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Money, possessions, and ownership in the Metaverse: NFTs, cryptocurrencies, Web3 and Wild Markets

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ABSTRACT

Our understandings of money, possessions, and ownership are all changing dramatically as consumption becomes digital and virtual. The Metaverse is an imagined future space where these building blocks of neoliberal production and consumption are delinked. We examine these changes through the affordances of cryptocurrencies, algorithmic collectibles, and NFTs. We seek to disambiguate these efforts at disintermediation through online auctions and speculation. We present practical implications for artists, art institutions, buyers, and investors. We theorize new forms of ownership with fractional ownership and fractionalized property rights. And we seek to understand why some consumers pay astronomical prices for digital art that includes simple and often silly artwork with limited property rights. To do so we distinguish alternate, but sometimes overlapping, buyer motivations in the wild world of crypto art as we purportedly move toward the Metaverse.

1. Introduction

Some predict that Web3 will be our next disruptive technology shift. According to advocates like Mark Zuckerberg we will live through avatars as we do our shopping, business, and entertainment consumption in the Metaverse. The Metaverse is an extended reality (XR) predicted to arise within the coming decade (Newton, 2021). This prospect has spawned a virtual land rush involving potential metaverses, new types of digital property, and new ways of owning this property. Such property comes with only some of the property rights associated with owning tangible things. Advocates see these new forms of ownership as promising democratization and decentralization of ownership as we move from Web 2.0 to Web3. They see these trends and the cryptocurrencies and NFTs (non-fungible tokens) that facilitate them as part of the Big Bang of digitalization that occurred in 2021 (e.g., Hyme, 2022). But others point to the crash of cryptocurrency values in 2022 and suggest that the crypto party is over (Hawkins, 2022). In that case, the Big Bang may be more like the Dot Com bubble burst of the late 1990s. This paper highlights the practical and theoretical issues that these new forms of ownership raise.

Practically, the implications of the metaverse are being felt in a variety of industries. Among them are gaming – both videogames and gambling – and such distinctions are blurring (Scholten et al., 2019). The fine art market too has been rocked by sales of NFTs with significant implications for auction houses, galleries, dealers, artists, collectors, and investors. Non-art collectible markets are also being facilitated by NFTs and auction sites like OpenSea. Wall Street and its global equivalents have joined independent investors in seeing this multi-trillion-dollar digital activity as a way to make money. Tech giants Meta, Microsoft, Apple, Tencent, Alibaba, Sony, and Nintendo are all building Metaverses as are game worlds like Fortnite, Decentraland, and Roblox. Platforms that now operate in 2D, whether gaming, commerce, or social media, will all need to think in 3D and MR (mixed reality) if the Metaverse ever comes to pass. That is a big "if" as we shall see.

Theoretically there are a number of new issues posed by the Metaverse and related applications, technologies, and other affordances that follow in its train. One such issue involves how rarity can be created for digital goods so that they might be used, collected, and considered valuable. The attractiveness and collectability of digital possessions is an issue that has been addressed in consumer research (Denegri-Knott and Molesworth 2010; Mardon & Belk, 2018; Watkins, Denegri-Knott, & Molesworth, 2016). Although this research has discovered sometimes strong feelings of ownership toward digital possessions and some possibilities for collecting them, it did not anticipate NFTs and the surge in collecting and speculating that this blockchain platform-free proof of ownership allows.

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Cryptocurrencies include Bitcoin and Ethereum alongside thousands of altcoins (Humayun & Belk, 2022). Then there are currency economies narrowly tied to a specific platform, digital world, or game such a Roblox's Robux, Second Life's Linden Dollars, and The Sims' Simoleans. The theoretical issue here concerns how we perceive and treat these new currencies. Are they seen like Monopoly play money or gambling casino chips that can be spent or wagered more freely than more traditional currencies? There has been some related consumer research into the meanings of money and alternative modes of payment (e.g., Belk & Wallendorf, 1990; Humayun & Belk, 2017; Khan, Belk, & Craig-Lees, 2015). There has also been some research with earning and spending in-game currencies (e.g., Boss, 2007; Hemp, 2006). Much more is needed.

A more perplexing theoretical issue is just what are the limits to what can be digitalized, commodified, and sold as an NFT. We now mostly accept the digitalization of once-physical books, mail, music, software, photographs, and games. Music and software are also available by subscription, allowing access rather than ownership. NFTs provide a proof of ownership, but what is owned may only be a share of something with a fraction of the property rights that would attend full ownership.

