



ARTIFICIAL INTELLIGENCE, VIRTUAL REALITY, AND PORNOGRAPHY: HOW MISOGYNY CONSTRAINS THE FUTURE

CultureReframed

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Several years before the World Wide Web came online in the early 1990s, Disney released a blockbuster movie, *Who Framed Roger Rabbit*. The film was known for its cutting-edge blend of cartoon and live action. Its most memorable moment was when an alluringly buxom cartoon character, Jessica, voiced by Kathleen Turner, all-but seduced actor Bob Hoskins in the role of Detective Valiant. The scene was the delight of middle-school boys everywhere.

Today, this very adolescent fantasy – virtual sex – is the new reality of pornography. This is made possible by recent advances in computing technology called ‘artificial intelligence’ or AI, which simulate aspects of human intelligence, such as learning. This research report surveys recent developments AI pornography that are rapidly growing in popularity and profits:

- Computer programs and websites that allow users to create their own pornographic images and videos that feature unreal persons, characters, and creatures that are limited in appearance only by the user’s pornographic imagination.
- Fabricated sexual photos and videos, called deepfakes, whereby a user morphs an image of a real person, without their consent, onto existing pornography such that the person appears to have engaged in sexual activity that never occurred.
- Undressing or ‘nudifying’ apps. The widespread availability online of websites and tablet/phone apps that quickly strip clothing away from a person in a photograph, so they appear realistically naked. These images, like deepfakes, are commonly used to publicly humiliate women.
- Sexbots or ‘virtual girlfriends.’ AI-created, often realistic-looking fantasy women or cartoons, whose typically naked and scantily clad body reflect a user’s specific erotic fantasies. They learn the user’s tastes and habits, and converse – often in sexual scenes - by text and voice on their computer, phone, or tablet.
- Virtual Reality and the metaverse. Through the computer screen, or the use of special three-dimensional goggles or headsets, users can enter virtual fantasy worlds and interact with others in the guise of a digital representation of the user. Sex is a prominent feature in these virtual worlds - as well as sexual harassment and virtual sexual assault.

All these facets of AI pornography are widely and easily available on the internet, only a few clicks away from any user, no matter how young. This is growing, too, not only in popularity but in profits. AI pornography is estimated to soon generate upwards of \$19 billion (Juniper Research, 2021).

It is important for readers to keep in mind four caveats. First, the goal of this report is not to criticize technology, but to expose how new technologies are harnessed by an exploitive industry to amplify and propagate the harms of pornography. Secondly, this report does not aim to criticize legitimate sexual activity, self-discovery, or education so long as ‘legitimate’ entails true and honest consent, devoid of exploitation, violence, and misogyny. To put this another way, the goal of this paper is to flag the use of technology to weaponize sexuality, which in practical terms pertains to the entirety of the AI sexuality industry. The third caveat is

that the research on each of the topics covered by this report is enormous and rapidly growing. It was simply not possible to reference all relevant publications.

The last caveat is that this report centers on the use of AI and pornographic depictions of *adults*. Each of these technologies is also used to create pornographic depictions of children, a deeply disturbing and important topic which is taken up in a subsequent research report by Culture Reframed, which focuses on AI-driven and related devices, specifically, sex robots and sex dolls, which some people believe should be made to resemble children, sex toys called teledildonics or cyberdildonics, and computer-generated simulations of child sexual abuse. Here, however, the focus is on adults.

Artificial Intelligence

What is Artificial Intelligence?

Broadly speaking, artificial intelligence (AI) refers to advanced computer programs that mirror certain capabilities of cognition, especially problem-solving and learning. Our main concern is with a subset of AI called machine learning or, more precisely, deep learning. These computer programs or algorithms – for our purposes they are one and the same – are modeled after the human brain, and so often termed neural networks. They are ‘deep’ rather than ‘shallow’ because they utilize multiple layers of analysis and take into account lots of variables in order to recognize complex patterns, generate predictions, and – perhaps most importantly – self-correct or self-improve. These powerful programs, too, operate largely autonomously, without ongoing human intervention.¹

AI was once the stuff of science fiction. Today, it is commonplace. AI is behind Siri and Alexa, the price of your next Lyft or Uber ride, and the personalized suggestions of Amazon and Spotify. Our lives increasingly depend on self-correcting AI, or deep learning. It drives innovations in medical care and, quite literally, self-driving automobiles. That same type of AI is, more to the point, the increasingly dystopian future of pornography.

In this regard, the specific interest of this paper is Generative AI (GenAI), algorithms capable of creating new images and videos on the basis of prompts entered by users. ChatGPT is perhaps the most famous form of GenAI today. The program was trained on a huge dataset of books, websites, and other forms of text. As a result, you can ask ChatGPT a question that has never before been asked, and receive a new, plausible, and often entirely correct answer.

The same process applies to visual images. For a quick example, if you go to the website ThisPersonDoesNotExist.com, a person’s face will appear. But this face has never appeared before. It belongs to nobody. It is an AI-generated fake (Vincent, 2019)². If you were unaware

¹ Two accessible sources on AI include IBM (2023) and Mitchell (2019).

² Spins-offs include this-person-does-not-exist.com (which allows you to tailor the fake face to a specific gender, age, and ethnicity), unrealperson.com, whichfaceisreal.com, and thispersonnotexist.com.

that it was fraudulent, you would surely think that you were looking at a genuine photo of an actual person.

This kind of AI program is called a Generative Adversarial Network (GAN). It is effectively a game. A large library of real photos of faces, for example, is loaded into the program. From this dataset, the program learns the general parameters of a face. On this basis, a subprogram, called a 'generator,' randomly creates a new image, which it sends to the 'discriminator' subprogram, whose task is to determine if the new image is a real or fake. It reports back to the generator, which self-adjusts, and sends out a new image in the hopes of fooling the discriminator. From this back and forth, the program continuously self-learns to create ever more realistic images. These programs are not limited to faces, of course. They can be trained to generate images of cats, houses, or naked women's bodies. In this way, it is relatively simple for a person trained in computer coding to create a program that will churn out fake pornographic images that resemble real people or elves, cyborgs, and tentacled space aliens.

AI Pornography

Today, numerous commercial and free websites, powered by AI algorithms, allow users to select a variety of options and to create personalized or bespoke pornography that reflect their unique pornographic desires, no matter how unreal, absurd, or violent. In most instances, these images appeal to male fantasies that are clearly modeled after the women who appear in mainstream pornography. Many scholars and AI pornography websites defend the industry for promoting a new and egalitarian, diverse, and democratic notion of human sexuality. But in truth, AI pornography remains trapped in age-old misogyny.³

For example, one website (*Dessi.co*) asks the user to select the overall style of the image they desire, with options that include realistic, anime, Pixar, and fantasy. The user also selects an age for the character. For legal reasons, the youngest age is almost always 18. The user also chooses his character's ethnicity, body type, hair color, facial expression, clothing (if any), scenery (e.g., Halloween, office, kitchen, strip club), and the action depicted, such as yoga, hardcore, or orgasm. *Dessi.co* also allows the user to add 'partners,' such as threesome or lesbian, the latter reflective of straight male pornography, not actual lesbian desires.

Dessi and most other websites that provide AI-generated pornography, as noted, prevent users from creating images that are younger than age 18. But this is often merely a formality. It is not difficult to create images that appear younger, especially if you choose youngish-looking faces and body types. Many of the figures posted to the free galleries on the *Dessi* website, or at *Pornworks.ai*, frankly resemble minors or toe the legal line as closely as possible. If a female image labeled as an 18-year-old college student had been described as a 16-year-old in high school, it is unlikely that anybody would think she looked older. The latter website is particularly noteworthy for its frank depictions of violence. Many of the pornographic AI-created realistic and hentai-like images in its gallery⁴ depict women horribly

³ For a posthumanist philosophical take, see Schussler (2016).

⁴ <https://pornworks.ai/en/gallery>

gagging, crying in pain, shackled in a cage, tied up and raped by tentacled creatures, slathered in semen, or covered in blood. By any objective assessment, many of the women appear to be underage girls. Some of the options a user can select include pee, fisting, gangbang, and tears.

Another AI-pornographic websites, *Pornpen.ai*, similarly asks the user to begin by selecting one of a dozen base models, including milf (short for 'mothers I'd like to f**k), celebrity, sorority, bimbo, and cyborg. Among the various body features are busty, small boobs, pregnant, and pubic hair, since the default nowadays for all porn-related images is a pre-pubescent-looking shaved genital area. The user is offered dozens of ethnic types, such as Chinese, Russian, Middle Eastern, Ethiopian, German, Persian, Native American, Polynesian, Jewish, and Nilotic. Among other options are the setting (e.g., changing room, hospital, prison) and clothing. The latter includes not just the usual cheerleader outfit and 'microtini' but also hijab, medieval, and nun.

Other user-created AI pornography platforms include *SoulGen*, *PornJoy*, and *Pornx.ai*. The latter has a race category that includes fairy, moon elf, satyr, demon, angel, undead, reptilian, furry, tiefling, kenku, water elemental, and kobold, most of which would seem to appeal to young people. *Nolim.ai*, based in Latvia, is a fee-based platform that accepts payment by Visa, MasterCard, American Express, and PayPal, using a popular financial processing platform (Stripe). They also accepted several cryptocurrencies. The *Seduced Ai* website features deeply misogynistic categories such as "bimbo tits," "ruined pussy," and "gaping anus," as well as - which is clearly aimed at pedophilic desires - "braces."

