

Accepted Manuscript

Title: The Five Dimensions of Futures Consciousness

Authors: Sanna Ahvenharju, Matti Minkkinen, Fanny Lalot

PII: S0016-3287(17)30161-1
DOI: <https://doi.org/10.1016/j.futures.2018.06.010>
Reference: JFTR 2327



To appear in:

Received date: 11-5-2017
Revised date: 10-4-2018
Accepted date: 15-6-2018

Please cite this article as: Ahvenharju S, Minkkinen M, Lalot F, The Five Dimensions of Futures Consciousness, *Futures* (2018), <https://doi.org/10.1016/j.futures.2018.06.010>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Version Monday, 9 April 2018

The Five Dimensions of Futures Consciousness

Sanna Ahvenharju^{a*}, Matti Minkkinen^a, Fanny Lalot^b

^a Finland Futures Research Centre, Turku School of Economics, FI-20014 University of Turku, Finland,
sanna.ahvenharju@utu.fi, matti.minkkinen@utu.fi

^b University of Geneva, Faculty of Psychology and Educational Sciences, 40 boulevard du Pont d'Arve, 1205
Geneva, Switzerland, fanny.lalot@unige.ch

* Corresponding author, sanna.ahvenharju@utu.fi

Highlights

- There is no commonly used, operational definition of future consciousness that could be used in empirical futures research.
- Future consciousness overlaps with many other related concepts, such as future orientation and anticipation.
- Our review and analysis of these concepts identifies five different dimensions that are central to future consciousness.
- The resulting model is called the Five Dimensions of Futures Consciousness.
- The dimensions are time perspective, agency beliefs, openness to alternatives, systems perception and concern for others.

ABSTRACT

Futures research studies and builds images of possible, probable and preferable futures and paths to such futures. Underlying this effort is human consciousness of futures that is present in everyday anticipatory behaviour and explicit foresight. Futures researchers often aim to increase this consciousness in order to enable decision-making towards more desirable futures. Despite the importance of the concept of Futures Consciousness, and the proliferation of related concepts, there is no commonly used definition or operationalization that would permit empirical research. This article presents a conceptual model of Futures Consciousness that is based on an integrated review and analysis of the descriptions of future consciousness and its related concepts in literature as well as in the theoretical underpinnings of futures research. The model contains five dimensions: 1) Time perspective, 2) Agency beliefs, 3) Openness to alternatives, 4) Systems perception and 5) Concern for others. The model provides the basis for further conceptual development and the operationalization of Futures Consciousness, which would enable its use in empirical research.

Keywords

future consciousness
futures consciousness
future orientation
future awareness
anticipation

-

1 An operational definition of future consciousness

Human awareness of the future has been a central concern in the field of futures studies for many years. Advocating for the benefits of widespread futures awareness and futures-oriented thinking has been a generally shared commitment among futures researchers: for example, according to Masini (1993, p. 90), increasing the level of knowledge of the consequences of actions was one of the key drivers in the emergence of the scenario research method in the 1960s. Similarly, at the very beginning of *Future Shock*, Alvin Toffler notes that his book is “designed to increase the future-consciousness of its reader” (Toffler, 1970, p. 2). Frederik Polak has proposed that raising future consciousness should serve as one of the key objectives in futures research, a particularly important task in post-War Europe where technology had been developing rapidly but the prevailing social mood was pessimistic (Polak, 1971; van der Helm, 2005).

Despite the general interest and theoretical discussions, there seems to be a gap between conceptual development of the future consciousness concept and empirical or practical applications in futures research literature. In a research effort spanning more than a decade, Thomas Lombardo (e.g. 2007, 2008, 2016) has developed a holistic conception of future consciousness, but we were unable to find applications of this inclusive model in empirical research or applied foresight. Apart from Lombardo’s holistic conception, exploration on the topic is scarce, and there is no commonly utilized and accepted framework or measures for studying future consciousness in research settings. This is consistent with Richard Slaughter’s (2009) finding that futures research tends to focus on structural phenomena, and that there are relatively few psychologically oriented articles in the field of futures research.

This article presents the results of the first stage of a research effort that aims to find ways to study future consciousness and to measure its prevalence. The goal of this article is to present a sufficiently comprehensive but simple and pragmatic model of Futures Consciousness, based on the exploration of scientific literature and related conceptual development in the field of futures research. The purpose is that the model would be applicable to both individual and group levels. The dimensions of the model specifically focus on the cognitive, emotional and motivational processes that lead towards Futures Consciousness. This model will then, at later stages of the research project, be applied to empirical research, to measure and analyse factors that explain future-oriented activities.