NBA Top Shot video clips represent a basketball action (often a slam dunk) by a particular player at a particular moment in time and space. Sports NFTs have an in-built group of fans who want to celebrate the highlights and heroes of "their" team. This is the "BIRGING" or basking in reflected glory phenomenon (Cialdini, et al, 1976). We preferably choose our "moments" (Tuohy, 2010) but mystery packs of "cards" and limited editions fuel collector desire (Mardon and Belk 2018). Photos of our collective memories memorialized in media that we can freely access on the internet are being thus bundled and sold back to us as NFTs. If the past can be bottled and sold back to us with limited property rights (see the next paragraph), what else can be commodified?

Finally, a key theoretical issue driving this paper is the change in the forms of ownership in the Metaverse. When NFTs and cryptocurrencies were conceived, the idea was the realization of "the techno-libertarian dream of a decentralized system for controlling capital" (Murray, 2021). The idea was to disintermediate, removing the middleman between producer and consumer. In the case of art, for example, NFTs largely eliminate the need for galleries, agents, and experts to validate authenticity while digital currencies eliminate the need for banks, credit card companies, and federal reserves. Today anyone can buy art online because its authenticity is guaranteed by a blockchain. Listing artwork online expands the potential market beyond gallery and exhibition visitors. And an NFT can carry a smart contract giving the artist a fixed percentage of the future sales of their artwork.

The Metaverse ties many of these issues together. To investigate such theoretical issues further, it is useful to consider the digital environment of these interwoven cryptocurrency, gaming, collectibles, art, sport, and investment worlds. Following that, we assess changes in theories of ownership necessitated by these developments.

2. The Metaverse

The term metaverse comes from the Neal Stephenson (1992) cyberpunk/cyberpunk parody novel *Snow Crash*. As Hollensen, Kotler, and Opresnik (2022) summarize:

> Somehow the Metaverse is a digital facsimile of how we are working in the physical world. In this 3D digital space, the users can come together via avatars that resemble them and mimic their movements, so that they can interact with each other and the surroundings, which also replicates the physical world (npn ahead-of-print copy).

This is a description of a singular Metaverse like the one that Meta (formerly Facebook) is striving to construct.

The multiverse that is more likely to emerge draws only metaphorically on the quantum mechanics hypothesis that we are living in one of several parallel universes that comprise a multiverse. Stephenson's metaverse is a dystopia in which the economy has crashed, and governments are replaced by corporations whose mercenary armies compete for defense contracts. If today's emerging metaverses are not so dystopic, neither are they utopic.

Ownership of digital property is a key issue. Despite promises, it is unlikely that you will be able to take your avatar, land, buildings, and most other unique digital possessions (e.g., clothing, cars, and furnishings) between universes (Marr, 2021). You may have an avatar in World of Warcraft, a house in Second Life, vacant land in Decentraland, cars in Gran Turismo, and in-game currency in Roblox, but they are not portable as these platforms are not currently interoperable. Solutions to some of these problems may be aided by NFTs and cryptocurrencies, but there may well be some intractable competitive issues and insurmountable technological issues. But then, that's what they said when railroads began with different gauge tracks and power sources (Simcoe & Watson, 2019).

There are already multiple metaverses owned by multiple entities, including some major internet and online gaming players. They each have their own standards and rules. Virtual worlds operate in an area of law that is still emerging when it comes to possessions, currencies, and other virtual objects (Hogan, 2014). Some of the ownership issues that arise in metaverses are subject to existing regulatory laws (e.g., by the US, China, or the EU). But given the new types of property, property rights, and property claims that exist in potential metaverses, much has yet to be resolved.

For example, most fledgling metaverses restrict economic transactions to cryptocurrencies like Bitcoin and Ethereum or use in-world/in-game currencies that can only be purchased with cryptocurrencies. This would present a problem in China, for example, where cryptocurrency transactions are banned unless they use China's own digital fiat currency the digital RMB (Huang, 2021). These differences seem unlikely to be resolved unless a dominant global cryptocurrency were to emerge.

