

Virtual Consumption, Sustainability & Human Well-Being

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There is widespread consensus that present patterns of consumption could lead to the permanent impossibility of maintaining those patterns and, perhaps, the existence of the human race. While many patterns of consumption qualify as ‘sustainable’ there is one in particular that deserves greater attention: *virtual* consumption. We argue that virtual consumption — the experience of authentic consumptive experiences replicated by alternative means — has the potential to reduce the deleterious consequences of *real* consumption by redirecting some consumptive behavior from shifting *material* states to shifting *information* states.

Keywords: Virtual Consumption; Sustainability; Well-Being; Experience Machine; Nozick

1. Introduction

More than a decade after Julianne Newton and Eric Freyfogle (2005) criticized appeals to sustainability as ‘notoriously vague,’ the concept is, today, more firmly established than ever before, and perhaps no less vague for that. Despite wide-ranging disagreement among ecologists, economists, and engineers, sustainability scholars and scientists generally agree on the following three propositions regarding the nature of sustainability. First, present patterns of human activity are unsustainable, in the sense of being indefinitely maintainable (Barry 1997; Dobson 1998; Norton 2005). There is widespread consensus that present patterns of human activity, including

resource consumption, waste generation, and commons despoilment undertaken to achieve and maintain high consumption lifestyles, could lead to the permanent impossibility of maintaining those patterns and, perhaps, the existence of the human race (Jackson 2006, 2009; Reisch and Thøgersen 2015; Middlemiss 2018). Second, given the apparent alternatives of extinction or an indefinite succession of unsustainable states of affairs, it would be preferable to adopt patterns of behavior, including consumptive behavior, that are sustainable. Third, some kind of reduction in material consumption is required to achieve sustainability, though whose consumption and when it should be reduced remain topics of disagreement (Crocker and Linden 1998; Ehrlich 1971; Hirsch 1976; Robeyns 2017). While there remain detractors, our impression is that very few contemporary sustainability scholars are likely to find the foregoing propositions objectionable (Sagoff 2000, 2008).

In this article, we argue that while many patterns of consumption might qualify as sustainable, there is one in particular that stands out through the serendipity of having already been partly implemented in practice, and without paternalism. This under-examined pattern is *virtual* consumption, or the experience of authentic consumptive experiences that is replicated by alternative means. We argue that while virtual consumption does not guarantee a sustainable pattern of consumption, it does promise to make significant advancements towards the goal of sustainability. Virtual consumption has the potential to reduce the deleterious impact of human resource consumption on our environment by redirecting some consumption from shifting *material* states to shifting *information* states.¹

After recognizing that some forms of consumption cannot be virtualized, and scrutinizing extant modes of virtual consumption, this article addresses what is perhaps the most significant

¹ To be clear from the outset, the objective of this article is *not* to advocate for any particular approach to the virtualization of consumption.

objection to virtual consumption. The objection derives its force from arguments that resemble Robert Nozick's (1974) famous experience machine thought experiment. Compared to real or material consumption, this thought experiment suggests that instances of virtual consumption would leave people worse off—*because it is virtual*. However, we argue there are likely to be many cases when virtual and real consumption yield the same degree of well-being for those who consume. Thus, if our argument is sound, virtual consumption may not only serve as an effective vehicle to advance the goal of sustainability, but it may do so without sacrificing well-being.

2. Metabolic Consumption is not Virtualizable

The Oslo Roundtable (1994) famously defined sustainable consumption as “the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations.” On this definition, if a pattern of human activity is sustainable so long as it does not cause or entail its own future impossibility, then it clearly precludes *some* forms of consumption. While in lay discourse ‘consume’ is synonymous with ‘devour’ and ‘destroy,’ beginning in the late eighteenth century, the classical political economist, Adam Smith, developed consumption as a term of art. In the *Wealth of Nations*, Smith ([1776] 1976) identified consumption as the conceptual opposite to production when he famously declared, “consumption is the sole end and purpose of all production; and the interest of the producer ought to be attended to only so far as it may be necessary for promoting that of the consumer.” However, Smith never developed a fully-fledged theory of consumption and many contemporary ecological economists, including Herman Daly (2005), have questioned this canonical distinction between

consumption and production, claiming instead that consumption *includes* production, which constitutes the total throughput of any given economy (Hassoun 2014).

