Article

Theories in Futures Studies: Examining the Theory Base of the Futures Field in Light of Survey Results

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Abstract

This review article opens discussion on theories in futures studies by analyzing survey results from Finland Futures Research Centre and using the results as an entry point to discussing theoretical lineages found in the literature. The survey, conducted in 2019, included twenty-four responses from researchers and postgraduate students. Altogether 192 different theories or theoretical frameworks were identified. Social science theories and conceptual frameworks were particularly prevalent in the responses, and the most common recurring themes included systems, complexity, and anticipation. The responses are discussed in terms of three levels: philosophy of science, theories of futures studies, and theories in futures studies. Theories in futures studies are further divided into theories of action, practices, and behavior; theories of change; and theories on the micro-, meso-, and macro levels. The results are contextualized and complemented by proposing five functionally differentiated theoretical approaches: (1) theories for forecasting, (2) theories for representing futures, (3) theories for pursuing desired futures, (4) theories for making sense of anticipatory processes, and (5) radical epistemological critiques. The analysis is intended to open discussion on theories rather than provide an exhaustive list of the most important theories. Nevertheless, we can conclude that the field has a rich theory base which could be emphasized in futures education and developed further. It is crucial that actors in the futures field are aware of the theories that guide them because influential theories take part in making the future.

Keywords

futures studies, theory, survey, theoretical framework, theoretical approach, anticipation, epistemology, review

Introduction

The aim of this review is to open discussion on theories in futures studies by summarizing key theoretical lineages of the field.[1] We know that the futures field has a multitude of methods, and sometimes the field is seen as a kind of method science, perhaps comparable with statistics. The philosophical and epistemological foundations of futures studies have also been discussed (e.g., Bell 1997; Niiniluoto 2009). What about the theoretical foundations of the field? Theoretical foundations are more difficult to perceive than prevailing methods or abstract basic premises such as

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unpredictability. An interesting comparison point is provided by Sovacool and Hess (2017), who used interviews to map theories of socio-technical change and discovered altogether ninety-six theories from twenty-two different disciplines. How numerous and diverse are the theories relevant to futures studies?

One is tempted to claim that if we ask ten futurists about the most important theories in the field, we will get as many different answers. Examination of the theory base is particularly fruitful due to two driving forces: fragmentation of futures studies into separate approaches such as policy foresight, systems modeling, and anticipation studies (Ahlqvist and Rhisiart 2015; Poli 2017; Son 2015), and the intention to professionalize the field and strengthen its academic and professional credibility (Hines and Gold 2013). The former opens new theoretical avenues, while the latter creates pressure to demonstrate rigor. To explore the diversity of theories, we conducted a survey on theories between January and March 2019 with my colleague Sanna Ahvenharju. The intention of the survey was to provide an entry point to the complex topic of theories in futures studies. The survey was targeted at researchers from our institution, Finland Futures Research Centre at the University of Turku in Finland. The results of the survey are the starting point for this review. However, the intention is to open discussion rather than fix the most important theories in the field. For this reason, the term "theory" is used in an inclusive sense rather than a strictly defined meaning. Nevertheless, in subsequent discussions, it is important to remember that a scientific theory generally requires more than general principles, central concepts, or diagrams.

Mapping theoretical foundations is important for three reasons. First, theoretical foundations are often left implicit in applied futures work. Results are often published in articles and reports, and the formats do not permit lengthy theoretical discussion. Making theoretical foundations and assumptions more explicit helps readers to interpret the results and implications of studies. Second, theoretical discussion helps to unpack the theoretical baggage that comes with specific concepts. There are many established concepts in futures studies, such as trends and weak signals, but they are often used without awareness of the broader paradigms and conceptual frameworks from which they stem. This can lead to conceptual confusion, as has been argued in the case of scenarios (Spaniol and Rowland 2019). A more reflective understanding of key concepts can foster more transparent and ethically sustainable foresight practice (Bussey 2014). Third, some degree of shared understanding on theoretical foundations helps futures studies to develop as a discipline (or trans-discipline). This does not mean consensus on foundations but at least a "meta-consensus" about what alternative perspectives exist (Dryzek and Niemeyer 2010).

The theory survey was sent to all the researchers and postgraduate students on the mailing lists of Finland Futures Research Centre. The total number of sent survey links was seventy and we received twenty-four responses, yielding a response rate of 34 percent. The survey included two questions:

1. Which theories (from any field) do you personally consider as the most important for futures studies?
2. Which theories (from any field) are the most important for your own work?

The questions were written in English and Finnish, and both questions were followed by ten text fields where the respondent could write up to ten theories, one theory per field. According to the instructions, the order of theories is irrelevant. The survey also included a text field for additional comments.

The results of the survey are followed by a categorization of key theoretical areas according to their notion of the function of theory, that is, what theory does. The review cannot claim to be comprehensive, because the futures field is transdisciplinary and its boundaries are often fuzzy (e.g., Marien 2010). Nevertheless, the review can contribute to building a meta-consensus on theoretical lines in futures studies.

Description of the Survey Results

Of the twenty-four respondents, eleven were female. Eleven respondents were in a senior researcher position and thirteen were junior

Table 1. Categorization of Theories.

Type	Number of responses	Examples
Philosophy of science	16	Social constructionism, critical realism
Concept or conceptual framework	80	Climate change, evolutionary theory, systems thinking, innovation ecosystems
Theory or concept in futures studies	44	Empty and lived futures (Adam and Groves 2007), Flechtheim's futurology, futures consciousness
Theory within the social sciences	104	Actor network theory, regional development theories, theories of practices
Theory within the humanities	33	Theories of temporality and space, discourse theories, representation theories
Theory within psychology	15	Cognition theories, theories of the development of human needs, self-determination theory
Theory within the natural sciences	13	Chaos theory, ecological theories, sustainability theories
Method	20	PESTEC (political, economic, social, technological, environmental, and cultural/consumer factors), causal layered analysis, pioneer analysis
Underlying principle	16	Participation, nondetermined future, multiple perspectives

researchers or project researchers. When the theories mentioned in the text fields were organized into a table and obvious duplicates were removed, 192 different theories were left. The list included heterogeneous elements, and therefore the theories were heuristically divided into categories (Table 1). The categories are nonexclusive, so the same theory may be included in more than one category.

