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THE PLAUSIBILITY OF FUTURE SCENARIOS

CONCEPTUALISING AN UNEXPLORED CRITERION IN SCENARIO PLANNING

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From:

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Conceptualising an Unexplored Criterion in Scenario
Planning

What does plausibility mean in relation to scenario planning and how do users of scenarios assess it? Despite the concept's ubiquity, its epistemological and empirical foundations remain unexplored in previous research.

Ricarda Schmidt-Scheele offers an interdisciplinary perspective: she presents approaches from philosophy of sciences, cognitive psychology, narrative theory and linguistics, and tests key hypotheses in an experimental study. A conceptual map lays out indicators for scenario plausibility and explains how assessments vary across scenario methods. This helps researchers and practitioners to better understand the implications of their methodological choices in scenario development.

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Summary of the book

Plausibility as a concept is omnipresent in the scenario planning literature. Practitioners and researchers regularly conclude that their planning processes have revealed 'plausible scenarios'. The common position is that for scenario planning exercises to create alternative future pathways, their selection cannot be simply limited to the most *probable* ones; neither does mere *possibility* allow for a meaningful collection of relevant and challenging scenarios. Methodological reviews, therefore, name plausibility a key effectiveness criterion for both scenario construction and utilisation. This has practical consequences: Plausibility guides what kind of scenarios are generated and presented and prescribes how to assess and consider scenarios for decision-making. Yet, insights into what scenario plausibility really means and how it is established and assessed by different actors, including scenario users, is largely unexplored.

The book addresses this conceptual and empirical gap and analyses the concept from the perspective of prospective scenario users. The small group of scholars more recently involved in the concept has predominantly looked at plausibility from the angle of scenario construction: Here, plausibility is thought to be established either by *method-driven* processes, e.g. different techniques and procedures prescribe scenarios as plausible only when they are internally consistent, or through *actor-driven* processes, meaning that involved stakeholders interactively co-produce a common understanding of the scenarios. Both positions neglect that important scenario user groups i) are often not involved in the actual construction process, ii) are confronted with multiple, contradicting scenarios in different formats, and iii) may consequently follow different mechanisms when assessing the plausibility of a scenario. Therefore, in this book, the following research questions are pursued: *How do scenario users assess the plausibility of a scenario? What factors influence an individual's plausibility judgment? Do judgments differ across scenario formats?*

The research literature on scenario planning and the community of Futures Studies does not provide theoretical frameworks or distinct directions for research designs to investigate these questions. However, a systematic review of extant debates in scenario research reveals helpful starting points: Scenario plausibility is associated with informal logic and inferences, with narrative storytelling and with cognitive capabilities of scenario users. To guide an empirical research agenda and to foster more nuanced conceptions of scenario plausibility, the book follows an explorative research design: It analyses theoretical models and concepts from corresponding academic disciplines and discusses their applicability to the context of scenario planning. Five core research propositions are synthesised that hypothesise what makes a scenario plausible from a user's perspective. A semi-experimental study is adopted to test the propositions. Master-level students are confronted with two scenario reports on the future of Germany's energy transformation and are asked to make several assessments regarding the scenarios' content and contexts. The reports were based on two scenario methods (Intuitive Logics, Cross-Impact Balance Analysis) that seek to convey plausibility in fundamentally different ways: through narrative storylines and matrix-based systems maps.

Quantitative and qualitative findings are presented in the form of a conceptual map of scenario plausibility. Against key assumptions from the theoretical discussions, matrix-based scenarios were judged significantly more plausible than narrative ones. Qualitative data suggests that individuals deploy different mechanisms when judging the two formats. Such flexibility in plausibility assessments has not been accounted for in theory. Findings also show that high credibility of a scenario, in the sense of its trustworthiness, likely leads to high plausibility perceptions. Yet, the map also determines source credibility as important factor – an interesting finding given that scenarios are not regularly related to specific sources or authors. A critical indicator for scenario plausibility is whether a scenario corresponds with a user's own beliefs and expectations. Compared to all other indicators, such effects are most strongly and robustly found across both scenario formats and are in unison with notions from the theoretically explored concepts. Scenarios that are perceived as too far-fetched in the sense of their likelihood are unsurprisingly judged less plausible. Such dynamics also relate to the internal structure of scenarios. (Dis)agreements with scenarios' causal links were often brought forward as reason for (im)plausibility. While causality has frequently been named as key driver of plausibility in theoretical models, it is particularly the *sense of causality*, i.e. 'implicit causalities', that are exploited

in scenario contexts. This also demonstrates the power of several heuristic patterns that are at play when making scenario plausibility assessments.