The article begins with a review of the existing definitions of future consciousness in section two. It then continues with a review of other similar concepts in section three. Section four describes the methodology of literature and conceptual review, and section five presents the five dimensions of Futures Consciousness that were created as a result. The discussion and conclusions are presented in the final sections.

2 Existing definitions and models of future consciousness

Among futures researchers, future consciousness is generally seen as a holistic concept that draws attention to the future as an internalized and experienced phenomenon. Johan Galtung defines future consciousness as “being conscious of what is possible, probable, and desirable in the future” (Johan Galtung, quoted in Lombardo, 2007, p. 2). According to this brief definition, future consciousness is the

heightened awareness of what could and should happen in the future. Another interesting definition of future consciousness has been written by futurist Anita Rubin (2013, p. 906), who defines future consciousness as an “active and action-oriented perspective on the future, present and past and the relations between these. [It is] an internalized form of the development of thinking [and] a specific effort to form a conception about the meanings and consequences of issues and our daily actions.” Rubin thus highlights the notions of agency, internalized futures thinking, and the links between the past, present and future.

Recently, researchers and futures practitioners associated with the International Futures Forum have defined future consciousness as a “shared capacity” and as “awareness of the future potential of the present moment”, limited by cognitive, psychological and systemic issues (Sharpe, Hodgson, Leicester, Lyon, & Fazey, 2016). According to them, three modes of anticipatory awareness, short-term ‘managerial’, mid-term ‘entrepreneurial’ and long-term ‘visionary’, represent foundational forms of future consciousness (Sharpe & Hodgson, 2017). The authors argue that the explicit use of all three perspectives, as in their Three Horizons method, can be thought of as future consciousness (Sharpe et al., 2016). However, the authors do not explore the structure and content of the concept of future consciousness further.

In addition to these brief definitions, during this project, only two authors were identified who have studied the concept of future consciousness and its contents in more detail. Øystein Sande’s article ‘Future Consciousness’, published in 1972 in the *Journal of Peace Research*, presents the six dimensions of future consciousness that are based on his research and observations that were made during the Ten Nation Study together with Johan Galtung (Sande, 1972). The dimensions include: 1) Length, referring to the time perspective of individuals and how far they plan and foresee the future; 2) Level of interest, indicating individual interests or concerns about the future at the personal, national or world level; 3) Optimism, referring to individual expectations of good or bad things happening in the future; 4) Influence, describing the sense of powerlessness or influence of individuals; 5) Expectations, referring to the future that individuals expect to happen; and 6) Values, as indicated in individuals’ desired futures (Sande, 1972).

Although these six dimensions that Sande presents serve as a good starting point for exploring the content of future consciousness, the dimensions are incongruent and do not seem to form a unified and cohesive whole. This was also noted in the critique the approach received at the time (Huber, 1977). The first four dimensions refer to the general axes of futures thinking, for instance, from the personal to the world level, while the last two dimensions cover the content of envisioned futures – probable and desirable futures, respectively. Using this approach as the basis for the operationalization of future consciousness would require further refinement to the model.

Another author who has done extensive work on the conceptual development of future consciousness and who has published numerous books and articles on the topic is Thomas Lombardo (See e.g. Lombardo, 2006, 2007, 2008, 2011, 2014, 2016, 2017). Lombardo defines future consciousness as “the total integrative set of psychological abilities, processes, and experiences humans use in understanding and dealing with the future” (Lombardo, 2008, p. 6). Lombardo emphasizes future consciousness as a multifaceted psychological capacity of an individual, involving several psychological processes including “perception and behavior; emotion and motivation; learning, memory, and understanding; anticipation, thinking, and planning;

intuition and imagination; self-identity; and social interaction” (Lombardo, 2016). For Lombardo, future consciousness is built upon humanity’s innate perception of time, persistence and change, it varies among individuals and groups, and it can develop over time. In addition to psychological abilities and processes, it involves thematic elements: hopes, fears, ideas, visions and beliefs about the future, as well as behaviours intended to create desired futures (Lombardo, 2008, pp. 7–8, 2016). Lombardo strongly emphasizes the holistic nature of future consciousness and its central role as the most distinctive capacity of humans (Lombardo, 2016).

