Scenarios and the art of worldmaking

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ABSTRACT

In this exploratory paper we propose 'worldmaking' as a framework for pluralistic, imaginative scenario development. Our points of departure are the need in scenario practice to embrace uncertainty, discomfort and knowledge gaps, and the connected need to capture and make productive fundamental plurality among understandings of the future. To help respond to these needs, we introduce what Nelson Goodman calls worldmaking. It holds that there is no singular, objective world (or "real reality"), and instead that worlds are multiple, constructed through creative processes instead of given, and always in the process of becoming. We then explore how worldmaking can operationalise discordant pluralism in scenario practice by allowing participants to approach not only the future but also the present in a constructivist and pluralistic fashion; and by extending pluralism to ontological domains. Building on this, we investigate how scenario worldmaking could lead to more imaginative scenarios: worldmaking is framed as a fully creative process which gives participants ontological agency, and it helps make contrasts, tensions and complementarities between worlds productive. We go on to propose questions that can be used to operationalize scenario worldmaking, and conclude with the expected potential and limitations the approach, as well as suggestions for practical experimentation.

it could be that if one clung too closely to reality, the result might well be far from realistic—Kobo Abe

1. Introduction: beyond 'probable' and 'plausible' scenarios

One of the main aims of scenario practice is to unleash the human imagination to explore and embrace the future, rather than to simply endure it (Wilkinson & Eidinow, 2008). In this sense, the imagining of future worlds should empower people in the face of the unknown, recognize ways to overcome future challenges, or envision and pursue better worlds. Ideally, considering a wide range of futures can reveal important aspects of the present—previously unrecognized seeds of future

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challenges (Van der Heijden, 2005) and structures that hold back the realization of better worlds (Kok, van Vliet Mathijs, Bärlund Ilona, & Sendzimir, 2011). The questions that guide this paper, then, are how can the imagination be freed to create powerfully engaging and meaningful future scenario worlds? How may imaginative scenario processes make the deep, essential mutability of the future productive, and how may they trace, foreground and operationalize the mutuality of futures with the present? And lastly, how may we encourage those participating in scenario-based processes to breach the limitations implied by current circumstances, and, by extension, shed the debilitating effects of the social, political, economic and environmental status quo?

In this exploratory paper, we begin charting possible answers to these questions by proposing 'worldmaking' (Goodman, 1978) as a framework for scenario development. We will argue that this framework provides a way to further develop existing disciplinary trajectories: the move away from attempts to reduce uncertainty, and instead embrace it through diverse, contrasting futures; and the need to approach not only the future but also the present in a constructivist and pluralistic fashion. To do this, the worldmaking framework will harness the notion of scenarios as 'worlds', providing an approach that is different, in both theoretical and practical terms, from more common approaches to scenarios as narratives or descriptions of systems change.

We first set the stage by discussing the current drive in futures research away from establishing certainty about futures and toward deepening pluralism. We then introduce worldmaking as a framework for scenario development, and illustrate how it may help operationalise "discordant pluralism" in scenario practice, and how it may lead to more imaginative scenario practice. We then propose a set of questions and suggestions intended to help apply the framework. Lastly, in the conclusion, we note some of the framework's limitations while proposing ways in which it could be embedded in broader processes and seeded through practical experimentation.

According to Ramírez and Selin (2014) and Wilkinson (2009), futures practitioners and researchers are often seen as divided into two groups: the positivist, 'probability' camp sees uncertainty as something that needs to be reduced in order to better assess the likelihood of particular future conditions. On the other hand, the constructivist or 'plausibility' camp sees scenarios as a tool that is primarily useful in conditions when prediction is not deemed possible. From the constructivist perspective it is more productive to engage intrinsic uncertainty through multiple diverse futures, without trying to evaluate the effectiveness of the process as a forecasting exercise. In this mode, future scenarios are often considered plausible if they offer both internally consistent narratives and a logical development from present conditions. Whereas the probability camp is primarily interested in objective measures of likelihood, the plausibility camp considers plausibility and scenario relevance to be a subjective and context-dependent matter.

However, Ramírez and Selin (2014) suggest that "many of the unhelpful debates, struggles and clashes over plausibility and probability can also be understood as efforts to obscure a fundamental concern of how to best keep discomfort (with what is known, ignored, hoped and feared) productive." They point out that even constructivist plausibility approaches often bias imagined scenarios too much toward what is prominent in the present and observed in the past. In their words: "settling into too much plausibility reduces interest into a lowest common denominator made up of commonly held assumptions, baseline expectations, 'the usual suspect' categories, and simplistic preconceptions and extrapolations".