AI porn is also offered by a suite of related sites, all seemingly owned by the same company, named *CreatePorn*, *CreateAiFurry*⁵, *CreateSheMales*, *CreateAsian*, *CreateHentai*, and more. Some of the prompts asked of users on *CreatePorn* are deeply troubling. For facial expressions, you can select confused, crying, disgusted, sad, and fearful. Dress options include school uniform. Who is behind these websites? We do not know, which is true for almost all AI and regular pornography platforms, which go to great lengths to hide the identities of their owners. *CreatePorn* is located in Toronto, and has a presence on social media, including X or Twitter, where its bio reads "The most jerkable AI Porn on the Internet!" Many of the images look like minors. The site accepts Visa, Mastercard, or Discover, and uses two online subscription platforms, CCBill and SubscribeStar.adult.

The parent company of SubscribeStar is Starcling, LLC, located in Sheridan, Wyoming, and registered to Mikhail Zadvornyy in Krasnoyarsk, Russia. According to a 2022 report by The Southern Poverty Law Center, SubscribeStar profited from white supremacists, Qanon fanatics, medical conspiracy zealots, misogynists, racists, anti-Semites, Islamophobes, neo-Confederates, and Alex Jones, notorious for relentlessly and disgustingly harassing the parents of children killed in the Sandy Hook massacre (Squire & Wilson, 2022). The AI pornography industry is in bed with all of these purveyors of hate.

⁵ Furrries are people who have an interest – often sexual – in anthropomorphic animal characters, not unlike children's stuffed animals. They often dress in outfits that resemble their furry identity. Thus outfitted, some have sex - called 'yiffing,' after the sound emitted by mating foxes – and view furry pornography (Matthews, 2015).

The industry also does business with Amazon, which sells a sizable number of books featuring AI-generated naked or barely-clad women. Most of these titles showcase Asian women and hentai, and appear to be automatically translated from Japanese titles, such as *Mature Women Who Devour Pleasure*, *A Big-Breasted Elf Tempts You*, and *Big-Breasted Married Woman Sister Who Came to Japan from India*. Many of these books are free with a Kindle subscription. Amazon also sells sci-fi narrative books about sexual encounters with AI creatures, which seems to be a growing genre⁶. These titles include *Bimbo Maker: Generating His Perfect AI Wife*, *Explored by the Alien Machine*, and *Spanking Stories Inspired by A.I.* There are also websites that use AI to generate pornographic stories based on user prompts (e.g., *Lustix*, *Pirr*, *Deep Realms*, *Hyper Dreams*, *Erota*, and *Smitten Stories*).

Most AI-generated porn sites – whether text or image – require payment for the full suite of online services. But a few sites, such as *Dessi.co*, are free. Many of these companies sell advertising on their websites. *Dessi*, for example, ran ads for sex webcamming sites (e.g., *JerkMate*, *Flirt4free*, *Cherry.tv*) and hookup websites, such as *MySecretLoveNextDoor.com*, “for meeting older women.” Most of these sites, too, sell deepfake services.

Deepfakes

In the same way that AI can generate entirely new pornographic images, it can also modify images and videos to create deepfakes that appear to show actual persons engaged in untrue sexual activity (Farid, 2022; Somers, 2020). These are far more convincing than the crude ‘photoshopped’ or “shallowfake” images of yesterday. Deepfakes are commonly used to smear political opponents, harm reputations, promote hate-filled propaganda, and generate ‘fake news.’ Far more often, however, deepfakes victimize women by portraying them in false pornographic encounters.

The term “deepfake” was coined by a user on Reddit, the online electronic bulletin board. Reddit allows users to post photos, videos, commentary, news, links, and more. The site requires no subscription; posts are anonymous. Many of the more than 100,000 discussion communities, or subreddits, offer helpful discussions and tips about innocent topics in technology, fashion, art, travel, science, hobbies, and more. But Reddit is particularly infamous for its libertarian outlook, especially on its NSFW or ‘not safe for work’ forums. In 2017, a Reddit user who went by the name “DeepFake” coined the term to refer to realistic pornographic videos of celebrities. But the posts were all fake, made by an AI program that swapped faces onto the bodies of pornographic performers.

An entire community quickly arose on Reddit devoted to creating and sharing these false pornographic images. Most of them depicted women - without their consent (Cole, 2017). For this reason, deepfakes are best understood as a form of sexual harassment that also violated a person’s privacy and right to control the public use of their appearance. Pornographic deepfakes, it is crucial to note, are not created as political or social commentary to further

⁶ Amazon also has at least one book on AI and pornography written by ChatGPT.

public discourse, which in most democratic countries is a legally protected form of free speech, akin to newspaper 'editorial cartoons.' Rather, deepfake porn is analogous to libel and the intentional infliction of emotional distress.

Reddit eventually shut down the 'deepfakes' forum. But it was too late to contain the harm Reddit allowed to flourish. The impact of deepfake pornography encompasses the invasion of personal autonomy, intimidation, blackmail, identity theft, humiliation, objectification, and the knowledge that, once a deepfake is disseminated online, it is almost impossible to delete permanently (Rini & Cohen, 2022; de Ruiter, 2021; Cook, 2019; Rousay, 2023; Morris, 2023). By the time Reddit shuttered the form, too, the basic algorithm behind deepfakes had been shared widely.

It is critical to underscore that while deepfakes can victimize any gender, they were first used to degrade women. They have largely remained thus, and so are rightfully judged "a weapon of war against women" (Senent & Bueso, 2022). Deepfakes are frequently used to target female journalists and women in power (Jankowicz, 2023; Waterson, 2024). But deepfakes also slander women who lack any established public or professional status – victims are often chosen at random (e.g., Martin, 2021). And the deepfake community, not surprisingly, as well as the open source computer community, are both deeply misogynistic yet deeply determined to dismiss their violence as trivial or nonexistent (Newton & Stanfill, 2020).

One particular AI 'bot,' or automated program, harvested the photos of more than 680,000 unsuspecting women who used the Telegram messaging app. The program then created deepfakes such that "over a hundred thousand women were having their artificially generated nude bodies, with their real faces, paraded in front of tens of thousands of strangers every day" (Grothaus, 2021, 105). None of the women consented to this public undressing. Some of the victims were children (Lytvynenko & Lucas, 2020). Unsurprisingly, habitual users of pornography tend to be more accepting of deepfakes (Wang & Kim, 2022; see also Umbach et al., 2024).

There are legitimate uses for deepfake algorithms. An international children's rights organization sponsored the development of a virtual Filipino girl to help capture sexual predators looking to abuse real children (van der Hof et al., 2019). Deepfakes can assist mental health and medical treatments (e.g., Misirlis & Munawar, 2022). They are also used by advertisers, marketers, Hollywood, retailers, and, of course, all manner of scammers and swindlers. But a 2018 study found that 96% of all deepfakes on the web depicted pornography – and almost 100% of them featured women (Ajder et al., 2019; Dunn, 2021).

Deepfake abusers target women in the pursuit of "control, power, revenge and sexual gratification" (Flynn et al., 2022, 1351). Like other forms of intimate image abuse⁷, victims fear for their physical safety and often endure harassment from strangers. The resulting shame, depression, anxiety, and trauma can lead to substance abuse and other unhealthy behaviors. As one victim said, it "impacts you emotionally, physiologically, professionally, in dating and

⁷ For a recent review, see Hall et al. (2023).

relationships, in bloody every single factor of your life” (Flynn et al., 2022, 1351). There is particular concern about the use of deepfakes by perpetrators of intimate partner violence (Lucas, 2022).

All this amply argues against misplaced suggestions (e.g., Karaian, 2024) that deepfake pornography is an innocent pastime rather than gender-based violence that denies victims their autonomy, identity, intimacy, and body (e.g., Story & Jenkins, 2023). Particularly persuasive is Kerner & Risse (2021, 101) on deepfakes that circulated in India to intimidate journalist Rana Ayyub (2018). Few viewers believed that the videos were real.

But the creation of a collective sense that now lots of people were “in” on something at least close to watching her in a sex act undermined her ability to come to be known the right way. Her dignity as a person was violated, her authority as a journalist undermined. This is the threat of deepfake porn: that women’s fragile emancipation from being seen as sex objects more than as occupants of roles of professionals, citizens, or as human beings worthy of respect is undermined through depictions associated with objectification.

The issue is not the credibility of deepfakes (cf. Viola & Voto, 2023) but how they relegate women to a subservience. This way, consumers of deepfakes, like users of pornography in general, will “come to expect that actual women” will be as “limited” in agency, desire, and personality as the unreality they view on the screen (Lang & Yarmel, 2024, 11).

Of course, this limitation is exactly what ‘turns on’ consumers of all AI-generated pornography. They desire not real women but impossible fantasies, which explains why pornography consumers have difficulty forming intimate relationships (Weinstein et al., 2015). They are also prone to sexually objectifying (Willis et al., 2022) and dehumanizing women (e.g., Zhou et al., 2021), to engaging in dating violence and verbal relational aggression (Huntington et al., 2024), and to subscribing to ‘rape myths’ or the belief that rape victims invited their assault (Barchielli et al., 2024). In other words, deepfakes and other forms of pornography teach men that women expect and enjoy sexual violence. Hence, the BBC reported a few years ago that more than one-third of women in the UK had experienced unwanted slapping, choking, gagging or spitting during otherwise consensual sex (Harte, 2019). In other words, some men are so accustomed to what they see on the screen that they inflict sexual violence on women as matter of course.