Theories within the social sciences and concepts and conceptual frameworks were mentioned most often.[2] Recurring themes in the responses are listed in Table 2.

Table 2. Recurring Themes.

Themes	Number of respondents
Systems	16
Complexity	9
Anticipation	8
Critical theory	7
Evolutionary approaches	7
Sustainability	7
Transition theories	5
Sociotechnical imaginaries	4

Several respondents mentioned systems theories, systems thinking, or the systemic nature of issues. These were mentioned in sixteen responses. The closely related concept of complexity was mentioned by nine respondents. Eight respondents mentioned anticipation theory, which discusses how living systems use the future in their behavior (e.g., Poli 2017). Evolutionary approaches, critical theory, and sustainability were prominently featured, and transition theories and sociotechnical imaginaries were also mentioned by many respondents. These themes illustrate the kinds of issues covered by theories in futures studies. As a provocative simplification, we could claim that futures studies considers complex systems and their evolution in a critical manner and taking into account the sustainability perspective. In the additional comments, respondents questioned the definition of a theory, mentioned different levels of theory (grand theories, research theories) as well as the tight connection between theory and methodology.

Categorization of Theories in the Survey Results

In this section, I will analyze the theories mentioned in the responses. Even though it is important to acknowledge the disciplinary origins of theories, it is also interesting to investigate the results across disciplinary boundaries. The categorization of foresight theories by Piirainen and Gonzalez (2015) is helpful in this task. The authors distinguish between three levels: philosophy of science/epistemology, theories of foresight, and theories in foresight. Adapting the framework to futures studies, the difference between the latter two is whether we discuss theories that explain and support futures studies or theories that explain the system under study (organization, institution, society) and its evolution. In other words, theories *of* futures studies are theoretical tools that help us understand the activities that take place in the futures field, for example, scenario building and visioning. Theories *in* futures studies mean theories which are used in conducting futures studies and which are about the studied phenomena and systems rather than about futures studies as such. Admittedly, these categories are somewhat ambiguous and they may overlap because the futures field is part of the society under study.

Philosophy of Science and Epistemology

Respondents mentioned several approaches in the philosophy of science: empiricism, positivism, critical realism, critical theory, social constructionism, hermeneutics, phenomenology, abductive reasoning, materialism, Weberian idealism, Foucault's power/knowledge, participation as an epistemological issue, and the general theory of consistency. The range of responses illustrates the diversity of perspectives in the humanities and social sciences. Following Alvesson and Sköldberg (2009), the approaches could be brought under three umbrella terms: positivism/post-positivism, social constructionism, and critical realism. The approaches differ in their stance toward value-free facts and the extent to which the empirical world covers all of reality. On the contrary, hermeneutics and phenomenology are closely linked to methodology. Phenomena appear very different when perceived through different approaches, but often these perspectives are not explicitly discussed in studies due to time and space constraints.

The claimed fragmentation of futures studies (Son 2015) is particularly clear at this level. There are not only different theories but different underlying notions of science and the role of theories within it. For example, an empirical-positivist philosophy of science considers discovery of facts about the world as relatively unproblematic. In contrast, a poststructuralist (social constructionist) perspective problematizes the ability of language to transparently describe social phenomena (Inayatullah 1998). It follows that theories are also constructing the social reality that they claim to explain. Therefore, theories are future-generating (Poli 2017, 70–72). Finally, a critical realist may attribute causal power to actors' beliefs, but the notion of a shared social reality with objectively occurring processes is not questioned (e.g., Bell 1997). The social constructionist and critical realist points of view in particular emphasize reflexivity, that is, positioning the researcher herself within the object of study.

Theories of Futures Studies

Several theories that explain or support futures studies were mentioned in the responses. Scenarios, alternative futures, and possible worlds were mentioned in at least seven responses. Scenarios may be seen not only as a set of methods but also as a theory or a family of theories, which includes theoretical consideration of possible worlds and different scenario archetypes (e.g., Boschetti et al. 2016). Two respondents mentioned networked foresight or foresight communities. In addition, respondents mentioned theories-in-use, theories of creativity, the theory of sociodynamic counseling, and theories of applied ethics. Theories of knowledge and information were also taken up. Roy Amara's (1981) premises of the futures field (the future is not predictable, the future is not predetermined, future

Table 3. Categorization of Theories in Futures Studies.

	Theories of action, practices, and behavior	Theories of change
Micro level	Sensemaking, anthroposemiosis, theories of representation, theories-in-use, rationality, practice theory, mental time travel, self-determination theory, futures consciousness, cognition theories, anticipation	Niche theory, pioneer analysis, innovation theories
Meso level	Theories of organizational culture, institutional theories, actor network theory, social network theories, the mobilities paradigm, anticipation	Theories of social movements, (sociotechnical) imaginaries, theories of institutional change, theories of regional development
Macro level	Theories of temporality, theories of decision making, (visionary) leadership, theory of power (Foucault), anticipatory governance, theories of complex systems, anticipation	Evolutionary theories, development theories, transition theories, cultural transformation, mediatization, images of the future (Polak), paradigms (Kuhn), the Annales school, Kondratieff waves, utopian thinking

outcomes can be influenced by individual choices) continued to be supported.

Theories in Futures Studies

Theories from several fields as well as transdisciplinary frameworks may be used to understand and explain phenomena in futures studies. As Wendell Bell (1997, 81) states, futurists are often "consumers and synthesizers of knowledge created by other scientists and scholars." Table 3 shows theories and frameworks from the survey results, heuristically divided according to two factors: (1) whether the focus is on action and practices or change in them and (2) the level of analysis. The micro level refers to individuals, the macro level refers to the surrounding society, and the meso level means all the different communities, organizations, and institutions between the micro- and macro levels.