From a knowledge perspective, this is all the more problematic given that humans are typically biased toward past experience, the known, and toward unambiguous accounts of the world. As Kahneman puts it, "The idea that the future is unpredictable is undermined every day by the ease with which the past is explained" (Kahneman, 2010, p. 212). When the goal is to imagine transformational futures, this means that the ability to imagine radically different futures will be similarly limited by "consensual presents". Since scenario practice has long grappled with the problem of getting beyond consensual, limited notions of present and future (see for instance work by Wack (1985), van der Heijden (2005) and Schwartz (1991)). Ramírez and Selin (2014) suggest that if truly novel futures are to be imagined, and if we aim to get freed or 'unstuck' from the limitations of the present, discomfort and knowledge gaps should replace probability and plausibility as scenario development criteria. This is because discomfort and ignorance point to problematic aspects of the reality of those involved in scenario processes—aspects that are normally ignored precisely because they evoke unease. Engaging with discomfort and ignorance as guidelines for scenario practice, therefore, may not only help produce truly novel insights on potential futures, but may also help produce deeper insights about the individuals or organizations involved in the exercise—at least reveal what they find discomforting and why.

At the same time, scenario practice has seen increased interest in ways to capture and represent the fundamental plurality of understandings of the future, especially with the growing popularity of societal and multi-stakeholder scenario processes (Wilkinson & Eidinow, 2008). This interest has arisen, in part, from "post-normal" and constructivist conceptualisations of knowledge that recognize the existence of fundamentally different ways of understanding and evaluating the world, and that these epistemological differences may often defy their merger into a single consensual outlook (Funtowicz & Ravetz, 1993; Klenk & Meehan, 2015; Kurtz & Snowden, 2003). Keeping in mind the coextensivity of knowledge and power (see for instance Flyvbjerg (1998)), and from the perspective of legitimacy and social inclusion, there is a clear need to fully acknowledge diverse perspectives as equally valuable and as irreducible to subsets of overarching frames. This is especially clear when looking at complex systems issues (poverty, environmental change, health, energy, etc.), where actors from multiple sectors, disciplines, worldviews and geographical scales play fundamentally different roles yet have a shared stake in the process's outcomes. Overall, the call to explore futures in a pluralistic fashion dovetails with the impetus to engage discomfort and knowledge gaps rather than pursue plausibility and probability. After all, contrasting

societal perspectives may yield discomfort, while particular understandings of the world can offer unanticipated insights. Both of these principles may, in turn, feed truly imaginative engagements with the future.

2. Worldmaking

Following Wilkinson and Eidinow's recommendation to "draw on other disciplines that explore different worldviews and have developed nuanced tools for their exploration" (Wilkinson & Eidinow, 2008), our search for a theoretical perspective that would support pluralist, imaginative scenario practice has led us to Nelson Goodman's notion of "worldmaking" (Goodman, 1978). Writing from a constructivist (or "radical pluralist") position, Goodman calls attention to the creative nature of understanding. Simply stated, to make sense of the world is to practically remake it; the world is not "fixed and found" but is always in the process of becoming. Accordingly, questions about how a (singular) world may be represented are less important than questions about how (multiple) worlds are created, evaluated, shared and made to endure.

Goodman's proposal is premised in his observation that our relation to the world consists of a series of cognitive operations with which we "divide and combine, emphasize, order, delete, fill in and fill out, and even distort" (Goodman, 1978, p. 17) worldly entities in ways that denote, exemplify or express particular worlds. The making of new worlds, however, does not happen in a vacuum, but always draws on elements from existing worlds. These elements are identified (or recognized), composed and decomposed into new elements, weighted, foregrounded or emphasized in certain ways, weeded out, deleted and supplemented, and even creatively deformed so that they may fit particular worlds. Taken together, the operations that Nelson identifies as forms of worldmaking manifest both individual and collective strategies for creating worlds that make sense, are resonant, and have the capacity to illuminate what we find to be the most important aspects of reality. Importantly, worldmaking involves concepts, percepts and affects, memories and experiences that need not be reduced to either logical calculations or purely affective or emotional impressions (cf. Berger & Luckmann, 1966). In this sense, art is as effective as science when it comes to worldmaking.