While perfectly disentangling the concepts of consumption and production is not the purpose of this article, there are two widely accepted claims regarding the nature of consumption that warrant our attention. First, few would deny that we humans currently consume a great many things, including what John Stuart Mill ([1848] 2006) referred to as the ‘spontaneous productions of the earth,’ and the various baubles and trinkets produced by intentional human agents for exchange in the marketplace. Second, while the exact relationship between consumption and human well-being remains elusive, there appears to be a strong connection between them (Syse and Mueller 2015). The standard economic model normally depicts individual welfare or well-being as determined *only* by the consumption of goods and services, or commodities (Mas-Colell *et al.* 1995). On this familiar account, which typically assumes local non-satiation and monotonicity, individuals can always realize a welfare gain by satisfying their subjective preferences for consuming ever more goods and services. However, if understood as a descriptive claim, this positive and invariable relationship between consumption and well-being is almost certainly false. There is a growing body of evidence, collected by happiness economists and positive psychologists, which portrays a highly contingent relationship between consumption and well-being. In fact, there may even be a satiation point with respect to consumption, and the factors that determine consumption possibilities, such as wealth and income per capita (Diener and Seligman 2004; Easterlin 1974, 1995, 2013; Frey and Stutzer 2013, 2002; Kahneman and Deaton 2010; Layard 2005).²

Whatever the exact relationship between consumption and well-being, it seems reasonable to

² Some economists have recently challenged this claim on empirical and methodological grounds (Benjamin *et al.* 2014; Deaton 2008; Stevenson and Wolfers 2013, 2008).

suppose that *some* kinds of consumption are necessary for well-being. In fact, this claim appears to hold across all philosophical theories of well-being, including desire satisfactionism (Heathwood 2016; Murphy 1999), objective list theories (Fletcher 2016; 2013), and mental state accounts, such as hedonism (Crisp 2006; Feldman 2004).³ Whatever ultimately makes a human life good—whether it be pleasure, friendship, knowledge, the satisfaction of desires, achievement, or some combination of these or other intrinsically valuable goods—if the basic metabolic processes required for continued existence count as *bona fide* instances of consumption (and it seems reasonable to insist that they do) then some consumption is essential to well-being. After all, every human life, whether good or bad, involves certain basic metabolic or biological forms of consumption. As Thomas Princen (2006, 56) states, “to survive, all organisms must consume—that is to degrade resources.”

We distinguish metabolic from non-metabolic modes of consumption here, not because it is novel, or because it carves nature at the joints, but because it serves to identify a category or class of human consumption that is, for all practical purposes, *not* virtualizable. Metabolic forms of consumption are distinct, in part, because they are essential to continued existence. At a given time and place, with a given level of technology, instances of metabolic consumption cannot be supplanted by instances of non-metabolic consumption without some individual or group of individuals going out of existence. Our claim, to be developed below, is that virtual consumption has the potential to reduce the deleterious impact of human resource consumption on our environment by redirecting some consumption from shifting material states to shifting information states is restricted to non-metabolic modes of human consumption. By identifying metabolic consumption as a non-virtualizable category of consumption from the outset, it enables us to focus

³ On classifying theories of well-being, see Parfit (1987, pp.493-502) and Woodard (2013).

our attention on other instances and patterns of human consumption—including many standard forms of resource consumption—that are, in principle, virtualizable.⁴

The next two sections argue that whatever extent sustainability scholars and scientists wish for humans to actually and voluntarily adopt patterns of behavior that reduce non-metabolic resource consumption, understanding and instantiating virtual consumption through the application of existing and future technology represents a promising and under-examined approach.

3. Virtual Consumption

In the West, economic consumption is so central to our lives and identities that the word ‘consumer’ almost always appears in that sense. Through metabolic consumption we literally consume food and drink, but how can it be said that the purchase of a computer, or the watching of a television show, is ‘consumption?’ In the case of material goods there is the analogy that an unpurchased good is theoretically available to anyone who can pay, but after purchase becomes unavailable for future use by anyone other than its owner. There is further analogy in the inevitable (but perhaps very long-term) deterioration of material goods. But in the case of media—books, music, plays—there is a *different* analogy, namely, that of taking something into ourselves, making it in some small way a *part* of ourselves. This analogy breaks down quickly at the realization that