On the micro level, respondents mentioned different sensemaking theories or approaches (sensemaking, anthroposemiosis, theories-in-use) as well as theories of practices and behavior such as Weberian rationality, theories of practice, and futures consciousness. Together with colleagues, we have promoted the study of futures consciousness drawing on the traditions of futures studies (Ahvenharju et al. 2018; Lombardo 2017). As general processes, sensemaking and semiosis also belong to the collective levels in addition to the individual level. Considering theories of change, different micro-level theories of emerging change were mentioned.

On the meso level, theories of organizational culture, institutions, and networks were mentioned, as well as theories that explain change on this level. Imaginaries and institutions are particularly interesting on this level, because these concepts can investigate the cultural and structural aspects of complex change processes and the interaction between cultural and structural aspects. In particular, the theory of sociotechnical imaginaries was mentioned by respondents (Jasanoff and Kim 2015). There are also numerous theoretical frameworks for studying institutional change that futurists can draw on, for example, the institutionalist schools of rational choice, historical institutionalism, and sociological institutionalism (Alasuutari 2016).

On the macro level, respondents addressed theories of temporality, leadership, power, and governmentality. Macro-level change can be seen through evolutionary theories, development theories, transition theories (such as the multi-level perspective; Geels 2002), theories of cultural transformation, theories of

mediatization, Kuhnian paradigms, the French Annales school of long-term history, and utopian thinking. On this level, there are three particularly interesting theories: Frederik Polak's theory of images of the future as drivers of change, Kondratieff waves that help to understand long-term economic development, and Pentti Malaska's framework of societal transformation (Malaska 1999; Polak 1973; Wilenius and Kurki 2017). Anticipation is mentioned in the left column on all levels, because the ability of living beings to make use of futures in their action covers micro-, meso-, and macro levels (Poli 2017). In addition, some methodological tools could be mentioned which include at least the seeds of a theory: weak signals, causal layered analysis (the theory of conceptual metaphors), visioning, and futures maps.

Contextualizing and Complementing the Results Based on Literature

While numerous theoretical perspectives were identified in the survey results, it is useful to contextualize them by investigating recent literature in futures studies and foresight. This review focuses on recent theoretical directions in futures studies. However, it should be noted that the approaches draw on long and complex histories in many cases. The review here does not explicitly cover the foundational assumptions of futures studies such as theories of time. For the history and basic assumptions of the field, there are several useful overviews of the futures field that have been produced over the years (e.g., Bell 1997; Cornish 2004; Masini 1993; Slaughter 2005). There are also useful historical timelines of the development of different approaches (Ahlqvist and Rhisiart 2015; Kuosa 2011; Son 2015).

In this section, I will present a categorization of five functionally differentiated theoretical approaches. Functional differentiation means that the theoretical approaches serve different functions within the broad field of futures studies. In other words, the focus is on what the theories are *for* rather than what they are *about*. Five functions are identified: rigorous forecasting, effective representation of futures, effectively pursuing futures, making sense of anticipatory processes, and radical epistemological critique. The typology is not exhaustive and certainly different theoretical approaches could be identified, but it serves as a scaffold for placing different theories in futures studies.

The identified theoretical approaches can be heuristically categorized according to two axes: the underlying philosophy of science, ranging from positivism to constructivism, and the perceived role of the theorist, ranging from analyst to influencer (see Figure 1). The boundaries between the categories are porous because different approaches often overlap each other rather than being neatly separated.

Theories in forecasting are connected to a positivistic philosophy of science and the aim of objectively analyzing phenomena and their future directions. Theories for effective representation, in turn, are generally skeptical toward positivism and emphasize imagination and creativity. However, representing the future through a limited number of possible end states and scenarios is still seen as fruitful. In contrast, when a constructivist epistemology is adopted, representing the multitude of possibilities through scenarios becomes problematic because the future is continuously being made and expanded by future-oriented agents (Tuomi 2012). Therefore, making sense of these anticipatory future-making processes becomes crucial.

When the theorist is seen as an active influencer, desired futures may be pursued either through rational and calculative planning or more creative approaches such as visioning and workshops. Each of these methodological approaches has its own distinct theoretical underpinnings. Finally, radical epistemological critiques consciously engage in acts of future making through reframing and redefining phenomena (e.g., Inayatullah 1998).

Before examining each theoretical approach separately, a few words about reflexivity are in order. In this context, reflexivity essentially means two interlinked abilities of researchers: moving across theoretical perspectives as necessary (cf. the concept of reflexive methodology by Alvesson and Sköldberg 2009) and positioning themselves as part of their object

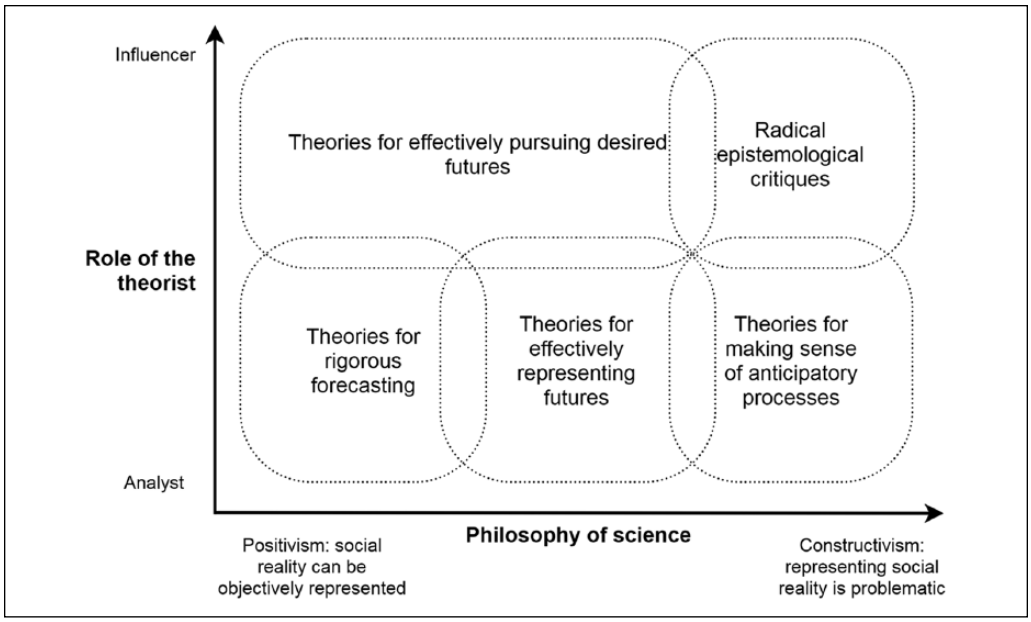

Figure 1. Categorization of theories according to philosophy of science and role of the theorist.