As another example, First Nations and indigenous people are demanding a seat at the Metaverse table so that the sins of the colonial confiscations of their possessions will not be repeated in virtual worlds (Barba, Mat, Gomez, & Pirovich, 2021). They claim for instance that:

> Virtual land that is being created as part of imaginary worlds is also being sold with neither recognition of the cultural significance that ownership of land entails for First Nations peoples, nor acknowledgement of the spiritual connection that exists between a person, the virtual land and their participation in it (Barba et al., 2022, 6).

Although it may seem a fantastic legal claim that the imaginary worlds encountered in the Metaverse overlap with those of indigenous belief systems, it would be an interesting legal contest to attempt to establish virtual infringement of cultural IP (intellectual property) rights.

A third problematic example is found in the application of Shariah finance principles to the construction and operation of the Metaverse (Katterbauer et al., 2022). In Islamic finance a special type of lease called an *ijara* is needed for either real or virtual land and property. It spells out maintenance obligations of the lessor and lessee, who is responsible if the property is lost or destroyed, and who must insure the property. How this might be implemented in the Metaverse is something that is still under discussion Katterbauer, Syed, Cleenewerck, and Genc (2022).

As these three cases illustrate, ownership of virtual objects is complicated, especially as metaverses evolve and change. In the following sections we briefly consider the popular press and blog attention that has greeted the metaverse as well as consumer research on predecessor virtual worlds. This is followed by returning to theoretical issues that the Metaverse poses regarding ownership and property.

3. Attention to the Metaverse in the business press

The business press has greeted the metaverse with exuberant headlines like: “Metaverse Market is Booming” (A2Z Market Research (2022), 2022), “The Metaverse is EVERYWHERE” (Young, 2022), and “Marketing in the Metaverse: Who’s Ready to Thrive?” (Rehbein-Wrightstein, 2022). They also tout NFTs as the future of marketing (BRACT Team (2021), 2021) and celebrate the power of instant digital branding in the Metaverse (Andrews, 2022). Recognizing that skepticism and technological constraints abound (e.g., Walsh, 2021), McKinsey offers “Six Reasons the Metaverse is here to Stay” (McKinsey, 2022). Others offer guides, explanations, and how-to directions for participation in the Metaverse.

In professional journals, there are also a few headlines touting the metaverse as the next big thing. But they are more analytical. Some call attention to various technical aspects of the Metaverse to which marketers should devote attention including NFTs (Chohan and Paschen 2021; Hofstetter, et al. 2022), cryptocurrencies (Breidbach and Tana, 2021), Augmented Reality (Rauischnabel et al., 2022), and digitalization (Verhoef et al., 2021). Some of this literature is also devoted to particular contexts likely to be impacted by the Metaverse, such as shopping (Xi & Hamari, 2021), services (Gadalla, Keeling, and Abosag 2013), and restaurants (Alcántara, 2022). And some of these journal papers look at impacts on advertising research (Liffreing, 2021; Taylor, 2022), consumer research (Kozinets 2022), branding (Sundararajan, 2022), and consumer well-being (Chattopadhyay and Haiyang Yang, 2022). Still, there is a hint of caution. Gartner, who maps hype cycles, pegged the NFT “Peak of Inflated Expectations” as August 2021 (Fishburne, 2022). This doesn’t mean it won’t ultimately succeed, but it does predict a big slide into skepticism and disillusionment first.

4. Consumer research on predecessor worlds

The idea of virtual worlds is not new to consumer research. In 2008 Miklos Savary wrote:

> Within five years, the dominant internet interface is likely to be the *metaverse*, a term used to describe interactive multiplayer games such as Second Life. In these new cyberworlds, companies will have not websites but, rather, virtual stores where their customers’ avatars can browse and chat with assistants before trying on and eventually buying that dress, t-shirt, or tie (30).

Technology has improved considerably in the 14 years since this overly optimistic forecast, but now we hear similar forecasts for Mark Zuckerberg’s Metaverse, except that the timeline is now 10 years from today.

