



# “The Most Trustworthy Coin”: How Ideology Builds and Maintains Trust in Bitcoin

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Bitcoin is an innovative technological network, a new, non-governmental currency, and a worldwide group of users. In other words, Bitcoin is a complex sociotechnical system with a complex set of risks and challenges for anyone using it. We investigated how everyday users of Bitcoin develop trust in Bitcoin on one of the largest online communities devoted to Bitcoin: the Reddit.com [r/bitcoin](#) forum. Using qualitative content analysis, we examined how trust in Bitcoin develops based on contributions to this community.

On [r/bitcoin](#), trust in Bitcoin is driven by a pervasive ideology we call the “True Bitcoiner” ideology. This ideological viewpoint is centered on the interpretation of Bitcoin as functionally “trustless” and risk-free. Despite widespread evidence of emerging individual and system-level risks with using Bitcoin, participants continue to maintain this ideological perspective. This ideology consists of three primary beliefs: viewing Bitcoin’s technology as more trustworthy than its people; rejecting ‘corrupt’ social hierarchies related to money; and the importance of accumulating or ‘HODLing’ quantities of Bitcoin as a strategy to create an ideal future.

We conclude that this “True Bitcoiner” ideology is maintained despite contradictory evidence in the world because it allows participants to more easily interpret Bitcoin and make decisions by reducing perceived risk and uncertainty in the system. The role of this ideology on [r/bitcoin](#) demonstrates an expanded conceptualization of how trust is created and socially-mediated in socio-technical contexts.

Additional Key Words and Phrases: bitcoin, online communities, sociotechnical systems, Reddit, trust, ideology

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## 1 INTRODUCTION

Socio-technical systems mix together technological elements with human and social relationships into an inseparable whole system [38]. In everyday life, people engage with numerous socio-technical systems, ranging from personal laptops to public transportation, online banking, and everything in between. In many of these systems, the people, institutions, and technologies interact in ways that are often obscured and difficult to understand. Because socio-technical systems are complex and difficult to understand, it is critical that people who use and interact with such systems *trust* in those systems[19].

Trust is a complex process that is mostly internal to people’s minds. How people make trust decisions is influenced by perception, personal beliefs, social ties, time, and many other factors.

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Trust connects current circumstances to aspirations and predictions for the future. Trust determines how people imagine the future, and what steps they take to get there. In socio-technical systems, people trusting the system plays a crucial role in its success.

In 2009, Satoshi Nakamoto (probably not his real name) published a whitepaper describing a new system he called “Bitcoin” [51], which has grown into a global currency. Bitcoin is simultaneously an innovative technological network, a new, non-governmental currency, and a worldwide group of users. In other words, because Bitcoin involves complicated interactions between humans and technologies, it is a complex socio-technical system.

Bitcoin is a particularly interesting socio-technical system to study right now because it is very new, complex, and not well understood. Werbach claims that Bitcoin represents a new and fundamentally different way of structuring trust in technology [66]; Bonneau et al. agree and claim that Bitcoin is a system where “practice is ahead of theory” [10]. Bitcoin is an especially interesting socio-technical system to study in the context of trust due to the fact that Bitcoin was purposefully designed to attempt to eschew some of the forms trust has taken in other socio-technical systems [51].

In order for Bitcoin to function as a currency that people can use to buy and sell goods and services, it is important that people trust Bitcoin [2]. But, trusting Bitcoin captures a complex interplay of entities and relationships. How do people decide who influences the system and how to trust them, when it is challenging to even use Bitcoin and understand how it works?

We investigate how everyday users of Bitcoin build and develop this trust in Bitcoin through their participation in an online community. We examine how individuals share their beliefs and intentions related to trust in one of the largest and most popular online congregation of Bitcoin enthusiasts, the Reddit [r/bitcoin](#) forum. What leads people to trust Bitcoin? Is this trust unconditional? Do people trust the technological aspects differently than they trust the social aspects? How do social pressures and individual beliefs change the way people trust and understand Bitcoin?

In our investigation, we found that a large and vocal group of users were regularly promoting an ideological viewpoint about how Bitcoin should fit into the world in the future. Using Smith’s functional definition of ideology [58], we argue that this ideological perspective influences how [r/bitcoin](#) participants navigate the risks and possibilities of Bitcoin.

Across discussions on [r/bitcoin](#), participants, when faced with alternative viewpoints, justify their continued use of Bitcoin by claiming that it is “trustless”. By trustless, they are referring to their perception that, because Bitcoin eliminates the need for third-party control, there is no need to depend on any institution to assure it is functioning correctly. They believe the underlying technology that maintains the Bitcoin network protocol is perfect, and that there is no risk of fraud or failure. While past work has identified the important role of trust in Bitcoin [44], our approach connects trust in Bitcoin to the development of a “True Bitcoiner” ideology on [r/bitcoin](#).

We argue that this ideological perspective is founded on three primary sets of beliefs: the belief that Bitcoin’s technology is more trustworthy than the people using it; that Bitcoin is a means to escape corrupt human institutions; and that accumulating or “HODLing” Bitcoin no matter what will lead to Bitcoin’s future widespread success. We assert that these beliefs are strengthened and reinforced through discussion about how these ideologies exist in tension with Bitcoin’s real world circumstances, such as privacy concerns and price volatility.

But how do these beliefs persist, despite widespread recognition of Bitcoin’s limitations and uncertainties, especially since trust is widely recognized as a key component of Bitcoin’s ability to function[12, 64]? We argue that the “True Bitcoiner” ideology has developed as a result of these tensions in the Bitcoin system that threaten optimism for Bitcoin’s future. By calling Bitcoin “trustless”, True Bitcoiners can deny the risks posed by socio-technical ties in Bitcoin by simply stating that trust does not exist in the system. These findings demonstrate the awareness

[r/bitcoin](#) participants have of the significance of trust in Bitcoin’s success, while simultaneously demonstrating how this desire to mitigate perceived risk has led to an ideological position that rejects potential risks and views these beliefs as reality.

Additionally, we argue that these findings demonstrate the need for future work on trust in socio-technical contexts that consider the potential of online communities to influence trust relationships, especially in the the context of complex, emerging technologies like Bitcoin.

We argue that [r/bitcoin](#) demonstrates an ideology founded in Bitcoin’s perception as trustless, with the operational outcomes of this ideology serving to prioritize a certain way of imagining Bitcoin’s future while out-grouping those who disagree. These findings demonstrate the conscious awareness [r/bitcoin](#) participants have of the significance of trust in Bitcoin’s success, while simultaneously demonstrating how this desire to mitigate perceived risk and assure Bitcoin’s future have led to an ideological position that rejects potential risks and views these beliefs as reality.

## 2 RELATED WORK

### 2.1 What is Trust

There has been a recent recognition that trust only becomes operationalized in terms of individual perception [14]. In other words, trust is not an externally verifiable quality, but an internal sensation. Based on this, a person’s knowledge of the situation and the potential trust partner are important. Even in a deceptively simple trust relationship, such as between two individual people, there is still considerable uncertainty about their intentions and outcomes. But consider systems where the inner-workings of the system are highly complicated, and in order to participate an individual must place their trust in hundreds of interconnected people and institutions behind the scenes?

Buscher investigated this role of system comprehension for trust through an analysis of adoption challenges in emerging "Smart Grid" energy systems. They found that, in navigating these complex systems, people centered their trust locally; they relied on delegating their trust to local politicians and other decision-makers, and based their confidence in these new implementations on their success in other real communities [14]. In making trust decisions about new technologies, people rely heavily on trust in practice as an important source of information. They depend on people they know and trust in helping them decide how to make decisions about these new socio-technical possibilities.