As implied by its very name, the notion of worldmaking sets itself against theories and praxes that confirm the existence of a single, stable, 'objective' reality. Instead, Goodman holds that reality is equivalent to multiple, coexisting worlds—a pluriverse. Each world carries its own particular characteristics, which may or may not be shared by other worlds. These, sometimes congruent but sometimes discordant worlds, do not represent different subjective perceptions of a single underlying reality, but are coextensive with that reality. In other words, Goodman's model reaches beyond questions of hermeneutics and epistemology to touch upon the very ontological substratum that grounds cognitive phenomena. Since, as Goodman argues, there is no perception without conception, it is meaningless to speak of a reality that precedes its perception: "Although conception without perception is merely *empty*, perception without conception is *blind* (totally inoperative). . . . We can have words without a world but no world without words or other symbols" (Goodman, 1978, p. 6); emphasis in origin). From this perspective, language, understood here as any system of symbols, whether associated with any of the senses and/or nonhuman operations such as computer language, can be seen as the medium through which multiple worlds are made and unmade.

Derived from this, when evaluating worlds we should not compare them against some "real reality" but in relation to each other, or according to internally-derived (or immanent) criteria: "a version [or world] is taken to be true when it offends no unyielding beliefs and none of its own precepts" (Goodman, 1978, p. 17). Since truth is contextual and discursive, the evaluation of worlds does not take place in the shadows of some transcendental or "redemptive truth" (in (Rorty's (2007)) terms), but is a matter of "fit" (with other worlds) or "rightness" (as an immanent property). As Goodman puts it, "Truth, far from being a solemn and severe master, is a docile and obedient servant" (Goodman, 1978, p. 18).[1]

While we acknowledge that a lack of external criteria may invite relativism, we note, along with Goodman, "That right versions and actual worlds are many does not obliterate the distinction between right and wrong versions, does not recognize merely possible worlds answering to wrong versions, and does not imply that all right alternatives are equally good for every or indeed for any purpose" (Goodman, 1978, p. 20–21). Put differently, "truth must be otherwise conceived than as correspondence with a ready-made world" (Goodman, 1978, p. 94). "Right" or "wrong", then, are seen as outcomes of internal consistency, resonance and appropriateness and not a degree of correspondence with some unchanging reality 'out there'. The upshot of this is that whether we focus on specialized domains of knowledge or on everyday life, we can all be seen as worldmakers: our agency extends into the most fundamental constituents of the world; we are capable of *ontological agency*.

To a large extent, then, the burden of scenario practice is to help devise ways to evoke, support and bolster ontological agency—to encourage participants to discover their capacity to shape worlds through and through. But what do we mean by the capacity for worldmaking? Since, on the one hand, worlds are never made from scratch but are made by reconfiguring existing elements, and, on the other hand, the process of worldmaking lacks (and eschews) the comfort of evaluating worlds against a stable, objective archetype, worldmaking is essentially a creative activity. In Goodman's words, "With false hope of

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[1] It should be clear that the notion of worldmaking differs quite substantially from similarly sounding activities such as 'world design'. In the latter, often discussed in the context of virtual worlds, game worlds, and so forth, worlds function as singular, consistent, and often richly detailed containers or environments for user activities (cf. Aarseth, 2012; Schön, 1988). By contrast, in Goodman's work, worlds are understood as psycho-spatial instantiations of collective imaginaries. Worldmaking, it follows, is not about representing worlds, but about the actual discursive conceptualization and mobilization of worlds; it is a work of ontological creativity.

a firm foundation gone, with the world displaced by worlds that are but versions, with substance dissolved into function, and with the given acknowledged as taken, we face the questions how worlds are made, tested, and known" (Goodman, 1978, p. 7). These questions, however, are much less innocuous than they seem since most of us engage in worldmaking tacitly, unable or unwilling to acknowledge both our complicity in processes of worldmaking and that things could be otherwise. Simply stated, we take our world for granted. While this can be seen, perhaps, as yet more evidence that perception is indeed guided by conception, it also clarifies the extent to which facing the questions associated with worldmaking requires reflection and the imagination. This is even more pronounced when we consider the ways by which we evaluate worlds against other worlds. In this case we are invited to reflect on what matters to us (and others), how we may foreground and possibly reconcile different worlds, how we came to know and believe certain things about the world, and so forth.