Despite the ever-receding day of glory, consumer research on predecessor environments has included virtual worlds like the Sims (e.g., Belk, 2003; Stanley, Hite, & Wood, 2018) and Second Life (e.g., Markos & Labrecque, 2009; Tumbat & Horowitz, 2008); online games such as World of Warcraft (e.g., Hu, Zhao, & Liu, 2018; Wang, Zhao, & Bamossy, 2008); and retail contexts such as trying on clothing using virtual avatars (e.g., Malter, Rosa, & Garbarino, 2008; Poncin & Garnier, 2012). In related theory, consumer researchers have studied virtual immersion and presence (e.g., Garnier & Poncin, 2010; Poncin & Garnier, 2012), extended self in virtual contexts (e.g., Belk, 2013; Vicdan & Ulusoy, 2009), re-embodiment in 3D avatars (Kozinets and Kedzior 2009); and the relevance of digital virtual consumption objects (e.g., Denegri-Knott, Watkins, & Wood, 2012).

The attention paid to Second Life was echoed in other social sciences during a period when it appeared that this virtual world along with a few others like There.com, marked what some had proclaimed was the “Exodus to the virtual world” (Castronova, 2008) or “the dawn of the virtual revolution” (Blascovich and Bailenson 2011). Some descriptions of the Second Life experience were full of the tales of discovering a magical new world. For example, based on their observations and interviews, Markos and Labrecque (2009) reported that:

> …in SL one can live out desires and seemingly unattainable dreams…. Exploring different facets of oneself is within reach and an exciting feature of virtual worlds…. Ultimately, anything is possible in a virtual world. (885).

Yet this was the same time that interest in Second Life began to decline. Only part of the decline seems to be due to the dissipation of the novelty and wonder of marvelous avatars doing marvelous things. According to a review by Howells-Barby (2021), the decline was also due to.

“…a string of high-profile hacks, resulting in major data breaches.” He adds that: “…the centralized ownership of the platform and all its assets created both an incentive for the team to make decisions that benefited the company over its users, as well as increased vulnerability to cyber-attacks.” Howells-Barby (2021) is making a case that this time will be different because the Metaverse will have decentralized ownership by users who have “skin in the game." Another factor that supports the notion that it will be different this time is the improved technology thanks to greater server power, 5G connectivity for smart phones, and more user device power from more powerful computer chips than in 2003 when Second Life was first introduced. At that time if your avatar teleported from one location to another, you might arrive before your clothes because they took longer to render. Something similar is now the case with Meta’s Horizon and Microsoft’s Mesh platforms where avatars have torsos but no legs, even if they sync to users’ voices and arm movements fairly well.

Meta, Google, and Apple are all reportedly working on lighter and less conspicuous interfaces than current VR headsets. Nevertheless, the refrain that “it will be different this time,” often indicates fear that it may **not** be different this time. Based on NFT auction prices in 2022, the current bubble may have already burst.

With this brief summary of consumer research on predecessor metaverses in mind, we now turn to the major impacts of emerging metaverses on the concept of property. We set the stage by briefly considering virtual property and non-fungible tokens (NFTs).

5. The nature of virtual property and NFTs

The first popular examples of NFTs were CryptoPunks (see Fig. 1), introduced in 2017. Celebrities including Stephen Curry, Jay-Z, Cameron Jordan, Gary Vee, Madonna, Paris Hilton, and Melania Trump invested in NFTs. In 2020 the NFT market started to grow rapidly when the artist known as Beeple’s “Everydays: The First 5000 Days,” a montage of digital artwork he produced daily, sold at Christies auction house for the staggering sum of $69.3 million. Although Beeple (Mike Winkelmann) was not totally unknown, this was the third highest price ever paid for a work of art by a living artist, after Jeff Koons and David Hockney (Nandini et al., 2021).

Outside of the art world, NFTs of profile pictures like CryptoPunks, game objects like “skins” (avatar looks), land in metaverses, and collectibles have also flourished as investments. For instance, in 2021 an investment firm paid $4 million for 2000 acres of virtual real estate in a metaverse called The Sandbox (Marinotti, 2022). Because these assets were non-fungible (i.e., unique) and guaranteed by a blockchain based on Ethereum, there is also a resale market using the Sandbox currency, SAND. One cross-platform NFT marketplace, OpenSea, achieved $3 billion in monthly trading volume as of August 2021. To put this in perspective, Nike generated $3.6 billion that same month (Storey, 2021). But despite the ballyhoo about prominent sales and celebrity buyers, most all secondary sales were below initial purchase prices, often far below (Okonkwo, 2021; Pennington, 2021).

