

ARTICLE

Attitudes About Cryptocurrency Incentives for Research Participation

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ABSTRACT

It is essential to continually assess and find new ways to recruit and retain participants for research studies. Cryptocurrency is growing in popularity and may be a novel way to incentivize research participants. 100 participants, 50 of whom already had a cryptocurrency wallet and 50 of whom did not have a cryptocurrency wallet, were recruited through Facebook ads and completed a survey that asked about their experience with cryptocurrency and non-fungible tokens (NFTs) and potential interest in use of it for compensating research participants. The majority of respondents (79%) had some experience with cryptocurrency and 85% said they were comfortable trading cryptocurrency. Many participants had exchanged cryptocurrency within the past month (62%) and over their lifetime (70%). Respondents, however, were less familiar with NFTs, with only half having some experience with them. 18% of those without a cryptocurrency wallet and 42% of those with a cryptocurrency wallet chose to be compensated by cryptocurrency and NFT. Results suggest that, although cash and gift card incentives are preferred, there is an interest in cryptocurrency and NFTs. More studies will need to be done on a larger sample size and some of the challenges discussed (like cryptocurrency volatility) need to be addressed.

Keywords: Healthcare; Behavioral intentions; User psychology; Cryptocurrency

1. Introduction

Participant recruitment, retention, and engage-

ment are crucial for the success of research and can be some of the greatest barriers for researchers^[1,2].

Because of this, it is important to continually assess

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and develop new ways to attract and retain research participants to ensure success of research studies. Researchers have been studying how monetary incentives affect survey participation and the majority of data suggest that incentives lead to higher participation without decreasing data quality ^[2,3]. A Cochrane review was done that recommended incentives to improve recruitment ^[4] and incentives themselves can be seen as a gesture of appreciation for a participant's time and efforts while participating in a study ^[5]. One study also concluded that incentives increased enrollment without producing undue or unjust inducement or other unintended consequences ^[6]. This is important as we do not want incentives to create a bias in the recruited sample. Incentives can also help increase participant responses, such as for surveys, and decrease recruitment failure and dropping out from a study ^[5]. This leads to more data collected, as well as a better quality of data. Incentives can be especially helpful in public health research and be used as a strategy to get people to start health promotion programs and other health interventions ^[7]. Sometimes that initial nudge is what is needed to join the program and then as they realize the health benefits, dependency on incentives can be reduced ^[7]. At the same time, incentives can further improve retention in these studies by offering rewards at various milestones or after achieving certain goals ^[7]. For example, you might receive a bonus if you attend all sessions during a study or you may receive additional compensation if you adhere to treatment consecutively for three weeks ^[7].

Deciding what kind of incentives to use and how much may depend on the study and the study population. With the rise in interest and popularity of cryptocurrency and non-fungible tokens (NFTs), using these new types of currency or digital assets may be a novel approach to motivate participants over traditional cash and gift card incentives. Even those not familiar with cryptocurrency and NFTs may be attracted to a new type of incentive. Cryptocurrency is a peer-to-peer digital currency run on blockchain technology that eliminates the reliance on a third party (centralized banking system) for transactions ^[8].

To date, there are over 22,000 cryptocurrencies active in exchanges and this number only continues to grow ^[9]. Many companies and stores are even starting to or are already accepting cryptocurrency payments ^[10]. NFTs are also run on blockchain technology but, unlike cryptocurrencies, cannot be replicated and each one is unique. They represent ownership of objects like art and other collectibles, both digital and physical ^[11]. While some of the initial popular examples of NFTs include digital art and video game items ^[11], NFTs could represent any asset similar to an electronic receipt. As each NFT is unique, it could be used as proof of attending an event, proof of membership for a club, or proof of completing training ^[12]. For example, for participating in a research study you could receive a special NFT (sort of like a collectible baseball card) that shows you have participated in a certain research study.

This manuscript seeks to explore people's interest and willingness in using cryptocurrency and/or NFTs as a form of compensation for participants in research.

2. Methods

From October 20, 2021 to November 9, 2021, online advertisements were placed on Facebook through their advertising platform inviting users to complete a survey that asked about their opinions and experience with cryptocurrency and NFTs. The survey was created and hosted on Qualtrics and participants were required to authenticate themselves using their Facebook credentials. Eligibility criteria for the study were adults, 18 or older, who lived in the United States. There was also a separate quota for people with and without a cryptocurrency wallet. The survey remained open until 100 participants had completed the survey, 50 of whom already had a cryptocurrency wallet and 50 of whom did not currently have a cryptocurrency wallet. Those who were eligible saw a study information sheet detailing study procedures for participants, as well as risks and benefits. Informed consent was obtained from all participants before receiving the survey by clicking a button, "I Agree." when seeing the study information

