¹ Furthermore,

- 59% of global foreign currency reserves are in US dollars (2nd largest is the euro at 20%)
- 64% of world debt is denominated in US dollars.
- 58% of international payments (excluding payments within the eurozone—and foreign exchange transactions) are in US dollars
- 54% of foreign trade invoices globally are in US dollars¹²
- 88% of foreign exchange transactions are in US dollars.¹³

This dollar dominance provides Americans with a huge advantage. Why so? The “Cantillon Effect.” This effect describes that “the closer you are to the source of money creation, the more you benefit.”¹⁴ For instance, you are able to receive your salary in the most dominant/demanded currency and you have direct exposure/access to participating in the world economy. Similarly, the further you are from the source of money creation, the more “pain” you feel. One of the United States’ largest exports is inflation. Over the past 10 years, G20 countries’ currencies have declined against the US dollar by:

1. Argentine Peso: -98.3%
2. Turkish Lira: -92.6%
3. Russian Ruble: -66.7%

⁵<https://www.bbc.co.uk/languages/guide/languages.shtml#:~:text=1,by%20less%20than%20100%2C000%20people>.

⁶<https://journal.lib.uoguelph.ca/index.php/perj/article/view/826/1358#:~:text=English%20dominates%20universal%20information%20space,of%20the%20global%20information%20production>.

⁷<https://www.middlebury.edu/language-schools/blog/what-are-most-popular-languages-world>

⁸<https://www.usnews.com/education/best-global-universities/rankings>

⁹<https://www.nber.org/reporter/2022number1/dominant-currencies>

¹⁰<https://www.cfr.org/background/dollar-worlds-reserve-currency#:~:text=How%20did%20the%20U.S.%20dollar,IMF%20and%20the%20World%20Bank>

¹¹<https://www.census.gov/popclock/>

¹²<https://www.brookings.edu/articles/the-changing-role-of-the-us-dollar/#:~:text=The%20dollar%20makes%20up%20a,of%20for eign%20trade%20invoices%20globally>.

¹³<https://www.atlanticcouncil.org/programs/geoeconomics-center/dollar-dominance-monitor/#:~:text=one%20side%20of,So%20for%20instance%20the%20dollar%20i s%20involved%20on%20one%20side,of%20individual%20currencies%20totals%20200%25>.

¹⁴<https://river.com/learn/terms/c/cantillon-effect/>

4. Brazilian Real: -55.4%
5. South African Rand: -47.6%
6. Japanese Yen: -34.3%
7. Australian Dollar: -31.7%
8. Indonesian Rupiah: -26.3%
9. Mexican Peso: -25.7%
10. British Pound: -24.8%
11. Indian Rupee: -24.7%
12. Canadian Dollar: -23.8%
13. Euro: -22.4%
14. South Korean Won: -20.8%
15. Chinese Yuan: -16.2%
16. Singapore Dollar: -8.5%
17. Swiss Franc: -1.6%
18. Bitcoin has been up 21,369% against the US dollar (By The Numbers).

In his book *Parallel: The Bitcoin Social Layer*, Brian E. De Mint explains that “there have been thousands of currencies throughout history,” but “the average lifespan of a fiat currency is 27 years...[and] the upper limit for fiat currencies is about 48 years.”¹⁵ The reasoning is simply that governments spend more than they make. They print money to make up for the deficit, decreasing its value and breaking their money in the process.

Historically, global reserve currencies have lasted, on average, 100 years.¹⁶ While history cannot predict the future, following the pattern since the Florentine Florin in 1250, it could be assumed the world will transition to a new reserve currency around the year 2044. Furthermore, it’s been 53 years since the US dollar was backed by gold (past the upper limit of 48 years), and the US finds itself in a debt spiral, which, as the name suggests, is impossible to exit from.

Imagine if every 27- 48 years, you had to learn a new (non-monetary) language. Imagine the societal dysfunction that would ensue.

Communication Protocol: Bitcoin

Bitcoin: A Peer-to-Peer Electronic Cash System

The above is the title of Bitcoin’s whitepaper.