In addition to the list of psychological processes involved in future consciousness, Lombardo provides a list of character virtues of *heightened* future consciousness, which is presented as a normative concept and viewed as the main feature of wisdom (Lombardo, 2016):

- Self-awareness, self-control, and self-responsibility (an empowered personal narrative)
- Realistic idealism (the belief in and pursuit of excellence)
- Self-growth (a progressive personal narrative)
- The skill and love of learning (including honesty, wonder, curiosity, humility, and the quest for truth and understanding)
- The skill and love of thinking and multiple modes of understanding (including self-reflectivity, intuition and insight, and the virtues of critical thinking)
- Expansive temporal consciousness (a rich and thoughtful integration of history and the future—imaginative and visionary foresight—an evolved grand narrative)
- Cosmic consciousness (including awe, ecological and global consciousness, and a sense of reciprocity, justice, and transcendence)
- Hope, courage, and optimism
- Love (including gratitude, passionate appreciation, and compassion)
- Deep purpose and tenacity (including discipline and commitment)
- Ethical pragmatism (practical wisdom—knowledge and ethics in action)
- Creativity and the adventuresome spirit
- Balance and temperance (the integration of multiple values and virtues)

While Lombardo presents a comprehensive account of future consciousness as a holistic and integrated set of psychological abilities and processes, it may be a problematic starting point for empirical research. Such a broad approach would require a complicated research strategy and use of multiple methods.

Nevertheless, several of Lombardo’s features can be used as a starting point in the search for a more pragmatic and simpler model of future consciousness, as we will argue below in section 4.

Although only two authors have made significant developments on the exact concept of future consciousness, there are a number of researchers and futurists who have written about similar phenomena but with different terms. To better understand what future consciousness could be and how it fits in with the context of futures research and thinking, it is necessary to create an overall view of the multiplicity of other similar concepts that exist within the field. A summary of these concepts is presented in the following section.

3 Overview of neighbouring concepts

The futures field has evolved into a network of scholars, practitioners, and consultants, and developments in the field have often centred around so-called flagship methodologies (Mermet, Fuller, & van der Helm, 2009). The practice-orientation of futures studies has meant that new concepts are often introduced without explicit definitions, theoretical grounding or empirical testing, which makes it difficult to conduct a systematic scholarly review of the diversity of concepts that have been introduced in the field. In addition, these concepts often have an explicitly normative dimension: they are meant to promote futures thinking. At the same time, other fields such as psychology, sociology and anthropology have developed their own distinctive approaches towards the future (Poli, 2014a). As a result, there are different scholarly 'dialects' that discuss similar phenomena. This section aims to provide an overview of the collection of terms and concepts that significantly overlap with future consciousness, at least in the initial investigation. The overview is intended to cover concepts that may be seen as substitutes for future consciousness rather than discussing all the possible constituent parts, prerequisites and consequences of future consciousness, which is beyond the scope of this article.¹

Future consciousness is connected to most, or all, of the central concepts in futures research, including images of the future, scenarios, visions, trends and weak signals. However, Seginer (2009) makes a distinction between *athematic* and *thematic* approaches to the future. She discusses this distinction within the context of future orientation, but it can be applied more generally to approaches to the future. While *athematic* approaches consider aptitudes, traits or capabilities related to future-oriented psychological processes without considering its content, *thematic* approaches explicitly consider the content of the envisioned futures. Images of the future, visions and scenarios are examples of *thematic* approaches to the future, as they describe particular futures. However, *athematic* and *thematic* approaches are closely linked to one another. For instance, an individual with a high level of future consciousness may have well-articulated images of the future, and likewise the development of future images is likely to increase their future consciousness.

This article will present a conceptual model of Futures Consciousness based on the *athematic* approach. Therefore the overview in the next sections concentrates on concepts referring to future-related cognitive skills, personality dimensions, thinking styles or analytical approaches – rather than content-oriented approaches like future visions, scenarios or images. The included concepts can be used to describe the capability of a person – or an organization – for comprehending possible future developments, the impact of perceived futures on the present situation as well as the impacts of present choices on the future. These concepts are *future orientation*, *prospective attitude*, *anticipation*, *prospection*, *projectivity* and *futures literacy*.

¹ For a holistic overview of related psychological concepts, see e.g. Lombardo (2008, 2017).