Castelfranchi and Ta argue that we need holistic interpretations of trust that consider its many interacting relationships and influences [17]. Trust is dynamic and constantly changing, both in terms of an individual’s cognitive state, the external environment, and the consequences of how the two interact.

While the literature on trust has identified many components, two of the most important are risk and control. *Risk* is an inherent quality of trust. Trust can only exist in a situation in which there is some level of uncertainty about outcomes [57].

The concept of *Control* is also important in trust decision-making. If risk is a recognition of future uncertainty, control is the perception of one’s ability to influence that future outcome. In socio-technical systems, control has been described similarly with the concept of agency, defined as how people assign responsibility for outcomes to components of the socio-technical systems [21]. How people interpret human agency as compared to machine agency in the socio-technical system affects the human-machine trust relationship [21]. People are more motivated to participate in an socio-technical system when they believe they have some power to make the outcomes of the system align with their personal goals [21]. It is also important to balance overhead control with natural trust relationships; too much control can actually damage people’s trust in the entire system [24].

While trust plays a role in virtually all social organizations, trust in sociotechnical systems has several important considerations. In sociotechnical systems, trust serves as an important bridge connecting the numerous social and technical components of the overall system [47].

How trust in sociotechnical systems is built through social interaction is not a new topic in CSCW. Trust serves to reduce perceived complexity of socio-technical interactions, and thus allow participants to more easily make use decisions [47]. A core component of trust-building in sociotechnical contexts is uncertainty reduction, and users often take advantage of available technological features in navigating uncertainty [35]. In dealing with uncertainty, how much knowledge participants have of the domain in question and how credible they view those with power in the system also influence trust [37]. Perceptions of righteousness and morality have also been connected to how trustworthy people view the behavior and outcomes of socio-technical systems [40].

In considering sociotechnical contexts related specifically to money, Ferreira, Perry, and Subramanian examined social and technical trust in transactions with a new geographically situated currency [22]. They found that use of this currency fostered stronger social ties between customers and business owners within the community; the use of this currency itself became a symbol of trustworthiness to users [22].

How to design socio-technical systems for improved control of trust outcomes is an emerging area of work [39]. One strategy for improving control over system outcomes is by enlisting a third-party to enforce the trust tie between two parties [17]. This often leads to the outcome of trust being transferred to the institution enforcing the outcome, rather than the other party in the primary trust relationship [17].

This idea is also an important part of Satoshi Nakamoto's vision for Bitcoin. It is precisely these third-party enforcers that they view as not trustworthy. It is difficult to predict and control exactly what outcomes are desired or even possible, especially in innovative, emergent systems like Bitcoin.

## 2.2 What is Bitcoin?

Bitcoin was never envisioned as a typical currency. When Bitcoin's creator, Satoshi Nakamoto, published his or her (or their) white paper introducing Bitcoin to the world [51], they proclaimed Bitcoin as a solution to fallible existing systems of money, an infrastructure which they claim "...still suffers from the inherent weaknesses of the trust based model." [51] Nakamoto argues that current systems of money are inefficient, costly, and risky due to the fact that people need to trust one another in order to use them. Whenever you make a transaction, you are relying on some "trusted third-party" [51] (such as a bank) to guarantee that the exchange is valid; the bank makes sure you have money to give, and that the other person receives it. A government oversees the bank, distributes valid currency, and so on.

Nakamoto's solution to this third-party control is not to build more trustworthy systems, but replace them with "an electronic payment system based on cryptographic proof instead of trust" [51]. In other words, a currency that doesn't need trust: Bitcoin.

Bitcoin was originally designed to be a currency. Bitcoin does not exist in a physical form like dollar bills; rather, it is purely digital, with Bitcoin balances and transactions recorded electronically. A currency has three essential properties [2]: (1) It can be used as a medium of exchange. I can give you it, and you can give it to someone else; (2) It can be used as a store of value. If I have some right now, it still has value after time has passed; (3) It can be used as a unit of account. We agree upon how to measure the currency and (mostly) how much value it has. A wide variety of items have been used as currencies in the past, from polished shell beads called "wampum" by the Iroquois, to coins made of precious metals, to the currently popular fiat currencies like the US dollar and the Euro.

Currencies enable people to conduct transactions, but also embed in their design wide variety of socio-economic consequences. Carroll and Bellotti describe a number of classes of currencies, such as location-specific currencies, time banks, cryptocurrencies such as Bitcoin, and the sharing economy. They argue that the ways these currency designs are embedded and enabled by modern technologies, and how they try to achieve important group and societal goals, make them appropriate and interesting objects of study for CSCW [16].

Bitcoin was originally intended to be fully distributed and not rely on any government or other third party to control or back the currency to give it value [51]. It has three important technological components [10]: (1) The *transaction system* enables people to transfer units of the currency (bitcoin<sup>1</sup>). The way Bitcoin is transferred from person to person is typically similar to an online bank transfer. But, rather than a bank overseeing the transactions, all the users of Bitcoin take on this important monitoring role in a democratic way. This is accomplished through the blockchain. (2) The *consensus mechanism*, or blockchain, allows a distributed network of computers to come to a consensus agreement about which Bitcoin transactions should be considered valid. Ideally, this means that every person who uses Bitcoin has an equal say in deciding if transactions are legitimate or not. (3) The *peer-to-peer network broadcast* enables this network of computers to communicate with each other to publicly log all valid transactions in a permanent ledger. This process can be thought of as each individual that uses Bitcoin has one ‘vote’ to accept or reject the accuracy of the public ledger [51]. Whatever historical record the majority of Bitcoin users agree is correct, becomes the main ledger of reference.

A social community has developed that is critical to the functioning of Bitcoin. This community includes a number of important actors, including [8]: (1) *Miners* are people who run the computers that operate the consensus algorithm (the “blockchain”). Miners play a central role in making new Bitcoin and certifying transactions as valid. (2) *Exchanges* are financial institutions that will accept money in one denomination (e.g. US dollar) and return it in another (bitcoin). (3) *Merchants* can choose to accept payments for goods and services in bitcoin. Famously, [overstock.com](https://www.overstock.com) began accepting bitcoin payments in 2014, though thousands of other merchants also accept bitcoin. (4) And *Developers* who make Coin Management Tools, often called “wallets”, which are third party technologies and/or services that enable people to keep track of their bitcoin.

Bitcoin is not backed by any governments or institutions. Instead, it is maintained by the distributed network of computers and the community of people around it. Because it isn’t backed by a government, the question of *trust* in the system is very important [66]. If people don’t trust the currency, they can’t rely on it to behave in a predictable and expected way and it won’t be useful or valuable. However, without a clear institution to trust, many users aren’t clear whether it should be trusted [55], or believe that they need to have a lot of technical knowledge in order to trust it [26].

### 2.3 Bitcoin Challenges and the Importance of Trust

In order to understand why the Bitcoin system relies on trust, it is valuable to understand the underlying risks that participants in the system face as they use Bitcoin. We characterize these risks into two categories: risks to the underlying Bitcoin infrastructure that threaten the system as a whole, and individual risks that mostly affect a single person as they use Bitcoin. Both categories of risks are socio-technical in nature, interweaving both technology and people.

**2.3.1 Bitcoin Systemic Risks.** The biggest systemic risk of Bitcoin is that the system will accept invalid transactions. Accepting invalid transactions would enable people to double spend money (spend the same coin twice, effectively doubling the money) [8].

<sup>1</sup>Following established convention, we refer to the socio-technical system as Bitcoin, and units of the currency using the lowercase bitcoin or the abbreviation BTC [10]

The Bitcoin design explicitly discourages this problem through the design of its consensus algorithm, but that algorithm relies on participants in the network following the algorithm correctly. Bitcoin users need to behave in a way that follows these rules and benefits the whole system, rather than making decisions that solely benefit themselves.