⁴ There is a well-known distinction between ‘consumption as using’ (related to the material degradation of things as they are used) and ‘consumption as buying’ (related to the market purchase of goods and services). How might these forms of consumption relate to metabolic and non-metabolic consumption? While, at first glance, it might appear that ‘consumption as using’ is identical to metabolic consumption and ‘consumption as buying’ is identical to non-metabolic consumption, it should be clear that some instances of ‘consumption as using’ are not instances of metabolic consumption and some instances of ‘consumption as buying’ may not instances of non-metabolic consumption. Our only claim here is that some forms of consumption – namely, metabolic consumption – are non-virtualizable and essential to well-being (insofar as metabolic consumption is essential for continued existence).

when one ‘consumes’ social and intellectual goods, not only do they *not* become unavailable for future use, in fact the opposite occurs.

Consider the psychic impact of taking a tourist trip to Japan. One’s airplane consumes fuel for travel, and one consumes Japanese food while there, but a poet might also say they ‘devour the sights’ or ‘drink in the culture.’ Such an endeavor we sometimes call a ‘consumer travel’ experience, and it is something one can purchase, prepackaged, at any travel agency. However, imagine that you have a friend who travels to Japan, then returns and relates to you her experiences. You did not go to Japan, and yet your friend would not consider herself to have communicated very well if, by the end of your conversation, some of the psychic impact Japan had on her was not also passed to *your* mind, albeit with rather less fidelity. You are not having a consumer travel experience, but you *are* getting some of the essence of one: you are *virtually* having the consumer travel experience, not through shifting material states but through the transmission of information. You might very naturally suppose that just hearing about Japan, or looking at pictures your friend took while she was there, is *not the same*, and that seems right. But, while the psychic impact of hearing her story is presumably less than the impact of living through it, the point is that the materials your friend consumed in her travels—jet fuel and ramen, say—are a fairly small part of the ‘consumer travel experience.’ Many people do travel to Japan, but a far greater number seem content with the accounts of other people’s experiences as contained in books, theaters, films, and restaurants, engaging in a sort of downstream or derived consumption of something that is, somehow, not made unavailable but arguably made *more* available the more widely it is consumed.

It might be objected that calling this ‘consumption’ simply stretches the metaphor too far—perhaps the best approach would be to argue that, whatever sorts of activity society might treat as ‘consumption’ for economic purposes, sustainability scholars ought to maintain better conceptual

separation between true consumption activities and the whatever-it-is-we-are-doing when we are watching television or otherwise imbibing (so to speak) psychic impressions. After all, this inquiry opened with a claim that, whatever else sustainability requires, it probably requires, or at least substantially benefits from, a reduction in material consumption and despoilment. Reducing *merely metaphorical* consumption appears to be no help at all. However, that is precisely the point. Virtual consumption is intended to pick out activities that result in similar (though probably, in most cases, lower-fidelity) mental states (or ‘experiences’) as material consumption, but that *do not* render the relevant material goods unavailable for future consumption by ourselves and others like us. At this point, it should be clear why virtual consumption simply is not possible with regard to metabolic consumption: looking at pictures of food can simply never replace the act of eating food. But, looking at pictures of Japan can in many cases serve as an acceptable, if low-fidelity, substitute for actually traveling to Japan. The transference of experiential information and engendering of derivative psychic impact is key to virtual consumption.

By this definition, we find that first world Western living already offers a wide variety of virtual consumption experiences; indeed, from a certain perspective, our entertainment media consists of almost nothing else. Material goods still underpin virtual consumption—televisions must be manufactured, books must be printed or replaced with electronic readers—so an important part of empirical inquiry into virtual consumption is determining whether particular approaches to virtualization are actually more sustainable than the experience they imitate. Nevertheless, music and drama have not been bound to concert halls or theaters in over a century. Virtual consumption is in fact so ubiquitous that most people think of digitally reproduced entertainment, such as theatrical productions streamed over the Internet, as a baseline experience rather than a virtual one. Even the act of reading a book is a form of virtual consumption, whatever paeans we may compose

to their tactile and olfactory virtues; at minimum, a novel virtualizes the author's fantasies, while an autobiographical tale virtualizes the author's life. Some thinkers have even expressed concern about this, privileging authentic experience above derivative experience—from William Wordsworth—

Books! 'tis a dull and endless strife:

Come, hear the woodland linnet,

How sweet his music! on my life,

There's more of wisdom in it.