3.1 Future orientation

Future orientation has been discussed by both psychologists and futures researchers. In both fields, the concept of future orientation highlights the expected future as a factor that motivates individuals to take certain actions. Within psychology, future orientation refers to a complex and multi-dimensional cognitive-motivational system involving the extension of the time perspective, subjective judgments of probability, motivational aspects and affective aspects (Trommsdorff, 1983). Future orientation has also been defined as “individuals’ tendency to engage in future thinking” and “generalized aptitude to think about the future” (See e.g. Seginer, 2009, pp. 3, 5). Future orientation has its roots in six orientations of psychology: human motivation, self-theories, personality, cognitive processes, neuropsychology, and human development (Seginer, 2009). Researchers on human motivation consider future orientation as a central aspect of behaviour; one’s goals and plans are located in the future, and hence one’s approach towards the future is based on their subjective construction (See e.g. Nuttin & Lens, 1985). Self-theorists look at how the future has been apprehended through the self, i.e. how one perceives oneself in a future and how this impacts one’s emotions, motivation and behaviour. For example, Markus and Nurius (1986) have proposed the notion of ‘possible selves’, which are anticipations of whom one could, would or wants to become. Personality researchers see future orientation as a stable personality trait that enables planning, fosters academic achievement, reduces risk-taking and increases resilience (See e.g. Zimbardo & Boyd, 1999, 2009). Cognitive psychologists draw a parallel between memory and future thinking and consider them both as processes of reliving and pre-living (Suddendorf & Corballis, 1997), whereas neuropsychologists study the commonalities and differences of the neurological processes underlying them. Finally, developmental research has studied the relevance and impact of future orientation to each period of human development, from infancy to adulthood and old age (See e.g. Nurmi, 2005).

In psychological literature, the focus is predominantly on the individual’s own futures. In futures research, the focus is somewhat broader. Future orientation has been defined by some Hungarian futures researchers as “the characteristic and the capacity, unique to human beings, which enable thinking to be regulated by the past and present, but also to reflect continuously assumptions and expectations regarding the future” (Nováky, Hideg, & Kappéter, 1994). Future orientation has a strong attitude component as future attitudes are “expressed in future orientation” (Nováky et al., 1994), and in places future orientation and future attitude are used almost interchangeably (Hideg & Nováky, 2010). In this approach, future orientation also means that thinking consists of preconceptions, imagination and expectations regarding the future, and the connections between the past, present and future (Hideg & Nováky, 2010). Overall, the approach is similar to Anita Rubin’s definition of future consciousness. However, this approach goes beyond the future-related capacities into actions taken in the interest of the future, such as signing up for insurance (Hideg & Nováky, 2010).

Obviously, the research on future orientation is broad, established and includes various approaches, and therefore it is difficult to summarise its main features or compare it with future consciousness as described in section two. Nevertheless, future orientation and future consciousness approaches share several viewpoints: the understanding of time, future-oriented thinking and the emphasis on the role of the

individual in changing the course of the future. Compared with the other concepts covered in this section, there is much more empirical research available on future orientation.

3.2 Prospective attitude

An early concept from the futures research tradition is Gaston Berger's *prospective attitude*, which means taking a broader look at long-term futures and having the imagination and courage for taking risks, while also taking care of humanity (Durance, 2010; Godet & Roubelat, 1996). The concept has also been translated as *foresight attitude* and defined as "modifying individual representations by building new frames of analysis" and allowing individuals to make better decisions (Bootz, 2010). The central features of the concept are the extensive time horizon, the bold imagination that this enables, and the focus on improving present decision-making rather than making accurate predictions. The prospective attitude was seen by Berger as necessary in the context of rapid social change, and thus the concept was framed normatively from the beginning. Compared with the definitions and dimensions of future consciousness in section two, prospective attitude seems to refer to a normative subset of the features of future consciousness. The focus on virtues (Durance, 2010) is similar to Lombardo's concept of heightened future consciousness.

3.3 Anticipation

Anticipation is a rising theme in futures research, and it has been the focus of recent papers, books and academic conferences (Poli, 2017a, 2017b). Some authors have even called for the establishment of the 'discipline of anticipation' (Miller, Poli, & Rossel, 2014). Anticipation is a deliberately broad concept that has been proposed as an umbrella term for all cognitive interest in futures (Poli, 2014a). It is a general phenomenon that encompasses all efforts that focus on knowing, thinking about, and utilising the future, from the individual to the organizational and societal level (Miller et al., 2014). Anticipation may be either explicit, conscious consideration of the future, or implicit and embedded in the structure and properties of an anticipatory system (Poli, 2010). The phenomenon of anticipation ranges from trees losing their leaves to human societies planning for the future. Anticipation is present in most human activities since, by nature, people look ahead and are open to the future (Poli, 2011, 2014b). Operationalizing anticipation is difficult, because the concept covers such varied phenomena and because the general theory of anticipation is still at an early phase of development (Poli, 2014b). Comparing anticipation with Lombardo's holistic future consciousness, anticipation could be seen as one of its parts. However, the model of futures consciousness presented later in this article may be seen as a prerequisite for anticipation and as a form of anticipatory capacity and attitude that is amenable to operationalization.