The word “bitcoin” is mentioned twice in the white paper. The word “network” is mentioned twenty-one times in the white paper. With the addition of a second person, a network emerges. When there are two people instead of one, communication emerges as a necessity.

¹⁵ Brian E De Mint, *Parallel: The Bitcoin Social Layer*

¹⁶<https://www.mesirow.com/insights/us-dollar-currency-dynasty#:~:text=Dominant%20reserve%20currencies%E2%80%94those%20currencies.spotlight%20and%20decline%20into%20obscurity>

Further, in the introduction of the white paper, Satoshi Nakamoto introduced the problem that “no mechanism exists to make payments over a communications channel without a trusted party.”¹⁷ The Bitcoin timechain is a communications channel “based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party.”¹⁸

The Bitcoin network holds immense power to foster connections worldwide. Through Bitcoin, we can communicate with people worldwide whom we’ve never even met, whose language we don’t speak, whose stories we don’t know and say, “I see you, I hear you, I value you, what you do means something to me — I respect you” in a way never before possible. And this, I feel, could be/is the deeper message of the white paper.

It was a network that brought us Bitcoin, and it’s a network who are and will continue the mission to protect freedom, human flourishing, property rights, privacy, energy, agency, critical thinking, community, _____.

Importance of Communication Protocols

Communication, exchanges, and transactions mediate our everyday life. An effective language protocol allows for the full expression of your personhood and your life. However, today, our ability to exchange truth and values domestically and worldwide is declining. As a result, our society is not achieving its full potential.

Whereas abundance in non-monetary languages can be beneficial, allowing for the transmission and preservation of culture, abundance in monetary languages can be detrimental because money is a representation of our expended energy.

*“Don’t work for a money someone else can create for free. Value your time and energy.”
- Nico Moran*

English → Mandarin → Swahili

In every translation, meaning is degraded; linguistic communication is lost.

US dollar → Chinese Yuan → Tanzanian Shilling

In every exchange, meaning is devalued; monetary communication is devalued.

We need scarcity at the root of our money to respect value and incentivize the production of value in order to have abundance in everything else. Money is on the other side of every transaction. Language mediates every transaction.

- Money is supposed to allow you to live your life as you want it — to store your energy, but we’ve never had money that actually allows us to store our energy.
- Language is supposed to allow you to collaborate and interact with others, but we’ve never had a language that allows us to communicate our full desire and intent.

¹⁷<https://bitcoin.org/bitcoin.pdf>

¹⁸<https://bitcoin.org/bitcoin.pdf>

With bitcoin, we can communicate the full economic expression of value with 100% verifiable certainty of the meaning being transmitted to the recipient. Only 1 billion people have this ability today. Bitcoin is an empowering technology that allows all 8 billion people to both speak and have their voices heard and received worldwide.

Communication, verbal or not, is how we play the games around us.

The Money Game

Peer-to-Peer: When you communicate by transacting with monetary information, you begin playing “the money game.”

“Fiat is a finite game. Wealth is in an infinite game” (h/t [Mark Moss](#)).¹⁹ How do we build a society functioning at its maximum capacity when money is finite? When the mechanisms representing the productivity of society have an expiration date? It’s almost as if knowledge is recorded in books in a certain language, but every 27-48 years, it becomes illegible.

Fiat is a finite game because governments that spend more than they earn (all governments) find themselves debasing their currency to make debt payments. Bitcoin is an infinite game because it’s immune to government manipulation of the money supply. Achieving digital scarcity resistant to corruption is a monumental achievement.

Fiat is a finite game because it’s about spending, not saving. Bitcoin is an infinite game because it allows for the building of wealth. Spending reinforces control. Saving reinforces choice. If you can save, you can have property rights.

Fiat is a ruler-based money that is programmed to debase. Bitcoin is a rules-based money that is programmed to be based.

The Language Game

Peer-to-Peer: When you communicate by conversing with linguistic information, you begin playing “the language game.”