Additionally, all Bitcoin transactions are publicly visible, and it is believed that this visibility discourages these kinds of attacks because accepting invalid transactions would undermine public trust in Bitcoin and reduce the potential benefits from doing so [10].

Another risk is that Bitcoin was intentionally designed to be free from government control [51]. The technology sets monetary policy (amount of currency in circulation and inflation rate) by hard coding constants into the software such that new coins are created approximately every 10 minutes, and a fixed amount of 21 million bitcoins will ever be produced [8]. It is often contrasted with “fiat” currency, like the dollar, euro, yen etc., where these policies are set by central bankers in governments. Governments, especially if they coordinate with each other, still have the ability to radically alter the way Bitcoin is used and valued. They can accomplish this not through traditional monetary policy, but by regulating exchanges and other intermediaries, or by outlawing its use. Government regulation is a significant source of potential risk in the Bitcoin system.

There is also internal governance that is required by the Bitcoin system in order to reach consensus and thus define what is the ‘correct’, most up-to-date version of the blockchain. For example, Bonneau et al. describe how the set of validation rules for deciding which transactions are valid is an important issue [10]. These rules can be altered by making changes that are coded into the Bitcoin software, necessitating a software update. They have changed a small number of times in the short history of Bitcoin, and many other changes have been proposed. Depending on the change, it may require a “hard fork” (when changes would be invalid under prior rules, so everyone must agree on the changes) or a “soft fork” (when a change is backwards compatible, and only requires a majority to agree on it). Each fork is simply one version of history that Bitcoin users can interpret as valid or not.

**2.3.2 Individual User Risks.** In addition to the infrastructure risks, there are a number of risks that individuals face as they use Bitcoin.

One of the biggest and most cited risks is the large market fluctuation in price [31]. Most currencies have a value that is relatively stable over time. For example, the US dollar to Euro exchange rate has only varied from a low of about \$1.05 per Euro to a high of about \$1.50 per Euro in the last 10 years (2009–2019). During that same time period, the value of a bitcoin varied from a few pennies to over \$19,000 [32], settling at about \$4,000 per bitcoin in April 2019. This high variability makes it difficult to price items using bitcoin, or to understand how valuable one’s bitcoins are [8]. Krombholz et al. found that this fluctuation in price is the largest concern of Bitcoin users [42]. It does, however, lead people to use bitcoin for speculative investing [28].

Bitcoin is often seen as privacy-preserving; users buying and selling bitcoin do not need to submit identifying information with their transactions, but instead only need their cryptographic keys associated with their Bitcoin digital wallet. However, this privacy has very important technical limitations [10], and participants can often be re-identified [46]. Even when using privacy-preserving technologies like Tor, it is often possible to identify people using Bitcoin [6]. Indeed, one of the most famous Bitcoin users, Ross Ulbright (known as the Dread Pirate Roberts) who ran the Silk Road, a marketplace that transacted mostly in illegal goods, was identified and arrested by the US FBI. Some users try to use technical means such as coin mixers to increase their anonymity [8], but those often do not provide strong privacy guarantees.



These are all risks that are well-known aspects of Bitcoin. It is because of these risks and others like them that *trust* is an important part of what makes Bitcoin work. Many of these risks will be mentioned, directly or indirectly, by the participants in [r/bitcoin](#), sometimes accurately and sometimes inaccurately. Our goal in this paper is not to reveal these risks, which are already known, but instead to better understand how members of the Bitcoin community talk about and manage these risks when making decisions about trusting Bitcoin. Trust is an ongoing series of decisions [17, 57], which makes how users perceive Bitcoin an important part of their trust decisions.

## 2.4 User Perceptions of Bitcoin

A number of researchers have worked with Bitcoin users, non-users, or trace data of Bitcoin use to try to understand how people think about and perceive the Bitcoin system. These user perceptions highlight the major concerns and issues that users have as they move forward with Bitcoin. These concerns are somewhat different than the system-level and individual-level risks highlighted above by the research literature.

**2.4.1 Technological Knowledge.** Studies that include non-users of Bitcoin often find that one of the biggest barriers to entry is a perception that using Bitcoin requires substantial technical knowledge. For example, Gao et al. [26] interviewed both users and non-users of Bitcoin. Almost all of their non-users cited their lack of technical knowledge as one of the biggest barriers preventing them from using Bitcoin. However, they also found that the users of Bitcoin did not have any more technical knowledge than the non-users, and often misunderstand numerous technical details about how Bitcoin works [26]. As compared to the identified risks related to rule violation by other users, some Bitcoin users appear to internalize their apprehension about Bitcoin as due to short-comings in their own knowledge and ability. These findings further suggest that level of Bitcoin knowledge does not actually influence whether a person becomes a Bitcoin user or not. Rather, it is possible that differences between users and non-users is related to if they use what they know about Bitcoin to interpret it as trustworthy.

**2.4.2 Coin Management.** One of the hardest challenge that Bitcoin users face is keeping track of their currency, especially when they have multiple wallets and store their Bitcoin in several different places. Ownership in Bitcoin is determined by access to complex cryptographic keys associated with each wallet. A number of Coin Management Technologies (CMTs) have been developed that allow users to manage their currency, including allowing exchanges and websites to manage currency [49], “hot” wallets that are connected to the network, and “cold” wallets that are physical objects disconnected from the network. Krombholz et al. did a large survey of Bitcoin users and found that coin management was one of the biggest and most confusing challenges faced by Bitcoin users [42]. In their large sample, almost 22% of users had lost currency due to issues with coin management, over half of which was due to self-induced error and the other half due to fraud or mismanagement on exchanges or website-based wallets.

Bitcoin is a complex system to understand and use. Rather than having one clear entity to trust or seek information from, participation in Bitcoin necessitates trust in a complex web of social and technical components, in addition to the systemic and individual risks that could have costly consequences. In light of this complexity, and evidence of financial [53], technical [18], and privacy [3] risks to users, how do people come to trust Bitcoin? And perhaps more importantly, why do people continue to trust Bitcoin after experiencing major problems, such as the December 2018 crash where Bitcoin lost over 50% of its peak value [53]?

## 2.5 Ideology

To understand how people think about issues around Bitcoin, we bring in the concept of ideology. An ideology is a collective set of beliefs about the world that are held by a group of people [11]. Ideologies usually involve beliefs about social order and how social structures should exist in society. As a result of this, many ideologies have the function of creating in-groups and out-groups [11], or of one group repressing another group [58]. In the online communities context ideology is typically described in relation to political ideology, with a recent emphasis on ideology's potential role in online extremist groups [43]. An examination of hate speech on the anonymous, provocative "Politically Incorrect" 4chan forum suggests that members of this community are intentionally doing things to promote their collective ideological beliefs, such as "raiding" YouTube with large amounts of comments reflecting their beliefs [33]. Similarly, researchers who examined a Donald Trump themed subreddit concluded that active participants of the community frequently expressed 'calls to action' in their postings. These postings promoted a dominant, widely understood set of ideological beliefs [25]. But, how members of online communities may be using the technological features of these spaces to produce certain social outcomes is still a developing area of work [25].

In our work, we use the conceptualization of ideology from the philosopher David Livingstone Smith [58]. Smith examines a number of ways of theorizing ideology as beliefs or mental representations, but ends up defining beliefs as ideological by their function; if a belief or set of beliefs has the function of encouraging a specific social order (and therefore enabling repression of other people), he defines it as ideological.

Ideological beliefs sometimes appear extreme, such as a white supremacist's statement about the inferiority of black people. And to outsiders, those statements can appear to be intentionally deceptive; ideological statements sometimes are seen as lies intended to repress people. However, this is not necessary to be an ideology, and indeed Smith argues that "those who embrace ideologies are committed to their truth" and often repress people because of the ideology and not the other way around [58].