3.4 Prosepection

Within psychology, a rising future-oriented approach is *prosepection*, which means guidance by present evaluative representations of possible future states (Seligman, Railton, Baumeister, & Sripada, 2013). A recent special issue of the *Review of General Psychology* was dedicated to “the science of prosepection” (Baumeister & Vohs, 2016). Poli (2014b) lists prosepection as a subcategory of anticipation. Thus, prosepection is narrower in scope than anticipation, but it is also a multi-dimensional concept. Szpunar, Spreng and Schacter (2016) have presented a taxonomy of prosepection which ranges from the episodic prosepection of personal events to semantic prosepection of the general states of the world, and encompasses simulation, prediction, intention and planning. When discussing the episodic side of prosepection, Szpunar (2010) prefers the term *episodic future thought*, since it links the concept directly to episodic memory, a link that studies have demonstrated (Berntsen & Bohn, 2010). Buckner and Carroll (2007), in turn, suggest that there are four different kinds of prosepection: navigational, social, intellectual and memorial. The literature on prosepection primarily deals with the ‘simulation’ type of prosepection, where individuals continuously generate future simulations and project themselves into the future, often without conscious initiation or monitoring. Simulations are simplified versions of reality that trick the brain into thinking that the expected events are already unfolding (Gilbert & Wilson, 2007). The theory is built around a feed-forward model of learning, where expectations are continuously adapted to observations (Seligman et al., 2013). Knowledge, cognition and emotions all play crucial roles in prosepection (Gilbert & Wilson, 2007; Szpunar et al., 2016). This episodic simulation type of prosepection relates to concrete imagined situations in a particular individual’s life. According to the prosepection approach, individuals continuously explore and evaluate their options based on future expectations. Prosepection encompasses both the processes and thematic content of futures. The relation between prosepection and future consciousness is similar as in the previous section on anticipation. Holistic future consciousness is broader than prosepection since it involves, for instance, self-identity and social interaction (Lombardo, 2016). The narrower conception of futures consciousness developed in this article could be defined as a precedent to prosepection, that is, a prospective tendency and capacity.

3.5 Projectivity

Projectivity is another subcategory of anticipation which has been discussed by sociologists as a temporal aspect of human agency. The discussion of projectivity draws on existentialism and phenomenology, and the central idea is that the ‘project’, understood as a future possibility to be realized, gives meaning to action for human actors (Emirbayer & Mische, 1998; Mische, 2009). The projectivity concept is essentially an adaptation of anticipation and prosepection to social action beyond the individual, which brings new dimensions such as social conflicts and negotiation (Emirbayer & Mische, 1998, p. 984). Its relationship to future consciousness is similar to the previous two concepts.

3.6 Futures literacy

Futures literacy is a normative concept that is intended to improve the anticipative capacities of organizations and societies. Futures literacy is defined as “the capacity to think about the potential of the present to give rise to the future by developing and interpreting stories about possible, probable and desirable futures” (Miller, 2007). Futures literacy differs from anticipation and prospection in its normative focus. Futures literacy is a learned ability that helps to promote analytical rigour in anticipatory activities, such as futures research and organizational foresight. Its ultimate aim is to shape better anticipatory systems. Futures literacy has been defined as a cumulative capacity consisting of three levels: awareness, discovery and choice (Miller, 2015). Before Miller, Slaughter discussed futures literacy similarly in terms of capabilities: grounding futures capability in futures concepts and using futures discourse as a basis for effective action or strategy (Slaughter, quoted in Krawczyk & Slaughter, 2010). Futures literacy pertains to futures research and organizational foresight processes, and it remains unclear whether it is intended to be extensively operationalized on the individual level, although a post-scenario survey study has been developed to measure participants’ cognitive categories of the future (Rhisiart, Miller, & Brooks, 2015). In relation to future consciousness, futures literacy is more focused on the development of futures thinking of specialists, whereas future consciousness encompasses laypeople as well as specialists and involves also other psychological processes than cognition.

As can be seen from the previous descriptions, there is a complex web of overlapping concepts describing similar phenomena. This is partly because the concepts have been developed for different purposes, such as practical foresight work or understanding the everyday futures thinking of individuals. For instance, Hungarian futures researchers have written about future orientation in the context of adaptation to a post-Soviet reality (Nováky et al., 1994), whereas the concept of anticipation has been ambitiously proposed as the basis for an entire discipline. However, all of these concepts contain aspects that are close to our idea and understanding of future consciousness. To be able to utilize these disparate concepts, the research analysis focused on the descriptions and lists of features from these approaches for the identification of dimensions that are central to future consciousness. This step of the process is described in the next section. The newly developed model will hence be referred to as Futures Consciousness with capital initials to separate it from the general usage of the term in the futures field.