For context, in a conversation, each person responds within about 200ms, but it takes about 600ms to produce a response. This reality means humans must produce a response before their partner has finished speaking. Furthermore, with room to remember 4 ± 1 (Cowan, 2000) or 7 ± 2 (Miller, 1956) linguistic items, language learners must balance auditory information disappearing within 50-100ms and 10-15 new phonemes arriving every second.²⁰ This dilemma could be called “The Language Game.”

How do humans win this game? Why does it matter that humans win it?” Humans win by squeezing meaning through the “Now-or-Never Bottleneck” due to its impact on language acquisition, use, and

¹⁹<https://www.tftc.io/bitcoin-infinite-money-game/>

²⁰ COGST 2150: The Psychology of Language Slides, W3-1

evolution of language. Language has led to the evolution of culture, “cataly[zing] explosive change in almost every aspect of human culture and society.”²¹ By extension, it is vital human’s win “the language game” because the consequence of not squeezing through the Now-or-Never Bottleneck is the stagnation of culture and the decline of humanity’s evolutionary dominance. Luckily, humans can employ strategies to squeeze through, acquiring, using, and evolving language.

We cannot afford to lose economic meaning in our money, especially when it’s not necessary. While you can’t win a linguistic language game with 100% meaning preserved, it is on the table for society to win an economic language game with 100% meaning preserved.

While there is much analysis that could be drawn, considering money in the framework/structure of language and vice versa, I will share a few below.

One could analogize Bitcoin’s blockchain (timechain) to its “Now-or-Never Bottleneck.” Unlike fiat currency or cryptocurrency, Bitcoin uniquely uses an input/output model rather than an account-based model for recording transactions. This means that, like language, patterns are the output, not the input, and as McCauley and Christiansen showed, language acquisition originates from chunking and so does bitcoin acquisition.²² Through chunking and stacking satoshis (the smallest unit of bitcoin), one can start small and build up meaning, squeezing through the bottleneck without friction and acquiring a language that is spoken around the world. Notably, the bitcoin inputs and output themselves are error-free. Furthermore, the UTXO model means one can transport bitcoin worldwide instantaneously and virtually free to arrive at someone else “Just-in-Time.”²³

Language meaning, like value, is subjective to the variation of the language each person speaks, further supporting why maintaining common ground in conversations is critical for getting through the bottleneck for yourself and for future generations. Bitcoin, a verifiable economic language that all 8 billion people can speak, is “common ground” unlike any monetary mechanism that has ever existed before. By default, the language that “never” makes it through the bottleneck is less likely to be passed on to the next generation. Through its blockchain (timechain), Bitcoin has immutably and verifiably allowed the purest form of humanity’s preferences “through the bottleneck” since its inception and will continue to pass on meaning to future generations.

The Now-or-Never Bottleneck is more than just getting words through the bottleneck but also the meaning the words catalyze. Similarly, each transaction recorded on Bitcoin’s blockchain is a record of upholding Bitcoin’s values of being an open, peer-to-peer, public, borderless, permissionless, censorship-resistant, neutral, decentralized, immutable, transparent, and rules-based global monetary network.

The 7,000 official languages and 7.7 billion persons’ individual languages, varied between and within, together blatantly disprove the idea of one perfect language or a universal grammar. Amongst all that difference is a single important similarity: the necessity of chunking, squeezing meaning through the

²¹Professor Morten H. Christiansen, *The Language Game*, Ch.8, p.82

²² COGST 2150: The Psychology of Language Slides, W8-2

²³ COGST 2150: The Psychology of Language Slides, W4-1

Now-or-Never Bottleneck, and winning the language game, opening up the floodgates of societal and cultural advancement for humanity as we know it. Bitcoin as a language offers this same reality.

The Infinite Game

In game theory, there are finite and infinite games. In the case of a game played a finite number of times, one can never induce cooperation due to a concept called “backward induction.” However, this is not the case for infinitely repeated games because there is no terminal period.