Ideological beliefs are frequently communicated in statements, images, and other media. Ideological images and statements often get reproduced and repeated in different contexts because they encourage a social order. Smith argues that ideologies get their function by being reproduced in various media such as images, drawings, news stories, etc. and thus media play an important role in enabling ideologies [58].

Online forums like Reddit and the [r/bitcoin](#) subreddit are new forms of media that can enable ideological statements and images to be reproduced and spread quite rapidly. The origins of Bitcoin are not just about the design of a technology, but came about with the intent to disrupt current social order [51]. Thus, we suspect that it is possible that ideological beliefs emerge on [r/bitcoin](#), and we investigate the discussions on the subreddit with an eye toward identifying one or more ideologies that might appear and how they do or do not influence how people do or do not trust Bitcoin.

## 3 METHODS

Our goal was to examine naturally occurring online discussions related to trust in Bitcoin. Since Bitcoin is a worldwide network, many of the discussions about it are occurring online and leave publicly available evidence that can be analyzed. This is a common way of examining how people make sense of new and complicated technologies; for example, Brown and Laurier analyzed videos posted to YouTube.com to understand perceptions of self-driving cars [13].

We chose to analyze the [r/bitcoin](#) subreddit on the website Reddit.com. Reddit.com is a website consisting of sub-forums, called subreddits, centered around thousands of different topics,



ranging from news to humor to hobbies and everything in between. Users can subscribe to their favorite subreddits and receive alerts when new topics and comments are posted on that subreddit. Participants can like or dislike other users’ topics and comments. Reddit’s demographics, according to one examination of users in the United States, are primarily young, male, and white [56]. Demographics of Bitcoin users are challenging to estimate due to the anonymity of the system, but past work has identified Bitcoin enthusiasts as predominantly young and male [9].

We selected Reddit as our field site of interest in understanding trust and ideology in Bitcoin for several reasons. We were specifically interested in the role of trust in Bitcoin as mediated by online communities, and [r/bitcoin](#) is one of the largest forums (over one million subscribers) focused on Bitcoin, and averages over 100 posts per day and around 1000 comments per day [1]. Additionally, Reddit has been identified as a valuable online space in which to understand how online norms and cultures develop. Work on Reddit has identified how subreddits vary in content and identify membership based on an ideological viewpoint[20]. Much work on Reddit has also focused on these communities’ roles in social support-seeking [60], advice-seeking [15], identity formation [34], and collective knowledge development [62]. Reddit has also been identified as well-suited for news and political topics [34, 62], which aligns with our goal of understanding how trust in Bitcoin evolves as the price and other news surrounding Bitcoin continue to change.

### 3.1 Data

We gathered and examined comments publicly posted on the Bitcoin [r/bitcoin](#) subreddit forum by using the Reddit API to download all new threads posted to [r/bitcoin](#) every hour, and then re-downloaded the threads three days later to capture all of the comments that occurred after the initial posting. Through manual checking, we found that almost no thread was still active after three days. We started the scraper on December 6, 2018, and continued to collect data until February 23rd 2019. In this time, we collected 12,625 unique threads. From this corpus, we randomly selected 1,881 threads to examine. After filtering out threads with very little content (no comments or no on-topic comments) and threads off-topic for the subreddit, we ended up coding 226 of these as relevant to trust in Bitcoin. In qualitative approaches to understanding social practices on Reddit there is considerable variety in the corpus size used [15, 20, 27] with emphasis placed on data saturation in determining an appropriate corpus size [4]. We identified relevant comments based on the codebook we developed after the initial exploratory analysis of [r/bitcoin](#). For ethical reasons, if we discovered that comments were deleted by their creator after the initial scraping, we excluded them from analysis.

### 3.2 Analysis

We approached our data analysis utilizing grounded theory. We centered our approach based on Timonen, Foley, and Conlon’s[63] synthesis of the most common and valuable principles of grounded theory in practice. These authors identified four “core principles” that we followed in our approach. The first is that the research is actually grounded, meaning that any hypotheses are derived from the data, with existing knowledge being ‘put in dialogue’ with any emergent directions. Another core principle is identifying social processes and interactions specifically in terms of the action they have in the context of the field site [63]. Next, is the process of engaging in constant comparison of the data to other data in order to identify differences, similarities, and patterns across the corpus [63]. The final principle identified by Timonen et al. is theoretical sampling, where new theories are derived from concepts in the data that lead to a cycle of more focused questioning and concept clarification. We followed these principles throughout the research process, as we outline in detail below.

We followed a three-step coding process [63]. We began with “open-coding” in which we spent time exploring [r/bitcoin](#). The first author spent time getting “a feel for the data”[63] by following [r/bitcoin](#) for several weeks, and reading the most popular threads. During this time, she openly coded concepts that emerged repeatedly across time and interactions, including trust, social inclusion/exclusion, defining true bitcoiners, and approximately two dozen other descriptive codes related to social life on the subreddit. Using this beginning codebook, all three authors began coding the same threads and comparing their thoughts and analysis at weekly research meetings. Based on these findings, “selective coding” was implemented to focus on the emergent patterns of trust and ideology in the data. Following Miles et al. [48], we built a data matrix to summarize our coding across these topics. This data matrix enabled us to summarize specific issues and isolate comments about each topic. After creating summaries of each topic we coded for, we looked for common patterns that linked these topics. Two authors used this second codebook to identify the following in the data: 1) ways that participants justify trust in Bitcoin; 2) how participants relate Bitcoin to other groups of people or institutions, and 3) how participants discuss problems or risks with Bitcoin. All three authors continued to meet weekly to discuss disagreements in content coding, and to update the codebook with new issues that arose in the content. During this process, we also actively engaged with Bitcoin news and relevant past work to contextualize these emerging concepts within existing knowledge. After identifying these concepts and sets of quotes that illustrate these concepts, we then went back to the data to check to make sure our description and example quotes accurately *represent* the original data, and to look for *negative cases* that were substantially different than our understanding [52]. Our findings passed our check for representativeness and we did not find negative cases.

### 3.3 Ethical Issues

Researchers of public access databases recognize that these spaces have unique potential for qualitative work in particular, due to how these observational methods allow the researcher to freely walk the line between outside observer and active participant, thus benefiting from multiple loci of inquiry [45]. In the context of online forums like Reddit, ethical considerations face unique challenges. These challenges include the inherent difficulty of collecting consent from millions of users and determining the authenticity of the data [45]. In Hutchinson’s[36] examination of a video game forum, she emphasized that although this forum actively recognized itself as public and prohibited the sharing of personal information, forum participants still framed their contributions in terms of the audience they imagine will care about and view their posts. Hutchinson’s interpretation of this ethical issue is to emphasize the importance of interpreting these contributions through the cultural lens of the contributor. In order to incorporate Hutchinson’s perspective, we considered questions such as, *Why did they offer this contribution?*, and *What do they hope will come of it?*, when interpreting our participant’s contributions.

Since this was publicly available data, our Institutional Review Board ruled that this study does not require human subjects approval. Still, there are ethical concerns with reporting on such data. An examination of how Twitter users interpreted research ethics showed that few typical Twitter users understood that researchers often use, and have easy, permissionless access to, their Twitter data [23]. Participants were most positive about their data being used in research when they were informed the research was taking place, were told the topic of the study, whether their 000profile information was analyzed, and how their data was presented in the research article [23].

We have taken steps to protect participant privacy by only analyzing and information which is necessary for our research goals. We are not analyzing any information from these participants outside of the [r/bitcoin](#) subreddit, such as their Reddit profiles and what other subreddits they may follow. Fiesler et al. found that people’s most salient concerns about privacy in research

data were related to how identifiable their information was [23], and we do not analyze or report identifiable information.