sheet. Those who clicked, “I Agree.” then saw the study survey. Questions used a combination of Likert scale questions, multiple choice, and short answer questions. Survey questions included 5 demographic questions (e.g. age, race, gender identity, zip code, whether or not they owned a cryptocurrency wallet). 13 questions in the survey were about experience and comfort with cryptocurrency: 1) How experienced are you with cryptocurrency (e.g. Bitcoin, Ethereum, Dogecoin, etc.)? 2) How comfortable are you sending or receiving payments in cryptocurrency? 3) How interested are you in being rewarded cryptocurrency for participating in societal/public health research? 4) In dollar (\$) value, please estimate how much cryptocurrency you have exchanged over the past month? 5) In dollar (\$) value, please estimate how much cryptocurrency you have exchanged over your lifetime? 6) Which cryptocurrencies have you traded? 7) How frequently do you trade cryptocurrency? 8) What factors are most important in choosing the cryptocurrencies you trade? 9) Compared to receiving compensation for this survey in the form of cryptocurrency, how much would you prefer to receive compensation as cash? 10) Compared to receiving compensation for this survey in the form of cryptocurrency, how much would you prefer to receive compensation as a gift code? 11) Compared to receiving compensation for this survey in the form of cryptocurrency, how much would you prefer to receive compensation as an entry into a lotto/sweepstakes? 12) Compared to receiving compensation for this survey in the form of cryptocurrency, how much would you prefer to receive compensation as a ticket to an event like a movie? and 13) Compared to compensation in the form of a \$5 gift card to an online retailer (e.g. Amazon, etc.), how many coins of a new cryptocurrency would you expect to receive? 10 questions in the survey were about experience and comfort with NFTs: 1) How experienced are you with non-fungible tokens (NFTs)? 2) How many non-fungible tokens (NFTs) do you currently own? 3) What types of non-fungible tokens (NFTs) do you currently own? 4) How interested are you in being rewarded non-fungible tokens (NFTs) for

participating in societal/public health research? 5) How interested are you in being rewarded NFTs that are specific to a research study? For example, for participating in this research you could receive a special NFT (again think of a collectible baseball card) that shows you have participated in a research study at the University of California, Irvine. 6) Compared to receiving compensation for this survey in the form of non-fungible tokens (NFTs), how much would you prefer to receive compensation as cash? 7) Compared to receiving compensation for this survey in the form of non-fungible tokens (NFTs), how much would you prefer to receive compensation as a gift code? 8) Compared to receiving compensation for this survey in the form of non-fungible tokens (NFTs), how much would you prefer to receive compensation as an entry into a lotto/sweepstakes? 9) Compared to receiving compensation for this survey in the form of non-fungible tokens (NFTs), how much would you prefer to receive compensation as a ticket to an event like a movie? 10) Compared to receiving compensation for this survey in the form of non-fungible tokens (NFTs), how much would you prefer to receive compensation as cryptocurrency? 1 question in the survey was about how important participating in research was to them. Participants were given their choice of incentive for completing the survey, either a \$5 Amazon gift code or 10 Recerca tokens and an art NFT showing they participated in this study. Recerca is a new cryptocurrency designed to compensate participants in scientific/public health research studies (<https://recerca.io/>). Descriptive statistics were done using Microsoft Excel. This study and the consent process were exempted by the University of California, Irvine Institutional Review Board. Please see the University of California, Irvine website for more details about self-exempt studies (<https://research.uci.edu/wp-content/uploads/confirmation-of-exempt-reference.pdf>).

3. Results

About 30% of respondents were below the age of 30, 33% were between 30 and 42 years old, and the remaining respondents were older than 42 years old.

The average age was 38.88 years old. The majority of participants were male (73%) and white (67%). See **Table 1** for additional details.

Table 1. Demographics of study population.

	Category	Participant
n		100
Age (mean, SD)		38.88 (12.23)
Ethnicity (%)	American Indian or Alaska Native	2 (2.0)
	Asian	8 (8.0)
	Black or African American	14 (14.0)
	White	67 (67.0)
	Hispanic	4 (4.0)
	Hispanic and White	3 (3.0)
	Hispanic and Black or African American	1 (1.0)
	Other	1 (1.0)
Gender Identity (%)	Female	27 (27.0)
	Male	73 (73.0)

The majority of respondents (79%) had some experience with cryptocurrency and only 15% said they were not comfortable trading cryptocurrency (**Table 2**).

Table 2. Experience with cryptocurrency and NFTs.

Category	Yes (Slightly experienced or more)	No (Not at all experienced)
Experience with cryptocurrency	79	21
Experience with NFTs	50	50

The majority of people had also exchanged cryptocurrency within the past month (62%) and over their lifetime (70%). Most respondents who had exchanged cryptocurrency had exchanged under \$1000 worth of cryptocurrency in the past month (47%) and under \$10,000 worth of cryptocurrency over their lifetime (55%). Bitcoin was traded the most by participants (62%), and the factor most important in choosing what cryptocurrency to trade was the “potential for making money” (69%). The majority of people (95%) believed participating in scientific or public health research was at least “slightly important” to them. 9% stated they were “not at all interested” in receiving cryptocurrency as a reward for research participation. Overall, cash (56%) and

gift cards (54%) were preferred as an incentive over cryptocurrency (25% and 27%, respectively). Cryptocurrency was preferred over a lotto or sweepstakes entry (73%) or an event ticket (58%).