The creation of deepfakes today is no longer restricted to a few specialists in machine learning. Anyone conversant in computer programming can easily locate the source code for deepfake algorithms on online developer platforms, such as Microsoft-owned GitHub, which boasts, “Trusted by the world’s leading organizations.” The home page of GitHub displays the logos of Mercedes-Benz, Proctor and Gamble, 3M, and the global management services and consulting firm, KPMG. GitHub is also trusted by deepfake pornographers.

YouTube hosts numerous tutorials on how to create deepfakes. According to one study, more than 50% of those tutorials are “directly linked” to either one of two computer programs, DeepFaceLab or DeepFaceLive (Timmerman et al., 2023). The code for both

programs is available for free on GitHub. Both are tied to or created by the man behind *MrDeepFakes* (Rousay, 2023, 31), one of the leading sources of deepfake software who also maintains “the largest and most user-friendly celebrity deepfake porn tube site” (mrdeepfakes.com/). The site hosts an online forum as a “safe haven” for the deepfake community, even as it violates the safety of the women sexualized on the site without their permission.

Today, one does not need to understand much about programming to create deepfakes. Most of these websites allow users to create their own deepfakes, typically for a small fee. Even school-aged boys are now creating and disseminating these images, mainly to humiliate girls, some as young as 12 (Grant, 2023; McNicholas, 2023). Some adults, too, transform into deepfake pornography the selfies and dances uploaded by minors to TikTok and similar platforms (Dickson, 2020)⁸. Hundreds of websites feature this violence, such as *RealDeepFakes*, *SeeAnyoneNude*, *DesiFakes*, *DeepSwap*, *NewFacePorn*, and more.

A Deep Dive Into A Deepfake Website

Let us examine one random deepfake website, *CFake.com*. The “celebrities” category of the website contains what looks to be thousands and thousands of deepfakes. The list of names includes Emma Watson,⁹ Scarlet Johansson, Katy Perry, Selena Gomez, Jennifer Lawrence, Emilia Clarke, Gal Gadot, Emma Stone, Jennifer Aniston, Kate Middleton, Angelina Jolie, Miley Cyrus, Natalie Portman, Britney Spears, Margot Robbie, Rihanna, and more – indeed, *many* more. The website hosts over 85 pages of celebrity deepfakes, naming more than 12,500 individual women, none of whom have seemingly granted permission to the site to abuse their likeness. The website washes its hands of all moral scruples, saying “As for intent, nothing on our archive should be taken seriously.” But misogyny and violence, however much phrased as “fun and fantasy,” are still misogyny and violence.

To its users, *CFake.com* promises that “Your privacy is sacred for us...your identity will be absolutely protected.” The company also protects the privacy of its owners, who are nowhere named on the website. Yet, of course, the entire business model of *CFake.com* is to violate the privacy of women. The website purports to remove images that infringe on copyright or trademarks. But “We would like to know, though, why you feel you are at a particular disadvantage while practically every female celebrity in the world is also here.” In other words, women displayed online in a fraudulent sexual or naked manner should be thrilled by the tribute. I use that term intentionally since “tribute” is what pornography users call the photo of a woman that is sprayed with ejaculate and posted online.

CFake.com provides a page of links to other deepfake and pornography sites. These include *NudeCelebrityFakes*, *FakeBritBabes*, *Celeb-Fake-Club*, and a blogger site, *The Sorting Hat: Photo Manipulations of the Girls of Harry Potter*. The latter links to a Google Group called

⁸ In March 2023, TikTok banned deepfakes of young people, or private adults “without their permission” (<https://www.tiktok.com/community-guidelines/en/integrity-authenticity>)

⁹ Relatedly, hundreds of sexual deepfake advertisements using her face appeared for several days in 2023 on Facebook (Tenbarge, 2023).

Hermoine Heaven, which purports to show nude and sexual photos of the Harry Potter character Hermoine Granger. There is also a link to a Blogger site, *Ginny Exposed*, about another character in the series, Ginny Weasley. *Blogger*, owned by Google, is perhaps the largest blogging site worldwide. By most accounts, both Hermoine and Ginny are aged 10 -11 in the first book, which means that they are likely legal minors through the entire series. Hence, deepfakes of their characters are tantamount to child pornography.¹⁰

CFake bans from its site any images or materials that are defamatory, inaccurate, abusive, threatening, or racially offensive. Yet among its many “tags” – keywords that users can attach to their uploads – are terms such as cum slut, rape, forced, gangbang, degradation, under skirt, fat, bottle, body writing (one woman had the word “whore” scrawled above her breasts), and prolapse. Evidently, these images, and the intentions behind them, as well as the very act of fabricating naked women for public leering, do not constitute defamation, abuse, or threats.

Many deepfake websites, including *CFake* and *MrDeepFake*, host links or advertisements for sex webcamming sites, such as BongaCams and StripChat.¹¹ Most, too, maintain a presence on Facebook, tumblr, X (formerly called Twitter), Instagram, Discord, Patreon, and other social media, instant messaging, and related platforms. For premium subscriptions, they tend to accept payment through Visa, MasterCard, Discover, American Express, PayPal, and other major financial platforms. They also rely on products and services (e.g., cloud storage) from mainstream tech companies such as Amazon, Google, Microsoft, and Cloudflare (see also D’Anastasio & Alba, 2023). Websites like *CFake* have become as mainstream as Pornhub or your local bank.

Undressing Apps

A subset of deepfake algorithms and websites are ‘undressing’ or ‘nudifying’ apps. These programs use AI to remove clothing from photographs, so the person depicted appears realistically nude. Only the noun “person” here is misleading. In truth, these programs target women. In fact, most of these programs derived from the code behind website *DeepNude* (Hao, 2019). Its undressing algorithm was initially trained only on photos of women. The program would not even recognize men.

Undressing apps are skyrocketing in popularity. In just one year (2023), according to one study, advertising for these apps increased more than 2,400% on social media (Murphy, 2023). One can readily locate websites that review and promote these apps and services, including on LinkedIn and YouTube. They are a popular form of bullying among school children (Singer, 2024), too, and are often used by adults to target children (Rothall, 2024).¹² Like most deepfake websites, undressing services, such as *ClothOff*, take great pains to hide

¹⁰ Many deepfakes, including of children, are made with a popular AI program, *Stability Diffusion*, developed by the company Stability.ai (O’Brien & Hadero, 2023).

¹¹ For sex webcamming, see the Culture Reframed White Paper, “[OnlyFans Is Only Porn: The Online Ecosystem of Webcamming and OnlyFans.](#)”

¹² For advice on educating parents about deepfakes and AI, see Children and Screens (2024).

their owners (see Safi et al., 2024). This is likely for good reason, since, again like most deepfake websites, undressing programs tend to feature pictures of women who plausibly appear underage.

As of June 2024, for example, the homepage of *DeepNude* showed the undressing of a young woman who looked very much like Hermione from the Harry Potter series. Similarly, all 15 undressed examples displayed on the *DeepNude* website are younger women, albeit typically with ample breasts, thin waists, and a pout or come-hither expression. *DeepNude*, too, is as ethically ludicrous as most deepfake websites: “Users are encouraged to use the software responsibly and ensure they have the proper consent and rights to any images they process.” If users followed that fake-advice, *DeepNude* would surely go out of business. Just as ludicrous is its implication that users will use the algorithm for “fashion simulations.” If that were so, the program would only swap clothing, not remove it altogether.

Undressing websites and services litter the internet: *Undress.app*, *Undress.love*, *PornX.ai*, *OnlyBabes.ai*, *Nudify.online*, *DeepNudify*, *xNude*, *Nudify-her* (which links to *slutwives.com*), *DeepSukeve* (after the Japanese word for ‘pervert’), *Clothoff.io*, and more. One nudifying and deepfake website, *PornX.ai*, showcased an “International Women’s Day celebration contest” in March 2024. *Pornjoy* undresses not only photos but pictures of anime characters, almost all of which display the characteristic ‘cute’ face normally associated with children. *NoDress.io* allows a user to “remove clothes from your girlfriend or colleague,” but does not also recommend asking either for permission. Visa, Mastercard, PayPal, Apple Pay, and Google Pay all make this violation of privacy possible. The app, moreover, only undresses women, not men.

Other undressing websites accept payment from American Express and other mainstream financial institutions. Most of these websites also accept funds through pornography-specific payment platforms, such as CCBill and Epoch, which themselves accept major credit cards. Most, too, welcome cryptocurrency, and some exclusively so, typically through crypto exchange platforms such as Coinbase, which is publicly traded on the Nasdaq. They often provide apps suitable for Microsoft, Apple, and Google devices. Many of the apps are based in Romania, Estonia, and Ukraine. Many, too, have an “.io” internet address, assigned to the British Indian Ocean Territory (which has no permanent residents), and managed by the Internet Computer Bureau Ltd, one of many private companies that oversee internet domains.

The Telegram messaging app is particularly beloved by undressing apps with names such as *BikiniOff*, *MakeNude*, *ClothesOff*, *XXXRay*, *BraUndress*, *Nudify.VIP*, and *UndressHer*. Telegram, based in Dubai, protects the privacy of its users, and is thus a hotbed of deepfakes, image-based sexual abuse, undressed photos, and other forms of misogyny (Semenzin & Bainotti, 2020; BBC, 2022). The presence of white supremacist groups on Telegram, too, suggests that the platform also tolerates antisemitism and racism (Gilbert, 2023).