### 3.4 Limitations

There are some limitations with studying Reddit. We did not interview any participants, and thus it is impossible to discern participant demographics and intentions. Our observational approach allowed us to examine how trust decisions were made and socially enforced in a naturally occurring social group that is directly related to Bitcoin. Additionally, we only examined a single subreddit. Both our corpus size and the amount of activity in our community of interest is comparable to other qualitative coding approaches in online communities [27].

One important consideration with [r/bitcoin](#) in particular is that this forum has been the subject of some controversy related to moderators censoring posts [7, 54]. [r/bitcoin](#) dealt with issues with moderators beginning as early as 2010 [7]. These issues were centered around one of Bitcoin’s most major controversies: the ability of the network to handle large amounts of transactions quickly. One high-ranking moderator on [r/bitcoin](#) and several related forums and their followers strictly censored any discussion that discussed changes to the Bitcoin network which would increase the transaction speed, especially if these changes were discussed in a positive way. This moderator still has power on [r/bitcoin](#) and several other as of some accounts [54]. Despite these past challenges, it still remains one of the most popular forums for discussing issues around Bitcoin, and continues to attract a steady stream of new participants.

## 4 FINDINGS

We begin by presenting a description of a set of beliefs that appear frequently and vocally in the [r/bitcoin](#) subreddit. We label this set of beliefs the “True Bitcoiner” beliefs, and argue that they represent an ideology which dominates discourse on [r/bitcoin](#). These ideological perspectives are built and strengthened through discourse on the subreddit. Even when this ideological perspective faces alternative viewpoints during these discussions, rather than being weakened, ‘True Bitcoiners’ are able to strengthen and further disseminate these ideological beliefs’ dominant position of [r/bitcoin](#) during these discussions. We identify three primary beliefs: interpreting Bitcoin’s ‘technology’ as trustless, Bitcoin as a mechanism of liberation from corrupt people, and the belief that collective investment and sacrifice will result in an idealized Bitcoin future.

### 4.1 The Importance of Trust in Bitcoin on [r/bitcoin](#)

The “True Bitcoiner” ideology exists in part because [r/bitcoin](#) participants actively recognize the role of trust in Bitcoin. Many users of [r/bitcoin](#) recognize that Bitcoin needs people to use it, and that trust is an important motivator for them. They recognize that participating in Bitcoin can be a significant investment of effort of money, time, and computing power. Additionally, gaining trust has become increasingly important as people continue to identify individual and systemic risks of using Bitcoin. Based on this, [r/bitcoin](#) users care about people trusting Bitcoin for reasons far beyond their personal, ideal conceptions of a Bitcoin future. Rather, they recognize that if people don’t find Bitcoin valuable, and don’t continue to input their computing power to verify transactions, that Bitcoin will no longer function. In other words, participants recognize that this complex socio-technical system depends on the trust of its participants in order to be sustained. There is no chance of this “radical Bitcoin dream” [61] being realized without widespread trust and support. **User 217A** clearly described this widespread perspective:

*“User 217A: Bitcoin is the most trusted system by a long shot [...] Bitcoin doesn’t have to be the fastest, the most coolest, the most hyped/marketed coin. It has to be the most*

*trustworthy coin. And lets be honest, if bitcoin becomes untrustable the blockchain will melt faster than our North pole.” (Thread 23)*

This quote by **User 217A** captured the core issue that drives discussions about trust on [r/bitcoin](#). They argued that trusting Bitcoin is necessary for it to even have a possibility of fulfilling the dreams of Bitcoin enthusiasts. As a result, users make an effort on [r/bitcoin](#) to promote and justify trusting Bitcoin. As they do this, however, they face opposition and disagreement from other users. Opposing users provide their own arguments and justifications. This back and forth describes many of the discussions that occur on [r/bitcoin](#). These disagreements also bolster the need for a collective understanding of what Bitcoin is and how people should use it. Bitcoin is highly complex, and there are many different ways to participate in the system. To uphold their visions of a Bitcoin future, “True Bitcoiners” work on [r/bitcoin](#) to distribute their dominant interpretation of what Bitcoin actually is. These quotes in our findings section serve as vivid examples of ideas repeated many times over on [r/bitcoin](#). This ideological work is accomplished through the three primary tenets that across people, place, and time serve as the dominant discourse on [r/bitcoin](#).

#### 4.2 Ideological Tenet 1: Bitcoin’s Technology is the Locus of Trustworthiness in the System

A core belief of the “True Bitcoiner” ideology is that Bitcoin is functionally “trustless”. However, as we have argued, participating in Bitcoin necessarily means being embedded in many socio-technical trust relationships, which participants widely recognize as important in recruiting and maintaining new Bitcoin enthusiasts. In light of this recognition, how can Bitcoin be interpreted as “trustless”? That is because trust is delegated to the people using the system. In other words, they argue that although Bitcoin itself is trustless, people may need some convincing to recognize this. However, in the face of risk and other Bitcoin challenges, this ‘myth of trustlessness’ is repeatedly used to shut down opposing arguments related to risk and uncertainty. In **User 50A**’s argument with **User 50B**, the way Bitcoin’s “trustlessness” is used as evidence of, ironically, verifiable trustworthiness is demonstrated.

*“User 50A: It’s not really trustless because the trust is in the 51%. If the majority decides you don’t have any Bitcoin then you don’t have any Bitcoin, even if you still think you do — and there’s nothing you can do about it.” (Thread 50)*

*“User 50B: It \*is\* trustless because you can run your own node. You don’t have to ask anyone about the state of a network. 51% attack vs the largest network doesn’t make much sense, especially when to do that you’d need to buy billions in miners, to only sabotage the reason you bought them.” (Thread 50)*

Here, **50A** and **50B** highlighted different forms of evidence when deciding whether to trust Bitcoin or not. In this part of the discussion, participants were speculating about what “fundamental flaws” Bitcoin may have. **User 50A** argued that one of these flaws is the 51% attack<sup>2</sup>. That is, they pointed out a system-level risk.

**User 50B** countered that Bitcoin is trustless, because you operate your own node. They highlighted personal control over individual-level risks. **User 50B** further discredits the system-level risk of a 51% attack by stating that such an attack “doesn’t make much sense”. Here, they’re highlighting their expectation that even if a 51% attack was possible, it would not benefit the perpetrator, and thus would be unlikely to happen. **User 50B** interprets Bitcoin as being trustless due to the

<sup>2</sup>51% attack refers to the possibility that, should one person or one institution have control over 51% or more of all the computers mining Bitcoin, then theoretically they would be able to take control of the entire system, due to the fact that they would be the majority, and thus able to authenticate any transactions in the ledger that they please, fictional or otherwise

underlying technology, which they view as mitigating risk. They interpret Bitcoin as affording individual control over engagement with the system, with the technology guaranteeing equitable participation. Their expectation that potentially problematic human actors would not behave in a way that “doesn’t make much sense” strengthens this interpretation. This idea of Bitcoin being trustless is also based in the belief that people make Bitcoin as a system less trustworthy. When participants defend Bitcoin’s trustworthiness, they often justify their optimism by highlighting how Bitcoin does not require trusting in people, as user **User 196A** describes below.