In sum, while theoretical and empirical findings picture scenarios to be rather vulnerable to users' assessments, plausibility judgments do not appear arbitrary. On the contrary, the conceptual map points to distinct patterns that cannot simply be represented by other concepts, such as credibility or believability. The findings bear direct implications for scenario research and practice. They demonstrate that scholarly-derived plausibility factors, e.g. internal consistency or narrative richness, play a role in users' judgments, but fail in accounting for the different mechanisms scenario users apply when they have not been involved in the scenario construction processes.

Key directions for further empirical and conceptual research are outlined at the end of the book. Empirically, the identified plausibility indicators should be further studied using different contexts, e.g. high- or low-stake topics, with different scenario user-groups. The findings also reveal interesting parallels to probability judgments. The almost compulsive isolation of the scenario planning community from questions of probability has not been worthwhile, and future research should be opened towards investigating the relationships between plausibility and probability. Conceptually, the presented research triggers more critical reflections as to whether plausibility as a normative effectiveness criterion of scenarios is still tenable. Rather, plausibility should be discussed as a descriptive means to better understand intended and unintended effects of scenarios on decision-makers. Such insights can ultimately enable more targeted research on scenario construction and communication.

1 Introduction

During an airport security check, the scenario researcher Selin was asked to remove her Christmas gift – a snow globe – from her suitcase. In a subsequent article, she reflected:

> "In an odd fit of anger, amusement and astonishment, I probed the security risk with the officer to learn that they have a policy prohibiting snow globes. [...] Since they cannot gain access to the magical juice, no snow globe is safe even if they contain only three ounces of glittering liquid. [...] By what mechanism does an innocent pleasure-giver, a rare treat of slowness and sparkle, become transformed to a security threat? [...] First, we have the climate of fear and a thwarted attack in 2006 thought to involve liquid explosives. The thing that didn't happen – the liquid bombs killing people – became the justification for much to do, the basis for a whole host of interventions. From one particular 'almost event' made plausible through intention, many other events have been imagined plausible, right down to my forsaken snow globe as a vehicle of mass destruction." (Selin 2011b:240)

This bizarre example illustrates how the emergence and assessment of scenarios about the future is guided by means of *plausibility* (there is not only the mere possibility that parts of a snow globe could be misused, but events in the past make it imaginable), rather than primarily by principles of *probability* (the instrumentalisation of a snow globe for an assassination does not seem very likely). This book explores the concept of plausibility, its meaning and consequences in contexts of scenario planning.

To consider the future and its possible developments has become an urgency, if not necessity in contemporary Western societies. According to Beckert (2016:58), today "[t]he future matters just as much as history matters" and so scenarios are considered universal remedies in almost all social spheres. As descriptions of multiple possible events in the future, scenarios are con-

cerned with the changes or differentiations of the future from the present or the status quo (Fuller & Loogma 2009). Scenario planning thereby means the systematic assessment of strategies or plans and their performance across a number of identified scenarios (Amer et al 2013; Bradfield et al 2005; Schoemaker 1995). For organisations, it presents "a key survival skill" (Ramírez et al 2010) and is imperative for organisations' viability and competitive edge (Noss 2013). For reasons of legitimacy and accountability, there is also an increasing political demand for scenarios. In times of anticipatory governance structures and responsible innovation, foresight is expected as a necessary capacity to assess and manage possible consequences of today's policy decisions or emerging technologies (Guston 2014; Nordmann 2014; Volkery & Ribeiro 2009). Scholars also acknowledge the relevance of scenario-based thinking in our daily life "[w]hen we think about changing jobs, getting married, buying a home, making an investment [...]" (Tetlock & Gardner 2015:2). In recent years, the interest of social scientists in 'the future' has rapidly increased. Scholars pay attention to whether and how future projections can impact actors' perspectives and behaviours in the present (Beckert 2013, 2016; Jasanoff & Kim 2009, 2013; Verschraegen & Vandermoere 2017). Thereby, future projections are looked at from different conceptual perspectives. While in Science and Technology Studies (STS), research focuses on rather implicit and collective future imaginaries or visions (Patomäki & Steger 2010; Verschraegen & Vandermoere 2017), this book addresses the more explicit and purposeful construction of scenarios as it is pursued in the distinct communities Scenario Planning, Futures Studies or Foresight (Fuller & Loogma 2009; Masini 2006; Sardar 2010). Over the past decades, this deliberate construction of futures has significantly increased in the socio-political sphere – so much that in areas of environmental planning and sustainable energy transformation, scenarios have become "ubiquitous knowledge products" (Pulver & VanDeveer 2009:2)[1]. In this field, scenarios bear a specified definition as "internally consistent and plausible picture[s] of a possible future reality" (EEA 2009:6). It is for this reason that practitioners in scenario reports and scholars in research papers regularly conclude that their work has produced "plausible scenarios"