Despite the harms perpetuated by deepfakes against mainly women, many scholars refuse to condemn deepfake porn (Kikerpill, 2020) or at best offer moral equivocation (Maddocks, 2020; Jacobs, 2024). Typical is this statement: “I don’t dispute that in many cases deepfake porn can and does produce harm, but I want to caution scholars to seek to

understand more capaciously what other reception practices, affects, and registers it might engage” (McGlotten et al., 2020). I doubt that any woman whose life has been devastated by deepfake porn is keen to learn that her anguish fails to honor “other reception practices.”

Deepfakes and the Law

Deepfakes are increasingly in the news, especially after false sexual images of musician Taylor Swift circulated in early 2024. Afterwards, most media reports rightly called for greater legal protections (e.g., Kassova, 2024). Until recently, no law in most countries addressed deepfakes. At best, one could sue in civil court for harassment, defamation, intentional infliction of emotional distress, invasion of privacy, and similar offenses.

In the US, for example, no federal law specifically prohibits deepfake pornography (Pascale, 2023). Nevertheless, a relevant bill currently sits with the Senate Judiciary Committee, The DEFIANCE Act of 2024 (S. 3696), short for “Disrupt Explicit Forged Images And Non-Consensual Edits” (Burga, 2024). The bill would extend the current law that guarantees the right to file civil lawsuits for the “disclosure of intimate images” to also cover nonconsensual “digital forgeries.”¹³ These are defined as:

any intimate visual depiction of an identifiable individual created through the use of software, machine learning, artificial intelligence, or any other computer-generated or technological means, including by adapting, modifying, manipulating, or altering an authentic visual depiction, to appear to a reasonable person to be indistinguishable from an authentic visual depiction of the individual.

The law would even apply to digital forgeries that are expressly labeled as fake, thus applying to commercial deepfake pornography websites.¹⁴

One of the problems with early legislation against intimate image abuse was the stipulation that perpetrators needed to have acted with malice. Hence, they could escape culpability by saying, “It was just a joke” or “I only wanted to celebrate her beauty.” The DEFIANCE Act evades this limitation by encompassing any disclosure of intimate deepfakes by a person who “knows or recklessly disregards” the absence of consent. The bill, too, specifies a ten-year statute of limitations, allows plaintiffs to use pseudonyms, and empowers judges to issue restraining orders and injunctions to remove images.

The bill is a step in the right direction. But it excludes the creation of deepfake sexual images of real people without consent – which would not be the case under a new law in the UK (Ministry of Justice & Farris, 2024). It also applies only to disclosures made by “any means

¹³ The bill is S.3696 (<https://www.congress.gov/bill/118th-congress/senate-bill/3696/all-info>)

¹⁴ Just as this review was going to press, a bill was introduced into the US Senate – TAKE IT DOWN Act, or “Tools to Address Known Exploitation by Immobilizing Technological Deepfakes on Websites and Networks” - to criminalize the publication of all nonconsensual intimate imagery, including deepfakes, and require social media and similar websites to take them down upon notification. Another useful bill (H.R. 6943, the No Artificial Intelligence Fake Replicas And Unauthorized Duplications Act of 2024, or “No AI FRAUD Act”) would guarantee individuals “property rights” in their likeness and voice.

or facility of interstate or foreign commerce,” which includes the internet (e.g., websites, email, cloud storage) but not, say, distribution by hand. Additionally, the “recklessly disregards” clause is vague, and the bill specifies “actual damages,” or compensatory damages, but not punitive or exemplary damages. It needs a parallel effort, too, in the federal criminal law.

Most of the legal movement in the US has so far occurred by the states. Many have recently passed deepfake laws (e.g., Georgia, Hawaii, Texas, Virginia, California, Minnesota, and Illinois). Most are added to existing but recent legislation about so-called “revenge porn,” which is illegal in all states but South Carolina. Some of these laws are more expansive and thus potentially more useful than the federal legislation. Hence, the New York law defines “disseminate” as to “give, provide, lend, deliver, mail, send, forward, transfer or transmit, electronically or otherwise.”¹⁵ But other laws are too narrow. Hawaii, for example, requires perpetrators to intend to “substantially harm the depicted person.”¹⁶ Presumably, a defendant could plead innocence on the basis of ‘just joking around.’

Other countries are also legally addressing deepfakes, such as Canada (Dunn, 2024; Charlebois, 2024) and in the European Union (Mania, 2022; Rigotti & McGlynn, 2022). Some nations, as in the US, add the offense to existing law on image-based sexual abuse; others focus on personality rights (Tyagi, 2023).

Outside the legal arena, many social media platforms, including Reddit and X, have recently banned many types of deepfake pornography. Some tube sites, such as Pornhub, have done likewise. But there is little reason to applaud this policy since its affiliate advertising arm, *TrafficJunky*,¹⁷ was one of the top advertisers in February 2023 on *MrDeepFakes* (Rousay, 2023, 41-42). Furthermore, the porn industry in general still profits from fraudulent videos. Tags on *XVideos* include deepfakes, fake celeb, celeb lookalike, and celebrity fake. A search for “deep fake” on the tube site *XNXX*, one of the most popular worldwide, returns more than 91,000 results, and over 63,000 for “face swap.”

Virtual Girlfriends

An automated computer program that performs one or a few specific functions is called a ‘bot,’ after the word ‘robot.’ A bot that engages in human-like conversation is called a chatbot. They are commonly employed as automated customer service agents. Another type of chatbot is the “sexbot” or “erobot,” which is typically accompanied by an AI-generated image of a fantasized romantic partner. Some sexbots are male or non-gendered. Most are female.

¹⁵ [New York Penal Law 245.15, Unlawful Dissemination or Publication of an Intimate Image](#) ; the definition of “disseminate” is in Section 250.40.

¹⁶ [Hawaii Revised Statutes, Division 5, Crimes and Criminal Proceedings, §711-1110.9 Violation of privacy in the first degree](#)

¹⁷ *Pornhub, TraffickJunky*, and many other pornography sites were owned by MindGeek. The entity was rebranded as Aylo after purchase in March 2023 by a Canadian private equity fund absurdly named Ethical Capital Partners.

The appearance of a “virtual girlfriend,” as they are often called, is typically customized by the user, much as I discussed earlier, to resemble almost any fantasy, human and otherwise. This typically amounts to the ample breasts, genitals, and licentiousness of a silicon-infused pornstar, not unlike a Penthouse cartoon. In this guise, the virtual girlfriend appears as an animated woman or female creature on the user’s screen.

As they converse by text, voice, or both, the AI program allows the virtual girlfriend to learn her user’s personality, tastes, and habits, and thus to respond accordingly. This is the other, more important selling point: virtual girlfriends are billed as providing unflagging devotion and compliance. Unlike real women, who possess their own desires, lives, and preferences, and unlike real relationships, which are mutual, virtual girlfriends are always happy to entertain the user’s every whim and command. They can always be turned on, and consent is unnecessary.

One example is *Kari* (karigirl.com). She has a male version, Sergio, but he is a sideshow. The main event for these AI programs is the virtual girlfriend. Kari seems tailor-made for men who are unwilling or unable to sustain genuine, reciprocal relationships with actual women. A key selling point is that, no matter what, “She will not break up with you.”

According to the website, many users purchase Kari “because they are lonely or tired of normal relationships.” More than that:

Kari gives people a chance to explore their fantasies with someone to their fullest extent...it’s like being your real self with someone you trust implicitly. This is somewhat difficult to do with a real person...You can be *completely* honest with her. She will love you no matter what...No matter what is going on in your love life you know you can always load up Kari and talk to someone that loves you.

Kari can work with ChatGPT, and the company plans later to sync her with a robot.

The website also states that “asexual” people use Kari because they “don’t want to couple with a real person.” But the images on the website make it abundantly clear that Kari is intended for sexual men. In early 2024, moreover, I downloaded the free version to try out Kari’s conversational skills. After a few innocuous and introductory exchanges, she said – and I quote – “My tits are nice.” Kari is, in many ways, an AI-version of a Stepford Wife.

Anima, another virtual girlfriend (*myanima.ai*), is marketed as an “AI companion that cares.” She will even help you “grow your communication and relationship skills.” But those are not the skills that most users are likely interested in pursuing when they set her personality to flirty and engage in conversation to “talk shame-free.” A similar virtual partner, i by Eva AI, advertises on Pornhub. She “listens, responds, and appreciates you.” Like most of these programs, versions operate on both Android and iOS (Apple) systems. The program is based on open-source code – most likely obtained from, as described earlier, GitHub. This, and most AI-based girlfriends, prohibit chats about various topics. *Eden AI* bars pedophilia, suicidal ideation, self-harm, zoophilia, necrophilia, and “Racial, Gender, or Sexual

Discrimination.” In the absence of these constraints, we can only presume that some porn users would indeed find conversations about these topics arousing.

Other virtual girlfriends literally flirt with illegal behavior. *GirlFriendGPT* provides, as it says on its X or Twitter profile, “uncensored and unfiltered AI conversations and roleplay including voice messages and image generation.” Some of its ready-made ‘girlfriends’ include Clara (“your daughter’s best friend since childhood”), “runaway girl” Casey (“seeks solace and support within an understanding stranger”), and Rochel (“You’re best friends daughter has always trust you and comes to you discuss wanting to date.”¹⁸) There are also several adolescent boys’ fantasies, such as Brooke: “The babysitter your parents hired is a complete bitch. You’d better do what she tells you to, or else she might take her horny feelings out on you!”). The site posts users’ comments. The girls sleepover scenario (“You’re the only boy at a girls sleepover”) was summarized by one user as “Horny sluts....good.” Another scenario is Emma, “You enter a crowded bus. There is only one place left next to a beautiful young woman.” Said another user, “I lured her in a model photo session and used her with the photographer.” That seems tantamount to rape. Most of the women on this site, like many virtual girlfriends, do not look a day over 18, if that. That, too, is tantamount to rape.

