Consuming new narratives: Second order design fictions as transition objects for planet-centric consumption habits

Anna Bertmark

Consuming new narratives: Second order design fictions as transition objects for planet-centric consumption habits

Anna Bertmark[a]

[a]University of Brighton, UK. annamy.bertmark@gmail.com

Abstract

The current dominant narratives of endless economic growth are contributing to unsustainable conditions that prevent humans from living within planetary boundaries. Many present sustainable alternatives fall short of embodying regenerative and equitable principles, casting doubt on the human capacity for mitigating climate change. This highlights the need for options that redirect the future of consumption. Second-order design fictions (SoDFs) is a method for reframing our relationship with the entrenched fictions that are part of dominant narratives. These half-familiar, tangible artefacts allow for critical sense-making that playfully provokes questions around the power structures, values and assumptions that uphold the consumption patterns that we engage in daily. SoDFs seek to interfere with consensus and allow observation of observations on how to address tensions between structures of thinking and formulate complexity of reality and possibility. The project builds upon work by Dulmini Perera, 'Superflux, The Liminal Space' and 'Do The Green Thing'.

Keywords: Sustainable design, Second-order Design Fictions, Narratives, Artefacts

Introduction

My second-order design fictions (SoDFs) relate to speculative planet-centric habits of consumption that both incorporate necessary basic needs (healthcare, energy, water, sanitation, clean air) and what can be deemed as luxuries (hot drinks, fashion, cosmetics). The *Dandelion Latte* suite (Image 1) provides a potentially locally abundant alternative to the unsustainable and fast-declining supply of tea and coffee (Kollipara, 2021). As a discursive artefact, *Dandelion Latte* integrates the familiar with the unusual, allowing the continuation of a comforting ritual and synthetic caffeine to provide stimulus, while rejecting threads to historical and modern-time extraction and exploitation of the Global South. Instead, it points to a local commons, culture and place. The spring-harvested taproots have a sweeter taste than fall-harvested ones, which taste more bitter. An accompanying café menu integrates the actual cost of items into the price, tapping into choice editing and nudging literature for voluntarily changing harmful consumption behaviours (Vowles, 2019).

The *Advanced Interconnectedness Meter* (Image 2) shows real-time data from your household (Catapult Energy Systems, 2021) and compares it to the city resident average, highlighting the energy and CO_2e consumption, sequestration and production. An integrated Cantril scale happiness meter used to measure citizens' wellbeing (Gallup, 2013), allows users to self-anchor themselves according to their mental state. It is inspired by Mathilda Tham's work *Me to We to World to Back Again* (2022) and her quote "Here Me is the person, We a unit of collaboration, and World our home, consisting of the ecological system and human-made systems". The meter provides a wider perspective and sense of co-evolution through which a participant may contribute to and follow the collaborative progress to reduce energy and water use. *National Veterinary Service Card & Council Tax Bill for Co-evolving Mutualism* (Image 3) imagines a future where the effects generated from inter-species symbiosis and co-evolution are granted greater value and

therefore converted into abstract financial metrics to possibly justify their decommodification and the existence of these artefacts.