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1   It should be noted that the construction of sustainable energy scenarios, indeed, has a long tradition. The well-documented construction and application of scenarios by The Royal Dutch Shell, but also the renown 'Limits of Growth' study by the Club of Rome are often considered prominent starting points for scenarios in the energy field (Ringland 2008).

(Agnolucci 2007; Moss et al 2010; Sala et al 2000; Sheppard et al 2011; Wiebe et al 2015). Plausibility is assumed to be a key indicator for the construction *and* utilisation of scenarios. In the methodological development process of scenarios, plausibility ought to be a guiding benchmark to ensure that the depicted developments challenge actors' expectations about the future, while at the same time still 'speak' to actors so that they are willing to 'suspend their disbeliefs' (McClanahan 2009; van der Heijden 2005). Two of the founding fathers of scenario planning populated the relationship between plausibility and scenarios during cold war times:

> "Any particular scenario may in fact contain paranoid ideas, but this must be judged on the basis of the plausibility of the particular scenario - often a difficult judgment in a world of many surprises - and care must be taken to allow for a possibly realistic inclusion of a not-implausible degree of paranoia [...]." (Kahn & Wiener 1972:161)

In this quote, plausibility presents a continuum that shall help to push individuals towards the edge of their own imagination of the future. It also links plausibility directly to the uptake of scenarios by its audiences and, hence, to the very core objectives of Futures Studies: Through plausibility, scenarios ought to challenge actors' mental maps, confront them with surprises and future shocks that have not been imaginable prior to considering the scenarios and guide them towards improved decision-making (Dufva & Ahlqvist 2015:252). A screening of the scenario literature and surveys of scenario planning methodologies demonstrate an overwhelming dominance of plausibility as an 'effectiveness criterion' for scenario work (Amer et al 2013; Wilkinson & Ramírez 2009). Yet, paradoxically, the omnipresence of plausibility in scenario research and practice for a long time did not trigger closer investigations of the concept. Scenario plausibility has simply been contrasted with *possibility* (a simple collection of options), *probability* (quantified assessment of likelihood) and *desirability* (preferred options by certain actors) (Selin & Pereira 2013:3). Only in recent years, several scholars have begun to inquire more closely the scope of the concept for scenario planning. Research workshops, roundtables and a Special Issue[2] dedicated to plausibility are indicators for this increased

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2   The scholarly activities around plausibility entail: The 'Plausibility Project' as a joint workshop between Oxford University and Arizona State University (2009), a roundtable during the SNet Conference in 2011 (Selin 2011b), a Special Issue in *International Journal of Foresight and Innovation Policy* (vol. 9).

interest. The emerging debate unanimously contemplates the lack of theoretical underpinnings and empirical studies. Selin (2015), for instance, criticises an insufficient understanding of the complexity of the concept and the diverse, implicit expectations associated with it: "[...] [W]hat plausibility actually (and symbolically) means, how it matters for practice, and why it is important for the contemporary coping with uncertainty is unclear".

Extant scholarly discussions reveal that with plausible knowledge, scenario planning enters uncharted epistemological territory. Two diametrically opposed camps seek to define and operationalise plausibility: One camp links it to the subject matter of scenarios itself; from this perspective, a scenario's plausibility can be independently established using clear indicators (Lloyd & Schweizer 2013; Wiek et al 2013). Examples include whether the depicted scenario is 'theoretically occurrable' or has occurred in the past under different circumstances. For a second camp, in contrast, plausibility is not intrinsic to the scenario itself but is linked to the social contexts in which scenarios are considered (Strand 2013; Wilkinson & Ramírez 2009). Particularly the contextualised conception of plausibility has received attention in recent research. Plausibility is discussed as the fruitful result of co-production, negotiation and collective sense-making processes (Ramírez & Selin 2014; Selin 2011a; Wilkinson & Ramírez 2009). To view plausibility as overarching framework for contextualising values, ideas and imaginations about the future, indeed, is viable for appreciating how plausibility can be *jointly produced* by scenario experts and stakeholders in participatory processes. More recent scholarly contributions, for instance, have added to a better understanding of the heuristic value of plausibility in scenario building processes (Uruena 2019), and have developed approaches for the methodological construction of highly plausible scenarios (Walton et al 2019). This research, however, does not account for the mechanisms that are potentially at play when scenario users *assess* the plausibility of given scenarios that do not specifically target their own values and perspectives about the future. Also, formalised notions of plausibility rather focus on establishing plausibility as quality criterion from scenario producers' perspectives, rather than providing conceptual or empirical explanations for users' assessments of it. Yet, the latter perspective is particularly relevant for cases in which scenario users, i.e. those actors whose assessments supposedly decide about the uptake of a scenario in decision-making, are not involved in the construction process. This is the case in many energy and environmental policy scenario projects (Schubert et al 2015; Dieckhoff 2015). Here, proponents of plausibility as a collective sense-making vehicle acknowledge that "[i]f