*“User 196A: The issue is that the people in charge of systems that powerful have a God complex, and I will not put faith in it, nor do I have to. You are trusting human beings with an immense task, and you should know that power corrupts us. [...] Bitcoin worked when it was worth pennies, it works now, and it will work 10-100 years from now. Best part, no one is in control, which is why there is no means to stop it, and no God complex at the top.” (Thread 196)*

Here, **User 196A** is responding to another user who remarked that Bitcoin has failed due to the recent volatile price swings. **User 196A** challenges this perspective by identifying “the best” part of Bitcoin being that there is “no God complex” controlling it. Based on their comment, **User 196A** interpreted existing financial institutions as having too much control over people. They extended this idea that “power corrupts us” to be a critique of human nature in general. To them, humans are the source of risk and uncertainty in financial systems. In opposition to human flaws, they presented Bitcoin as not just a trustless solution, but one that has always worked and will always work. “True Bitcoiners” interpret Bitcoin as being somehow unchanged and constant over time. This is an interesting contradiction with the fact that Bitcoin has received numerous software updates over the course of its existence, and has continuous human involvement due to the core software development team and all the people who mine and transact on the blockchain. These ideas, that Bitcoin is a solution to human flaws and that it will always function in this way, are important ideological positions in [r/bitcoin](#) discussions, despite the inherent contradiction. Its possible that this interpretation of Bitcoin as trustless serves as a risk mitigation strategy in the face of Bitcoin’s recent problems. In other words, Bitcoin’s human elements are viewed as the source of all error, as compared to the unchanging, ‘perfect’ technical nature of Bitcoin. This allows the concept of Bitcoin failures to be attributed to external problems rather than Bitcoin itself.

In addition to being unchanging and free of human trust, Bitcoin has also been interpreted as “permissionless”. **User 24A** posted these comments as part of an exchange with another member of the subreddit who expressed skepticism about what value Bitcoin actually provides people for everyday use, as most of the past use had related to illegal activity.

*“User 24A: Both of your notions are better expressed by the notion of “permissionless.” Bank money requires strong identity, contracts and a system of forceful jurisprudence. We don’t think about those things but bank money can’t work without that. Bitcoin takes care of all that in a network protocol. Bitcoin requires no identity, no legal contract and no court enforcement, yet it has never been fraudulent and has a perfect (error free to 15 decimals) transaction record. [...] Think of the deep sociological impact of a world where commerce happens without third party consent and little third party knowledge. Most people are frightened by that, but like it or not, it’s arriving. This is a much deeper impact than even the Internet. ...” (Thread 24)*

Here, **User 24A** describes Bitcoin as ‘permissionless’ due to the fact that technology is what makes it trustworthy and special. [r/bitcoin](#) participants argue that this technology is what sets Bitcoin apart from other cryptocurrencies and makes it so revolutionary. In this quote, **User 24A**



identifies 'bank money' as problematic due to the necessity of identity and contracts. It seems as though this participant interprets these forceful assurance properties as somehow risky, or at the very least ineffective. Bitcoin, in contrast, they view as 'perfect', again capturing this idea of perfect technology due to the 'network protocol'. It is interesting that **User 24A** describes Bitcoin as having "never been fraudulent", when there has been plenty of fraud associated with Bitcoin, such as exchange hacking [49]. Bitcoin's transaction record is only as accurate as the majority of users deem it. Based on that logic, it seems as though **User 24A** is interpreting Bitcoin as error-free due precisely to the fact that the "network protocol" is enforcing the rules of the system. In other words, they believe this makes it impossible for Bitcoin, and by extension its users, to need laws and other control. Bitcoin doesn't need people making sure that transactions are legitimate; they believe that the technology underlying Bitcoin ensures honesty.

Bitcoin is interpreted as trustless due to the widespread perception that Bitcoin's underlying technology is perfect and immune to fraud, while human actors in the system would not have the power or be incentivized to violate the protocol for personal benefit.

### 4.3 Ideological Tenet 2: Bitcoin is Liberation from Corruption

A key motivation described by [r/bitcoin](#) participants is that Bitcoin is better than existing governments, economic systems, and other institutions. Centralized power over money and people is regarded as both evil and inefficient due to their perception of Bitcoin as ensuring equality for every user. **User 209A**'s response is a typical example of this perspective:

*"User 209A: As long as people, especially the poor, can easily exchange whatever the hell they have for bitcoin [...] they will be much better off with btc than the rest of the trash out there. This is not only about getting rich for some people but to exit a corrupt economical system [...]" (Thread 209)*

Here, **User 209A** is arguing that all people would benefit from transferring their financial holdings to Bitcoin. They expanded upon this by describing how Bitcoin could especially help poor people, due to corrupt people with more resources no longer being able to mistreat them. When identifying Bitcoin's separation from banks and governments as a benefit, they typically refer to these institutions as inevitably corrupt or controlling. **User 209A** also introduced the widespread idea of Bitcoin's superiority to other financial institutions and cryptocurrencies with their reference to "the rest of the trash out there". In this comment, **User 209A** also highlights the tendency of these beliefs to be presented in tandem with moral justifications. **User 209A** does this through highlighting "the rest of the trash out there" as "corrupt", in addition to mentioning that "getting rich" is not their only motivation. Highlighting motivations about improving peoples' lives as more important than monetary motivations is commonly used in these ideological arguments about Bitcoin.

Based on our analysis of [r/bitcoin](#), "True Bitcoiners" perceive a core benefit of Bitcoin as being the freedom they believe it provides from centralized control. They believe that because Bitcoin allows people to manage their money without the influence of people in banks and governments, this will protect Bitcoin users from power centralization and unethical control. But, these perspectives fail to consider the myriad ways in which banks and governments protect their users, such as offering recourse from losses in fraud. The following comment by **User 134A** identifies several reasons why Bitcoin's separation from centralized institutions is perceived as so valuable:

*"User 134A: Bitcoin was about putting the power back into the hands of the people! To rid of the Banksters and all their evil deeds! If for one second you have bitcoin on an exchange and think you own them. Forget it!! Exchanges use your bitcoin value, just like banks lend your dollars out."*



[...]

*Time to show yourself responsible for your money, your bitcoins and yourself. Get a private key and take power! It's not like you haven't been warned!"* (Thread 134)

**User 134A** began their comment with a proclamation of what Bitcoin is meant to be used for: taking power away from the “Banksters and all their evil deeds” and giving it back to “the people”. This interpretation suggests that Bitcoin is actually viewed as a mechanism of this power exchange, both through the individual power this affords people and by how it weakens the centralized institutions themselves. Based on **User 134A**’s response, a key issue with institutions like exchanges and banks is their ability to lend out their money. **User 134A** navigated this threat to the idea of Bitcoin being trustless by encouraging private key ownership, which they believed would assure these idealized outcomes. **User 134A**’s interpretation expressed the common idea that keeping your private key absolutely private is the only way to truly own your Bitcoin, perhaps related to recent widespread fraud in relation to Bitcoin exchanges [50]. But, **User 134A** fails to recognize the way banks have different assurance features than exchanges. For example, if a bank crashes or mis-manages your money, there are some legal protections. With these third-party exchanges, there is no recourse.

In order for this rejection of domineering human influence in Bitcoin to be maintained, what “True Bitcoiner’s” perceive as the solution, Bitcoin’s underlying technology, must be understood as both able to consistently fulfill the roles of the human actors and guarantee that these power inequalities will not be reproduced in the Bitcoin system. **User 50A** argues that Bitcoin’s technological design achieves these goals:

*“User 50A: math and a decentralized network ...*

*which is better than > a dozen humans who aren't elected representatives*

*Which do you think is going to go corrupt first? Math and equal governance or a small body of humans that the public doesn't directly vote in?*

*If you have no say in the people “managing” how your money is created , you're most likely going to see corruption over time.*

*Because in btc each node is equal, and anyone can run a node, everyone has a voice in bitcoin. The system is already set up to run via mathematics.”* (Thread 50)

**User 50A** equated “math”, combined with the decentralized network, as being sufficient for Bitcoin to function without human interference. Again, this interpretation is embedded with contradiction, due to the fact that Bitcoin is still managed by various human actors, such as the core development team that facilitates and approves software updates. **User 50A** interpreted the “math” underlying Bitcoin as an “automatic” structure that guarantees equality in the system. This illustrates how many [r/bitcoin](#) participants placed extraordinary trust in the technology of Bitcoin, while simultaneously questioning the human aspects of the system. Additionally, this moral idea of equality is referenced by their emphasis on Bitcoin permitting everyday people to have a direct say in the function of the system.