Browser Warning Pop-up for Added-Friction Consumption (Image 4) is inspired by warning labels on cigarette packets, seatbelt alarms in cars, Do The Right Thing's *Amazero* campaign, highlighted by Popova (2009), and Postcards from the Future (Postcard Futurists, n.d.). This voluntarily installed browser pop-up activates when you enter websites that sell high-carbon services and products (such as Easyjet, Asos, Amazon) and that may also harbour obscure traceability of supply chains, enabling agnotologic or unintentionally harmful consumption. Adding friction to a sometimes otherwise frictionless transaction, it informs the customer of the potentially harmful repercussions of their purchase and queries whether they can meet their need for the product or service in an alternative way. To add emotion to an otherwise flat and detached experience, an image depicting the local effects of climate change (to the purchaser) is presented and a high-pitch alarm noise plays until you select your answer. The perceived added anxiety from this experience by the viewer (similarly induced by seatbelt alarms and cigarette packet warnings) can be put in context with the possible precarity and stress felt by the most vulnerable stakeholders in the advertised product's lifecycle.
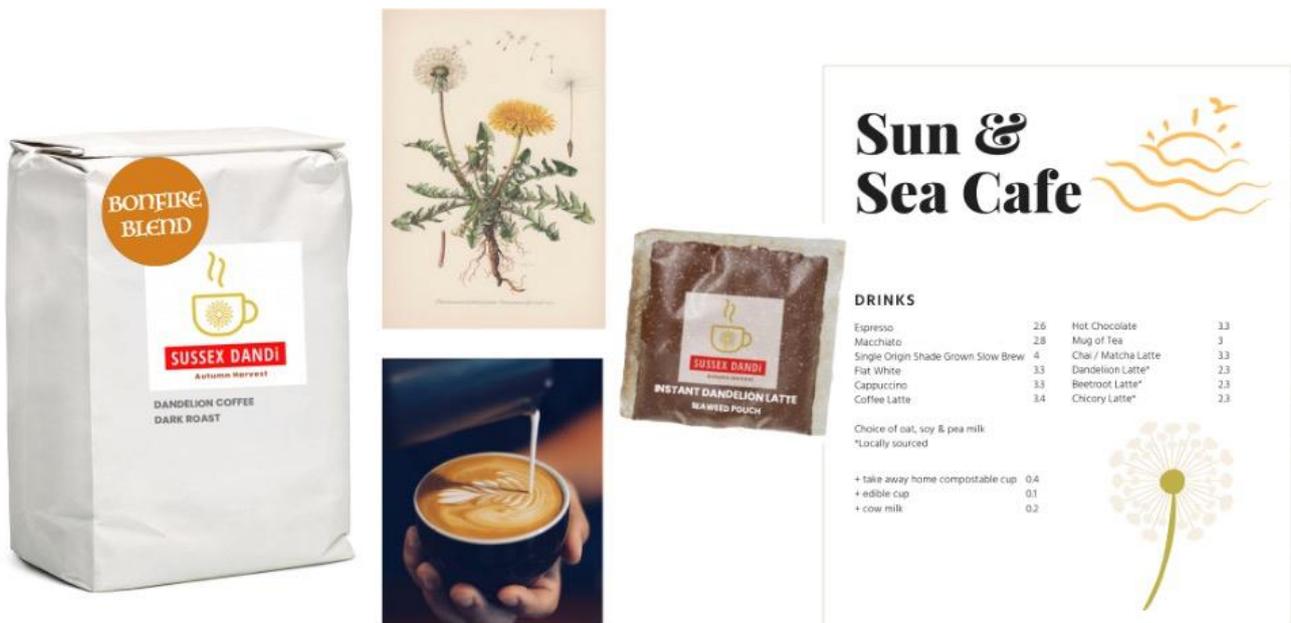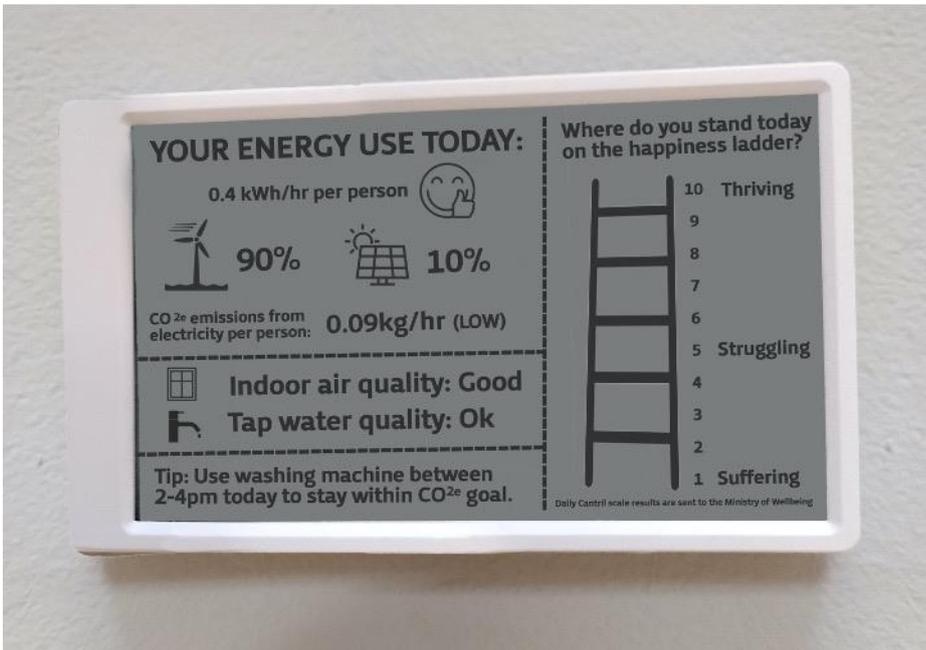

Image 1: Dandelion Latte suite.

Image 2: Advanced Interconnectedness Meter.

Image 3: National Vet Service Card & Council Tax Bill for Co-evolving Mutualism (derived from a Brighton & Hove City Council tax bill).
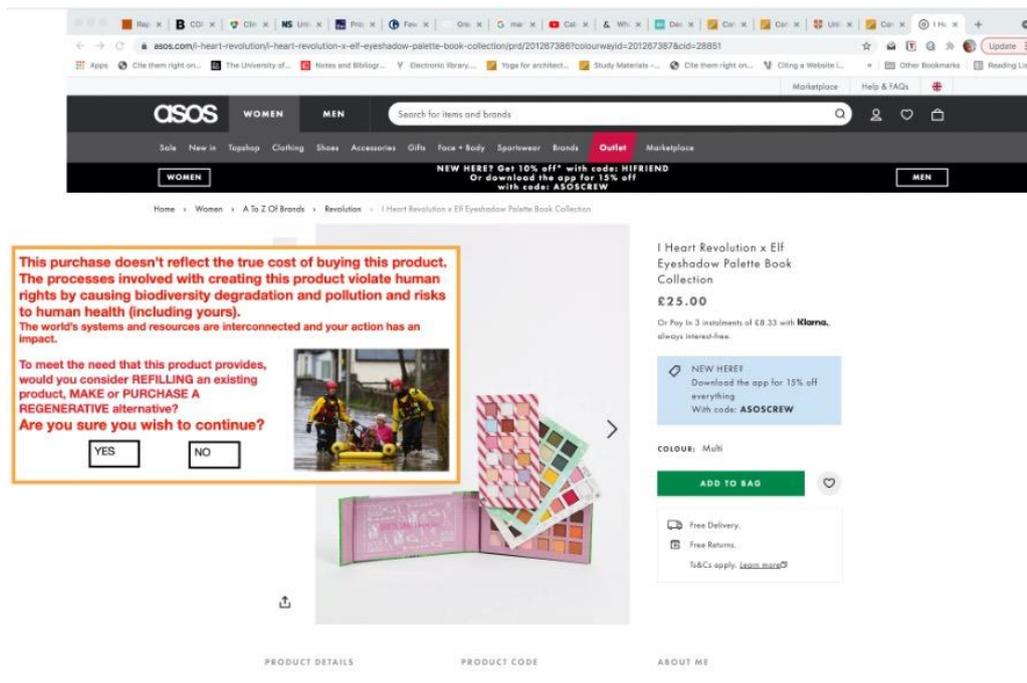
Image 4: Browser Warning Pop-up for Added-Friction Consumption.