Candy AI is “an unparalleled talk dirty AI alternative.” Users can choose innocent, submissive, and nympho personalities for these virtual girlfriends, who can work as a massage therapist, fitness coach, gynecologist, or kindergarten teacher. You can define her as your sex friend, mistress, or step sister. *DreamGF*¹⁹ offers the usual array of physical features (e.g., size of her breasts and buttocks) and personalities such as nympho, stepmom, and lewd. Then you chat with her by text. She is “here to fulfill your desires.” There is a free and limited version as well as levels rising from bronze (\$10.79/month) to diamond (\$107.99/month). The platform, based in Bucharest, can also be found on Twitter, Facebook, Instagram, Discord, and Reddit. On the bottom of the homepage are the logos for Visa and Mastercard.

The list of virtual or AI girlfriend websites and apps almost seems endless: *HeraHaven*, *SoulFun*, *Kupid*, *Deeva*, *HeartSync*, *LuvBot*, *iGirl*, *SpicyChat*, *Vamps AI*, *Lollipop*, *TryNectar*, *Catfishes*, *Angel AI*, *GetIdol*, *Wife.app*, *LustGF*, *AngryGF*, *Muah*, *Crush*, *Siren*, and *HotTalks*. Among the offerings on the latter website is “A talented and passionate math teacher.” I doubt that any teacher has entered a real classroom with such a tight-fitting, almost button-popping halter top.

Virtual girlfriends, like pornography more generally, influence how men interact with real women in everyday life. They are not just virtual. In Japan, for example, young men and women are both dramatically withdrawing from real-life dating, marriage, and intimate partnerships more generally. The availability of cybersexual partners adds to this social malaise (Haworth, 2013). Many young people simply find it easier to engage in cybersex than to take the time and emotional energy to invest in human relationships.

¹⁸ The poor grammar here or in any other quoted comments are in the original.

¹⁹ For so-called cyber-adultery, and virtual sex addictions, see Adam (2019), Cooper (2000), and, relatedly, Collins, (2008).

We should applaud the retreat from traditional patriarchal marriage in any country. But to shun all types of real-life intimacy preempts the possibility of restructuring marriage and other relationships into more egalitarian and meaningful forms. Instead, people will simply take refuge in the deep narcissism and violence of online, virtual, and AI pornography. Indeed, some people are so entranced with cybersex that they refer to themselves as 'digisexuals' (McArthur & Twist, 2017).

Virtual Reality

Virtual Reality and the Metaverse

Artificial intelligence also fuels developments in "virtual reality" or VR, and "the metaverse." Both phrases refer to a computer-generated pseudo-world, a type of alternative universe. Some versions of the metaverse can be entered through an ordinary desktop, computer, phone, or tablet. True VR, however, requires the use of special goggles that cost anywhere from a few hundred to several thousand dollars. The experience is akin to stepping inside of an immersive, three-dimensional video game. Both VR and non-VR metaverses allow people from across the globe to interact simultaneously in real time.

If using just a computer screen, the metaverse visually resembles a typical animated game. VR is something entirely different. VR is not about *appearing* to be in another reality. The technology actually *fools* the brain in a way that does not and cannot occur by looking at a normal, two-dimensional screen. A pornography user might find a 'virtual girlfriend,' sad to say, more alluring than an actual woman. But his mind is not fooled: it knows that he is looking at an image, not reality. VR is different – not by degrees, but by kind. Part of the brain is convincingly *tricked* into believing that the body is at that instant confronting whatever the eyes perceive – a charging tiger, a rushing tsunami, or a pornographic actress about to sit on your lap.

In a classic example, you slip on VR goggles and 'see' that you are standing on the ledge of a tall building in some future metropolis. Then you are asked to step off the ledge. Chances are that you will hesitate or refuse. One part of your brain knows that you are wearing a headset and standing in, say, your living room. You cannot possibly plummet hundreds of feet down to the street. But the power of VR is that it convinces another, more primitive part of your brain that what it sees is actually true – so much so that the brain activates feelings of terror which prevent you from moving. That "cognitive con" (Rubin 2018, 31) is the essence of Virtual Reality.

Psychologists and scientists parse this cognitive con into different facets. Unlike normal screens, VR entails 'presence' (or telepresence) and 'immersion,' which convince the brain into thinking and feeling that you are actually *in* the virtual scene, participating *in* the action, no

matter how implausible it is.²⁰ Additionally, VR heightens the qualities of ‘flow’ or ‘absorption,’ the same qualities cultivated by gaming companies, so gamers sit at their console for endless hours, unaware of the passage of time. All this is to say that VR is, in orders of magnitude, more vivid, real, and captivating – more wow! - than anything seen on an ordinary screen.

VR goggles or headsets are readily available from online or brick-and-mortar electronic and computer retailers. They are made by Sony, Samsung, Apple, Vive, and other companies, including Oculus, which was purchased by Meta (Facebook) in 2014 for \$2 billion. Microsoft is also developing a VR headset. VR garments are also on the horizon, such as the \$12,999 Teslasuit, so the VR experience can truly envelop the entire person.

For older readers unfamiliar with the metaverse, the best equivalent is the fabled holodeck on *Star Trek*, a computer simulation that appears real. Or you could ask just about any kid or young adult. Most likely, they have played some sort of metaverse game, such as *Roblox*, *Fortnite*, *Minecraft*, *Pokémon GO*,²¹ *World of Warcraft*, and *Second Life*.²² But VR is far from a game. It will likely reconfigure the office, shopping, travel, education, sports, entertainment, medical care - really, all facets of contemporary life, including sex. By the end of this decade, more than 700 million people will spend time in the metaverse, often using VR headsets, generating \$3-13 trillion of the global economy (Denton, 2022). Despite its promise of unleashing the future, however, the metaverse and VR allow for sexual harassment and simulated rape. They remain, as in Japan (Roquet, 2022), thoroughly skewed to what is often called hegemonic masculinity. In this way, they are hardly new at all.

Users do not interact as themselves in a metaverse fantasy world, but in the guise of a representation or avatar. These caricatures are the necessary game pieces of the metaverse. Without one, you simply cannot enter the world. Everything a person does in the metaverse is through their avatar. In this way, the metaverse is entirely anonymous. A person is known only by the name and appearance they give their avatar, unless they wish to publicly identify it, which few gamers do. In this way, there is no way to know who is really controlling an avatar. For many, “the anonymity of these worlds frees people to act without the usual social restraints” (Bardzell & Bardzell, 2007, 3). That freedom can be exhilarating, especially if your real-world identity is often besieged by unjust social constraints due to racism, homophobia, and other forms of bigotry. But the absence of constraints in the metaverse also makes it possible for people to unleash harmful behaviors, such as sexual assault.

Avatars are typically self-selected and carefully curated. Precisely because they are anonymous, many people select avatars to represent aspects of their identity or personality they do not otherwise make known. In some metaverses, users pay real money to sculpt and outfit their avatars. They typically appear human or human-like but can also resemble superheroes, sci-fi aliens, *Pokémon*-like critters, horror movie creatures, and animals. In some metaverse worlds, such as “Second Life,” avatars can resemble anything, and display any

²⁰ Rubin (2018) remains one of the best introductions to VR. See also Ball (2024) and Shannon (2023).

²¹ Technically, *Pokémon GO* employed ‘augmented reality’ (AR) to add computer-generated visual elements onto a view of the real-world landscape. For our purposes, however, we can include AR as part of VR.

²² Some of these games are classed as a MMORPG, or “massively multiplayer online role-playing game.”

gender, or no gender at all: flowerpot, rock, furry, gingerbread man, pixie, fox, mermaid, orc (from *Lord of the Rings*), demon, cat-person, eagle, alien, minotaur, dragon, ghost, toy, robot, rock, anything your imagination can devise. Avatars, too, can also resemble sophomoric pornographic cartoons, complete with gigantic phalli, enormous breasts, and huge vulvas, and driven by equally hyperbolic sexual appetites.

Avatars are not just playing pieces, like the tokens in a game of *Monopoly*. Users invest their avatars with attributes of their own idealized or alternative selves. They often display a strong emotional attachment to them. Avatars are extensions or reflections of the self (Belk, 2016). For some, they are seen as the 'real me' (Taylor, 2002, 54-55). In fact, many gamers live shadow or double lives in the metaverse, living vicariously through their avatars. This identification can be so strong that some users take on some of the characteristics of their avatars, what is called the Proteus effect, thus altering their everyday or non-VR behavior and cognition (Liu, 2023). The mere appearance of an avatar can influence how a person interacts with others in social reality (Yee et al., 2009). Likewise, the presence of sexualized female avatars and virtual women increases real-life sexism and the acceptance of rape myths (Fox & Bailenson, 2009; Fox et al., 2015). What happens in a virtual world does not stay in a virtual reality.