**User 50A** took further issue with traditional currencies because leaders in these systems are not directly elected by the public. They viewed the consequence of this lack of input as inevitable corruption. This illuminates a key idea that directly relates to tensions about human control over Bitcoin: some users recognized that people will be using the network, and that this could lead to problems if there are not mechanisms in place to prevent some people from gaining more control than others. But, they still recognized that people deserve to have direct, communal control of how the network operates. **User 50A** believed this aim is fulfilled by “math and a decentralized network”. In other words, the value (and trustlessness) of Bitcoin is interpreted as ensuring fairness and equal contribution to governance of the system. Thus, Bitcoin is still perceived as trustless.

Bitcoin is also identified as resistant to corruption due to a unique quality of the Bitcoin network protocol. Miners contribute their computer processing power in order to verify transactions, and are randomly rewarded with Bitcoin. However, the protocol is designed so that after 21 million Bitcoins are released, this incentive will end and no more Bitcoin will be produced [51]. **User 44A** identifies this property as a valuable defense against manipulation of Bitcoin:

*“User 44A: I know how much total can exist within the network, I can verify that myself by looking at the code. I know that if I hold 1 BTC today I will always own 1/21M of all bitcoin and that share of ownership will remain fixed indefinitely. No person or entity on this planet has the power to change that now or ever. Perhaps even more importantly, no person can use my stake in this currency to fund needless wars or commit violent acts on my behalf against my will. That alone is reason enough for me to hold and use bitcoin.”*  
(Thread 44)

Bitcoin has been designed so a maximum of 21 million coins will be all that mining will ever be able to produce [51]. **User 44A**’s trust comes from their interpretation that this quality of Bitcoin will prevent people from manipulating how much money they have. **User 44A** also praised how nobody can use their money in a way they disagree with. **User 44A** clearly identified the “best” feature of Bitcoin as being purely related to the technology. They justified trusting the technology because they feel they are able to “verify [the technology] myself [themselves] by looking at the code completely independently. Additionally, they recognized value in their belief that their ownership of Bitcoin will remain unchanged “now or ever”. This idea of permanent, assured ownership and control reflects an important aspect of the “True Bitcoiner” ideology: Bitcoin is valuable not just because this personal control is possible, but because it is believed to remain this way forever. To these participants, if there is no risk of failure, then it only makes sense to trust Bitcoin.

Based on these findings, we conclude that the “True Bitcoiner” supports the perception of Bitcoin as trustless due to valuable features of Bitcoin’s underlying technology that participants perceive as more trustworthy than corrupt human institutions and imperfect individuals. In addition to trust in the technology and freedom from corruption, “True Bitcoiners” also believe that by collectively accumulating Bitcoin, their dreams for Bitcoin’s future will come true.

#### 4.4 Ideological Tenet 3: Making a Better Future by “HODL”ing Bitcoin

Many participants on the subreddit believe that with collective action, the revolutionary future they envision for Bitcoin will become possible. There is some variety across individuals as to how exactly they define their personal wishes for this future; most describe the future as Bitcoin becoming a widespread currency that damages institutional control and improves income inequality. Some aspire for profit or having Bitcoin to leave for future generations. But, what is common across all of these imaginings is how True Bitcoiners believe that they can collectively make a positive future for Bitcoin a reality. While past work has identified challenges with Bitcoin participants’ attempts to translate these abstract imaginings for the future into reality[41], on [r/bitcoin](#), this shared goal of a positive future leads to a unified interpretation of what must be done to produce this future. They believe that if they buy a lot of Bitcoin, and don’t sell it in accordance with the volatile fluctuations of the market, that eventually Bitcoin will become valuable and successful. This approach is also referred to by the slang term “HODL”.

The concept of “HODLing” originally emerged as a typo on the official Bitcoin forums in 2013. It caught on as a popular slang term, group identifier, and rallying cry for those who “hold” their Bitcoin. On a surface level, HODLing means accumulating as much Bitcoin as you can and not selling your Bitcoin for any other kind of currency, such as other cryptocurrencies or fiat currencies like US dollars. But, descriptions of HODLing incorporated ideological features beyond just owning

bitcoin. Participants claimed that they HODL bitcoin because keeping their bitcoin, no matter, will make Bitcoin successful as money and/or an everyday store of value. This idea is exemplified in the following comment:

**“Thread 217:** *Still not selling, and still more bullish than a year ago. Let 1MM subscribers here remind us of what we’ll see USD wise on CMC when our plan to takeover fiat is done. To all the brave warriors here, let’s aim for 2MM now. HODL.*” (User 217A)

**User 217A** created a thread as a response to the [r/bitcoin](#) forum reaching one million subscribers. **User 217A**’s comment “Still not selling, and still more bullish than a year ago” exemplified the HODLER principle to not sell even if there is profit to be made. Describing Bitcoin’s successful future as including “our plan to take over fiat” demonstrated the HODLER idea that HODLING bitcoin represents more than just making money, but a desire to make their vision for a better future a reality. For **User 217A**, this means having Bitcoin replace existing monetary institutions, a commonly expressed goal. **User 217A** clearly knew that they could sell immediately and make money; but, they see this anticipated future as more valuable. HODL also captures an idea of sacrifice. True Bitcoiners recognize that trusting and holding Bitcoin is challenging, especially in the face of an uncertain future. This recognition of HODL as an intentional sacrifice is intensified by the use of the imagery of “brave warriors” to signify resisting hardships. In this comment, **User 217A** identified how the HODLING ideology is used in this socio-technical system as a strategy for building trust in Bitcoin’s future despite current financial risk.

**User 217A** expanded upon the challenges of making these sacrifices, including how they envisioned them paying off in the future. **User 217A** posted this thread as an open letter of sorts to their future grandchildren, who they are planning to leave their bitcoin to.

**“Thread 32:** *[...] Hard to hold and not “cash out” during multiple bear markets. [...] Hard for their grandfather to watch his initial investment multiply tenfold and then lose eight fold but still hold on because he wasn’t a professional trader. What made it manageable was knowing that Bitcoin is revolutionary and although hard sometimes their grandfather saw how it was a game changer from the current (at the time) monetary policy and crooked fiat schemes. [...] Remember that In every battle there comes a time when both sides consider themselves beaten, then he who continues the attack wins.*” (User 32A)

**User 32A** further expresses and justifies the HODL ideology. Their comment exemplifies the widespread belief that people need to maintain their optimism in Bitcoin no matter the current circumstances.

**“Thread 186:** *If you believed in Bitcoin at 16.7k, you must love it even more at 3k as you would be grateful of this opportunity. What has changed in a year (beside the price)? If you bought because you are a trend follower and out of FOMO, then you would now sell out of despair and FUD. This is what most people do unfortunately. In my honest opinion, you should buy more (bitcoin and not altcoin<sup>3</sup> as less risky) [...]*” (User 186A)

**User 186A** here emphasized that while Bitcoin is worth less, it needs to be trusted even more than while it is worth a lot. They also criticized those that buy and sell due to market trends for “FOMO” (Fear of Missing Out). **User 186A** described the common strategy of HODLers who, during price falls, buy more Bitcoin to lower their average buy-in cost. This supports the HODL ideal of accumulating as much Bitcoin as possible. Participants often shared their current buy-in average with other participants as a way to brag about their current Bitcoin holdings. **User 186A** reiterated these HODLER ideas while also expressing that Bitcoin is valuable because of the human effort

<sup>3</sup>“altcoin” refers to other cryptocurrencies that are not part of Bitcoin

that was input into Bitcoin's development. It was also common to criticize and belittle people who "cashed out" their Bitcoin or used cryptocurrencies other than Bitcoin.