Context

The project lies within the context of the urgent need to confront ecological overshoot caused by unsustainable consumption habits in the Global North (Economist Intelligence Unit, 2021). Although the cause for this issue has been attributed to a growing world population attaining a higher quality of life, scientists believe that it is more pressingly caused by the ecological footprint intensity of inhabitants in high-consuming countries and the unequal distribution of resources, according to the Global Carbon Project (Our World in Data, 2021). Ian Gough (2017) proposes three carbon-eliminating strategies to reach climate goals: 1) increasing the eco-efficiency of production and reducing energy demand and emissions, 2) by recomposing consumption using low-carbon services and products and 3) by going towards a steady-state economy through reducing and stabilising levels of consumer demand. Recomposing consumption refers to a shift from high- to low-carbon goods and services without decreasing general consumption expenditure. He states that the first strategy is currently dominating the climate discourse, as this aligns well with the neoliberal capitalist meme that the most desirable way to gain a better life and to save the planet is through "green" consumerism and sustainable business. This will however not be adequate on its own, due to the embedded emissions of carbon-intensive consumption.

The other two strategies are yet to capture the imagination of society, although all three are required to meet the agreed-upon climate goals by 2050. According to Lorek et al. (2021), each EU citizen emits 8.2 tCO_2eq on average per year, compared with the global average of 4.8 tCO_2eq. To keep within the Paris Agreement target of a 1.5°C average global temperature limit, individual emissions need to be reduced to 2.5 tCO_2eq by 2030 and 0.7 tCO_2eq by 2050. Effectively, each person's greenhouse gas emissions will need to be halved each decade to keep global warming from having challenging effects on ecosystems and human wellbeing. Although a carbon footprint is only one responsibility metric with which to quantify the

effects of human impacts on ecosystems, it can mitigate the other pressures on the planet, according to Engström et al. (2020).

Hubacek et al. (2017) argue that climate equity is vital for reaching climate neutrality because it will have the largest impact on the most vulnerable, while high-income groups contribute significantly more to climate change through carbon-intensive activities. The Well-being of Future Generations Act (Future Generations Wales, 2022), implemented in Wales in 2015, shows the possibility of design justice in public procurement and the notion of the "human right not to harm" through consumption. However, according to Prys-Hansen and Klenke (2021), as the recent COP26 conference showed, the collaborative efforts to reach the goals set out at the recent climate summits are driven by the tensions between different countries' priorities, capabilities and value systems, which in turn form expectations and responsibility acknowledgements. Since the current patterns of production and consumption are unsustainable, as they are tied to short-term economic goals and the goal of perpetual GDP growth, alternative planet-centric paradigms are needed to initiate "1.5-degree lifestyles". Highlighting the role and responsibility that designers hold as creators and "experts" in this regard, Peters (2019) states, "Design creates culture. Culture shapes values. Values determine the future. Design is therefore responsible for the world our children will live in".

Artefacts for enhancing our powers and comforts have become increasingly accessible since the Great Acceleration, primarily for the nations that have benefitted from global extraction and exploitation, according to Steffen et al. (2015). Johar and Raworth (Design Council, 2021) observe that living within the ecological carrying capacity will require a distinct set of values for governing transactional activities. The challenge then is to design a future that ensures well-being for all and fair allocation of resources. My drawing (Image 5) shows a combination of Voros' *Futures Cone* and Di Giulio and Fuchs' *Consumption Corridor* model to illustrate the context and the speculative future "corridor space" where my designed artefacts *belong*. The *Futures Cone* provides a simplified model with which to facilitate exploring ideas about the future. The *Consumption Corridor* concept describes the space within which people may get their basic needs met and dwell as they wish within planetary boundaries; it is illustrated by Lorek et al. (2021) as having the minimum consumption standards as the floor and the maximum ceiling to equally protect others' ability to live well. While minimum basic consumption standards are present in many countries to mitigate poverty, Tham and Fletcher observe that the concept of "less" is the largest provocation associated with the transition to sustainability (CFS+, 2020). I believe this may be also true for implementing rather paternalistic consumption ceilings.

While the consumption corridor concept provides opportunities for designing much-needed references for planet-centred consumption narratives, this provocation fosters temptations to veer into "techno-fixes". The belief that we can consume ourselves out of unsustainable consumption is perhaps the greatest tension and cause of cognitive dissonance. In the present absence of consumption corridors and prevailing climate anxiety amongst young people, according to research by Crandon et al. (2022), I believe that design plays a critical role in providing positive references for recomposed consumption.
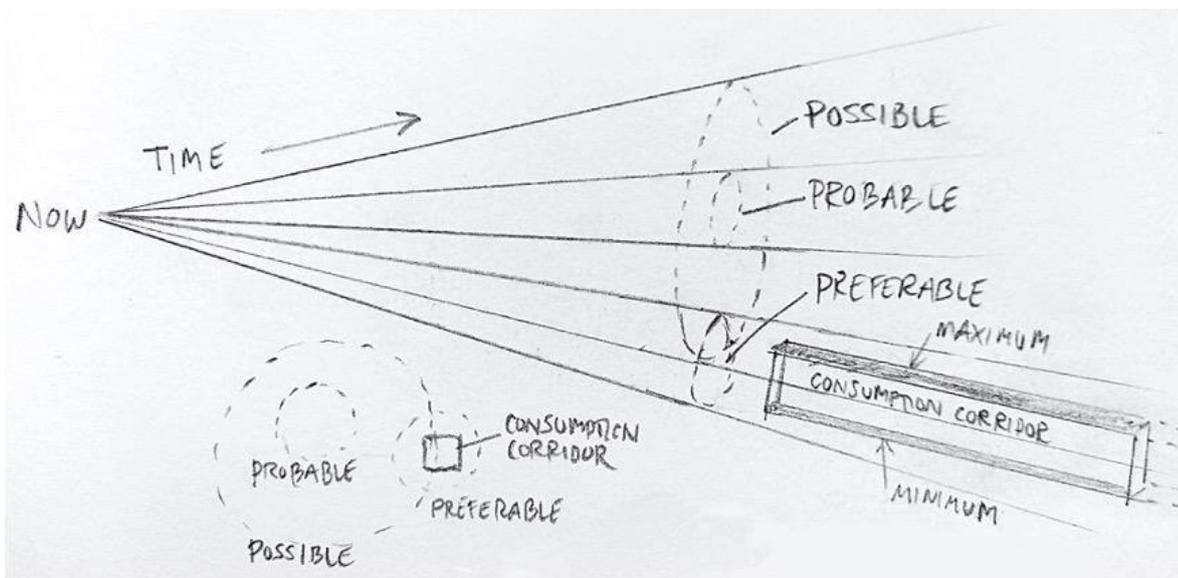
Image 5: Author's drawing derived from the Futures Cone by Candy (2010) and Hancock and Bezold (1994), and the consumption corridor by Di Gulio and Fuchs (2020).