So, what do people actually own when they buy an NFT? Normally it is not the artwork, avatar, or virtual land that many thought they were buying. You normally purchase the right to claim sole ownership of a digital image of a thing and its metadata on the blockchain, even though

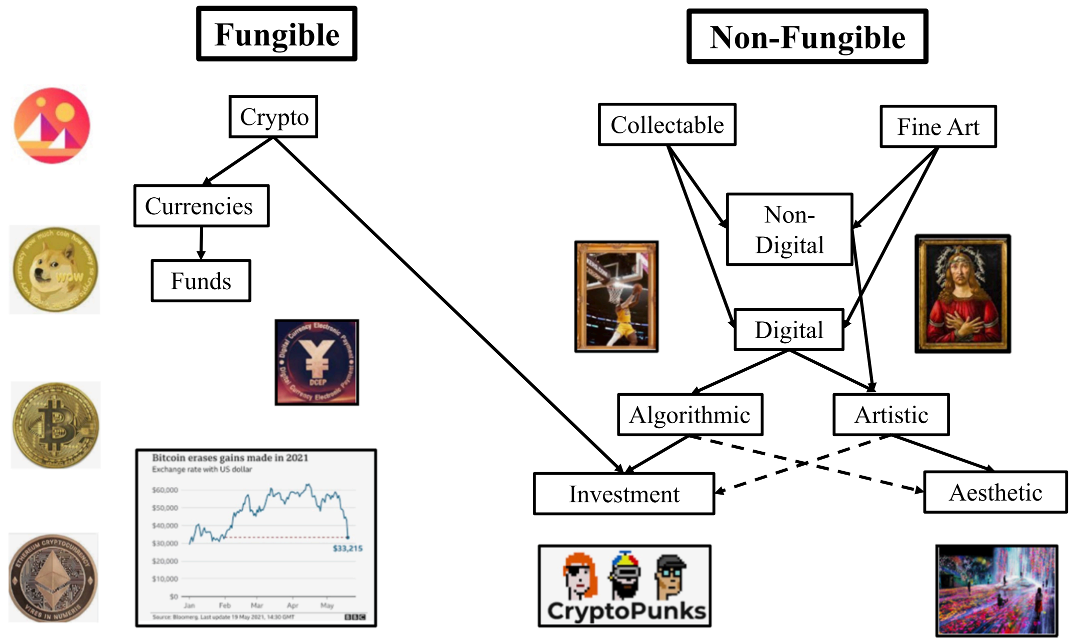

Fig. 1. Blockchain-Registered: Crypto, Collectables, and Art.

the image may also be available for free online. Unless you receive IP rights as some NFTs now offer, you cannot put it on your website or t-shirt, and in any case you do not have a right to any subsequent increase in the value of the original artwork, regardless of what you may have assumed when you bought the NFT. Even your personal avatar is not truly yours; it is owned instead (at least for now) by the company or metaverse in which it was created. If they shut down , your avatar disappears, even though the main reason for having a blockchain-backed NFT is that it can, at some promised point in the future, be used across platforms. Ideally an NFT-backed avatar or game object like a powerful sword would be usable in a different world or game. This is interoperability, as noted earlier. But because of a lack of a profit-oriented reason for developers of gaming platforms to open their walled gardens, interoperability is unlikely to happen (Morris, 2022). Furthermore, armor and weapons from one gaming world like World of Warcraft or Assassin's Creed may not be appropriate for another gaming world like Animal Crossing or Pokémon.

As discussed earlier, smart contracts might be used for example so that an artist retains a right to a percentage of the increases in the value (i.e., sales price) of their artwork or artwork's NFT after their initial sales. This is called Artists Resale Rights (Rendle and McLean, 2021). Since this typically only applies to the NFT of a work, it does not address the problem highlighted in an auction of traditional art works as shown in a 72-minute documentary film by Edward Vaughn and John Schott (Kirschenbaum, 1979; Velthuis, 2005). The film documents the 1972 Scull auction and captures a confrontation between collector Robert Scull and artist Robert Rauschenberg. Rauschenberg accuses Scull of profiteering at the artist's expense. His painting *Double Feature* for which Scull had paid only $2500 for in 1959 had sold for $90,000. Rauschenberg laments – "I've been working my ass off for you to make that profit." Something similar could happen with resales of an NFT, but thus far this appears less likely due to weak resale demand and high initial price NFT sales.