... One impulse from a vernal wood

May teach you more of man,

Of moral evil and of good,

Than all the sages can.

Enough of Science and of Art;

Close up those barren leaves;

Come forth, and bring with you a heart

That watches and receives.

Wordsworth ([1798] 2013)

—to Bertrand Russell, whose seminal essay, “Knowledge by Acquaintance and Knowledge by Description” stands, more than a century later, as one of the most influential philosophical

examinations of the difference between experiencing something and merely reading about it (Russell 1910). Both Wordsworth and Russell recognize that the written word, for all its power, is not the same as the lived experience.

However, if reading about Japan just *isn't the same* as traveling to Japan, then why does anyone bother doing it? Why not simply *go*? One answer might be that reading about travel is just a totally different kind of experience than actually doing it, such that some people will prefer one and some will prefer the other. But this seems unlikely to be the usual case; the fact that consumer travel typically involves a significant outlay of time and resources likely incentivizes substitutions like reading travelogues, or eating at culturally-themed restaurants, or consuming imported media. The Japanese cuisine served in an American hibachi grill probably lacks some authenticity, such that the experience of eating there results in a lower-fidelity impression of Japanese food than might be gained through consumer travel, but when people eat there it would not be at all strange for them to wonder how close it is to the 'real thing'—implicitly identifying the experience as in some measure virtual. Wordsworth and Russell's concern may be less a matter of separate kinds than a question of fidelity along a continuum. The fidelity of virtual consumption—its faithfulness to the psychic impact of the 'true' experience—might be quite low or extremely high. Reading a book about Japan is a fairly low-fidelity virtualization of consumer travel, whereas listening to recorded music is a comparatively high-fidelity virtualization of attending a live concert, such that it would be quixotic to insist that the only 'real' music is 'live' music. Whether perfect fidelity is achievable is an empirical question, but certainly in the much-vaunted 'information age' we enjoy a variety of extremely high-fidelity virtualizations in the form of digital goods. Among these, some of the most immediately promising for sustainability through consumption reduction are telecommunications and video games—two technological innovations that introduced interactivity

to the world of virtual consumption.

In fact, telecommunication may be the single most underutilized form of virtual consumption in existence. Telephone conversations are extremely high-fidelity modes of virtual consumption, though even ‘virtual’ barely applies; speaking into the receiver approximates the psychic impact of a face-to-face conversation in a future so close it is effectively synchronous, consuming in the process a tiny fraction of the energy resources it would require to bring two people together for an ‘authentic’ conversation. Furthermore, depending only on one’s equipment setup, a theoretically infinite number of people could join that conversation, far more than could possibly fit in the physical space within hearing distance of one person’s voice. With the advent of videoconferencing, the experiential fidelity increases further still. How important are touching, tasting, or smelling to a fully authentic conversation? Doubtless, that will depend somewhat on the nature of the conversation, but it is easy to wonder why anyone concerned about carbon emissions despoiling our atmosphere would ever organize a physical conference (to which people must travel, often by jet plane) instead of a digital one. Likewise, the number of white collar professions for which centralized office space is increasingly skeuomorphic is far higher than the number of professions actually transitioning to commute-free virtual offices.

Video games are perhaps less ‘shovel ready’ in sustainability circles, but likely they are key to future developments in virtual consumption. The first video game—a 1958 oscilloscope project called ‘Tennis for Two’ that, thanks the 1970s version, most people today would call ‘Pong’—bore only slight resemblance to the game for which it was named (Kent 2001). Tennis for Two was interactive, but the choices players could make were limited: they could only move their paddles along a single axis. Video games today often feature a dizzying array of interactive options. The most interactive genre of games, ‘sandbox’ titles, feature activities ranging from

stealing cars and robbing banks to parasailing and playing darts, all conducted in virtual realms as large and detailed as some actual cities and even populated by other human actors. These activities all take place on a screen and are carried out by a series of button-presses, but in terms of psychic impact they are at least of sufficient fidelity that the U.S. military uses them to train soldiers.⁵ As graphical presentation and processing power improves, the fidelity of the experience continues to rise. Recent advancement in ‘virtual reality’ gear—at present, visors that project simulated environs across a player’s entire field of vision, with numerous models already available for retail purchase—further immerse players in virtual activities. Here the implications for sustainability really begin to shine; does not the availability of an extremely high-fidelity virtual environment (a digital Louvre, say) encourage people to indulge their desires for certain psychic impacts while drastically reducing the resource costs?