4 Searching for the dimensions of Futures Consciousness

Futures Consciousness, in our view, is clearly a complex phenomenon that is linked to all of the concepts described in section three. To be able to form a simple and pragmatic model of Futures Consciousness as a human capability for empirical purposes, an approach was chosen that focused on the potential dimensions that the concept would consist of. The relevant question, then, is what features does an entity need to have in order to have a high level of Futures Consciousness? The entity in question may be an individual, a group, an organization, a nation state or, perhaps, humanity overall.

While developing the dimensions, certain choices had to be made in order for the model to be pragmatic and suitable for empirical research. Firstly, the number of dimensions should be reasonably few and clearly

different from one another to avoid confusion and overlaps. Secondly, the dimensions should be understood as precursors of future-conscious behaviour that include different processes of motivation, emotion and cognition. Thirdly, the model should allow empirical study into the behavioural impacts of Futures Consciousness and therefore it cannot include behavioural aspects in itself. Fourthly, the dimensions should be defined in a way they may be applied to both individuals and groups, although they may be operationalized differently at different levels.

To identify potential dimensions of Futures Consciousness, an exploratory study with a qualitative approach (Creswell, 2007) was carried out utilizing the relevant literature. The exploration concentrated on the identification and analysis of dimensions relevant to Futures Consciousness. First, a systematic literature review was carried out to find existing lists of features, variables, characteristics or dimensions that have been proposed as the components of Futures Consciousness, as well as lists that had been used to characterize any related concepts. The resulting collections of lists can be found in Table 1.

Of the lists in Table 1, the first one was already presented in section two. The second one presents a shorter and earlier version of Lombardo's heightened future consciousness, which is more concise than the one presented in section two and hence more suitable for our purposes. Six more lists were identified from the traditions of future orientation, prospective attitude and anticipation. The *components of future orientation* have been suggested by Gisela Trommsdorff (1983) in the context of analysing socialization processes. Her conceptualization of future orientation has been summarized and tested by Sarah Beal (2011) in her dissertation. The *basic virtues for developing a prospective attitude* as well as the *features of a prospective attitude* have been defined by Gaston Berger (Durance, 2010; Godet & Roubelat, 1996) in the context of establishing the French 'La prospective' school of foresight after the Second World War. And the *cumulative levels of futures literacy* have been proposed by Riel Miller for developing organizational capabilities for rigorously exploring possible futures and assessing today's choices (Miller, 2007). Mische (2009) sketches a list of *cognitive dimensions of future projections* in the context of linking cognition and action and understanding the role of projected futures in social change. Ogilvy (2011), in turn, lists three *dimensions of the scenaric stance*, which is defined as a frame of mind in which one is capable of holding multiple futures continuously in view, both optimistic and pessimistic ones.

In addition to the above, four lists of characteristics describing the field of futures studies were also included in the analysis. The reasoning for this is that futures studies in itself is a form of futures thinking and reflects a process that should involve a high level of future consciousness. These four lists are: *elements of a rationale* by Richard Slaughter (1996a) presented in the context of defining futures concepts to help future-oriented discourse; *key assumptions of futures studies*, a classic list by Wendell Bell (1997), described in his work on the foundations of futures studies; *four laws of futures studies* that were suggested by Ziauddin Sardar (2010) in a discussion of the terminology used in the futures field and the preferred direction for futures studies; and the *multiple faces of futures research*, which Sirkka Heinonen (2013; 2015) has developed in the context of future energy scenarios and developed further in future workshops with Nick Balcom Raleigh.

It should be emphasised here that only such lists were included that could be used as a basis for identifying dimensions of Futures Consciousness as a human capability. For example, there are a number of lists within

futures research that describe the critical elements of future-related processes or the contents of ideal types of future thinking that are not directly applicable for this purpose. Such lists are, for example, the five dimensions of future time perspective (see e.g. Seijts, 1998), as well as the three components of future orientation by Rachel Seginer (2009). Anticipation, in turn, is such a multifaceted and contextual phenomenon that no generic list of dimensions for human anticipation were found. Roberto Poli (2014a), Riel Miller (Miller, Poli, & Rossel, 2013) and their colleagues have listed aspects of an emerging discipline of anticipation, but these dimensions concern basic distinctions and emphases of the discipline, and they do not provide ideas for potential lists of anticipatory capacities or a basis for operationalization.