It is also not yet clear what rights these smart contracts (versus property laws regarding intellectual property and copyright) can convey. Buying an NFT artwork is somewhat similar to buying a limited-edition print. You can sell the print, but you do not own the original (which is often destroyed after the print run to assure that no further copies are made). As with the NFT, you do not own the rights to capitalize on the artist's copyright by making copies or selling photographs of your print. But unlike the NFT, you can mount a print on your wall and display it for all to see.

Even though virtual artwork, avatars, land, buildings, and other virtual goods online may have been purchased with game-specific currencies like SAND, there have been cases adjudicated in real world courts in China and Korea for property crimes such as theft and trespass in virtual worlds (Ludlow & Wallace, 2007). This may or may not be averted with NFTs and blockchain proofs of ownership.

Confusing? Call in the lawyers. Table 1 presents a summary of the rights of an NFT art owner versus the owner of the original artwork on which it is based. These rights may differ slightly with a collectable like CryptoKitties which allows earnings of up to $100,000 per year using and "breeding" its virtual cats. Although it is uncommon, there are also NFTs with "smart contracts" attached that may convey other rights such as full ownership for the buyer (Chandra, forthcoming). These rights are summarized in Table 1.

6. The lessons of second life

Second Life was created by Philip Rosedale in 2003. It is still in operation today.

Unlike the Metaverse (and other metaverses), rather than rely on advertising revenues, Second Life relies on rental fees for virtual property and a commission on sales of virtual goods like clothing and "skins" (avatar appearance). In Philip Rosedale's opinion, this frees it from the surveillance and other dangers forecast for the Metaverse (Koyanagi, 2022).

Stock (2022, 25) observes that "Once you've acquired something in

Table 1
Full Versus Fractional [NFT] Property Ownership Rights for an Artwork.

RIGHTS	Full Ownership	NFT (Fractional Ownership)
Use	Yes	Yes
Sell or dispose of	Yes	Yes
Manipulate or modify	Yes	No
Exclude Others	Yes	No
Copyright	No	No
Intellectual property	No	Possibly with some NFTs
Income from	Yes	Mostly no
Artist Resale (% for artist)	No	Possibly yes

the metaverse, you can sell or trade it with other users. This provides a sense of riches and prestige….” Well, maybe. Maybe someday it will be like that. But for now, there aren’t many people to marvel at you in any of the would-be metaverses. The market value of your purchase is likely less than what you paid for it. And the property rights that you have are only limited fragments of those that attach to real world property. There is also a big “maybe” in predicting whether the Metaverse will be much bigger than Second Life, which at its peak had about a million active participants (Gent, 2021) out of a total of 70 million registered users.

That said, there are also opportunities for buying, selling, and earning money with virtual property and virtual possessions in metaverses, just as there have been with early virtual worlds like The SIMS and Second Life. By November 2006, Second Life virtual property developer Anshe Chung held more than US$1million in virtual property (Ludlow and Wallace 2008, 206). Metaverse vendors may vend not only virtual objects, but RW (Real World) objects as well. You may want to be dressed exactly as your avatar is, and vendors like Zara and others are already making this possible (Bennett, 2022; Joy, Zhu, Peña, & Brouard, 2022). But loosening of our feelings of ownership occurs as we move from real property to virtual property in the metaverse. Both weaker relationships with what we own and lesser feelings of permanence of possession are likely to result (Belk, 1992; Kleine & Baker, 2004; Siddiqui & Turley, 2006). Even though we can still feel psychological ownership of virtual possessions (Helm, Ligon, Stovall, & Van Riper, 2018), these feelings of ownership are attenuated compared to feelings regarding material possessions (Watkins et al., 2016). Furthermore, what we mean by ownership is also changing in light of the fractionalization and unbundling of property rights in NFTs.

Jenkins, Molesworth, and Scullion (2014) observe that with informal interpersonal borrowing between friends and relatives, the lender experiences ownership without possession while the borrower experiences possession without ownership. But both attachment to and possessiveness toward shared objects (elements of Belk (1985) conceptualization of materialism) are likely less tenacious and strong for both lenders and borrowers when formal (marketized) lending and borrowing occur. Extending this argument to virtual possessions and fractionalized ownership, we would also expect less attachment, possessiveness, and materialism with virtual objects and NFTs than with fully owned unshared material objects.