It might be objected that a virtual Louvre *still isn’t the Louvre*, but this is a bit like claiming that talking to someone on the phone isn’t *really* talking to a person, but to a phone. It is technically true, but as long as the fidelity is high, the fact that an experience is simulated is functionally irrelevant in almost every conceivable circumstance. Furthermore, high fidelity can effectively mitigate feelings of deprivation that stand to discourage otherwise low-consumption behaviors. If you are a committed environmentalist who thinks that international air travel results in morally blameworthy levels of carbon emissions, your deep appreciation of European art might nevertheless overcome your scruples the moment you get an opportunity to visit the Louvre overseas. However, if you can take a private, high-fidelity walkthrough of the Louvre, any time you want, without ever leaving your home, perhaps your scruples are more likely to prevail.

⁵ Peter Holley, “The Military is Now Using Video Games to Train Millennials in Cold War Technology,” The Washington Post, December 2, 2014, <https://www.washingtonpost.com/news/post-nation/wp/2014/12/02/the-military-is-now-using-video-games-to-train-millennials-in-cold-war-technology/>.

Likewise, four-wheeling through pristine wilderness, drag-racing low-efficiency vehicles, or hunting endangered megafauna. In many cases, it seems that the less we feel we are asked to sacrifice (or the more we feel we are gaining in the bargain), the easier it is to overlook such shortcomings in experience fidelity as might manifest. If you doubt it, simply consider how tiny the range of sound reproduced by a pair of nice headphones really is by comparison with a live orchestra. Many people still enjoy live music, but the vast majority of us are mostly content with high availability, low(ish) fidelity alternatives. And, if you *still* doubt it, consider the case of virtualized engine noise: when increased fuel efficiency resulted in quieter engines, customers were dissatisfied with how weak their engines *sounded*, until auto manufacturers solved the problem by building fake engine noise into their vehicles.⁶

In all likelihood, we are just getting started. Telecommunications connects individuals while video games simulate increasingly fidelitous environments; what happens when we really put them together? Might Amazon.com one day look more like a shopping mall than a catalog? Could the academic conferences of the future look exactly like the academic conferences of the present, but with zero travel and a correspondingly smaller carbon footprint? These are possibilities *right now*, achievable with technology that *already exists*. Add well-established possibilities for near-term technological breakthroughs to consideration and the virtual consumption possibilities accelerate exponentially. Augmented reality—in which simulated realities are digitally overlaid onto physical environments—presently exists in Microsoft’s ‘HoloLens’ laboratories (Kalantari and Rauschnabel 2017). Imagine completely redecorating your home without replacing any of your furniture, or changing the (perceived) paint job or body style

⁶ Drew Harwell, “America’s Best-Selling Cars and Trucks Are Built on Lies: The Rise of Fake Engine Noise,” *The Washington Post*, January 21, 2015, https://www.washingtonpost.com/business/economy/americas-best-selling-cars-and-trucks-are-built-on-lies-the-rise-of-fake-engine-noise/2015/01/21/6db09a10-a0ba-11e4-b146-577832eafcb4_story.html.

of your car at the touch of a button. So long as the reduction in material consumption outweighs the energy cost of running your HoloLens, this kind of virtual consumption could make an incredible dent in consumer waste, because fashion and other cosmetic luxuries could be relegated to the realm of information technology. The possible benefits of virtualization even extend beyond the promise of sustainability, potentially including the preservation of experiences made impossible by climate change or other forces—for example, allowing humans to experience ‘snow skiing’ in a world with no snow. In the highly speculative transhumanist long-term, we might even inhabit Matrix-style ‘brain in a vat’ realities, consuming just enough energy to maintain metabolic functioning and whatever virtual realms we choose to inhabit, while most of the globe is allowed to return to cycles unmarred by human appetites.