In a finite period game, you cannot sustain cooperation because you know it is in the rational best interest of the other player to “dump” you in the next period. However, in an infinite period game, cooperation can work because the players could give the threat of the trigger strategy. You do not have a terminal period to work back from to engage the argument of backward induction. Therefore, a player could cooperate, and then if the other person defects, from then on out, they would also defect, and the other player would know this as well, and then they would all do worse off than if they had sustained cooperation.

If there were ever any money set up to be an infinite game, it would be bitcoin.

The game on the field is one of values. What values do I care about? What values respect me? What values do I want to transact with? Values are receptive and expressive. Bitcoin is an infinite game, allowing for the potential of worldwide cooperation to be induced.

While it’s mind-warping at first, if we make the same assumptions of player rationality, bitcoin’s game theory influences human behavior and pushes players to be more ethical participants simply because it is in their economic interest. It’s important to remember that Bitcoin solves precisely the problem of transacting *without* trust.

Money that empowers you to feel confident thinking about the future and to think critically changes you and, in the cumulative, has the potential to change society.

The first world reserve currency, the Florentine Florin “maintained an unchanged weight and purity, about 3.5 grams of pure gold, spanning an astounding four centuries...It also found popularity amongst working people as a way to literally carry their entire life's savings in their pocket.”²⁴ As the florin showed, money is valuable and sustainable because of trust in its authenticity.

Bitcoin is the perfect form of money: decentralized, immutable, durable, divisible, portable, fungible, verifiable, acceptable, scarce, and pure. Bitcoin is literally transacting with truth, with inclusion. Inflation reduces the purity of your purchasing power to pursue liberty for yourself and posterity. Bitcoin is a trojan horse for good, restoring power equitably now and for generations to come.

²⁴ Nik Bhatia, *Layered Money*, Pg. 14

Argument

The 21 million bitcoin are tools to communicate and shape a changing world.

Language is how we communicate, but words can be cheap. Monetary exchanges are a verification of action to shape.

Communication is the basis of transitions in society.

So much so that in 1675, King Charles II attempted to ban coffee houses as they were forums of discussion, “help[ing] spread modern democracy, spur the Enlightenment and birth periodical literature.”²⁵

If we reflect on the evolution of the dissemination of communication from tablet ledgers → papyrus paper manually copying books → the printing press → telegraph → newspapers → internet, in each wave, the number of people who could participate in creating communication increased, which led to the collapse of the dominance of institutions and changed how power worked in society.²⁶

Speech doesn’t matter without distribution, and Bitcoin is the most censorship-resistant, transparent, permissionless, and distributed communication protocol.

The 21 million bitcoin are tools to understand and shape a changing world. Bitcoin, as a communication protocol and as a language, is the tool to shape our changing world because language has always been the ultimate technology that brings about change in society. Bitcoin is the first way to verify the communication of monetary and non-monetary meaning/value (to verifiably communicate monetary and non-monetary value).

(Non-monetary) language/ communication, our most basic tool for facilitating understanding and transferring meaning, is flawed because there is no absolute verification. Language is often just “good enough.” Numbers are the only thing in the world that self-identify (h/t Michael Dunworth).

Humans are told what they are through language and someone else’s competence in using that language. The same example could be applied to vision: How do we know the blue I see is the blue you see? We don’t. Further, in perception, we were evolutionarily adapted to perceive in a certain way where we obfuscate truth (h/t Donald D. Hoffman, *The Case Against Reality*).

As an implication, in a broader context, society has never had a communication protocol to verifiably process what is occurring. Building off of what was warned in the *Sovereign Individual*, we’ve never been able to see transitions as they happen because we’ve never had a language that could communicate them, especially at scale across the world.

²⁵ <https://www.bbc.com/travel/article/20201119-how-coffee-forever-changed-britain>

²⁶ Rabble, Baltic Honey Badger, 2024

If you can speak the language of Bitcoin, you will have a tool to understand and communicate, providing clarity and guiding you to the best use of yourself and your resources.