the scenarios are not used exclusively by those that produced them, and/or need to be shared or disseminated, altogether different dynamics around plausibility and probability erupt." (Ramírez & Selin 2014:65). The scenario literature hints at some scenario-specific contexts that may evoke different dynamics of plausibility:

- Scenarios often leave their construction contexts and 'travel' (Selin 2011b) to other discourses or societal spheres in which they develop a life of their own. As such, the plausibility of a scenario is assessed detached from its original context. Analyses of foresight products, therefore, assume differences in the communication and reception processes of scenarios by citizens, the media, organisations or public bodies (Lösch et al 2016:9).
- In cases of institutional divides between scenario developers and users, different 'cultures of plausibility' may clash. Particularly, discrepancies between scientific and non-scientific understandings of plausibility may exist. Wilkinson & Ramírez (2009:6) raise the concern that "plausible/implausible outputs from science become implausible/plausible inputs for policy-making."
- Different scenario formats – narratives, models, systems maps – may trigger different assessments. Analyses have shown how models versus narratives affect the construction of meaning by different stakeholders (Chabay 2015; Lord et al 2016) so that scenarios may be more easily conveyed by some overarching storylines than by models (Strand 2013).

On this basis, the book investigates the following research question: *How do scenario users that were not involved in the scenario development process assess the plausibility of a scenario?*

This involves two sub-questions:

· *What factors influence an individual's scenario plausibility judgment?*
· *How do plausibility judgments differ across scenario formats?*

A systematic review of the extant scenario plausibility debate provides some helpful starting points to approach the research questions. It shows that plausibility has been associated with informal logic and inferences (Walton 2008),

storytelling (Bowman et al 2013; Schwartz 1991; van der Heijden 2005), the grounding of scenarios in cultural narratives (Boenink 2013; Strand 2013) as well as with individuals' cognitive capabilities (Morgan & Keith 2008). Plausibility does not have a natural disciplinary home-base; neither do scenarios. In fact, scenario research is continuously enriched through other academic disciplines and theory-building (Ahlqvist & Rhisiart 2015). Therefore, to initiate conceptual and empirical research on scenario plausibility, theoretical concepts from the corresponding disciplines are explored (table 1). While this theoretical discussion of plausibility is not meant to be exhaustive, it is thought to enrich understandings in the context of scenario planning.

Table 1: Overview of explored theoretical concepts of plausibility

Starting points in scenario planning literature: Plausibility is associated with…		
informal logic and inference	narrative storytelling	cognitive capabilities
Corresponding academic disciplines are consulted:		
Philosophy of sciences, informal reasoning, argumentation theory in policy studies	Narrative theory, including notions from linguistics, structural and cultural narrative theory	Cognitive and educational psychology
Key notions:		
• Provides clear rules for plausibility assessments and connects plausibility with source credibility • Insights into how individuals judge the plausibility of a set of given propositions and arguments	• Narratives feature a generalised internal structure that conveys plausibility (linguistic approach) • Plausibility is dependent on the story's resonance with cultural identities and well-established rules of social interaction (cultural theory-infused approach)	• Models of plausibility pay attention to processes involved in individuals' plausibility judgments: The relation between plausibility and congruence of information with individuals' own beliefs, their cognitive and emotional involvement, their personality traits and styles