There is no need, however, to rely on exciting speculation to get the point that virtual consumption has massive untapped potential for reducing consumption and despoilment that presently occurs in the name of commercial consumerism. Virtual consumption is happening already, with virtual economies rising and falling in simulated worlds, inhabited by people who choose to be there, often who pay to participate, no paternalism or cultural browbeating required. The higher we ratchet fidelity, the more virtual consumption can grow, and the faster material consumption and despoilment can shrink—at least to some degree. Important empirical questions remain, as the relative benefits of virtualization could be erased if building or maintaining virtualization infrastructure prompted individuals to simply increase their overall consumption, rather than be satiated by virtualization of extant consumption. If there are modes of virtualization that consume *more* resources and energy than parallel authentic experiences, these should be identified and avoided.

4. Experience Machines

So far, we have suggested that metabolic consumption is essential to well-being, and that well-being is normally thought to be closely connected to other forms of consumption also, no matter which philosophical theory of well-being is true. However, the problem, identified by sustainability scientists and scholars, is that many forms of material consumption despoil the environment. We then proposed virtual consumption as a promising means to reduce the harmful consequences associated with some forms of real consumption.

This line of reasoning exposes us to something like Robert Nozick's (1974) infamous experience machine thought experiment, which suggests that virtual consumption would leave people worse off, precisely because it is virtual. In this section, we respond to this concern by arguing that, in some cases, virtual and real consumption are likely to leave consumers equally well off. If that is correct, then one central task for sustainability scientists and scholars is to identify cases where virtual and real consumption yield the same degree of well-being for those who consume, and to distinguish them from cases where this outcome fails to obtain.

Nozick's experience machine thought experiment is easily summarized. Nozick invites readers to imagine a machine invented by "super-duper neuropsychologists" who have contrived a way to give our minds "any experience" imaginable while we actually rest idle, as if comatose, with electrodes attached to our heads (Nozick 1974). Would we choose to use the machine? Nozick asks (rhetorically), "what else can matter to us, other than how our lives feel from the inside?" (Nozick 1974, 42-45). Then he gives three intuitive responses:

1. There are things we want to *do*, rather than merely *experience*.
2. There are ways we wish to *be* that are incompatible with being vat-bound lucid

dreamers.

3. We would not want our experiences limited to a reality “no deeper or more important than that which people can construct.”

Nozick suggests that while we can imagine yet other machines intended to satisfy these concerns, he thinks it clear that we would either not use such machines in conjunction with the experience machine (as in the case of a machine that transforms us into all we wish to be), or we would not use them at all (as in the case of a machine that simply produces all the results we desire). “What is most disturbing about” these machines, he writes, “is their living of our lives for us” (Nozick 1974, 44). He concludes that the “question of what matters *for people* other than their experiences” is sufficiently “intricate” that it would be inadequate (and not only with regard to humans) to suppose *experience* is all there is to human existence and well-being (Nozick 1974, 45). While Nozick does not back his claims empirically, other philosophers have polled people on whether they would use the experience machine. The answer appears to be that it depends on the precise circumstances, but there does seem always to be a non-trivial number of people who reject use of the experience machine no matter the circumstances (Smith 2011). Though people’s specific *reasons* for rejecting the experience machine are unavailable, the data seems to support Nozick’s intuition that, when asked to choose, many people prefer what might be called ‘authentic reality’ to virtual reality.

Prima facie, it is difficult to reconcile these results with the modes of virtualization discussed in Section 3. Telephones virtualize the experience of having an in-person conversation. Empirical studies of social media suggest that the interactions we have there are sufficiently disconnected from reality that it would be farcical to call them ‘authentic’ experiences, but that

does not seem to have inhibited their growth (Gil-Or *et al.* 2015).⁷ Video games, too, are more popular than ever, with 42% of Americans playing video games for at least three hours per week, supporting a multi-billion dollar industry—and that is small potatoes compared to the average American’s consumption of more than four hours of television per day.^{8,9} Which of these pursuits would be meaningfully different if they were piped into our skulls by electrodes rather than our eyes and ears?