Bitcoin, based on numbers and cryptographic proof, offers itself as the first verifiable communication protocol for all 8 billion people. With Bitcoin, the exchange of value can be done fairly and without any friction. The Bitcoin timechain records the purest form of the language, preferences, and transactions of all 8 billion people; it serves as an immutable and verifiable record of truth.

Language is uniquely human and has contributed to our survival and dominance in the world. But, it is failing us in how we transmit values across cultures. Bitcoin can win the “language game” in ways spoken language cannot. Through Bitcoin, we can communicate with people all around the world, whom we’ve never even met, whose language we don’t speak, whose stories we don’t know, and say, “I see you, I hear you, I value you, what you do means something to me — I respect you” in a way that language could never get through. In a way that spoken words would not be able to get through the bottleneck.

Through Bitcoin, our property rights are protected, allowing for the protection of our freedom of thought, freedom of will, freedom of speech, freedom of assembly, and freedom to parse the transition of the world around us verifiably.

Conclusion

With **bitcoin**, we have money that allows us to store our energy for generations and pursue what brings us joy. With **Bitcoin**, we can communicate in ways never seen before and live a life aligned with the values we strive for.

With bitcoin, this is the first time that you can not only transfer value but also store value and energy for generations. And, in order to store your energy, you don’t have to exert energy. Further, people can realize their value with no barriers; they don’t have to be born in the US, go to an Ivy League university, or live in a dollar-dominated country.

Tied to nature and incentivizing low-time preference, Bitcoin is an infinite game, allowing cooperation to be induced in ways previously unimaginable. Bitcoin, embodying the characteristics of sound money, offers itself as a reset button. Additionally, it is an “open, public, borderless, neutral, and censorship-resistant” system.²⁷ “Bitcoin is the radical proposition that anyone anywhere should have access to free commerce, free financial services.”²⁸

Money “is a broader term that refers to an intangible system of value that makes the exchange of goods and services possible, now and in the future.”²⁹ Money is used to measure and communicate value and to facilitate the exchange of preferences worldwide. Good money should be durable, portable, divisible, agreeable, fungible, scarce, acceptable, and verifiable. 4% of the world’s population has access to the current dominant tool. Because there is a breakdown in money, people must look to other avenues to store

²⁷https://www.youtube.com/watch?v=qlAhXo-d-64&ab_channel=aantonop

²⁸https://www.youtube.com/watch?v=qlAhXo-d-64&ab_channel=aantonop

²⁹<https://www.investopedia.com/terms/c/currency.asp#:~:text=Money%20is%20a%20broader%20term,in%20some%20kind%20of%20transaction>

their wealth, their energy, their economic energy, if they even have access to do so. Hence, people with access to the modern financial system create diversified portfolios of real estate, equities, bonds, commodities, fine art, etc. They, or their financial advisors, exert energy to store their economic energy. However, what Bitcoin offers is a way to not exert energy, except minimally initially, to store your economic energy.

Bitcoin is a simple, as opposed to a complex, and inclusive tool for all 8 billion people to pick-up and shape a changing world.

Primary Research Questions

- Is Bitcoin a language?
 - What is a language?
 - What is communication?
- Is Bitcoin a tool to shape a changing world?
 - What is a tool? Is (B)itcoin one?
 - Why is bitcoin in a place to do any “shaping?”
 - Is the world changing? Are we at the convergence of transitions?
 - Does bitcoin encompass the world?
- If so, how are the 21 million bitcoin tools to shape a changing world?
- What are the tools to shape a changing world and see a transition that is underway? Are FOSS (Free Open Source Software) protocols the only eligible protocols to do so?
- What is the role of communication in innovation?
- Speech is powerful through distribution. Does FOSS allow for an explosion of openness?
- Is maximum meaning extracted through FOSS protocols or not?
- What is the impact of past open-source protocols?
- What is the impact of past revolutions in communication on society? (The printing press, the telegraph, etc.)

From Meg:

- How is bitcoin a language to express financial freedom?
- Explore: practical and philosophical
- And why should we speak it - what problem is it solving?