3. The value of worldmaking to scenario practice

In the next section we ask about the value of worldmaking for scenario practitioners and suggest ways in which it may be translated into a practice of 'scenario worldmaking'. First, we explore how worldmaking responds to the need for pluralistic scenario practice. Then, we discuss how this pluralism, and the conceptualisation of worldmaking as a creative act that involves all human faculties, can lead to more imaginative scenario development.

3.1. Operationalising discordant pluralism through scenario worldmaking

To help formulate the need for pluralistic scenario practice, and to examine whether scenario worldmaking can help achieve this, we use the notion of discordant pluralism borrowed from Critical Systems Thinking (CST) (Gregory, 1996).[2] Discordant pluralism is not currently linked to scenario practice, but it offers a very compelling, epistemological view of pluralism, and therefore sets a standard against which we can compare both current scenario practice, and the potential for worldmaking to make scenario practice more pluralistic. Discordant pluralism acknowledges that "There are some paradigms, traditions, perspectives, value systems, or cultures that are so antagonistic to one another that there is no position from which they can be reconciled" (Gregory, 1996, p. 616). Gregory points out that often, different paradigms are so discordant that they cannot be resolved into a single overarching framework without distortion. If we are to avoid losing the nuanced information that is contained in each discordant perspective, we should attempt to appreciate each paradigm for what it is, thus seeing the tensions between paradigms – what Herrnstein Smith (1997) calls "the microdynamics of incommensurability" – as keys to deeper understanding. In this mode, Matthews argues that "discord is perhaps the most fundamental characteristic of 'true' pluralism; a pluralism devoid of any totalizing attempt to reduce or control the diversity of viewpoints offered" (Matthews, 2004, p. 331). This way, discordant pluralism helps raise to the surface deeper assumptions, values, and attachments to worldviews—and can lead to dialogical, imaginative engagement (Bakhtin, 1981).

Many scenario practitioners and theorists fall within the constructivist camp (Ramírez & Selin, 2014), and have long engaged with the challenge of making scenario practice truly reflexive and pluralistic. They have been motivated by a desire to involve different types of knowledge and knowing, as well as by a need for social inclusiveness and legitimacy (Chaudhury, Vervoort, Kristjanson, Ericksen, & Ainslie, 2013; Rickards, Ison, Fünfgeld, & Wiseman, 2014). However, when examined against discordant pluralism, we find that scenario processes still often work within a single frame. Though many scenario processes involve a wide range of stakeholders, they tend to work with the notion of multiple futures and a single present, to which participants bring different perspectives. This results in a use of consensual plausibility among a group of participants (Ramírez & Selin, 2014), which is fine if consensus is the aim of the process, but can also limit genuinely explorative scenario practice, and it can contribute to phenomena like many sets of scenarios all ending up as variations of each other (van Vuuren, Kok, & Girod, 2012). Seeking more pluralistic approaches, a number of scenario processes recognize that different societal perspectives may not lend themselves to consensus and provide more productive explorations of the future if they are used to shape futures according to their own logics. These processes map different societal perspectives (RIVM, 2004), myths (Eames & Skea, 2002), worldviews (de Vries & Petersen, 2009) or discourses (Paillard, Treyer, & Dorin, 2011), and often go on to develop a set of scenarios in which each scenario represents a different worldview, discourse, et cetera. In a number of cases, conflicts and incommensurable differences between worldviews are made productive by foregrounding their contrasts (Johnson et al., 2012). However, the overarching framing of such processes still holds that different perspectives should be included on what is implicitly *a single reality*. Though the intention may be to understand both present and future as plural, this framing runs the risk of (unintentionally) communicating worldviews and discourses as mere 'perspectives' or even 'opinions', and tends to obscure their origins.

We believe seeing scenario development as worldmaking provides a useful language for the application of discordant pluralism in scenario practices, since it speaks of multiple co-existing *worlds* rather than *worldviews*, and thus underlines the notion that an overarching framework is often problematic. It also emphasizes the way in which the present too is contingent and fluid (qualifying, for instance, assertions about the "tyranny of the present" (Ted Nelson in (Toffler, 1972, p. 198)) extends pluralism ontologically, and thus foregrounds contrasts and differences in their most fundamental manner. As such it also

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[2] Of course, other intellectual fields such as culture studies, political theory and legal studies (to name just a few) have engaged with the question of pluralism in important ways, however these remain outside the scope of the present paper.

extends notions of agency: to have voice in a worldmaking process goes beyond sharing one's perspective on the world to sharing one's world. Participants do more than express future worlds on their own terms and learn about the relevance of other worlds, but enter, deconstruct and recombine worlds. Recognizing the existence of multiple presents, as well as their associated futures, allows scenario worldmaking to extend the agency of participants and make scenario development an ontologically meaningful process. After all, our current worlds are plural, not given, and subject to change. This is both empowering in terms of social inclusion and legitimacy, and makes scenario worldmaking highly conducive to the creation of new insights.