It would seem that the first and third of Nozick’s explanations for reluctance to enter the experience machine simply reflect a failure of imagination. The first, that there are things people wish to *do* rather than merely *experience*, relies on an experience machine as envisioned by a 20th century philosopher whose exposure to video games would have been, of necessity, minimal and extremely low-fidelity. Suppose, rather than a machine that injected pre-determined experiences into your consciousness, like watching an especially high-fidelity but totally scripted movie, the experience machine were more like a Star Trek holodeck or Matrix-style digital reality—a fully-customizable environment, helpfully overseen by a friendly artificial general intelligence with the ability to charitably interpret and execute your every wish. Furthermore, suppose that your holodeck was networked to others, such that you could invite or exclude other participants, and that you could enter or leave your virtual space at any time. This interactive configuration of the experience machine is no more fanciful than the one so famously advanced by Nozick. Given the choices people already make to spend large quantities of time enjoying virtual experiences like television and video games, it seems likely that many people would not only willingly enter this

⁷ Andrew Perrin, “Social Media Usage 2005 – 2015,” *Pew Research Center*, October 8, 2015, <http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015/>.

⁸ Entertainment Software Association, *2015 Sales, Demographic and Usage Data*, <http://www.theesa.com/wp-content/uploads/2015/04/ESA-Essential-Facts-2015.pdf>.

⁹ Peter Kafka, “You Are Still Watching a Staggering Amount of TV Every Day,” *Recode*, June 27, 2016, <http://www.recode.net/2016/6/27/12041028/tv-hours-per-week-nielsen>.

machine, but that many would in fact enter it as frequently as possible. Those prone to complain about the inauthenticity of using the machine would be seen as quixotic, the way much of the world already views adults who do not own a cell phone or who never watch television. Certainly, there are those who would say that reading a book or doing philosophy is not ‘really’ doing anything at all, and people who do those things ought to ‘get out more’ or ‘live a little.’ But this does not hold up under scrutiny. One’s choice of media consumption does something, even if only to one’s psyche; *having* an experience *is* doing something. The claim that people prefer to *do* things rather than just *experience* them boils down to a claim that people prefer doing some things rather than doing other things, which is vacuous; if you have any preferences at all, then you prefer some things rather than others. That some people do not prefer virtual experiences does not reveal any deep truths about human nature, it just restates the obvious truth that there exists a plurality of preferences.

Nozick’s third concern, that we would not want our experiences limited to a reality no deeper than one constructed by people, relies on a shortchanging of human creative enterprise. There are an infinite number of experiences that you *cannot have in reality*, which you can have in virtual reality. Video games already exist that put players in the role of superheroes, time travelers, space explorers, and even gods, and higher-fidelity editions of such pursuits would likely have even greater appeal. To the extent that Nozick might be hinting at something like a depth of religious experience with this objection, we are not aware of any religious sect that views its commandments and proscriptions as inapplicable to virtual spaces, nor its deities as unable to perceive or influence such spaces. Books and movies are routinely praised for their depth or insight by many regarded as wise; on what grounds would we exclude (other!) virtual experiences from such evaluations?

No, the hard challenge to virtualization appears in Nozick's second point: that there are ways we want or ought to *be* that are just not compatible with having many virtual experiences. The fact that many do choose to spend most of their waking hours having technologically mediated interactions does not mean that it is good for us. To mention just one small example, the use of social media networks has been linked to a significant increase in user depression (Liu yi Lin *et al.* 2016). There are a variety of possible explanations; perhaps people feel inadequate when they fail to realize that the way others present themselves is not a fair reflection of their everyday existence, or perhaps people need higher fidelity (or straightforwardly authentic) personal interaction to reap the benefits ordinarily associated with social connection. Even if virtual consumption results in precisely the mental states we desire, it will almost certainly remain the case that at least some people just will not want to *be* people who spend most of their lives playing (essentially) video games, no matter how interactive or high-fidelity—or even productive and profitable.

We are not proposing that people should spend every waking moment attached to an experience machine. Society might very well call quixotic those individuals who deliberately *avoid* such machines, but this does not actually refute their position. The quixotic or self-righteous do tend to have reasons for their departure from cultural norms. What reasons might a person have to eschew virtualization, to *be* the kind of person who demands authenticity in their consumptive behavior? One weighty reason might be that virtualization leads to a fool's paradise, in which subjective consideration of one's well-being fails to be grounded in reality. There does not seem to be a significant distinction between owning an 80-inch television and having the capacity to *simulate* such a television through augmented reality, and much economic consumption appears this way. But there are many experiences we value in ways that defy virtualization. Enjoying a night out with friends or hand-knitting your first grandchild a christening gown are activities for

which the relevant visual or auditory stimuli could easily be virtualized with existing technology, and yet it seems that such virtualization would not merely be low-fidelity, but tacky—perhaps even blameworthy. This realization begins to tip the inquiry toward an empirical question concerning just how much of our material consumption is as easily satisfied virtually as it is materially, and how much of our material consumption is essential to experiences we would be better off not virtualizing.