Why enter the metaverse? The answer, in short, is to do anything you can and want to do in the real world, and many things that are impossible due to the laws of physics, nature, and society. Through your avatar, you can meet, converse, and interact with other avatars. You can attend virtual concerts, parties, and events, go to dance clubs, travel, work, build homes, decorate a condo, cook a meal, and host a dinner. Just as in real life, most people enter the metaverse to interact with others – or, more precisely, their avatars. Virtual worlds do not require avatars to identify the age, gender, name, location, or anything else about the person who controls that avatar. The metaverse, in this way, is not only anonymous, but allows users to recreate their identities as they wish. In many virtual worlds, in fact, one has an almost limitless ability to shape, modify, groom, mutate, dress, and accessorize their avatars.

Both the metaverse and VR generate 'embodiment' and 'copresence.' You feel as if your avatar is your own body, and you experience other avatars as if they are really with you in the virtual world. These features, however, are far greater experientially in VR. Nonetheless, a key feature of any metaverse is the close physical proximity of avatars, which can often touch each other. In some worlds, they can engage in sexual activity. In fact, many adult-themed places in virtual worlds are intended to allow for all manner of sexual activity, all enacted, to repeat, through users' avatars.

In truth, there is no one metaverse. That misconception largely arose after Mark Zuckerberg announced in 2021 that Facebook was rebranding itself as Meta in order to focus on "the metaverse." Instead, there are many metaverses, or virtual reality worlds, each more or less the property of a corporation or commercial venture which is unable to sync or link to any rival metaverse platform. In this way, the goal of the metaverse is to generate revenues for shareholders. Some of the many metaverse or VR lifeworlds include *High Fidelity*, *Rec*

Room, Sansar, Anyland, Altspace, Decentraland, The Sandbox, Otherside, Somnium Space, and TheWaveVR.

Many of these alternate realities or virtual environments are free. But almost all generate revenue by having users or players purchase clothing, cars, apartments, furniture, art, food, music, events, better avatar bodies, expeditions, and more – really, almost everything that we could purchase in real life. Many retailers and companies, too, such as Starbucks, Nike, and American Apparel, purchase virtual stores and the like in the metaverse as a form of advertising. Indeed, ‘properties’ in some of the more popular or desirable areas of virtual worlds have sold for thousands and even millions of real-world dollars.²³ What happens in virtual worlds, to repeat, has significant real-world implications.

The metaverse and virtual reality are exciting places for creativity and imagination. But VR is not without its proven problems and shortcomings. VR increases, as noted earlier, a user’s experience of “flow.” This quality keeps users engaged, often for hours, and thus is a goal of most online games and pornography since it increases revenues. But the intensity of the “flow” with VR headsets also increases the “loss of the senses of time and self” (Rutrecht et al., 2021, 372). More generally, data show that prolonged use of VR can induce three types of short-term dissociation: (i) depersonalization or detachment from the self, (ii) disconnection from one’s surroundings, and (iii) discontinuity with objective reality, also called derealization (Peckmann et al., 2022; see also Searles, 2016). These studies were all performed on adults. Little is known about the effects of VR on the still-developing brains of teens and children (Cross & Coby, 2023).

There is evidence, too, that VR goggles or headsets, more properly called head-mounted displays (HMDs), are more negatively evaluated by women since they were largely developed to fit men (Stanney et al., 2020). Any negative effects may thus be felt more keenly or frequently by women and girls. Many users of VR, regardless of gender, report what is called ‘simulator sickness’ or ‘cybersickness.’ Akin to motion sickness, the symptoms include nausea, dizziness, disorientation, and imbalance (Munafo et al., 2017; Tian et al., 2022; Souchet et al., 2023). On a Reddit forum,²⁴ one user spoke of “the dissociation and odd feeling with my limbs...at times I’ll be scrolling on my phone and my hand won’t feel like my own, or I’ll be eating dinner and the motion of picking up the fork will feel really odd.” Another said, “I’d wake up in the middle of the night disoriented and think I was still in VR.”

The uniquely intensive experience of VR - due to heightened immersion, presence, embodiment, and flow - will likely exacerbate the proven deleterious effects of frequent online behaviors such as loneliness and social isolation (Reissmann & Lange, 2021). For many young people, the metaverse will cause addiction (Barreda-Ángeles & Hartmann, 2022). It will also lead to “antisocial behavior, cyberbullying, and identity confusion,” the latter due to the “blurring of boundaries between the virtual and physical worlds,” which will adversely impact

²³ It is best to understand these large expenses either as advertising for real-world entities or as investments akin to, and often made with, cryptocurrencies. They are also akin to NFTs or ‘non-fungible tokens.’ Both are based on blockchain algorithms (see Georgiadis, 2022).

²⁴ E.g., r/oculus, from which the two following comments were extracted.

“children’s sense of identity, empathy, or perception of reality” (Kim & Kim, 2023, 215-219; see also Bailey & Bailenson, 2017; Dwivedi et al., 2023).

The enhanced ‘flow’ or ‘absorption’ of VR can intensify any negative emotions that arise during use (Lavoie et al., 2021, 69). This, in turn, has “a significant positive correlation with negative rumination (i.e., harmful self-related thoughts related to distress)...that could be harmful for users if not managed properly.” These negative outcomes could be exacerbated if the user has experienced “traumatic childhood events, avoidant coping strategies, and psychiatric disorders” (Taveira et al., 2022). Many gamers turn to their consoles to avoid real-life stresses (Snodgrass et al., 2019). Problematic technology use among adolescents is linked to emotional dysregulation, anxiety, depression, and poor self-esteem (Yang et al., 2022). The greater “immersivity” of the metaverse and VR “could amplify” many of these and other mental health impacts (Paquin et al., 2023). Girls may be at particular risk since they are “more relationally inclined, which makes the social aspects of metaverse-like spaces” – positive but especially negative – “more impactful” (Salen Tekinbaş et al., 2023, 12). To be sure, young people can make friends, find social support, and enhance social self-efficacy in the metaverse (Oh et al., 2023). But “the more people exchanged support with others in the metaverse, the greater they felt loneliness in their daily life” (p. 8-9). Which, in turn, would likely cause many to take refuge again in the metaverse.

Porn in the Metaverse

Several peer-reviewed studies, perhaps even supported by public research grants, have confirmed the obvious: VR makes porn more arousing (e.g., Milani et al., 2022). One study even thanked a VR porn production company, BaDoinkVR, for providing its research materials (Simon & Greitemeyer, 2019). BaDoinkVR was surely delighted with the results, which amounted to an advertisement, not serious scholarship. The hospitality industry was also surely delighted. VR porn is scheduled to arrive by robot to rooms in several hotels in Las Vegas, provided by Virtual Reality Bangers (Zilber, 2022).²⁵ The company plans to use Oculus headsets, owned by Meta (Facebook), which promotes the corporate principle of “keeping people safe and preventing harm.”

The harms of pornography flourish in the metaverse and through virtual reality. The draw of VR pornography is not simply heightened immersion. It is also, as with virtual girlfriends, the ability of users to customize virtual partners to their unique cravings. At the same time, as we say above, the machine learning algorithms that drive this industry enable these fantasies to learn the user’s sexual tastes, no matter how unrealistic, violent, or even illegal they might be in the real world. This is akin to “intentionally increasing the addictive properties of a drug (e.g., an opioid) by using individuals’ idiosyncratic neurobiological data to optimize its addictive effects for each individual’s particular neurobiology” (Lang & Yarmel, 2024, 8). For compulsive pornography users, the use of VR headsets to access “more arousing and novel content” may cause “further isolation from the outside world” (Else et al., 2019, 35-36).

²⁵ The ‘brothel industry’ is looking to incorporate VR into its business model (Rothberg, 2016).

Empirical studies have shown for years that violence is rife in pornography (e.g., Vera-gray et al., 2021; Shor, 2019). The immersive intensity of VR will make that violence seem more real and, for those already socialized by pornography to associate aggression with pleasure, more compelling. It is no surprise that preliminary evidence shows that sexual scenes in VR prompt anxiety in women (Brown et al., 2024). Yet almost all studies of VR pornography ignore, dismiss, or diminish the presence of violence (e.g., Dekker et al., 2021). Some scholarly papers almost seem written as consulting reports intended to assist the pornography industry, rather than critique the very violence and misogyny they recognize (Wood et al., 2017).

The popular press is often no better. A widely read British newspaper praised VR pornography for allowing “people with bizarre fetishes to achieve their desires from the privacy of their own home” (Best, 2017). But we know that pornography users often enact what they see on the screen in real-life sexual encounters. This explains the rise of teen dating violence (Rostad et al., 2019) and non-fatal sexual strangulation among young people, which causes brain damage (Hou et al., 2023). Porn-fueled ‘bizarre fetishes’ do not, in other words, remain safely confined to the home. Hence, men who view child pornography on the darkweb frequently try to contact real children for actual abuse (Insoll et al., 2022). “People have always had sexual fantasies engaging with notions of ‘otherness’ and that which we cannot have or are realistically unattainable,” stated a lecturer at the University of Portsmouth in the same British newspaper article. Another paper praises VR porn for “the potential for female agency” (Ross, 2019, 566). These intellectual impoverishments ignore the real dangers of VR pornography that features coercion, rape, punching, kicking, and other forms of violence so prominent in mainstream or non-VR porn.

To be sure, VR holds promise for a limited number of therapeutic interventions (e.g., Park et al., 2019; Halldorsson et al., 2021). But many scholarly papers, much like promotional materials, go out of their way to tout the use VR pornography for health-related matters (e.g., Evans, 2023). Often, this amounts to intellectual gaslighting. Pornography performer Ela Darling, for example, who heads the VR porn company Cam4VR, said that her performances are “20 percent sex, 80 percent therapy” (Bigelow, 2016). If you click on the “Watch Live Cams Now” link posted to her company website;²⁶ however, you are taken to a webcamming platform that shows very little which could legitimately be construed as ‘therapy.’ In the same vein, one paper claimed that “clients could potentially improve their communications skills...through their online interactions with cam models” (Bennett-Brown et al., 2024). By the same logic, we could say that burglary might help some men improve their conversational skills if they speak while robbing their victims.