These expectations are summarized in Table 2. Compared to owning and possessing a material object like an automobile, borrowers of such a virtual object are expected to feel less sense of attachment (Bardhi and Eckhardt 2012). A minor exception would be in the case of voluntary car sharing organizations where ownership is shared (Belk, 2014). This is sometimes called collaborative consumption and it is closer to true sharing that has not been marketized or monetized (Laamanen and Wahlen 2019). The use of in-world currencies like Simoleans in the SIMs, Linden Dollars in Second Life, or Bells in Animal Crosing may be seen as an effort to disguise the commercial nature of transactions between participants. The same is likely true with virtual currencies in gaming and in proto-metaverses like Meta’s Horizon Worlds and its forecast Zuck Bucks (Will 2022). As Simmel (1900/1978) asserted, money tends to replace qualitative relationships between people with quantitative measurements linking people as strangers. Since the Metaverse will purportedly provide a sense of presence in interacting with others via 3-dimensional avatars and with virtual currency, it remains to be seen whether this succeeds in creating a sense of intimacy or if the neoliberal logic of financialization will prevail.

Table 2
Ownership, Possession, and Attachment in Material and Virtual Objects.

	Material Object Owner	Material Object Borrower	Material object Lender/ Renter	Virtual Object Owner
Ownership?	Yes	No	Yes	Yes, Proof + Provenance (with fractional property rights)
Possession?	Yes	Yes	No	Yes
Attachment?	Yes	No	Yes, but diminished due to shared possession	Yes, but diminished due to fractional property rights & immateriality

One of the problems with cryptocurrencies as a means to anchor metaverses to a common currency and as a way to potentially keep these virtual spaces free of centralized control is that outside of El Salvador and the Central African Republic which have both adopted Bitcoin as their national currency, cryptocurrencies are not widely accepted. Although they are held up by some as a store of value and hedge against inflation, thus far none of the more than 200 crypto currencies, including so-called stablecoins has performed this role well. They are all too volatile, often doubling or halving their value, often within a few weeks. This has led some (e.g., Mann, 2017) to compare owning cryptocurrencies to speculating on Tulips in seventeenth century Holland.

7. New types of ownership

Returning to the theoretical issues raised about new forms of ownership, NFTs have made possible both fractional ownership and fractional property rights. Fractional ownership of either a RW or digital artwork means that multiple owners have a right to benefit financially from increases in the value of the artwork if it is resold. For example, in December 2021 more than 28,983 buyers each spent $575 on Nifty Gateway for 312,686 shares of the as-yet unseen digital artwork, “The Merge” by an anonymous artist or artists known as Pak (Block, 2021; Smee, 2021). While this sounds good, it means that the participants in fractional ownership are most likely investors rather than art enthusiasts.

The second type of fractionalization involving property rights means that some property rights accrue to NFT buyers, while others are retained by the artist. As Crawford (2022, p. 4) explains, “Downloading a DAPP [decentralized app] that specializes in NFT art allows you to buy, sell, or trade art on the blockchain without having to know code or blockchain technology yourself.” Theoretically property comes with the right to use and manipulate or modify the thing owned, the right to exclude others from using it, the right to the income the thing might produce, and the right to sell or dispose of the thing (Rochat, 2014). But NFTs fractionalize (unbundle) these rights. You normally purchase the right to claim sole ownership of a digital image of a thing, even though the image may also be available for free online. You also have the right to sell or dispose of the image. But you do *not* have the rights to exclude others, to manipulate or modify the NFT, or to gain income that the image may produce. Nor do you normally have any right to the original art object regardless of whether it is physical or digital. That is, as buyer of an NFT you do not have copyright or intellectual property rights to the original. And because of fractional ownership, you may be one of a number of owners of a visibly identical NFT. With NFTs, scarcity must be artificially created since the supply of digital goods and even digital land parcels is potentially infinite. So the number of owners is generally fixed and is often tied to a limited edition (number x of y total NFTs). Both x and y affect the value of the NFT (Khezr and Mohan 2021), with lower being better. These new forms of ownership create not only new legal issues, but new behavioral issues as well, such as the degree to which owners of NFTs engage with them as art objects and as meaningful possessions.