of study. The ability to move across perspectives means being able to apply the theoretical ideas behind forecasting when operating with relatively closed phenomena, and shifting to scenario planning theories or transition approaches, for instance, when developments appear more uncertain, perhaps within the same study. Of course, then researchers are vulnerable to accusations of theoretical eclecticism, and it is difficult to master many different theoretical perspectives. Therefore, cooperation across perspectives is important, and reflexivity always remains imperfect. The ability to reflexively position oneself in the object of study is important in all perspectives. For example, forecasts become part of the forecasted social reality, imagined scenarios may expand what is seen as possible, and futurist facilitators in a visioning process may influence the outcome at many points.

Theories for Rigorous Forecasting

The first approach is theories that support forecasting. This includes two aspects: domain-specific theories and general theories of heuristics, cognitive biases, and characteristics of successful forecasters. Domain-specific theories include innumerable theories about phenomena, such as economic behavior and political power, which help to make forecasts about the future of these phenomena. In addition to examining likely developments, forecasting includes "what-if" style questions where different events and likely outcomes are analytically tested based on certain theoretical assumptions.

The second element is the discussion of heuristics and cognitive biases (Bryson et al. 2016; Winkler and Moser 2016) and characteristics of successful judgmental forecasters (Tetlock and Gardner 2015). These theoretical discussions broadly come from systems and operations research. The common thread here is that the goals are to achieve rational and unbiased projections. In general, this line of work could be characterized as leaning toward developing methodology for empirical research, such as the Delphi method, rather than extensive theorizing (e.g., Hasson and Keeney 2011). Theories are primarily seen as analytical tools to be empirically tested. For example, *Technological Forecasting and Social Change* and the recently established journal *Futures & Foresight Science* steadily

publish papers on these theoretical and methodological developments.

Theories for Effectively Representing Futures

Theories for effectively representing futures include theories in scenario planning and explorative and possibilistic futures studies more broadly. The theoretical basis of scenario planning has been given significant attention recently. At least two conferences at the University of Warwick and two corresponding special issues of *Technological Forecasting and Social Change* have been dedicated to improving the theoretical foundations of scenarios. The theories behind scenario planning largely come from organizational studies and decision analysis. Chermack (2005) draws attention to scenario stories, learning, mental models, decisions, and performance. Wilkinson (2009) raises three areas of reflection for developing the theory basis of scenarios: distinguishing scenarios clearly from forecasts (including consideration of knowledge and ignorance), considering what is meant by "effectiveness," and paying attention to new theoretical developments such as University of Oxford's application of causal textures theory and sensemaking. The roles of causation, probability, complexity, structuration, and history have also been addressed specifically in scenario planning (Bradfield et al. 2016; Derbyshire 2016, 2017; Derbyshire and Wright 2017; MacKay and Tambeau 2013; Ramírez and Selin 2014). Utilizing the concept of "futures map," Kuusi et al. (2015) develop quality criteria for strengthening the comprehensiveness and effectiveness of the exploration of possibilities. The common thread in scenario theorizing is that these theories aim to improve scenario planning a practical activity rather than theorizing about social change as such. In the survey results, this is reflected, for instance, in the emphasis on sensemaking and theories-in-use.

Another thread can be found in theorizing around plausible futures narratives, worldmaking, and the role of aesthetics (e.g., Carbonell et al. 2017; Eidinow and Ramirez 2016; Raven and Elahi 2015; Vervoort et al. 2015). This line of theories goes beyond pragmatic development of scenario planning and further into understanding future orientation, but representing alternative futures remains a core concern. The "theory of possible worlds" is an example of this line of theory from the survey results. Discussions on complexity and (deep) uncertainty are somewhat cross-cutting and linked to many perspectives, but they are perhaps most prominent in theorizing and methodological development of scenarios (e.g., Derbyshire 2016; Wilkinson et al. 2013). However, it should be remembered that Mika Mannermaa (1991) proposed complexity-oriented evolutionary futures studies as an alternative to the scenario paradigm.

Theories for Effectively Pursuing Desired Futures

Effective pursuit of desired futures is commonly seen as one of the tasks of futures studies (Amara 1981; Bell 1997, 75–97). Desirability can be viewed narrowly, as helping clients pursue their preferred future or as a broader mission of ensuring desirable futures across society. Combining proactivity with exploration has been a key theme in futures studies at least since the early work of the French school of *la prospective*. Bertrand de Jouvenel's (1967) distinction into dominating and masterable futures is a central theoretical starting point.

One key strand of this theorizing is linked to planning and policy making, and in particular improving the link between foresight and policy making (van Dorsser et al. 2018; Vink et al. 2016; Volkery and Ribeiro 2009). From this perspective, it is crucial to understand policy processes and functioning of political power because these largely influence the effectiveness of foresight work. Therefore, policy sciences and policy analysis are important sources. One interesting example of this line of theorizing is Tapio and Hietanen's (2002) typology of futures paradigms based on who forms possible futures, who assesses their desirability, and who makes the final decisions. Notably, the concept of wicked problems originates from planning

theory (Rittel and Webber 1973). The *Future-Oriented Technology Analysis* conferences, organized by the European Commission, are one key forum for discussions on these themes.

Sustainability and transition theories were mentioned by many survey respondents, and this is a prominent theme in futures studies. In recent literature, for example, different kinds of sociotechnical transition pathways and different actor roles in transitions have been theorized (de Haan and Rotmans 2018; Svensson and Nikoleris 2018). Going further from transitions to transformation and closer to methodology, pioneer analysis has been proposed as an approach to analyzing transformations and the role of future-making pioneers (Heinonen and Karjalainen 2019).