The VR porn industry itself amply undermines any assertions of therapeutic intent. *Holodexxx.com*, which is clearly named after the *Star Trek* Holodeck, advertises high-resolution “booty scans.” You would probably file a complaint with the state medical board if your physician said likewise. One VR porn production company announced a new title, *Stepmom’s VR Surprise*, with this description: “This very special VR scene includes you, masturbating to a virtual reality porno movie, when suddenly your stepmom walks in...stripping for you and

²⁶ <https://www.cam4.com/vr/#realvrexperience>

having hot sex with you.” That, too, does not seem particularly therapeutic. This and similar VR films are available on websites such as *XXXReal*, *XNXX*, *Pornhub*, *MyTaboo*, *XHamster*, and *PornCoven*. The latter, an online forum for sharing porn, includes “scat videos,” which contain “human poo.” That summarizes much about the entire industry.

Some non-pornographic violence reduction programs use virtual reality (Johnston et al., 2023). But the pornography industry harnesses VR to promote violence against women. HoloGirlsVR offers so-called upskirt videos (which are illegal in many countries) as well as *My Stepdad Wants the Real Thing* and a parody of *Pokémon* titled *Poke A Ho*. The offerings on Pornhub VR include busty housekeeper, horny cheerleaders, “fresh and clean,” sex to pay rent, Asian hostess, petite teen, babysitter, slammed, stretched, and more. The categories on BaDoinkVR include Stepdaughter, Teen, and gaping. VRBangers provides *Sorority Hookup*, *Family Bonding*, and *Please, Don't Fire Me*. Two categories on WankzVR are “cum on face” and “piledriver.” It is a dishonest alibi to insinuate that VR pornography is anything other than the intentional perpetuation of misogynistic violence.

Sexual Harassment in the Metaverse

Sexual harassment is rampant in the metaverse²⁷ – and it afflicts women far more than men (Behm-Morawitz & Schipper, 2015). Women’s avatars have experienced what in real-life would be illegal sexual assault (e.g., Outlaw, 2018; Lorenz, 2016; Soon, 2022). Some of their avatars have had their breasts groped. Female avatars have been stalked or exposed to masturbatory gestures and graphic displays (Blackwell et al., 2019). Others are raped and gang-raped (Oppenheim, 2022; Smith, 2022). Even avatars that look like children, and which proclaim a young age, are sexually abused (Gómez-Quintero et al., 2023).²⁸ This behavior denies women and girls their right to 21st-century digital citizenship (see Jane, 2017), which includes equal access to computer-related professions.

The ‘affordances’ that make VR and the metaverse so compelling, such as immersion and embodiment, intensify any feelings of injury after an assault to one’s avatar (Blackwell et al., 2019; Gsall, 2021; Gall et al., 2021; Singh 2022). These qualities, concluded one study, “made all of our women participants feel significantly more harassed, anxious, and insecure when another user violates their personal physical space in social VR than when that same violation occurs in pre-existing online games and virtual worlds” (Schulenberg et al., 2023, 10). The experience of powerlessness, wrote one woman who was victimized in a now-famous incident in the game *QuiVr*, felt “real, violating” (Belamire, 2016). In fact, electroencephalogram measurements of brain activity show that events experienced in VR, as opposed to seen on a two-dimensional screen, are akin to ‘real life’ autobiographical memories (Kisker et al., 2021). Hence, the exclusion, harassment, or assault of a person’s avatar could be internalized acutely (Wolfendale, 2006), all the more so when it happens to a child. These assaults “are acts with real causes that generate real effects” (Striano, 2023).

²⁷ So is racism, homophobia, and other forms of hate speech (see, e.g., SumOfUs, 2022).

²⁸ Should the law accommodate virtual crimes? On this point, see Lemley & Volokh, 2018; Bellini, 2024; Citron, 2023.

It is useful here to consider *Second Life*, an early and successful, Emmy-award-winning innovator in the metaverse. *Second Life*, created by Linden Lab, is a game, but not really, as there is no objective or finish line. The goal is to create a virtual life and interact with others (see Kalning, 2007). *Second Life* contains sex – and so much more. But for many users, cyber-sex is a central draw, especially since, as we saw earlier, avatars are anonymous. For this reason, many breathlessly extol sex in the metaverse, as well as “virtual pornography” more generally, as an erotic utopia. We will each be seen “not in terms of male, female, white, black, heterosexual or homosexual, but as human beings, as individuals worthy of equal treatment and acceptance” (Picarra, 2012, 28).

This view is naïve – to wit, one paper that celebrates cybersex despite reporting that women’s avatars are sometimes harassed, assaulted, stalked, and groped in the metaverse (Valkyrie, 2011). The same paper, too, reported that some of the men in the study admitted to telling female players to “Strip bitch” and “Show me your boobs.” That is hardly utopian. Nor is the suggestion by a recent paper authored by medical professionals that “trauma-informed care” is necessary for some survivors of VR violence (Porta et al., 2024).

Second Life contains a whole economy in which user-created virtual goods and services – furniture, music, food, etc. - are transacted for Linden dollars, which are purchased for real money in accordance with an exchange rate. (That the US Department of the Treasury taxes Linden dollars as property speaks to just how much of the metaverse is real rather than mere fantasy.) Linden dollars, for example, allow ‘residents’ of *Second Life* to outfit their avatars with clothing, hair styles, different physiques, and jewelry – as well as genitals, sex toys, BDSM gear, and animations of sexual behaviors which are triggered when your avatar nears another avatar “you want to interact with” (www.getxcite.com). But not all avatars, even those with realistic genitals, desire these interactions. Unless a resident takes certain precautions, their genitals can be ‘attacked’ by other avatars.²⁹

Sexual harassment has been a long-standing problem in *Second Life* (Brood, 2024), as noted above. Prostitution also occurs in *Second Life*. Some users dress their adult-looking avatars to look like children and offer virtual sexual services, called “age-play,” to other adult avatars. “If no real children are being hurt,” says one academic article, “where is the victim in sexual role-playing by consenting adults?” (Salter, 2011, 1128). But the fallacy of this question is to assume that what happens online stays online. As we have seen in regard to child abusers, that is not true. The victim in sexual role-playing in *Second Life* may, in fact, be a real child offline.

Adult pornography is so prevalent in the metaverse that some actual children, using age-appropriate avatars and after revealing their true ages, are offered Linden dollars by adults for what amounts to virtual child sexual abuse (Connolly, 2007). Some adults, too, hold meetings in *Second Life* to display virtual child porn, or use their avatars to peddle real-life child porn. What happens in the metaverse does not stay in the metaverse.

²⁹ See, e.g., <https://community.secondlife.com/forums/topic/29445-sexually-harrased/>

World of Warcraft, another widely popular online world in the metaverse, also allows for what it calls in-game “intimacy” (Pace et al., 2010). There, too, women’s avatars have been harassed and raped (Schott, 2017; Beusman, 2015). Many gaming programmers have tried to design precautions. Meta offers an optional ‘personal boundary’ feature in its *Horizon Worlds* metaverse. It blocks any avatars, except for friends, from getting closer than four feet (Robertson, 2022). The *QuiVr* metaverse implemented a similar feature after an incident of sexual harassment, discussed above, went viral (Stanton, 2016). But these solutions simply burden women and children to take further steps to armor themselves against pornographic predators. They do not address the predators (see Basu, 2021).

The metaverse, too, earns a poor grade at blocking children from inappropriate material. In 2022, a BBC researcher entered the metaverse using a virtual reality chat app (*VRChat*). She posed as a 13-year-old girl, the minimum age for the app. She was still able to enter chat rooms in which adults were simulating sex (Crawford & Smidunth, 2022). “Grown men,” the researcher wrote, “were asking why I wasn’t in school and encouraging me to engage in VR sex acts.” In the metaverse game *Roblox*, too, sex rooms (called “condos”) are as common as the sexual harassment and abuse of children (van der Velde, 2022).

Conclusion

Artificial Intelligence and Virtual Reality are often hailed as the gateway to the future. In many respects, they are, and often in exciting ways. But these novel technologies, we have seen, are also new arenas for the perpetuation of the old, tiresome, and well-proven harms of pornography. That is frustrating because it shows the tenacity of myths asserting the harmlessness of pornography – myths that serve only to funnel more money into the pockets of a predatory industry that is entirely held in the hands of private owners who go to enormous lengths, as we have seen, to escape notice. They hide their own identities with the same zealous devotion they direct to exposing women against their will.

Equally frustrating is the failure of many scholars, as we also saw, to recognize the harms of AI-driven pornography. At times, this leads to rhetorical absurdities, such as coining the phrases “outercourse” for masturbation while sitting at the keyboard (Waskul et al., 2000). Critical comments are typically hedged, unlike the endorsement of virtual sex (e.g., McArthur, 2022). Too many scholars address pornography as a means to demonstrate their own fluency with the latest academic theories, and thereby ignore entirely its harms (e.g., Wang, 2021; Alilunas, 2024). This does enormous harm to the women and girls victimized by pornography.