Conceiving scenarios as distinct worlds allows for incommensurability at the level of the governing paradigm (epistemic/ ontological/sociological etc.), and as such promotes continued debate and communication. Gregory proposes that different paradigms be treated as "temporarily juxtaposed within a 'constellation' in which both the aversions and the attractions that each has for the other may be exposed" (Gregory, 1996, p. 617). Application of the notion of worldmaking to scenarios similarly explores the idea that each scenario be experienced as a different world, juxtaposed so that their ontological differences may be brought to the fore. Accordingly, tensions between scenario worlds should not be minimised or swept under the rug even if, as Midgley (2000), p. 251 notes, "every time one person listens to another whose thinking is based in another paradigm, he or she can only interpret what they are saying through his or her own terms of reference", or, as Gregory (Gregory, 1996, p. 618) points out, "any appreciation of another's position will be subtly altered on each occasion that it is considered". Despite the tendency of participants to experience different scenario worlds 'through' their own 'native' worlds, interaction with different worlds may result in learning and self-transformation if both designers and practitioners manage to avoid being "dismissive or to think that full understanding has been achieved" (Midgley, 2000, p. 251).

The shift from settling on a single 'most likely' future (and a concomitant predictable world), to accepting the need for multiple plausible futures in the face of the future's fundamental uncertainty, has often turned out to be difficult – at least initially – for those used to positivistic approaches (Ramírez & Selin, 2014). Once this shift is made, however, it colours all subsequent engagement with future scenarios. We believe that worldmaking allows for a further paradigm shift—letting go of any single present, even a present seen from multiple perspectives, and accepting the fundamental plurality and constructed nature of *both* present and future worlds. This would be particularly useful in scenario worldmaking for multi-stakeholder processes around complex, multi-dimensional challenges where pluralism is key (Chaudhury et al., 2013; Wilkinson & Eidinow, 2008).

3.2. Evoking imaginative scenario worlds

One of the key aims of scenario practice is to provide an imaginative response to future uncertainty—as "Imagination is the key to pre-experiencing alternative futures" (Kepes, 2006, p. 159). Our focus on worldmaking as a way to harness plurality and move beyond the limitations of a singular present is ultimately aimed at the *collaborative creation of imaginative future scenarios*.

The imagination is often coextensive with our creative faculties, the seat of our ability to envision something into existence. But it is also invoked in less personal and more collective manners, often discussed as the imaginary or imaginaire, with further reference to social, economic, cultural or political imaginaries. These may be thought of either as the sum total of the values, suppositions and norms that serve as the horizon under which social actors find entities meaningful and certain path of action possible and permissible (Taylor, 2004), or as the continuously shifting grounds from which particular social and political formations emerge only as temporary stabilizations (Castoriadis, 1987). The capacity of the imagination to bridge present and future is premised in its phenomenological structure (Casey, 1976; Sartre, 2004). The imagination is always rooted in available present and future worlds, taking its raw material, so to speak, from existing perceptions, experiences and memories. But it also reaches into the future, allowing us to project, extrapolate, surmise and speculate about things that may not exist materially, and events that have yet to take place. In this mode, the imagination allows us to extend beyond our current spatiotemporal perspective and consider "imaginative possibilities to become otherwise" (Yusoff & Gabrys, 2011). It is in this sense that the imagination is often associated with radical difference and thus key to envisioning and pursuing alternative social configurations (Haiven, 2014; Haiven & Khasnabish, 2014; Wright, 2010). In the context of scenarios, the imagination allows participants to bridge the gap between present realities and future possibilities, to imagine things can be otherwise, to conjure the "irreal" in Sartre's (2004) terms, and to do so in creative ways.