The actual cost and agnotology of consumption

Despite an increasing awareness among citizens about unsustainable consumerism, scholars have identified several barriers to curbing over-consumption. These can be attributed to the increasingly frictionless nature of hyper-consumption by the perceived normalisation of affluent lifestyles and to the *value-action gap*, which is the contradiction between values and behaviour. Anthropologist Graeber (2001) defines values as "the way people represent the importance of their actions to themselves", which highlights the complexity of human behaviour. Also, the ideologically condoned social condition of *affluenza*, according to Denniss (2017, p.10) can be increasingly recognised. It refers to socially and economically privileged citizens' insatiable pursuit for *more* and their inability to perceive the consequences of their actions. The harmful impacts of our day-to-day activities can easily be ignored, either knowingly or unknowingly, according to Anti-Slavery International (n.d.) and True Price (n.d.), as the concealment of the actual impact of our demands, considering factors such as social and environmental impacts, benefits the economic growth logic, illustrated by Tham and Fletcher (CFS+, 2020).

Agnotology describes the study of culturally generated deliberate ignorance. This framing can be applied to the obscurity with which the products and services that we consume daily are produced and disposed of (see Image 6). Modern consumption is upheld by obscure supply chains and complex geopolitical market forces which sustain considerable vagueness and knottiness around *"Who is responsible?"*. Betancourt (2010) argues that this agnotology allows for the prevention of the possibility of dissent to this system in society, where this question does not need to, nor can, be answered. He posits that *agnotologic capitalism* is a feature, not a bug, in that it "enables the economy to function as it allows the creation of a "bubble economy". This poses the question: is it humanly possible to (even imperfectly) *know* through whom and how all the things we consume come to be?

Efforts to establish transparency within supply chains of products and services through technology are in their infancy and are yet unviable, as current blockchain technology requires all actors involved in a supply chain to have the means to interact with the system to achieve transparency, according to Sunny et al. (2020). As the current discourse within sustainable business management now focuses efforts on shifting the narrative from shareholder capitalism to stakeholder capitalism, the possibilities, challenges and limitations that the dominant paradigm offers are being examined. As sustainability is not inherently valued

in Western culture, strategies to shift harmful production processes need to align with companies' purposes and goals, which are predominantly revenue-based. Considering this agnotology of production and consumption and the invisible threads that bind the tight knots that keep the sometimes ambiguous violations against human rights, dignity (Slavery Footprint, n.d.) and ecological collapse in place, according to Pinto (2017), does the dominant narrative give consent to consumerism as an indirect act of violence and (eventual) self-harm? (Carrington, 2021). The ontological aspects of everyday design objects and the importance of being a *good ancestor* come to mind.

Gough's (2017) need theory helps us to differentiate between needs and wants. What we feel that we *need* and what we *want* are often blurred, as our needs are often contextual, and our wants frequently relate to whom we consider our "consumption peers" to be. Deranty and Breen (2021) link this "new consumerism" to the self-perpetuating work-spend cycle of precarious work lives and hyper-consumption driven by increased inequality, as summarised in a quote by Juliet Schor (1998): "the more people consume, the more people must work". Blowfield (2013, p.273) suggests three ways to meet future demand for products; "expanding supply, increasing productivity and altering the nature of demand itself". Johar (Bristol+Bath Creative R+D, 2021) believes that the notion of "growth" requires careful handling and the singular word hides a lot of injustices and nuances. He posits that while some parts of the world will need to grow to meet the basic needs of their populations, together with our intangible economy, the richest 20% of the world population needs to "de-grow" and reach a state of regenerative homeostasis.

Figure 6: Author's sketch of the notion of the obscurity and lack of supply transparent information in chains, awareness and understanding, contributing to the agnotology of consumption.

I believe that citizens' everyday tensions lie in the fact that, although there is an increased demand for sustainable consumption (Economist Intelligence Unit, 2021), the current paradigm does not provide diverse alternatives, according to O'Neill et al. (2018), nor many positive references for consuming differently. Meeting the required level of dematerialisation of society requires the notion of *less* to be decoupled from the association with hardship and loss of social status. As Kimmerer states (2013, p.111), "In a consumer society, *contentment* is a radical proposition. Recognizing abundance rather than scarcity undermines an economy that thrives by creating unmet desires". I believe that bearing the capacity to stay with, and work from, this understandable resistance, is critical when designing explorations for positive references and alternative ways of meeting our needs. Krippendorff (2012, p. 74) suggests that "designers need to question prevailing ontological beliefs", and that "designers need to explore what it takes to unfreeze cherished habits or convictions, or to get people to learn something new".