To the extent the buyer is only engaged financially and if the object is part of a series like the 10,000 computer-algorithm-driven CryptoPunks in Fig. 1, they may be subject to influence by prominent celebrities whose purchases act as endorsements (Hawkins, 2022). This suggests that something new may be afoot in the way people, and especially young people, relate to digital art, NFTs, investments based on new forms of ownership, and new influences on market valuations. Notably, of the 22 million people logged into Christie's for the first public NFT auction in March 2021, 60 percent were under 40 (500px, 2021) and 75 percent of NFT buyers were new to Christies (Tripathi, 2022).

NFT ownership and internet trading may come more naturally to Gen Z consumers (ages 18–24): 87 percent play videogames (Blake, 2021), 54 percent invest, and 47% own cryptocurrencies (Caporal, 2021). They were more than five times more likely (28% vs 5%) than those age 41 and over to rely on social media and influencers for investment advice (often "meme investing") (Caporal, 2021). Together with the observation that Play-to-Earn videogames and gambling increasingly resemble each other (Scholten et al., 2019), it is understandable that Gen Z consumers prioritize "getting rich" over "comfortable retirement" as their investment goal (Cook, 2022).

The dividing line between financially motivated collectibles and artistically motivated fine art may also be an increasingly permeable one. Frye (forthcoming, p. 3) observed that after Christies auctioned a set of nine rare CryptoPunks for $17 million in 2021, "Suddenly CryptoPunks were fine art." The pricing dynamics here and the tongue-in-cheek escalation to high art are provocative and in need of further research.

8. Conclusions

We are still working out the "natural" rights for digital property. One version of the metaverse/multiverse also has a communal bottom-up vision of a distributed metaverse ownership (e.g., Hackl, Lueth, & di Bartolo, 2022; Parisi, 2021), although it seems likely to be overwhelmed by top-down ownership models like those that now dominate the internet, despite lofty initial ideals for both (Goldston, Chaffer, and Martinez 2022). In support of this interpretation, Solis (2022) contends that the top two percent of Bitcoin ownership owns 95% of Bitcoin and the top nine percent of web3 accounts own 80% of the value of NFTs. Gehmilch (2022) concludes that the NFTs with value "are [the] tokens created, bought, and displayed by top artists, celebrities, and the wealthy." Such elite control defies the assertion that decentralized currencies, tokens, and platforms mean democratized ownership.

The arena of digital ownership, Web3, NFTs, and Cryptocurrencies is currently so fraught and contentious that one recent treatment has spoofed the metaverse book (Cline, 2011) and Spielberg (2011) movie *Ready Player One* with an article entitled "Ready Lawyer One" (Murray, 2022). Many artists have found to their surprise that there are numerous pieces of their art that have been turned into NFTs for sale on the internet without their knowledge, participation, or consent. Art theft and fraud through NFTs proliferate (Beckett, 2022). Online "Mafias" emerged in Second Life and The SIMs to facilitate frauds, thefts, and extortion (Ludlow and Wallace 2019). Money laundering and counterfeits are further types of NFT crimes (Faife, 2022). These activities make it more difficult for would-be investors to successfully navigate the minefields of NFTs despite auction houses and exchanges that exist to facilitate their trading.

It is not impossible that the metaverse will form the backbone of the next iteration of the internet, Web3. But it is fair to say that its PR greatly precedes it. What seems more certain and likely to continue regardless of the fate of the Metaverse is the extension of fractional property rights to new forms of property and ownership centered around virtual properties like NFTs. Here too the hype exceeds and, in some cases, misunderstands the reality. The technological innovation of fractionalized property rights, while foreshadowed to a degree by time-share properties, has ushered in a new type of ownership that is yet to be fully understood. It will likely take years for the judicial system to catch up with issues like whether blockchain ownership constitutes a new arbiter of property transfer with delimited rights conveyed. As noted, there is evidence of the influence of celebrity buying in affecting property values. And we are learning new ways of owning and appreciating objects that we cannot touch, except virtually. Perhaps we will become less materialistic in the process. But then materialism may reflect an old-fashioned value system based on only material things. If we can become possessive, stingy, and envious when it comes to non-material things, we might more aptly call it immaterialism.

CRediT authorship contribution statement

Russell Belk: Writing – original draft, Visualization, Project administration, Investigation, Formal analysis, Conceptualization. **Mariam Humayun:** Formal analysis, Investigation, Writing – review & editing. **Myriam Brouard:** Formal analysis, Investigation, Writing – review & editing.

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