Once the lists were collected, the different characterizations were divided into their single components and their contents were then analysed and compared with each other, to identify differences and similarities. Finally, the single components were collated together to identify groups of components that could depict different dimensions of Futures Consciousness. The results of this exercise are shown in Table 2. The analysis resulted in the identification of five different dimensions of Futures Consciousness: 1) Time perspective, 2) Agency beliefs, 3) Openness to alternatives, 4) Systems perception and 5) Concern for others.

However, some characterizations could not be placed within this structure, and those that were left out have been placed under the label 'miscellaneous'. All the terms in this category from Sande, Bell, Trommsdorff and Beal were thematic concepts that describe thought contents, or results from futures research, instead of capabilities. Examples include Sande's 'expectations', Bell's 'future facts', 'sequence of events' from Trommsdorff and Beal as well as Sardar's future discourse impacts. 'Clarity' and 'genre' (Mische, 2009) refer to structural aspects of future projections which are difficult to connect to human capacities. In addition, the basic virtue of 'sensitivity' as defined by Berger was difficult to interpret, because no longer texts explaining the content of the terms were available for the authors of this paper. Thus, it was placed under miscellaneous.

It should be noted that the process of grouping and naming these components is vulnerable to researcher bias. It is up to subsequent research – and especially the application of this framework in empirical research – to demonstrate if this structure of dimensions is useful and explanatory.

As the last stage of analysis, the components included in each of the five dimensions were studied in more detail, and the contents were then reflected with other futures research literature to provide more depth, context and content to these five dimensions. The results of this analysis are presented in the next section.

5 The Five Dimensions of Futures Consciousness explored

In short, the resulting model of Futures Consciousness consists of the following five dimensions: Time perspective, which allows the understanding of the past, present and future as well as the value of long-

term thinking; Agency beliefs, which depicts one's trust in their ability to influence future events; Openness to alternatives, which enables critical questioning of established truths and seeing the possibilities that changes may bring about; Systems perception, which helps to see the interconnectedness between human and natural systems as well as the complex consequences of decisions; and finally, Concern for others, which makes one strive for a better world for everyone. In the following sections, each of these aspects will be explored in more detail with insights from futures research literature.²

5.1 Time perspective

Time perspective, long-term thinking, looking at the future – most of the lists of characteristics contained an aspect related to time or the future. The time perspective forms the foundation of the multidimensional model of Futures Consciousness: understanding the concept of passing time and being aware of tomorrow are the basic prerequisites for being conscious about the future. The first of the five dimensions was named time perspective rather than future perspective, since an emphasis was put on all three aspects of time: past, present and future.

How people understand time is subjective, and '30 years in the future' does not mean the same thing to a 20 and a 60-year-old person. According to Sande (1972), a person who is reasonably confident in how their future will unfold would have a more far-reaching future consciousness than a person living in perpetual uncertainty. Similarly, Lombardo (2006) emphasizes that the human capacity for imagining the future may vary from person to person, and some are more capable of long-term thinking than others.

Much of the tradition of psychological future-orientation research has focused on how far an individual plans their future or how far their images of the future reach (Beal, 2011). Time perception makes individuals aware of the way that events and their consequences follow each other as sequences of events over time.

5.2 Agency beliefs

The capacity and tendency for looking forward in time form the basis of Futures Consciousness, but one must also have a sense of being able to influence how the future will unfold, which makes agency a highly relevant building block for this model. The capacity for influencing the future through individual or collective agency is a shared assumption in the field of futures research, where the future is commonly understood as contingent and open within the limits of what is possible (Bell, 1997). There is no predetermined future that could be discovered. Instead, people are seen as active agents who can exercise their power and causal influence towards shaping the future, and this can be seen in most of the characterizations listed under this dimension in Table 2. Bell even claims that the "futurist model of social behaviour centrally rests on a conception of motivated individuals pursuing their own projects", which is

² The authors are preparing another article to review relevant psychological concepts related to the Five Dimensions of Futures Consciousness.

similar to the concept of projectivity (Bell, 1997; Mische, 2009). This concept of agency also has a normative underpinning: to tackle future challenges, responsible action with a long-term vision is needed.

The key question concerning agency is tractability, that is, to what extent individuals can shape the course of future events (Rescher, quoted in Malaska, 2001). De Jouvenel (1967) makes a distinction between dominating and masterable parts of the future. Masterable parts are those that can be influenced by an agent with their own actions. A similar distinction is made by Polak (1973) in his definition of influence optimism and pessimism and essence optimism and pessimism. The former relates to a category of events whose course can be influenced by action and the latter to unchangeable events that cannot be influenced. A person can feel optimistic or pessimistic about events in both categories. In any case, it is important to be able to identify what can be influenced by the focal actor acting alone or together with others. This way, the future does not have to be accepted as inevitable, if it actually can be influenced by individuals or groups. Expanding on these notions, Michel Godet (2001) has classified attitudes towards the future into five categories: passive, reactive, preactive, proactive and anticipative. The first two categories describe a low level of agency regarding the future, whereas the next two describe a high sense of agency: the preactive attitude means taking precautionary steps to anticipate contingencies, and proactivity means taking steps to make the desired future happen. The final category is a combination of the previous three categories.