So how does scenario practice engage with the imagination, and how can scenario worldmaking empower it? Scenarios are often thought of as narratives of the future (van Notten, Rotmans, van Asselt, & Rothman, 2003; Rasmussen, 2005), intended as frameworks for organizing and communicating participants' experience in lively ways that enable dialogue. Simply stated, narratives allow participants to reflect on common (and divergent) values, worldviews, histories and memories and share them in non-didactic ways. As Umberto Eco notes, engaging with narratives is always an interpretative, imaginative act: "Every text [. . .] is a lazy machine asking the reader to do some of its work" (Eco, 1994, p. 3). The "lazier" the machine, the more evocative the story: "to make a story good, it would seem, you must make it somewhat uncertain, somehow open to variant readings, rather subject to the vagaries of intentional states, undetermined" (Bruner1990, pp. 53–54); (see also (Bakhtin, 1981)). This is, of course, even more pronounced when it comes to narratives of the future since these fundamentally rely on our ability to imagine ourselves and others in situations that have yet to occur. It follows that the more "open" the narrative, that is, the more room it leaves for interpretation, the stronger it calls upon participants to use their imagination. Psychological and neuroscience research on storytelling also shows a close relationship between

story production and story understanding and impact (Mar, 2004), supporting Goodman's assertion that "comprehension and creation go on together" in worldmaking Goodman, 1978, p. 22. This is in line with research that indicates that it is not necessarily the resulting narrative but the *process* of scenario narrative development through dynamic social interactions that is most stimulating for the imagination (Bowman & MacKay, 2013). Therefore, instead of creating scenarios once and then treating them as self-contained, finished narratives to be shared, Wilkinson and Eidinow (2008) recommend that scenarios remain open to invite experimentation and exploration (see also (Vervoort et al., 2014)).

How can scenario worldmaking complement and extend narrative-based approaches to scenarios? First, scenario worldmaking provides the imagination with a different weight and meaning. We may say that the imagination is the *sine qua non* of worldmaking. If all worlds are constructed, and worldmaking is a fundamentally creative process, imagined future scenario worlds have the same reality status as available present and future worlds. Since scenario processes are often framed by plausibility, scenarios expressed as narratives and system descriptions are mainly seen as accounts or representations of either a common reality and its bounded range of future development possibilities, or of (normative) perspectives on the future. By contrast, when applied to scenario practice, the notion of worldmaking implies that facilitators and participants cooperate in acts of collective, future-oriented, reality-making.

Second, the focus in worldmaking on plurality and exploration, and on re-combining, reordering and subverting worlds, means that it is inherently open and unfinished—always in the process of becoming. To create a scenario world is to experience rather than tell, and to allow discovery and recognition—to "see or hear or grasp features and structures we could not discern before" (Goodman, 1978, p. 22). It means that we always question how a scenario world was constructed and how it relates to other worlds, and in this sense, scenario worldmaking promotes a more open and experimental use of narrative approaches.

4. Operationalising scenario worldmaking: key questions

If we accept the notion that we are all worldmakers, how do we make that explicit in scenario processes in a way that harnesses the proposed strengths of scenario worldmaking? We would like to suggest that any scenario worldmaking process consists of the following elements:

a) Cultivating a basic understanding of the plurality and constructed nature of available present and future worlds. This helps participants to 'get unstuck' from limiting notions of the present and future. At the same time, it helps to get insight into the characteristics of these worlds, and how they relate to each other. When this perspective is communicated at the beginning of a scenario process it helps to ensure that participants recognize the limits of currently available present and future worlds, the need to explore new scenario worlds, and to identify which worlds would be most likely to result in new insights by exploring discomfort, knowledge gaps and contrasts between available worlds.
b) The creation of new scenario worlds by reordering, recombining, contrasting, challenging and inverting available present and future worlds.
c) Analysing the relationships between newly created scenario worlds and previously available present and future worlds.

With these elements in mind, scenario worldmaking can be operationalised by using two sets of questions—questions asked from *within* any world, and questions asked about the *relationships between worlds*. Considerable interplay back and forth between the intra- and inter-questioning of the created worlds functions as a dynamic process within which participants have great agency in crafting, refining, and reassessing scenario worlds.

4.1. Questions asked from within a world

Who are we?

Once we accept the notion that worlds are constructed, questions about identity, and how the world relates to it, offer the best entry point for scenario worldmaking. Who are we in this world? What are our values and what has shaped them? How does this world make us who we are? How might we change or adapt in this world? Which actors in this world can and cannot be represented in our process? While asking these questions, an understanding that identities are multiple and partial (chinese, vegetarian, lesbian, engineer) is conducive to pluralistic conceptions of worlds (Sen, 2007). This may also open up a space for very inclusive notions of agency and actors, including non-human actors, ideas etc. (Latour, 2004).