A change of narrative

Kuhnhenn et al. (2020) believe that it is possible to stay within the global carbon budget of 1.5°C warming if today's consumption levels are reduced, but that this reduction in production and consumption requires

a "democratically planned socio-economic transformation with the satisfaction of people's needs at the centre". The global carbon budget looks at all nations' carbon emissions and the amount of reductions that is needed to reach the Paris Agreement goals (Future Earth, n.d.). However, Riedy (2020) highlights the point that most historical discourse shifts were not planned but were the product of many ideas that aligned and knotted together over time, strengthened by adversity, and that resonated with and benefitted increasing numbers of people. Research shows that social tipping points for overriding social norms happen when a minority group, dedicated to a specific cause, reaches a certain size ("critical mass"). This in turn gives rise to wider acceptance of the minority view across the broader population, as research by Centola et al. shows (2018). The critical mass of the minority group required to reach the tipping point depends on the cause. In cases such as the UK smoking ban, the minority group grew after scientific papers were published that presented proposals for educating the public and offering options for voluntary shifts, eventually reaching legislation and compulsory compliance. Soaring evidence of the negative effects, together with offering options for change, led to further growth of the initial minority group (Institute for Government, n.d.). Mont et al. (2013) argue for a more considered framework for communicating, policymaking and prioritising and placing new ways of generating wellbeing as the primary strategy for recomposing consumption (Image 7). Could this model be a guide conducive to **"consumption corridor"** innovation and design?

Haidt's (2006, p. 4) simplified model of the "elephant, driver and path" for behaviour change offers a snapshot of the conditions that designers can draw inspiration from. However, Riedy (2020) argues that storytelling is recognised to be a powerful driver for social change and can "inspire and persuade people to adopt new practices". It is interesting to think about how Riedy's plural discourses and Gough's proposed strategies might affect society, work, leisure, business, production and which new stories we must now tell ourselves? As I believe our habits of consumption shape the narrative of our future(s), by enabling the coexistence of diverse economies, a larger number of alternatives may allow for equitable planet-centred living. Putting different limits on the ways we meet our needs may allow us to discover new possibilities of entangled value flows within a planet-centred paradigm. Capitalism has worked well for some of the world's population over a relatively brief period in human history. However, it has proven to be an insufficient model for the pluralistic facets of humanity and life-giving systems that we share and need to consider going forward, taking inspiration from the mitigating impacts generated by the Montreal Protocol, the smoking ban and the plastic bag charge, to name a few policy changes that have saved lives and shifted narratives.

I am interested in how design may renegotiate current values and change the discourse in tangible ways. Examples where design has been used to intentionally shape societal shifts include the "acceptera!" manifesto, world expos and media campaigns where preferred future narratives have been curated, although they have often been inevitably paternalistic. Some present radical shifts in the dominant work/consumption ontologies are emerging through initiatives such as the "4 Day Week Campaign" (Platform London, 2021), "Tang Ping" [*lying flat*] (BBC News, 2021) and the "Buy Nothing" movement, according to Telford (2021).

Ecological economists such as Kallis et al. (2012), believe that change cannot happen within the dominant economic model. I believe that rather than dismissing it, new discourses will have to work from the dominant ones to un-tame the wicked problem of overconsumption and shift societal and behavioural patterns of participation. A certain degree of compassion is needed to sit with these tensions. Co-participatory storytelling through interaction with new artefacts may help generate previously unexplored possibilities.

In Bergthaller and Mortensen's work (2018, p.6), the sustainable communications agency Futerra states that "we must build a visual and compelling vision of low carbon heaven". If positive references for dwelling well within planetary boundaries in the Global North are lacking, a gentle shaking of the ideological tree may be the most ethical and effective way of shifting the story of our future. Let us explore artefacts with which to tangibly play a new story into being.
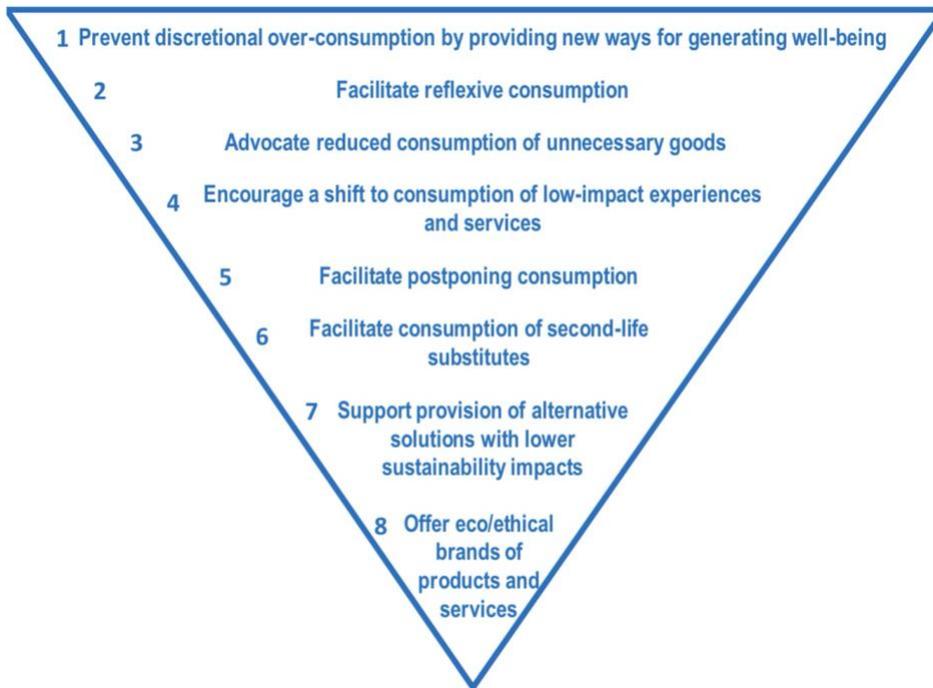

Image 6: "A suggestion for a consumption hierarchy (in order of priority)" by Mont et al. (2013).

Second order design fictions and wicked possibilities

Oxman (2016) declares that "Good Design, for example, is good exploration: it questions certain belief systems—physical and immaterial—about the world. Then it releases some embodiments of these speculations into the world, contributing to the build-up of what we know as culture".