Theories for Making Sense of Anticipatory Processes

Theoretical tools for making sense of anticipatory processes have long been part of futures studies, and they are recently gaining attention within social sciences more broadly. These approaches differ from the previous ones because they do not examine possible or preferable futures but rather the processes and mechanisms around ideas of the future. Social and sociotechnical imaginaries were prominently featured in the survey, and the related concept of semiosis was also mentioned. Social imaginaries and the role of imagination in building futures have been discussed in recent years by several social scientists, building on foundations laid by Benedict Anderson and Cornelius Castoriadis, for example (Anderson 1991; Castoriadis 1987; Jasanoff and Kim 2015; Patomäki and Steger 2010; Steger 2008; Sum and Jessop 2013; Taylor 2004). The sociology of expectations is a closely linked field that investigates expectations as "forceful fictions" (Borup et al. 2006; Selin 2008). Turning toward methodology, Ruth Levitas argues for utopia as a sociological method drawing on Ernst Bloch's work on the "principle of hope" (Levitas 2013). In futures studies, these topics have been pioneered by Fred Polak's (1973) *The Image of the Future* and Wendell Bell and James Mau's (1971) early work on images of the future, and continued by Anita Rubin's studies on images of the future and theory building around visioning (Rubin 2013; van der Helm 2009). Due to common themes, there is much scope for mutual learning between futures studies and the social sciences.

Recent efforts to study anticipatory processes have been united under the umbrella term "anticipation." The emerging field of anticipation studies is developing a distinct theoretical basis around the concept of anticipatory systems, drawing on theoretical biology, philosophy, and a range of fields, including design thinking, knowledge management, and Mikhail Bakhtin's narrative chronotopes (Miller 2018, 18; Poli 2017; Rosen 2012; Tuomi 2019). Anticipation was one of the most common recurring themes in the survey results. Anticipation studies is difficult to describe generally because it is envisioned as an umbrella for diverse future-oriented investigations in the natural sciences, social sciences, and humanities (Poli 2017, chapters 2 and 3). The field is also a moving target with biannual conferences and book series, although to my knowledge, there is no journal clearly devoted to anticipation at the time of writing. The uniting factor is the focus on understanding how complex anticipatory systems function rather than making projections about futures.

Radical Epistemological Critiques

The final category is radical epistemological critiques. The foundations of so-called futures knowledge have been problematized by critical futurists at least since the 1980s (Slaughter 1982). The roots of radical future-oriented critiques can be traced to utopian thinking and literature which posited different worlds, free from current limitations (e.g., Bell 2003, chapter 1). There are diverse critical and poststructural social theories that have influenced futures studies, but the common factor is the critical stance toward empirical-positivistic social science and theoretical problematization of phenomena. The original concept of critical futures studies drew on Jürgen Habermas' notion of the emancipatory knowledge interest (Slaughter

1982, 183–92). As an alternative perspective, poststructuralism has been adapted to serve as a foundation for futures theorizing and methods in the 1990s (Inayatullah 1998). Feminism (Hurley et al. 2008) and postcolonial critiques have also been proposed (Nandy 1987; Sardar 1993), and the critical lens has been turned to issues such as education (Amsler and Facer 2017). Integral futures also represent an epistemological critique of mainstream futures studies by incorporating the "inner worlds" of individuals and cultures into a holistic inquiry (Slaughter 2008).

There have been calls for integrating critical social theory more broadly into futures studies (Ahlqvist and Rhisiart 2015; Ehliasson 2008; Karlsen et al. 2010). In addition, and sometimes in opposition, to poststructural theorizing, there are also perspectives inspired by political economy, Habermasian critical theory, Latourian science and technology studies, and critical utopian imagination, for instance (Ahlqvist and Rhisiart 2015; Goode and Godhe 2017; Karlsen et al. 2010). Design fiction and speculative design represent another theoretical direction, which is linked to utopian imagination and practice and which combines design thinking and critical theory (e.g., Dunne and Raby 2013). The design fiction approach could also be seen as representing futures. However, the aim tends to be freely imagining and constructing different alternative perspectives now rather than representing possible or plausible long-term futures.

Conclusion

As stated in the "Introduction" section, the aim of this review is to open discussion rather than presenting an exhaustive list of the most important theories in futures studies. The empirical material is based on responses from researchers and postgraduate students in a single European organization, Finland Futures Research Centre, and the survey was intentionally short and light. Therefore, the results should be interpreted as issues for further discussion rather than making definite conclusions about theories in the futures field. For instance, it is important to ask what is missing from the above lists and categories and what should be given more emphasis. To what extent are shared theoretical starting points and theoretical coherence desirable features of an interdisciplinary field? Should futures studies include a broad range of diverse theories, as long as the theoretical starting points are openly discussed? If "foundations of futures studies" exist, do they consist of a general worldview or shared methods rather than shared theories? One conclusion can be drawn from these survey results: futures studies has a rich theoretical basis which could be emphasized in futures education and developed further, also taking into account tensions between different traditions and schools.

The futures and foresight literature provides many examples of theoretical directions. Five broad approaches have been chosen to contextualize and complement the survey results: (1) theories for forecasting, (2) theories for representing futures, (3) theories for pursuing desired futures, (4) theories for making sense of anticipatory processes, and (5) radical epistemological critiques. These approaches represent different parts of the futures field, and they can be placed in different positions along the continua from positivism to constructivism, and from analytical orientation to proactive influencing. No doubt other theoretical approaches could also be identified, and indeed it is valuable that the discussion remains open and inclusive. Developing futures studies as a theoretically and methodologically rigorous interdisciplinary field is an ongoing challenge.

As argued in this review, it is important to draw attention to the importance of reflexivity when discussing theories in futures studies. In this context, reflexivity means two things: that we can consciously move across different theoretical fields as necessary for research objectives, and that we recognize our impact on the world as we study it in light of particular theories. This is especially important in futures studies, because influential theories, such as theories of mainstream economics, can create futures in two different senses. First, theories produce expectations about the future and thus fill our horizon of expectations with particular images of the future. Second, theories influence decision making and societal development, and therefore, they are making the future world for

coming generations. For both scientific and ethical reasons, it is crucial to recognize and discuss the theories that guide us and continue to develop and transform them.