#### 4.5 The "True Bitcoiner" Ideology

Participants in [r/bitcoin](#) repeatedly mentioned three important beliefs that they used to justify a range of actions: that Bitcoin's technology is the only thing that needs to be trusted, that Bitcoin can free people from corrupt social institutions, and that "HODL"ing on to Bitcoin is the way to achieve this new social order.

These findings demonstrate the development and practice of an ideological viewpoint on [r/bitcoin](#). These beliefs align with Smith's conceptualization of ideology. Smith argues that in his functional conceptualization of ideology, ideologies can exist based on the *intent* to change social order or produce oppression, whether they actually do or not [58]. To explain this, Smith uses the example of KKK members who hold white supremacist views, but live in a society that prohibits them from acting upon these views. Forum members hold these three beliefs with the intent of changing the social order of who is important and who is not; these beliefs are ideological even if they do not actually achieve this change [58].

It is difficult to determine if, based on the conversations on [r/bitcoin](#), this community is actually influencing oppressive outcomes through Bitcoin use. However, as our findings demonstrate, forum members, through their statements, explicitly define who is or is not a legitimate and beneficial participant in Bitcoin. They also assign negative associations to the out-group, including degrading bankers and individuals who choose to exit the Bitcoin system.

Smith describes how media enables representations of ideological beliefs to be replicated and spread across groups of people over time [58]. We find that this process is happening on [r/bitcoin](#), with the True Bitcoiners repeating this set of beliefs in a wide variety of threads and using them to justify repressing parts of society that they deem corrupt.

Finally, Smith argues that "those who embrace ideological beliefs do so because they consider them to be true". "True Bitcoiners", based on their engagement with [r/bitcoin](#), appear to truly believe in Bitcoin's merit to improve the world and people's lives. They go as far to reject profit motive and other individualistic approaches to Bitcoin as unimportant or even immoral. Based on these ideas, interpreting [r/bitcoin](#) in terms of Smith's functional conception of ideology demonstrates how these three beliefs influence how [r/bitcoin](#) participants interpret the reality of Bitcoin, including who does and does not belong as a "True Bitcoiner".

## 5 DISCUSSION

These findings demonstrate how ideology functions on [r/bitcoin](#) to support a dominant viewpoint about the reality of Bitcoin. All three ideological tenets identified in our findings section connect back to the core conceptualization of Bitcoin as "trustless". On [r/bitcoin](#), how participants refer to trustlessness can be described as the perception that the usage and function of Bitcoin is not influenced by any social ties that imply vulnerability, including human control over the system. This ideological perspective serves to support the viewpoint that Bitcoin is "trustless", and thus merits continued participation and hope, even in the face of mounting risks and failures.

In our inquiry, our goal was not to evaluate Bitcoin or the "True Bitcoiner" ideology as beneficial or harmful. Rather, our aim was to understand how, in the context of Bitcoin as an innovative socio-technical system, people decided to trust and use Bitcoin. Our contribution with this approach is outlining the role trust and ideology play in how people build trust in socio-technical contexts. We also highlight the potential of online communities as an interesting place where this trust-building happens.

Despite the seeming contradiction, this ideological “trustlessness” is maintained through these trusting social ties. These allow the ideology to disseminate and resist contradictory viewpoints and evidence. On [r/bitcoin](#), how participants refer to trustlessness can be described as the perception that the usage and function of Bitcoin is not influenced by any social ties that imply vulnerability, including human control over the system. And yet, this definition is embedded with inherent contradictions. As we described in our examination of Bitcoin’s history, any participation involves trusting the technology to function as expected, trusting the other people using the system to follow the rules of the consensus algorithm, and trust in the integrity of the socio-technical relationships, such as mining, that keep the system functional. Bitcoin functions based on trust, and trust is inherently social. Rather than recognizing that the blockchain causes trust to metamorphize, not disappear, participants interpret the nature of Bitcoin overall as trustless.

We use this interpretation of trustlessness to demonstrate that [r/bitcoin](#) participants believe in this “True Bitcoiner” ideology of trustlessness not as a result of misunderstanding or deception, but as a means to more easily navigate the many uncertainties of Bitcoin. Many of these users claim to have invested considerable time, money, and effort in Bitcoin. We argue that the “True Bitcoiner” ideology functions to both legitimize this investment and define what kinds of people and behaviors need to be permitted into the Bitcoin community. This ideological gate-keeping functions to insure that this effort will not have been in vain.

Beyond the [r/bitcoin](#) context, these findings demonstrate a potential way trust in complex socio-technical systems develops using ideology that is developed and driven by everyday participants. There is extensive evidence in the online communities literature demonstrating the power online communities have to build trusting social ties and a sense of community [59], influence how people learn and understand complex ideas [30], and produce imagined, collective futures [29]. But, the role of ideology being formed in online communities for the purpose of socio-technical interpretation suggests that this type of social process may have a powerful influence in other socio-technical contexts. Our findings demonstrate that the reality of socio-technical systems is interpreted socially. This interpretation can become operationalized via this ideology, which serves to spread, maintain, and strengthen that belief, and, in the perspective of the participants, influence the success of the socio-technical system itself.

However, this ideological perspective on [r/bitcoin](#) does continue face real world challenges. Recent challenges with Bitcoin’s massive price drops in late 2018 [53], fraudulent exchange services [65], privacy issues [42], and the difficulty in predicting Bitcoin’s future as an asset, currency, or investment [5, 28] have led to doubts on [r/bitcoin](#). These issues directly challenge the radical and hyperpositive aspirations of the “True Bitcoiner” ideology. However, rather than weaken these beliefs, the tension between these real world issues and the “True Bitcoiner” ideology is actually what drives much of the discussion on [r/bitcoin](#).

## 6 CONCLUSION

Bitcoin is a complex socio-technical system [10] that depends on user trust [2] in order to function properly. By analyzing almost three months of postings on the [r/bitcoin](#) subreddit, we described how people use this online community to build and maintain trust in Bitcoin. We found that participants have a specific “True Bitcoiner” ideology that they promote. This ideology is founded on an interlocking set of beliefs that define Bitcoin’s underlying technology as infallible, interpret existing institutions of money and powerful people as corrupt, and allow the collective imagination of an idealized Bitcoin future produced by accumulating and “HODLing” Bitcoin.

These beliefs all connect back to the core belief that stems to Bitcoin’s intended purpose: a “trustless” system of money. Despite ample contradictory interpretations and real-world failings, this belief in the trustless nature of Bitcoin is maintained by this ideological perspective. Interpreting



Bitcoin as trustless reduces interpretive complexity, minimizes the recognition of risk, and supports the development of community camaraderie to collectively imagine, and work towards, a new Bitcoin future.

This ideology's role in socio-technical building has implications for how people understand and use socio-technical systems broadly. It is difficult to build trust in a complex socio-technical system like Bitcoin when most people do not fully understand that system. But it is important to do so, or people won't use the system. This "True Bitcoiner" ideology that has emerged on [r/bitcoin](#) gives participants in the subreddit ways to justify trusting the system, and the tensions we identified give the subreddit participants ample opportunity to do so. The role of ideology in other socio-technical contexts has potentially major implications, as our findings have demonstrated, for how people interpret the system, build community around it, and develop ideological beliefs.

Ideology in the media has contributed to the rise and fall of empires throughout recorded history [58]. As socio-technical places continue to become more ingrained in how people learn and connect with one another, the way ideology influences how people imagine the reality of these systems and their place within them could have far-reaching consequences. What technology people decide to trust could shape the landscape of trust in modern socio-technical life. Just like experiences of trust, the nature of modern socio-technical systems is continuous evolution and change. As our findings demonstrate, the role everyday people do in trusting, internalizing, and sharing ideological perspectives on these complex systems has the potential to change the very nature of these systems.

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