Why was this world constructed like this?

How does this world show us its constructed nature? Which beliefs and values have shaped it? Who has shaped it and according to what ends? How has this world evolved over time? What major events were fundamental to its development? Such questions are key to scenario worldmaking, because they help us understand how a world was created, and therefore also how it could change and be affected in various ways. They help us identify core beliefs that underpin the world.

Where are we?

If the previous question foregrounds temporal issues, this question initiates spatial consideration about the scale and scope of the world. Is the extent of this world large (global, universal) or small (local)? What is the function of place? How do

physical and social geographies intersect in important ways? To what extent are we rooted geospatially, and to what extent do we interact through trans-spatial networks? Do we segue seamlessly between diverse world scales and how is this facilitated? In what sense are we mobile and how may nomadic, situated or networked phenomena function together (antagonistically or synergistically)?

How do we come to experience the world?

What does the world look, sound, feel and taste like? Are there important sensorial inputs? What are the roles of pleasure and joy in this world and how are they achieved? How do language and the distribution of information function in this world? How are novel experiences perceived and dealt with? Such questions are useful to bring experiential richness to a world, but also to understand how the world functions, and how core beliefs and ideas about the world are encountered and maintained.

What are sources of discomfort and gaps in this world?

What issues, when considered, create the most discomfort among those in the world, and are therefore usually avoided? Where are the acknowledged or unacknowledged knowledge gaps and blind spots among those in this world? What concepts or structures require the most bravery in tackling? Such questions are aimed at finding the edges of a world we are exploring, and identifying where unexplored spaces can be found where other worlds could play a useful role—connecting this set of questions to the next.

4.2. Questions about relationships between worlds

How do new scenario worlds draw on available worlds?

How do new scenario worlds draw on multiple present worlds, as well as previously created 'possible' worlds (think of trend projections, science fiction stories, diegetic prototypes (Kirby, 2010) and other pre-existing future worlds)—what is taken into account, what is left out? What is emphasized? Goodman (1978) identifies composition, ordering, weighting, deletion, supplementation, and deformation as ways in which new worlds are created based on existing worlds. Which are useful or engender the richest imaginative possibility? Which happen inadvertently?

How are worlds interacting?

The notion that there are multiple present and future worlds includes the understanding that worlds overlap and influence each other. How are different present and future worlds interacting with a new scenario world? How do different scenario worlds interact with each other? Are there 'sub-worlds' within a scenario? What is the relationship between worlds of different scales and how are they distributed? How might worlds previously unaware of each other cope with an encounter? Scenario practitioners often speak about multiple scenarios unfolding simultaneously in different locations and depending on different perspectives. Scenario worldmaking offers a pluralist take on this observation.

What relevance does this new world have for available present/future worlds?

Working with the realization that there are many present and possible future worlds does not mean that all worlds are equally useful. In what ways may a newly created scenario world threaten present worlds? What opportunities may it bring? What new ideas? What elements of this scenario world create the most discomfort for available worlds? How does it challenge the values associated with present worlds? Which elements could help fill knowledge gaps and blind spots? What would happen if elements of this world emerge in some present worlds but not in others? Because such questions focus on the contrasts and tensions between a multiplicity of present and future worlds, and because they investigate the transformative potential of worlds, they are expected to give us different insights than questions asked when we merely consider how the current world may develop into different future directions (similar to when 'plausible' scenarios stick too closely to a single present). Deeply questioning and reconsidering the internal concepts, values, issues and structures of a created world (4.1) within a pluriverse framing (4.2) creates considerable room for rich development within a broad imagination space.

5. Conclusions

In this paper we have explored the relevance of Goodman's (1978) notion of worldmaking for scenario practice. We argued that the central tenet of worldmaking – that both present and future worlds are plural and constructed – can help scenario practitioners move beyond the limitations of probability- and plausibility-based approaches because it recognizes the limitations of coupling the imagining of futures to a single objective present or 'real reality'. The analysis of the ways in which worlds are constructed undermines belief in the final primacy of any given world over others, thus removing an always-already fictional "firm foundation" (Goodman, 1978) and allowing for "unlearning" (Wilkinson & Eidinow, 2008). While unmooring a priori stable reference points may carry a liberating effect, it may also create discomfort, ambiguity and bring about a recognition of knowledge gaps (as per Ramírez and Selin (2014)). It asks participants to endure a paradigm shift not unsimilar to the shift from attempting to predict the future to exploring multiple plausible futures—from pursuing probability to accepting plausibility. Accepting the multiplicity of both present *and* future worlds allows participants to ask

questions about contrasts, frictions, commonalities and complementarities between worlds—questions that inherently include both analytical and imaginative modes of engagement.