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Notes

1. This review is a revised and expanded version of an article in Finnish published in *Futura*, 2/2019.
2. It is also possible that, as a social scientist, it is easiest for me to recognize these theories.

References

Adam, Barbara, and Chris Groves. 2007. *Future Matters: Action, Knowledge, Ethics*. Supplements to the Study of Time. Leiden: Brill.

Ahlqvist, Toni, and Martin Rhisiart. 2015. "Emerging Pathways for Critical Futures Research: Changing Contexts and Impacts of Social Theory." *Futures* 71:91–104. doi:10.1016/j.futures.2015.07.012.

Ahvenharju, Sanna, Matti Minkkinen, and Fanny Lalot. 2018. "The Five Dimensions of Futures Consciousness." *Futures* 104:1–13. doi:10.1016/j.futures.2018.06.010

Alasuutari, Pertti. 2016. "Neoinstitutionalist Sociology." In *The SAGE Handbook of Cultural Sociology*, edited by David Inglis and Anna-Mari Almila, 144–158. London: Sage. doi:10.4135/9781473957886.

Alvesson, Mats, and Kaj Sköldberg. 2009. *Reflexive Methodology: New Vistas for Qualitative Research*. London: Sage.

Amara, Roy. 1981. "The Futures Field: Searching for Definitions and Boundaries." *The Futurist* 15 (1): 25–29.

Amsler, Sarah, and Keri Facer. 2017. "Contesting Anticipatory Regimes in Education: Exploring Alternative Educational Orientations to the Future." *Futures* 94:6–14. doi:10.1016/j.futures.2017.01.001.

Anderson, Benedict R. 1991. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. Rev. and extended ed. London: Verso.

Bell, Wendell. 1997. *Foundations of Futures Studies: History, Purposes and Knowledge*. Human Science for a New Era. Vol. 1. New Brunswick: Transaction Publishers.

Bell, Wendell. 2003. *Foundations of Futures Studies: Human Science for a New Era*. Values, Objectivity, and the Good Society. Vol. 2. New Brunswick: Transaction Publishers.

Bell, Wendell, and James A. Mau. 1971. "Images of the Future: Theory and Research Strategies." In *The Sociology of the Future: Theory, Cases, and Annotated Bibliography*, edited by Wendell Bell and James A. Mau, 6–44. New York: Russell Sage Foundation.

Borup, Mads, Nik Brown, Kornelia Konrad, and Harro Van Lente. 2006. "The Sociology of Expectations in Science and Technology." *Technology Analysis & Strategic Management* 18 (3–4): 285–98. doi:10.1080/09537320600777002.

Boschetti, Fabio, Jennifer Price, and Iain Walker. 2016. "Myths of the Future and Scenario Archetypes." *Technological Forecasting & Social Change* 111:76–85. doi:10.1016/j.techfore.2016.06.009.

Bradfield, Ron, James Derbyshire, and George Wright. 2016. "The Critical Role of History in Scenario Thinking: Augmenting Causal Analysis within the Intuitive Logics Scenario Development Methodology." *Futures* 77:56–66. doi:10.1016/j.futures.2016.02.002.

Bryson, Stephanie, Megan Grime, Adarsh Murthy, and George Wright. 2016. "Behavioral Issues in the Practical Application of Scenario Thinking: Cognitive Biases, Effective Group Facilitation and Overcoming Business-as-Usual Thinking." In *Behavioral Operational Research: Theory, Methodology and Practice*, edited by Martin Kunc, Jonathan Malpass & Leroy White, 195–212. London: Palgrave Macmillan. doi:10.1057/978-1-137-53551-1_10.

Bussey, Marcus. 2014. "Concepts and Effects: Ordering and Practice in Foresight." *Foresight* 16 (1): 1–16. doi:10.1108/FS-04-2013-0017.

Carbonell, Javier, Antonio Sánchez-Esguevillas, and Belén Carro. 2017. "From Data Analysis to

Storytelling in Scenario Building. A Semiotic Approach to Purpose-Dependent Writing of Stories." *Futures* 88:15–29. doi:10.1016/j.futures.2017.03.002

Castoriadis, Cornelius. 1987. *The Imaginary Institution of Society*. Cambridge: Polity.

Chermack, Thomas J. 2005. "Studying Scenario Planning: Theory, Research Suggestions, and Hypotheses." *Technological Forecasting & Social Change* 72 (1): 59–73. doi:10.1016/j.techfore.2003.11.003.

Cornish, Edward. 2004. *Futuring: The Exploration of the Future*. Bethesda: World Future Society.

de Haan, Fjalar J., and Jan Rotmans. 2018. "A Proposed Theoretical Framework for Actors in Transformative Change." *Technological Forecasting & Social Change* 128:275–86. doi:10.1016/j.techfore.2017.12.017.

de Jouvenel, Bertrand. 1967. *The Art of Conjecture*. New York: Basic Books.

Derbyshire, James. 2016. "The Implications, Challenges and Benefits of a Complexity-Orientated Futures Studies." *Futures* 77:45–55. doi:10.1016/j.futures.2016.02.001.

Derbyshire, James. 2017. "The Siren Call of Probability: Dangers Associated with Using Probability for Consideration of the Future." *Futures* 88:43–54. doi:10.1016/j.futures.2017.03.011.

Derbyshire, James, and George Wright. 2017. "Augmenting the Intuitive Logics Scenario Planning Method for a More Comprehensive Analysis of Causation." *International Journal of Forecasting* 33 (1): 254–66. doi:10.1016/j.ijforecast.2016.01.004.

Dryzek, John S., and Simon Niemeyer. 2010. "Pluralism and Meta-consensus." In *Foundations and Frontiers of Deliberative Governance*, edited by John S. Dryzek, 85–116. Oxford: Oxford University Press. doi:10.1093/acprof:oso/9780199562947.003.0005.

Dunne, Anthony, and Fiona Raby. 2013. *Speculative Everything: Design, Fiction, and Social Dreaming*. Cambridge: The MIT Press.