The theoretical concepts are synthesised and research propositions are derived that revolve around three core dimensions: The assumed relation between plausibility judgments and i) context-related assessments of scenarios (credibility, trustworthiness, form of scenario presentation), ii) content-re-

lated assessments of scenarios (concept coherence of scenarios with individuals' beliefs, background knowledge, their educational background), and iii) personality-related assessments (individuals' need for cognitive closure, their interest in engaging with scenarios). Due to the novelty of this approach, it cannot revert to previous studies and research designs for an operationalisation and testing of the theory-derived propositions. In the explored academic disciplines, empirical research on plausibility and how it is perceived has predominantly been investigated using experimental study designs (Canter et al 2003; Lombardi et al 2016b; Lombardi et al 2015; Lombardi et al 2014; Lombardi & Sinatra 2013; Nahari et al 2010). This book adopts this tradition for two reasons. First, scenario planning is a context-sensitive field that is dependent on the content of the scenario exercise, the methods applied (Wright et al 2013a, b) and the actors involved (Franco et al 2013). An experiment enables the control and manipulation of the contexts under which plausibility assessments are made and allows for planned observations of the theoretically-derived variables (Sarris & Reiss 2005). Second, the presented study can build on the few previous studies that empirically investigated plausibility in other areas so that findings can be compared and reflected. The experiment uses a classroom-based setting with master-level students. Participants are presented with two different scenario formats (narrative and systems-maps) and are asked for plausibility and related assessments at different points in time. Quantitative and qualitative data is collected.

An analysis of scenario users' plausibility assessments is by no means an intellectual 'nit-picking' exercise but has practical relevance with respect to fundamental issues in scenario planning. For a long time, Futures Studies has engaged in more 'utilitarian approaches' (Ahlqvist & Rhisiart 2015) with the ultimate purpose to arrive at a set of scenarios about the future. The scenario community has produced more and more different methods to construct scenarios – "sometimes to a point of excess" (Mermet et al 2009:67). This has caused a recent upsurge of critical perspectives on this machinery of 'futures making'. Scholars criticise the manifestation of a 'forecasting industry' (Verschraegen & Vandermoere 2017) in which futures have simply become 'commodities' (Urry 2016). According to Colonomos (2016), futures products, e.g. scenarios, are 'sold' to its consumers and an increasing estrangement between 'sellers' and 'consumers' is evident: The power to claim and populate plausible futures clearly resides with those actors who develop the scenarios, typically scenario experts or researchers (Ferry 2016). Hulme & Dessai (2008:56) point

to the imbalance of supply and demand for energy scenarios. The authors criticise the disproportional supply of scenarios that is paired with a lack of investigations into the effects scenarios can have on users and on society as a whole. Over the past years, scholars have increasingly urged for more empirical research to address this gap in 'evaluative scenario work' (EEA 2009; Lempert et al 2008; Parker et al 2015; Volkery & Ribeiro 2009) and called for comparative case studies, ethnographic observations or laboratory studies on the cognitive impact of scenarios (Bryant & Lempert 2010:35). The research presented in this book, therefore, is situated in these current debates around intended and unintended effects of scenarios. It sheds light on user perspectives and questions the applicability of scenario developers' sets of quality criteria for users' needs and judgment patterns.

Structure of the book

Chapter 2 provides a broad introduction to scenario planning research and practice that is essential for the exploration of plausibility. The chapter does not enlarge on all the different scenario development methods that are currently 'on the market' but focuses on the core characteristics of scenario methodologies as well as on fundamental and still unresolved questions about scenario objectives and usage. For the purpose of this book, the scope of scenario planning as a "very fuzzy multi-field" (Marien 2002) is narrowed down towards a workable basis: The construction of sustainable energy futures presents an area of application in which the methodological debates about *how* scenarios should be developed, for *what purpose* and with *what effects* are particularly vivid. Within these debates, two qualitative scenario methods – Intuitive Logics and Cross-Impact Balance Analysis – receive increased attention and, therefore, are introduced and discussed in chapter 2.3 as application examples for the subsequent empirical analysis. Chapter 3 reviews previous contributions towards understanding plausibility that exist within the Scenario Planning and Futures Studies literature. The 'life path of scenarios' (Grunwald 2011) is adopted and enhanced in chapter 4 as framework to identify relevant contexts and actor constellations in which plausibility assessments are to be explored. The remainder of the chapter discusses theoretical concepts of plausibility from three disciplinary perspectives. The chapter closes with five core research propositions. Chapter 5 outlines the semi-experimental study design; quantitative and qualitative findings are presented in chapter 6 and 7 respectively. Chapter 8 constitutes the core outcome of the study: A concep-

tual map presents units of analysis and indicators to understand plausibility assessments of scenario users. Based on the map, chapter 9 discusses implications for scenario research and practice and proposes further research agendas. Figure 1 provides an overview of the book's structure.

Figure 1: Overview of the structure of the book