Here, sustainability scholars persuaded by the promise of virtual consumption might observe that the proposition admits both a weak and strong formulation. A strong formulation might be that significant worries about sustainability give us strong reason to *enforce* virtualization, as often as possible, perhaps even regardless of available fidelity. Depending on the quality and availability of virtualization technology, a defense of the strong formulation would have to clear significant hurdles related to (among other things) distributive justice. Such hurdles are worth examination, but will not be taken up here. The weak formulation suggests that we do not actually need *everyone* virtualizing their consumption *all the time* in order for virtualization to prove beneficial. Simply persuading a large number of people to virtualize a large amount of their material consumption would be a huge step toward sustainable patterns of human behavior. But the weak formulation only moves the worry from the personal level to the societal level; even if we enforce, encourage, or merely accept thorough virtualization on the individual level, do we really want to *be* the kind of society whose non-metabolic pursuits are wholly relegated to digital spaces? Even setting aside the tremendous potential for mischief along the lines of propaganda, censorship, and other large-scale political challenges such as those presently plaguing the global Internet, Nozick's concern gives us reason to doubt that virtualization can ever be a fully adequate substitute for present patterns of human consumption, because authentic well-being (or at least

some aspects of it) are perhaps as non-virtualizable as metabolic consumption. We think this doubt is best accommodated by adopting the weak formulation of virtualization: pursuing empirical inquiries into the invention and adoption of consumption-reducing virtualization technologies, but stopping short of requiring their use.

5. Conclusion

Nozick was not the first philosopher to raise concerns about virtualization. In fact, the issue turns out to be a problem as old as Western philosophy itself. The Allegory of the Cave, Plato's celebrated rendition of his metaphysics—and his mentor's martyrdom—is also a story about preferring reality to simulacra (*The Republic*, 514a–520a; Cooper 1997). Plato's intuition, however, appears somewhat at odds with Nozick's: the prisoners in the cave, rather than welcoming freedom and truth, slay Socrates when he arrives to liberate them. Is this, perhaps, our real worry—that technology is currently forging chains to lock the human race in Plato's cave forever? Is virtualization simply a way of giving up on the real and sinking into a waking dream of mere seeming? If so, this worry is probably misplaced. After all, it seems unlikely that people would ever face a genuine dilemma between virtualizing all non-metabolic forms of consumption and rendering the earth an uninhabitable wasteland. If we *were* faced with such a choice, perhaps the strong formulation of virtualized consumption would be the correct one; in the near-term, however, the weak formulation seems sufficiently promising that it merits pursuit.

We have argued that virtual consumption is one under-examined pathway to reduce the harmful consequences associated with resource consumption by redirecting some forms of consumption from shifting material states to shifting information states. If our argument is sound, then sustainability scientists and scholars have good reason to focus some of their efforts on

engineering attractive alternative patterns of human behavior that reduce consumption and despoilment, with virtualization being *one* such pattern—but also to focus some of their efforts on distinguishing between patterns that can be virtualized without reducing human well-being, and patterns that cannot. While Nozick’s concern regarding virtual human beings hooked up to experience machines is not entirely misplaced, given the number of ‘proto experience machines’—from theater to books to video games—that have augmented or improved human well-being, we are inclined to conclude that the Nozickean challenge to sustainability through virtual consumption is weaker than it first appears.

Finally, we wish to emphasize that the received view among many sustainability scientists and scholars is that a commitment to sustainability entails that some people must make a sacrifice, which is generally thought to be accomplished by restricting or reducing welfare-enhancing consumption. On this view, members of the present generation face a choice between living sustainably, while sacrificing their own well-being, and living unsustainably while securing their own well-being. However, if some instances of virtual consumption can supplant some instances of real consumption while leaving people equally well off, the result would be a significant departure from the recent tendency among sustainability scholars to suggest that a commitment to sustainability necessarily requires a material or psychological sacrifice. Virtual consumption is one promising strategy to advance the cause of sustainability without such sacrifice and, therefore, it is worth taking seriously.

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