Ehliasson, Kent. 2008. "Futures Studies as Social Science: An Analytic Scheme and a Case Study." *Futures* 40 (5): 489–502. doi:10.1016/j.futures.2007.10.007.

Eidinow, Esther, and Rafael Ramirez. 2016. "The Aesthetics of Story-Telling as a Technology of the Plausible." *Futures* 84:43–49. doi:10.1016/j.futures.2016.09.005.

Geels, Frank W. 2002. "Technological Transitions as Evolutionary Reconfiguration Processes: A Multi-level Perspective and a Case-Study." *Research Policy* 31 (8–9): 1257–74.

Goode, Luke, and Michael Godhe. 2017. "Beyond Capitalist Realism—Why We Need Critical Future Studies." *Culture Unbound: Journal of Current Cultural Research* 9 (1): 109–29. doi:10.3384/cu.2000.1525.1790615.

Hasson, Felicity, and Sinead Keeney. 2011. "Enhancing Rigour in the Delphi Technique Research." *Technological Forecasting & Social Change* 78 (9): 1695–1704. doi:10.1016/j.techfore.2011.04.005.

Heinonen, Sirkka, and Joni Karjalainen. 2019. "Pioneer Analysis as a Futures Research Method for Analysing Transformations." In *Anticipation, Agency and Complexity*, edited by Roberto Poli and Marco Valerio, 61–77. Cham, Switzerland: Springer International Publishing.

Hines, Andy, and Jeff Gold. 2013. "Professionalizing Foresight: Why Do It, Where It Stands, and What Needs to Be Done." *Journal of Futures Studies* 17 (4): 35–54.

Hurley, Karen, Eleonora Masini, Elise Boulding, Riane Eisler, Smita Premchander, Pamela McCorduck, and Patricia Kelly, et al. 2008. "Futures Studies and Feminism." *Futures* 40 (4): 388–407. doi:10.1016/j.futures.2007.08.004.

Inayatullah, Sohail. 1998. "Causal Layered Analysis: Poststructuralism as Method." *Futures* 30 (8): 815–29.

Jasanoff, Sheila, and Sang-Hyun Kim, eds. 2015. *Dreamscapes of Modernity*. Chicago: University of Chicago Press. http://www.press.uchicago.edu/ucp/books/book/chicago/D/bo20836025.html.

Karlsen, Jan Erik, Erik F. Øverland, and Hanne Karlsen. 2010. "Sociological Contributions to Futures' Theory Building." *Foresight* 12 (3): 59–72. doi:10.1108/14636681011049884.

Kuosa, Tuomo. 2011. "Evolution of Futures Studies." *Futures* 43 (3): 327–36.

Kuusi, Osmo, Kerstin Cuhls, and Karlheinz Steinmüller. 2015. "The Futures Map and Its Quality Criteria." *European Journal of Futures Research* 3 (1): 22. doi:10.1007/s40309-015-0074-9.

Levitas, Ruth. 2013. *Utopia as Method the Imaginary Reconstitution of Society*. Basingstoke: Palgrave Macmillan.

Lombardo, Thomas. 2017. *Future Consciousness: The Path to Purposeful Evolution*. Lanhan: John Hunt Publishing.

MacKay, Brad, and Paul Tambeau. 2013. "A Structuration Approach to Scenario Praxis."

Technological Forecasting and Social Change, Scenario Method: Current Developments in Theory and Practice 80 (4): 673–86. doi:10.1016/j.techfore.2012.06.003

Malaska, Pentti. 1999. "A Conceptual Framework for the Autopoietic Transformation of Societies." FUTU-Publication 5/99. http://www.utu.fi/fi/yksikot/ffrc/tutkimus/hankearkisto/Documents/futu_5_99.pdf.

Mannermaa, Mika. 1991. "In Search of an Evolutionary Paradigm for Futures Research." *Futures* 23 (4): 349–72.

Marien, Michael. 2010. "Futures-Thinking and Identity: Why 'Futures Studies' Is Not a Field, Discipline, or Discourse: A Response to Ziauddin Sardar's 'the Namesake.'" *Futures* 42 (3): 190–94. doi:10.1016/j.futures.2009.11.003.

Masini, Eleonora. 1993. *Why Futures Studies?* London: Grey Seal Books.

Miller, Riel, ed. 2018. *Transforming the Future: Anticipation in the 21st Century*. Abingdon: Routledge.

Nandy, Ashis. 1987. *Traditions, Tyranny, and Utopias: Essays in the Politics of Awareness*. Delhi: Oxford University Press.

Niiniluoto, Ilkka. 2009. "Futures Studies: Science or Art?" *Futura* 28 (1): 59–64.

Patomäki, Heikki, and Manfred B. Steger. 2010. "Social Imaginaries and Big History: Towards a New Planetary Consciousness?" *Futures* 42 (10): 1056–1163.

Piirainen, Kalle A., and Rafael A. Gonzalez. 2015. "Theory of and within Foresight—'What Does a Theory of Foresight Even Mean?'" *Technological Forecasting & Social Change* 96:191–201. doi:10.1016/j.techfore.2015.03.003.

Polak, Fred L. 1973. *The Image of the Future*. Translated by Elise Boulding. Amsterdam: Elsevier.

Poli, Roberto. 2017. *Introduction to Anticipation Studies*. Vol. 1. Cham, Switzerland: Springer International Publishing.

Ramírez, Rafael, and Cynthia Selin. 2014. "Plausibility and Probability in Scenario Planning." *Foresight* 16 (1): 54–74. doi:10.1108/fs-08-2012-0061.

Raven, Paul Graham, and Shirin Elahi. 2015. "The New Narrative: Applying Narratology to the Shaping of Futures Outputs." *Futures* 74:49–61. doi:10.1016/j.futures.2015.09.003.

Rittel, Horst W. J., and Melvin M. Webber. 1973. "Dilemmas in a General Theory of Planning." *Policy Sciences* 4 (2): 155–69. doi:10.1007/bf01405730.