Approaching scenario practice as worldmaking has consequences for several scenario genres. In the context of 'explorative' scenarios that are meant to offer challenging future contexts against which to test the feasibility of plans and policies (Vervoort et al., 2014), drawing on the idea that worlds are not given but made, and that multiple present worlds exist, may add possible contexts to consider. For 'normative' (Van Notten, 2003) or 'transformative' (Kahane, 2012) scenarios that seek to imagine how the world could be changed through the actions of participants, treating scenario processes as worldmaking can help mitigate the disempowering assumption that societal actors will have to adapt to a set of consensually 'plausible' futures instead of actually reshape those futures. Additionally, we expect that the focus of the proposed approach on deconstructing, reconstructing, combining and contrasting different worlds will be useful when adapting and re-imagining existing scenarios for new decision contexts (Mar, 2004). And lastly, approaching scenario practice as worldmaking can also have consequences for the methods and tools used in scenario processes. In particular, the emphasis on the imaginative engagement with both present and future worlds creates affinities with kindred techniques such as participatory game design (Van Notten, 2003), role-playing (Kahane, 2012), experiential futures (Bruner, 1990), critical and speculative design (Dunne & Raby, 2013) and the use of various means of participatory media (Vervoort, Kok, van Lammeren, & Veldkamp). This may not only expand the methodological arsenal of scenario practice but also create interdisciplinary bridges and potential collaborations between practitioners.

While the ideas presented here are fairly exploratory in nature and are still in need of evaluation *in practice*, some of the approach's limitations already stand out. First of all, the constructivist and pluralistic nature of worldmaking scenario development may be quite difficult for participants coming from a more positivist background. Scenarios that focus on 'subjective' plausibility already require a significant shift in the way participants conceptualize and relate to the world, to which the worldmaking approach adds an even more explicit and ultimately destabilizing focus on the constructed nature of worlds. Participants may simply feel too lost without a consensual present. Furthermore, the range of questions used for deep engagement, exploration and deconstruction of available present and future worlds, as well as the building of new scenario worlds, could be fairly temporally intensive. This means that a scenario worldmaking process that encompasses all relevant present and future worlds and uses all proposed questions for scenario development may only be suitable where there is sufficient time for deep reflection and exploration, and where the pluralistic approach of scenario worldmaking is most valuable (for instance when dealing with highly contested issues).

Finally, given that sensorial, perceptive, emotional and embodied registers are foundational elements of worldmaking—as Goodman puts it, "worlds are made [. . .] not only by what is said either literally or metaphorically but also by what is exemplified and expressed – by what is shown as well as by what is said" Goodman, 1978, p. 18 – there is a need to explore the ways in which the worldmaking approach can evoke these and integrate them into what may otherwise risk becoming a fairly analytical exercise. In this vein, considering experiential markers such as (sensorial and social) immersion and, more importantly, finding ways to replace current emphases on *suspending disbelief* by the much more active *creation of belief* seems to be the next step in fostering compelling, thought provoking and imaginative scenario processes.

All things considered, we believe that scenario practitioners that aim to facilitate imaginative and pluralistic scenario processes will find the questions presented in section 4 useful. For instance, questioning the constructed nature of a scenario or its mobilisation of a predefined present may be useful for identifying some of the hidden yet salient assumptions that underlie the process. Similarly, questions about relationships between scenario worlds could prove useful for highlighting contrasts and complementarities between participants. In this sense our approach does not totalize: some of its aspects may be useful even if the approach in its entirety is not—this is, of course, as long as the underlying belief in the ontological constructedness of the world is maintained. If we accept that we are all worldmakers (whether we are aware of it or not), the approach we outline here may potentially liberate scenario practitioners from the need to cling to *reality* as a characteristic of (probable or plausible) futures, and instead open up new ways to explore imaginative futures in a more *realistic* fashion.

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