Participants were not as familiar with NFTs, with half of participants having no experience with NFTs (**Table 2**). 29% of respondents owned any NFTs. Art was the most popular type of NFT, with 11% of participants owning an art NFT. 21% of respondents stated they were “not at all interested” in receiving NFTs as a reward for research participation. Cash (69%) and gift cards (66%) were preferred as an incentive over NFTs but NFTs were preferred over a lotto or sweepstakes entry (60%) or an event ticket (49%). In line with the previous questions, cryptocurrency was preferred (62%) as an incentive over NFTs.

The majority of participants (70%) chose to receive an Amazon gift code. Of the 30 participants who chose to receive Recerca tokens and an NFT, 9 (18% of those without a cryptocurrency wallet) of them did not own a cryptocurrency wallet and 21 (42% of those with a cryptocurrency wallet) of them owned a cryptocurrency wallet.

4. Discussion

Our findings suggest that there is an interest in the use of cryptocurrency and NFTs as a method for compensation in research. Almost a third of participants chose to receive cryptocurrency and an NFT over the more traditional, electronic gift code, especially those who already owned a cryptocurrency wallet. As cryptocurrencies and NFTs become more popular, we may see a growth in participants who will prefer this as compensation for research so it is important to also follow current trends to see what types of incentives will be most popular for a given study population. The majority of participants were also already familiar with cryptocurrencies, showing that it is starting to become integrated into our current society. For those not yet as familiar with cryptocurrencies, its novelty can also help attract participants who may be curious about a new currency. Even out of those who did not currently own a wallet, almost 20% chose to receive cryptocurrency

and an NFT over a gift code. As it appears cryptocurrency is here to stay ^[13], researchers will need to continue exploring this avenue as an option for compensation to keep up with evolving trends.

As cryptocurrency gains popularity, however, there are some challenges that will need to be addressed. The anonymity of cryptocurrency transactions may attract those who are more criminal-minded ^[14]. Fears of cryptocurrency being used for illicit activities ^[15] have led several countries to begin imposing regulations and creating frameworks for the use and trading of cryptocurrency ^[16]. Some countries like China have even gone as far as banning all cryptocurrency ^[14]. This may or may not affect a participant's willingness to be involved with projects using cryptocurrency as a reward. Other challenges are the market risk and fluctuations and security issues that come with a volatile currency such as cryptocurrency ^[16]. Bitcoin in 2021 was very volatile and saw swings of 50%-100% ^[14]. And not all cryptocurrencies are the same; volatility can be even greater for less popularly-traded cryptocurrencies. Cryptocurrencies similar to Bitcoin also have a very high energy demand ^[14]. Some reports have even shown that Bitcoin used more energy than in some countries like Norway ^[14]. There are newer cryptocurrencies that consume much less energy like Ethereum, but the energy cost is still high ^[14]. Finally, there may also be some ethical concerns as there is the potential for undue influence because there is so much in the media about cryptocurrency being a get rich quick scheme, particularly for studies with more vulnerable populations such as those with participants who are active drug users. Prior research on incentives have shown that incentives did not cause undue influence ^[6] but more research will need to be done involving cryptocurrencies and NFTs as incentives. Also, while more research around cryptocurrency and NFTs are needed, these challenges have made it hard to find a fit for funding from government agencies due to the above fears. There is currently a lack of funding opportunities related to cryptocurrency and NFTs and the challenges mentioned above are major research priorities ^[14].

In an effort to address some of these barriers, education may be an approach to encourage those who may be interested in participating in research efforts rewarded by cryptocurrency. In addition to information about the study and the purpose of the research, study websites may offer more non-technical information to enlighten the public who may be curious but not too familiar with cryptocurrency about its origin, benefits, challenges, and drawbacks. It is very important that the public becomes more educated about cryptocurrencies and NFTs as it is still relatively new and so that they are informed about the risks. While many people may have heard of cryptocurrency and NFTs, there are few people who know exactly how it works, and many people may have learned about cryptocurrency and NFTs from social media, which can provide misinformation ^[14].

Some limits of our study include the small sample size. Online advertisements were also targeted at Facebook users so they may not be representative of society as a whole. The cryptocurrency participants received was also a brand new one that is not widely used yet. The popularity of the cryptocurrency incentive may have an effect on their choice of incentive. Future studies will need to explore a larger sample size, as well as a more diverse population.

5. Conclusions

While other incentives may currently still be preferred over cryptocurrency and NFTs, we have shown there is interest in both as an incentive for research participation. We also showed that many people are already familiar with and actively using cryptocurrency and NFTs. These digital assets are here to stay and their use by the public continues to grow. Though challenges abound, more research and education may be needed to increase awareness and promote the role of cryptocurrency and NFTs as a reward or incentive in scientific research and address those challenges.

Author Contributions

Dominic Arjuna Ugarte: Conceptualization,

Validation, Investigation, Data Curation, Writing – Original Draft, Writing – Review and Editing, Project Administration. **Sean D. Young:** Conceptualization, Methodology, Resources, Writing – Review and Editing, Supervision, Project Administration, Funding Acquisition.

Conflicts of Interest

The authors have been working on development of a coin designed to reward people for participating in research.

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