At the heart of design collective Superflux's (2021) practice lies critical sense-making and speculative storytelling to enable future uncertainty in choices in the present day. Their conceptual film *The Intersection* highlights the importance of co-future with humility, a wider consciousness paradigm, and acknowledging the potential and power of agency. I believe that this demonstrates qualities coincident with us as adults of a species, of a deeper way of knowing. However, their featured artefacts may feel far removed from most people's contexts and other relatable objects, which may hamper their desired impact on their audience. According to Tharp and Tharp (2019, p. 217), discursive design artefacts "experiment with the relationship between objects and the stories they support and are supported by". *Tomorrow's Home* exhibition by The Liminal Space (n.d.) showcases how embedding healthcare technology in household objects may shape homes of the future, through translating academic research into tangible and accessible interventions. This aligns with my fascination with how World Expos and design manifestos have enabled societal change in the past.

Seeking to label my work within the design discourse, I would describe it as adversarial, since it concerns the political perspective of agonism, as described by Di Salvo (2015, p. 2), and highlights the potential positive outcomes of a conflict or tension. Going beyond the questioning qualities that define critical design, *agonism* emphasises the importance of having compassion for the *problem* in design struggles;

to celebrate and acknowledge a productive and good struggle. This echoes Haraway's (2016) notion of *staying with the trouble;* not being paralysed by fear or eager for solutionism. I've designed these artefacts to help make sense of the present and articulate tangible alternatives for positive narratives about the future, both for myself and for others. We must remember that the future does not yet exist, but actively emerges from the basis of a society's hopes, fears and images of the future. As Mouffe states in Benhabib's work (2021, p.255), "conflicts and confrontations, far from being a sign of imperfection, indicate that democracy is alive and inhabited by pluralism".

I initially dubbed my designed artefacts "transition objects", as they embody a liminal space in the necessary transition we need to make in our consumption habits, bridging the familiar present to an equitable and regenerative future of planet-centred consumption. Upon learning about second order design fictions (SoDFs) through Perera's (2021) work, I realised that my understanding of my "transition object" aligned better with this concept. Perera (2021) sees the methodology of design fictions as a way of interfering and playing around with consensus, as "they go beyond the neo-liberal design logic notions of fact and fiction, blending the familiar and different, and offer a stimulating tactility to facilitate the questioning of complex tensions". Fry (2021, p. 3) states that second-order design fiction can contribute towards "redirective practices" and a renegotiation of values. He posits that second-order design fictions have appropriated "lessons of observations" from second order cybernetics and that "the conceptual essence of second-order design fiction is the observation of observation". Second order cybernetics is used here as a tool to generate the desired effect of change through interaction. These are more than mere artefacts for provoking dialogue but are objects of interrogation that "invite recursive re-engagement".

The household context provides additional context and meaning to the artefacts, and the tangible characteristic of the artefacts is an important aspect. This makes the observation "real" and gives the objects authority, as if this alternative narrative is established and these artefacts *make sense* in that parallel reality. Interacting with these artefacts-as-conversation contributes to the effects of participatory design and puts the participant in the scenario to co-author a new story. Krippendorff (2012, p.75) argues that "because design becomes real in communication with others, inquiries into what makes a proposal compelling are inquiries into how people understand and act on narratives pertaining to desirable worlds". I would argue that this is the desired outcome of my design fictions: a new insight or shift in perspective, generated by the observation from the "conversation" between participant and artefact. The detritus that might be generated by the interaction with an artefact can be taken away and used to build upon existing culture. Although these SoDFs allow me to research through design, I have not yet developed the resources to measure the potential success of this research.

SoDFs play with both product semantics and the definition of design as a sense-making activity. Inspired by Donna Haraway's *implosion method* of analysis through various value dimensions as described by Dumit (2014), I have considered using this methodology for designing artefacts to explore and ensure how these might belong in a planet-centric future. The implosion method highlights the messiness and knottiness of stories and worlds that artefacts hold, analysed through the following dimensions: symbolic, professional, labour, material, technological, political, economic, textual, bodily, educational and historical. This is not to attempt to design "crisis-management models" (Perera, 2020) or utopian solutions for problematic everyday objects, nor to merely raise awareness of issues. It is important for the designer to make this implicit information apparent and contextual, as Tonkinwise and Lorber-Kasunic (2006) remind us, "because the knowledge embedded within an artefact is rarely made explicit, it can only be accessed and communicated by those who can interpret it".

The problem of recomposed and post-material consumption is a wicked problem, as it cannot be predicted, nor measured to be solved. By adding to, rather attempting to tame wickedness, designers acknowledge the uncertainty, plurality and diverse paradigms in which all stakeholders dwell and act. People's needs, values and motivations are contextual, fluid and irrational. Tham (2022) also highlights the importance of these tensions and cruxes, positing that "if we don't encounter this friction, change is not taking place". These may be a gentle provocation to imagine safe ways of living with both compulsory and voluntary demateriality, low-carbon and overall sufficiency in ways that are not primarily associated with hardship, precarity or loss of status by the participant. I am, however, aware of the subjective notions of these concepts and the ethical consequences of imposing my own beliefs about what is considered safe and precarious. As SoDFs are artefacts that belong to a different narrative, encountering and interacting with these may generate new ways of seeing, knowing and valuing. It poses the question "If this object exists, where do I exist within this narrative?". However, Tonkinwise (2015) and Tham (2022) remind us why discursive design artefacts need to remain unpolished and open to participation, to avoid merely normalising "a pretentious taste regime". Hence why I have focused on designing artefacts of the mundane.

Each of my exhibited objects presents a structure for playful exchanges, aiming to engage diverse participants in imagining and making sense of the changes needed to mitigate crises with a less precarious outcome. It suggests a "hopeful continuation" to counter the dominant *defuturing* (Fry, 2021) narrative that has been generated within the cognitive dissonance of capitalism's failure to provide. According to Lorek et al. (2021), "1.5-degree lifestyles can be diverse as long as they stay within ecological boundaries". I look forward to further exploring how design can provide reference and innovative ideas for all to dwell well.