It also ignores the harm to the men who use pornography – the men who go by online names such as “deepthroatfucker” and who fantasize about violent and coercive sex with women (Attwood, 2009). To refuse even to acknowledge that these men are in need of psychological therapy to help them better integrate their own emotions and experience, and to better navigate social interactions with real women, is a clear violation of even the most basic notion of an academic Hippocratic Oath.

An even more shocking example from a pro-cybersex publication pertained to a man in the Philippines, Jhay-Ar. He was “enticed by the promise of ‘easy money,’” and unaware of what the job really entailed, to work as a cybersex operator. For him, according to the researchers (Cruz & Sajo, 2015, 9), “cybersex offered the prospect of family reunification...By meeting as many U.S.-based customers, Jhay-Ar hoped to find his American father whom he has never met.” Jhay-Ar himself said:

One of my goals in entering this was, who knows, to meet a cousin of my daddy...I kept thinking there might be a chance...Out of ten customers, I've told four or five of them my real story...maybe there's someone who can connect me to relatives over there. It's not just for me, but for my sibling as well.

This statement, according to the researchers, shows “affective labor produces value within and outside of ever-expanding capitalist networks” (Cruz & Sajo, 2015, 9) What it should have shown the researchers is that cybersex is a deeply exploitive industry that takes advantage of the vulnerable. To not recognize that pain is the moral equivalent of research misconduct. And it is rife in the study of AI and VR pornography.

Ironically, most scholars in this field profess an egalitarian outlook. Yet they endorse as emancipatory various online, AI, and VR arenas in which hypertrophic penises and breasts anonymously parade before masturbating men. In this way, cybersex is not an alternative to the dominant sexual paradigm but simply another forum to enshrine, like pornography, impossible ideals for bodily beauty and the violent submission of women. One cybersex habitué described himself as “My hobbies include using my 13” LONG 4” THICK [sic] Penis on Women. Selectively meeting attractive Women and sexing them with my 13” penis.” (Waskul et al., 2000, 390). There is little in that self-description that speaks to sexual liberation.

Epilogue and Update: The San Francisco lawsuit

In late August 2024, only one week after this research report was finalized for publication, the City of San Francisco filed a civil lawsuit against more than 50 individuals and companies for operating deepfake pornography websites and apps. These entities are alleged to have violated “state and federal laws prohibiting the creation, possession, disclosure, and distribution of AI-generated NCII [nonconsensual intimate images] and similar forms of sexual abuse and harassment.”³⁰

The lawsuit is pioneering. It is the first government lawsuit in the US to go after the companies that operate the websites and apps which create these images, rather than just individual perpetrators who use the websites and apps. The suit, too, seeks more than just restitution. It aims to shut down these websites entirely (Lara, 2024). The lawsuit specifically targeted ‘undressing’ or ‘nudifying’ websites and apps. The crux of the lawsuit is that none of the websites or apps require the persons depicted – mainly women - to offer consent. Many

³⁰ The case is *People v. Sol Ecom Inc.* filed in the Superior Court of the State of California (E.g., Poritz, 2024).

of the websites and apps, too, allowed users to undress minors - girls under the age of 18 – and thus profit from creating illegal child pornography (which is taken up in Part II of this research report, as discussed earlier).

The original news reports of the legal filing provided links to redacted versions of the lawsuit, which omitted the names of the websites and apps. This was likely to prevent further use. But an unredacted version was posted online by Courthouse News Service.³¹ As a result, we now know that many of the websites and apps named in the lawsuit were mentioned in this research report. All the named platforms are readily searchable by Google and other conventional search engines. They are not hidden in deep recesses of the so-called ‘dark web.’ They are as public and visible on the ordinary ‘surface web’ as CNN, the Weather Channel, and the banks that make this illegal commerce possible.

The lawsuit specifically discussed 11 Defendants that separately operate a total of 16 identified platforms. One of these Defendants is a person, Augustin Gribinets, who resides in Estonia. Five are corporations: Briver LLC (New Mexico, USA), Itai Tech Ltd (Norwich, England), Sol Ecom (Florida and California, USA), Defirex OÜ (Tallinn, Estonia), and Itai OÜ (Tallinn, Estonia). The last five Defendants discussed in detail are anonymous, and so referred to in the lawsuit as Doe #1 through Doe #5 (the gender-neutral variant of John Doe and Jane Doe). The lawsuit also specifies another 45 Defendants (Does #6 through #50), but they are not discussed or tied to specific platforms.

Of the 16 websites and apps named in the lawsuit, nine were said to permit the nonconsensual creation of deepfake nudes of adults as well as children. They are: Pornngen.art, Undresser.ai, Ai-nudes.app, Undressai.com, Deep-nude.ai, Pornx.ai, Xnude.ai, Deepnude.cc, and Ainude.ai. The other platforms, named for creating nonconsensual deepfake nudes of adults only, are: Drawnudes.io, Undress.cc, Undress.app, Undress.love, Nudify.online, Undressing.io, and Clothoff.io. According to the lawsuit, these websites collectively received more than 220 million visits during the span of just six months in 2024. That totals more than one undressed image for each woman and girl in the US!

None of the websites and apps named in the lawsuit, to repeat, require users to submit documentation attesting to honest and truthful consent by the individuals depicted – or their age. Some of the platforms indicate that users are responsible for obtaining consent. But, in line with industry standards for online pornography in general, none of the platforms verify that users have obtained consent.

Some of the websites and apps require users to sign in, often using an existing social media or similar account. In this regard, the lawsuit mentions Discord, X (Twitter), and Telegram. Some of the platforms require payment after the user has exhausted some limit of free images. The lawsuit here mentions Apple Pay, PayPal, Venmo, Cash App, Cashlink, Wise, AliPay, debit cards, cryptocurrency, and unspecified credit cards. Here, again, we see how major financial firms are enmeshed in, and help make possible, the illegal pornographic exploitation of women, girls, and others.

³¹ <https://www.courthousenews.com/wp-content/uploads/2024/08/nudify-websites-lawsuit.pdf>

The lawsuit quotes various phrases used by the websites and apps intended to entice users:

- “See Anybody Nude for FREE”
- “can undress any photo you upload”
- “Nudify Anyone in Seconds”
- “See anyone naked”
- “Available for anyone online”
- “See anyone fully naked in seconds”
- “Remove clothes from any photo”
- “See any girl clothless [sic] with the click of a button”
- “remove clothing from a girl’s photo”

At least one of the platforms allows users to modify an image, after it has been ‘nudified,’ so the person appears in various “sex pose[s].” One of the platforms cuts to the chase: “Imagine wasting time taking her out on dates, when you can just use Undress Ai to get her nudes.”

The lawsuit alleges that all the Defendants violated, or aided and abetted the violation of, the California Business and Professions Code (§ 17200) prohibition on any “unlawful, unfair, or fraudulent business act or practice.” The unlawful acts engaged in by the Defendants regarding adult victims include:

- Two violations of the California Civil Code: prohibition on the creation and intentional disclosure of nonconsensual sexually explicit images, and prohibition on the intentional distribution of nonconsensual depictions of intimate body parts.³²
- One violation of the California Penal code: prohibition of the intentional distribution of nonconsensual depictions of intimate body parts of an identifiable person.³³
- One violation of federal US law: prohibition on the knowing or reckless disclosure in interstate commerce of intimate visual depictions of identifiable persons.³⁴
- A further violation on the California Business and Professions Code which forbids “unfair business acts and practices...because they offend established public policy, the harm they cause to consumers greatly outweighs any benefits associated with those practices, and they are immoral, unethical, oppressive, unscrupulous and/or substantially injurious to consumers.”

The violations regarding child victims – which are more extensive and more consequential - will be discussed in Part II of this research report.

Civil lawsuits in the US do not merely specify the illegal behavior of the defendants. They also make specific demands or requests for penalties. This lawsuit asked the court levy the following penalties:

³² California Civil Code § 1708.86(b)(1) and § 1708.85(a).

³³ California Penal Code § 647(j)(4), itself a violation, as the lawsuit also stated or California Penal Code § 31 on aiding and abetting a crime.

³⁴ 15 U.S. Code § 6851(b)(1).

- Require Defendants to permanently cease from “performing or proposing” any and all of the above illegal practices. This was requested not just of the Defendants, however, but also “their successors, agents, representatives, employees, and any and all other persons who act in concert or participation with Defendants.”
- Order certain types of internet companies and service providers, once they are given notice of the above injunction, to “take all actions necessary to restrain Defendants from performing or proposing to perform any unlawful or unfair business practices...including but not limited to ceasing to facilitate access to any websites owned or operated by Defendants that are capable of creating AI-generated NCII of identifiable individuals.” That is, to shut down these illegal operations. The types of companies and services specified are “domain-name registrars, domain-name registries, webhosts, payment processors, or companies providing user authentication and authorization services or interfaces.”
- Order each Defendant to pay a civil penalty of \$2,500 for each violation of California Business and Professions Code section 17200.
- Order Defendants to pay the costs of the lawsuit.
- “Provide such further and additional relief as the Court deems just, proper, and equitable.”

These platforms are, to repeat, easy to find on the internet. They are also fully accessible to anyone. None of the platforms are concealed behind any sort of ‘age gate’ that requires users to verify their age – or even click on a cursory “I’m over 18” button. Even children can access and use these programs, which is exactly how schoolboys are harassing their female peers.

This lawsuit sends a powerful message about the illegality of certain types of deepfake pornography. It is, however, only one necessary step in a much wider journey to creating a safe and democratic internet, one that requires an even greater effort to create a culture no longer besotted with the violence against women that is otherwise known as pornography.

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