Rosen, Robert. 2012. *Anticipatory Systems: Philosophical, Mathematical, and Methodological Foundations*. 2nd ed. IFSR International Series on Systems Science and Engineering, Vol. 1. New York: Springer.

Rubin, Anita. 2013. "Hidden, Inconsistent, and Influential: Images of the Future in Changing Times." *Futures* 45:S38–S44. doi:10.1016/j.futures.2012.11.011.

Sardar, Ziauddin. 1993. "Colonizing the Future: The 'Other' Dimension of Futures Studies." *Futures* 25 (2): 179–87. doi:10.1016/0016-3287(93)90163-n.

Selin, Cynthia. 2008. "The Sociology of the Future: Tracing Stories of Technology and Time." *Sociology Compass* 2 (6): 1878–95. doi:10.1111/j.1751-9020.2008.00147.x.

Slaughter, Richard A. 1982. "Critical Futures Study and Curriculum Renewal: Implications for Secondary Curricula in England and Wales." University of Lancaster. http://richardslaughter.com.au/wp-content/uploads/2008/04/Slaughter_PhD_Critical_FS__Curric_Renewal_1982.pdf.

Slaughter, Richard A. 2008. "What Difference Does 'Integral' Make?" *Futures* 40 (2): 120–37. http://linkinghub.elsevier.com/retrieve/pii/S0016328707001759.

Slaughter, Richard A. 2005. *The Knowledge Base of Futures Studies Volume 1: Foundations*. CD-ROM. Foresight International. https://foresightinternational.com.au/wp-content/uploads/2015/04/KBFS_Vol_1_Intro.pdf.

Son, Hyeonju. 2015. "The History of Western Futures Studies: An Exploration of the Intellectual Traditions and Three-Phase Periodization." *Futures* 66:120–37. doi:10.1016/j.futures.2014.12.013.

Sovacool, Benjamin K., and David J. Hess. 2017. "Ordering Theories: Typologies and Conceptual Frameworks for Sociotechnical Change." *Social Studies of Science* 47 (5): 703–50. doi:10.1177/0306312717709363.

Spaniol, Matthew J., and Nicholas J. Rowland. 2019. "Defining Scenario." *Futures & Foresight Science* 1 (1): e3. doi:10.1002/ffo2.3

Steger, Manfred B. 2008. *The Rise of the Global Imaginary: Political Ideologies from the French Revolution to the Global War on Terror*. Oxford: Oxford University Press.

Sum, Ngai-Ling, and Bob Jessop. 2013. *Towards a Cultural Political Economy*. Cheltenham: Edward Elgar. doi:10.4337/9780857930712.

Svensson, Oscar, and Alexandra Nikoleris. 2018. "Structure Reconsidered: Towards New Foun-

dations of Explanatory Transitions Theory." *Research Policy* 47 (2): 462–73. doi:10.1016/j.respol.2017.12.007.

Tapio, Petri, and Olli Hietanen. 2002. "Epistemology and Public Policy: Using a New Typology to Analyse the Paradigm Shift in Finnish Transport Futures Studies." *Futures* 34 (7): 597–620. doi:10.1016/S0016-3287(02)00003-4.

Taylor, Charles. 2004. *Modern Social Imaginaries*. Durham: Duke University Press.

Tetlock, Philip E., and Dan Gardner. 2015. *Superforecasting: The Art and Science of Prediction*. 1st ed. New York: Crown Publishers.

Tuomi, Ilkka. 2012. "Foresight in an Unpredictable World." *Technology Analysis and Strategic Management* 24 (8): 735–51. doi:10.1080/09537325.2012.715476.

Tuomi, Ilkka. 2019. "Chronotopes of Foresight: Models of Time-Space in Probabilistic, Possibilistic and Constructivist Futures." *Futures & Foresight Science* 1 (2): e11. doi:10.1002/ffo2.11

van der Helm, Ruud. 2009. "The Vision Phenomenon: Towards a Theoretical Underpinning of Visions of the Future and the Process of Envisioning." *Futures* 41 (2): 96–104. doi:10.1016/j.futures.2008.07.036.

van Dorsser, Cornelis, Warren E. Walker, Poonam Taneja, and Vincent A. W J Marchau. 2018. "Improving the Link between the Futures Field and Policymaking." *Futures* 104:75–84. doi:10.1016/j.futures.2018.05.004.

Vervoort, Joost M., Roy Bendor, Aisling Kelliher, Oscar Strik, and Ariella E. R. Helfgott. 2015. "Scenarios and the Art of Worldmaking." *Futures* 74:62–70. doi:10.1016/j.futures.2015.08.009.

Vink, Martinus, Martijn van der Steen, and Art Dewulf. 2016. "Dealing with Long-Term Policy Problems: Making Sense of the Interplay between Meaning and Power." *Futures* 76:1–6. doi:10.1016/j.futures.2016.01.003.

Volkery, Axel, and Teresa Ribeiro. 2009. "Scenario Planning in Public Policy: Understanding Use, Impacts and the Role of Institutional Context Factors." *Technological Forecasting & Social Change* 76 (9): 1198–1207. doi:10.1016/j.techfore.2009.07.009.

Wilenius, Markku, and Sofi Kurki. 2017. "K-Waves, Reflexive Foresight, and the Future of Anticipation in the Next Socioeconomic Cycle." In *Handbook of Anticipation*, edited by Roberto Poli, 1–21. Cham, Switzerland: Springer International Publishing. doi:10.1007/978-3-319-31737-3_36-1.

Wilkinson, Angela. 2009. "Scenarios Practices: In Search of Theory." *Journal of Futures Studies* 13 (3): 107–14.

Wilkinson, Angela, Roland Kupers, and Diana Mangalagiu. 2013. "How Plausibility-Based Scenario Practices Are Grappling with Complexity to Appreciate and Address 21st Century Challenges." *Technological Forecasting & Social Change* 80 (4): 699–710. doi:10.1016/j.techfore.2012.10.031.

Winkler, Jens, and Roger Moser. 2016. "Biases in Future-Oriented Delphi Studies: A Cognitive Perspective." *Technological Forecasting & Social Change* 105:63–76. doi:10.1016/j.techfore.2016.01.021.

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