References

Anti-Slavery International. (2021). Slavery in supply chains. https://www.antislavery.org/slavery-today/slavery-in-global-supply-chains/

BBC News. (2021). China's new 'tang ping' trend aims to highlight pressures of work culture. https://www.bbc.co.uk/news/world-asia-china-57348406

Benhabib, S. (Ed.). (2021). Democracy and difference: Contesting the boundaries of the political. Princeton University Press.

Bergthaller, H., & Mortensen, P. (2018). Framing the environmental humanities. Brill.

Betancourt, M. (2010). Immaterial value and scarcity in digital capitalism. CTheory, 6-10. https://journals.uvic.ca/index.php/ctheory/article/download/14982/5883?inline=1

Blowfield, M. (2013). Business and sustainability. Oxford University Press.

Bristol+Bath Creative R+D and Watershed. (2021, July 17). Hopeful futures: Rethinking the structures of the present for a different future [webinar]. https://www.youtube.com/watch?v=t1jWLTS4pZ4

Candy, S. (2010). The futures of everyday life: Politics and the design of experiential scenarios. Unpublished doctoral dissertation]. University of Hawai'i at Mānoa. https://tinyurl.com/2ey5et5c

Carrington, D. (2021, December 8). Microplastics cause damage to human cells, study shows. https://www.theguardian.com/environment/2021/dec/08/microplastics-damage-human-cells-study-plastic

Catapult Energy Systems. (2021). Greenwashing tariffs can be stopped by tracking carbon from generator to consumer, finds new report. https://tinyurl.com/52tbhcvd

Centola, D., Becker, J., Brackbill, D., & Baronchelli, A. (2018). Experimental evidence for tipping points in social convention. Science, 360(6393), 1116-1119. https://www.science.org/doi/abs/10.1126/science.aas8827

CFS+. (2020, October 14). Kate Fletcher and Mathilda Tham: Earth logic–Grow out of growth & consumer-facing transparency [webinar]. https://www.youtube.com/watch?v=OnZ_6Xi0e6Y

Crandon, T. J., Scott, J. G., Charlson, F. J., & Thomas, H. J. (2022). A social–ecological perspective on climate anxiety in children and adolescents. Nature Climate Change, 12, 123-131. https://www.nature.com/articles/s41558-021-01251-y

Deranty, J. P., & Breen, K. (2021). Whither work? The politics and ethics of contemporary work. In The politics and ethics of contemporary work (pp. 1-15). Routledge.

Design Council. (2021, November 9). Design for the planet: The big picture with Kate Raworth and Indy Johar [webinar]. https://vimeo.com/657489496

Denniss, R. (2017). Curing affluenza: How to buy less stuff and save the world. Black Inc.

Di Giulio, A., & Fuchs, D. (2014). Sustainable consumption corridors: Concept, objections, and responses. GAIA-Ecological Perspectives for Science and Society, 23(3), 184-192. https://tinyurl.com/wmjy7dka

Di Salvo, C. (2015). Adversarial design. Mit Press.

Dumit, J. (2014). Writing the implosion: Teaching the world one thing at a time. Cultural Anthropology, 29(2), 344-362. https://journal.culanth.org/index.php/ca/article/view/ca29.2.09

Dunne, A., & Raby, F. (2001). Design noir: The secret life of electronic objects. Springer Science & Business Media.

Economist Intelligence Unit. (2021, May 17). An eco-wakening: Measuring global awareness, engagement and action for nature. https://tinyurl.com/mrh4tcpm

Engström, G., Gars, J., Krishnamurthy, C., Spiro, D., Calel, R., Lindahl, T., & Narayanan, B. (2020). Carbon pricing and planetary boundaries. Nature Communications, 11(1), 1-11. https://www.nature.com/articles/s41467-020-18342-7 .

Fry, T. (2021). Writing design fiction: Relocating a city in crisis. Bloomsbury Publishing.

Future Earth. (n.d.). Global carbon budget.
https://futureearth.org/initiatives/other-initiatives/global-carbon-budget/

Future Generations Wales. (2022). Well-being of Future Generations (Wales) Act 2015.
https://www.futuregenerations.wales/about-us/future-generations-act/

Gallup. (2013). Understanding how Gallup uses the Cantril Scale: Development of the 'thriving, struggling, suffering' categories. https://news.gallup.com/poll/122453/understanding-gallup-uses-cantril-scale.aspx

Gough, I. (2017). Recomposing consumption: Defining necessities for sustainable and equitable well-being. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 375(2095), 20160379. https://tinyurl.com/2p833pt4

Graeber, D. (2001). Toward an anthropological theory of value: The false coin of our own dreams. Springer.

Haidt, J. (2006). The happiness hypothesis: Putting ancient wisdom and philosophy to the test of modern science. Random House.

Hancock, T., & Bezold, C. (1994). Possible futures, preferable futures. Healthcare Forum Journal, 37(2), 23-29).

Haraway, D. J. (2016). Staying with the trouble. Duke University Press.

Hubacek, K., Baiocchi, G., Feng, K., Muñoz Castillo, R., Sun, L., & Xue, J. (2017). Global carbon inequality. Energy, Ecology and Environment, 2(6), 361-369.
https://link.springer.com/article/10.1007/s40974-017-0072-9

Hunt, V., Nuttall, R., & Yamada, Y. (2021, April 26). From principle to practice: Making stakeholder capitalism work. McKinsey and Company. https://tinyurl.com/3dep9hk5

Institute for Government. (n.d.). The ban on smoking in public places (2007).
https://www.instituteforgovernment.org.uk/sites/default/files/smoking_in_public_places.pdf

Kallis, G., Kerschner, C., & Martinez-Alier, J. (2012). The economics of degrowth. Ecological Economics, 84, 172-180. https://www.sciencedirect.com/science/article/abs/pii/S0921800912003333

Kimmerer, R. (2013). Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants. Milkweed Editions.

Kollipara, P. (2021). Climate change could slash coffee production.
https://www.science.org/content/article/climate-change-could-slash-coffee-production

Kuhnhenn, K., Da Costa, L. F. C., Mahnke, E., Schneider, L., & Lange, S. (2020). A societal transformation scenario for staying below 1.5°C. (Schriften zu Wirtschaft und Soziales; No. 23). Heinrich-Böll-Stiftung.
https://www.econstor.eu/handle/10419/228703

Krippendorff, K. (2012). Design research, an oxymoron. In Design research now (pp. 67-80). Birkhäuser. https://www.degruyter.com/document/doi/10.1007/978-3-7643-8472-2_5/html

The Liminal Space. (n.d.). Tomorrow's Home. https://www.the-liminal-space.com/all-projects/tomorrows-home

Lorek, S., Gran, C., Lavorel, C., Tomany, S., & Oswald, Y. (2021). Equitable 1.5-degree lifestyles: How socially fair policies can support the implementation of the European Green Deal. (Policy Brief #1). ZOE-Institute for future-fit economies. https://tinyurl.com/4dwxm7yv

Mont, O., Heiskanen, E., Power, K., & Kuusi, H. (2013). Improving Nordic policymaking by dispelling myths on sustainable consumption. Nordic Council of Ministers. https://tinyurl.com/nyccudps

O'Neill, D. W., Fanning, A. L., Lamb, W. F., & Steinberger, J. K. (2018). A good life for all within planetary boundaries. Nature Sustainability, 1(2), 88-95. https://www.nature.com/articles/s41893-018-0021-4

Our World in Data. (2021). Are consumption-based CO_2 per capita emissions above or below the global average? https://ourworldindata.org/grapher/consumption-co2-per-capita-equity

Oxman, N. (2016). Age of entanglement. Journal of Design and Science. https://tinyurl.com/2m3ebsfc

Perera, D. (2021). After work: Questions concerning transition imaginaries towards a post-work society and the use of second-order design fictions as frames that resist consensus. Paper presented at Relating Systems Thinking and Design (RSDX) Symposium 10, Oslo, Norway. https://tinyurl.com/msyn6sbu

Peters, L. R. (2019, January 3). Robert L Peters/"Quotable quotes"… (gone rogue). http://robertlpeters.com/news/quotable-quotes-gone-rogue/

Pinto, M. F. (2017). To know or better not to: Agnotology and the social construction of ignorance in commercially driven research. Science & Technology Studies, 30(2), 53-72. https://sciencetechnologystudies.journal.fi/article/view/61030

Platform London. (2021). Stop the Clock: The environmental benefits of a shorter working week. https://tinyurl.com/mv7vvrkf

Popova, M. (2009, November 27). The season's hottest item: Nothing. https://www.good.is/articles/the-seasons-hottest-item-nothing

Postcard Futurists. (n.d.). Globe conscious luxury products. https://virajvjoshi.com/postcards-from-the-future/16

Prys-Hansen, M., & Klenke, J. (2021). Requirements for a successful COP 26: Commitment, responsibilities, trust. (GIGA Focus; no. 7). German Institute for Global and Area Studies. https://tinyurl.com/2n3barm2

Radical Methodologies, University of Brighton. (2020, July 24). Dulmini Perera – Wicked possibilities [webinar]. https://tinyurl.com/2y34wnj9

Riedy, C. (2020). Storying the Future: Storytelling practice in transformative systems. In P. Molthan-Hill, H. Luna, T. Wall, H. Puntha, & D. Baden (Eds.), Storytelling for sustainability in higher education: An educator's handbook (pp. 71-87). Routledge. https://tinyurl.com/y8cvy65z

Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015). The trajectory of the Anthropocene: The great acceleration. The Anthropocene Review, 2(1), 81-98. https://journals.sagepub.com/doi/abs/10.1177/2053019614564785

Sunny, J., Undralla, N., & Pillai, V. M. (2020). Supply chain transparency through blockchain-based traceability: An overview with demonstration. Computers & Industrial Engineering, 150, 106895. https://www.sciencedirect.com/science/article/abs/pii/S0360835220305829

Schor, J. (1998). The overspent American. Basic Books.

Slavery Footprint. (n.d.). Methodology. http://slaveryfootprint.org/about/#methodology

Superflux. (2021). Projects: The Intersection. https://superflux.in/index.php/work/the-intersection/#

Telford, T. (2021, December 10). Buy Nothing groups offer an antidote to waste and isolation, with a world of free stuff. Washington Post. https://www.washingtonpost.com/business/2021/12/10/buy-nothing-gift-economy/

Tham, M. (2022). Metadesign meditation to find agency for careful Earth work from within a ball of yarn. In John Wood (Ed.), Metadesigning designing in the Anthropocene. Routledge. https://doi.org/10.4324/9781003205371

Tharp, B. M., & Tharp, S. M. (2019). Discursive design: critical, speculative, and alternative things. MIT Press.

Tonkinwise, C. (2015). Just design: Being dogmatic about defining speculative critical design future fiction. https://medium.com/@camerontw/just-design-b1f97cb3996f

Tonkinwise, C., & Lorber-Kasunic, J. (2006). What things know: Exhibiting animism as artefact-based design research. Working Papers in Art and Design, 4, 1-14. https://tinyurl.com/mrxw2wev

True Price. (n.d.). CONSUMERS. https://trueprice.org/consumer/

Vowles, N. (2019, March 11). Cut the cups: How the University of Sussex has encouraged a significant drop in paper cup use in its campus cafes. https://www.sussex.ac.uk/broadcast/read/48062

WWF. (2011). Overshoot. https://tinyurl.com/jhujwd2m