5.3 Openness to alternatives

The third building block for Futures Consciousness was named openness to alternatives. It combines several related characterizations of creativity, imagination, critical thinking and openness, and it is strongly linked to the capability of embracing and appreciating change, seeing the value of alternative ways, and questioning established truths.

Although societies and individuals are engaged in repetitive patterns of behaviour, the fact that the future may always bring new phenomena was a central theme in most of the characterizations under this dimension (See e.g. Sardar, 2010; Slaughter, 1996b). Bell emphasizes the 'possible singularity of the future' (Bell, 1997) which infers that the future never follows a straight trajectory that is determined by the past. At times when social change is not rapid, the future may seem similar to the past, and hence one's past understanding may suffice in understanding the future. But especially in times of rapid social change, cognitive maps may be drastically outdated for grasping the future as it unfolds (de Jouvenel, 1967). The punctuated equilibrium model and evolutionary futures studies emphasize this type of thinking (Capoccia & Kelemen, 2007; Mannermaa, 1991). In such unprecedented situations, the ability to reconstruct cognitive maps through critical thinking is put to a test, and conflicts may occur when old traditions and authorities are questioned.

The necessary capacities for dealing with potential changes include a variety of capacities from courage to hypothetical thinking, from creativity to constant questioning, risk-taking and thoroughness (Berger, quoted in Durance, 2010; Godet & Roubelat, 1996; Heinonen, 2013; Lombardo, 2008, 2016). Being flexible in the face of many alternatives requires holding multiple futures in view and avoiding simple optimism or

pessimism (Ogilvy, 2011). Miller, in turn, argues that futures literacy requires the acknowledgement of novel and emergent phenomena (“unknown unknowns”) and the capacity for spontaneity rather than ‘colonizing’ the future by predicting and making detailed plans that are based on past images of the future (Miller, 2015).

5.4 Systems perception

The fourth dimension of Futures Consciousness is systemic perception. Systemic and holistic thinking were not as obviously visible in the lists of characteristics in Table 2 than the previous three dimensions. However, in many of the aspects that were described in previous dimensions, systemic conceptualization of problems and processes could be identified in the background.

Taking a systemic approach to societal problems is one of the main traditions of futures research. The origins of the Club of Rome and their studies on the future of economics and natural resources were based on systems models, notably the Limits to Growth report (Meadows, Meadows, & Randers, 1972). Systemic and holistic approaches – rather than linear and hierarchical ways of thinking – are considered especially applicable when dealing with human cultures and societies. The complexity of these systems makes it difficult and perhaps impossible to foresee every consequence and impact of a given decision, and thus there is always the possibility of unexpected impacts (Meadows, 2008). Furthermore, significant conflicts may arise when defining what is good or best, since the optimal solution for one part of the system might not be the best for the system as a whole, and vice versa (Luukkanen, 2016). As a link to the previous dimension, recent work in futures research emphasizes an open systems approach with open anticipatory assumptions rather than viewing systems as closed, deterministic and controllable, arguing that the former is more appropriate for taking into account human agency and emergent novelty (Miller et al., 2013; Patomäki, 2006).

We wish to highlight that we are not arguing that an individual or group needs to adopt a particular systemic worldview or theory of reality in order to have a high level of futures consciousness. However, they need to have the capacity for systems perception when it is necessary or useful, and we argue that it often is both. Thus the capacity and tendency for systems perception are separate from any particular description of systems, in the present or in the future. According to Bell, there are strong interrelations and interdependencies between systems, and in order for anyone to be future-conscious, one has to be able to look at the problems and issues at hand from a holistic point of view (Bell, 1997) or to ‘look breadthwise’ (Berger, quoted in Godet & Roubelat, 1996). If one’s focus is only on partial systems, one would be less able to understand the complex and long-term consequences of one’s decisions. Miller emphasizes the capacity of anticipatory systems to systematically and rigorously imagine possibilities and causal structures (Miller, 2007). Heinonen (2013), Sardar (2010) and Slaughter (1996b) emphasize a holistic approach towards understanding the complexities and causalities of the systems which people are living in.

5.5 Concern for others

Once a person or an entity is capable of long-term thinking, has a sense of agency, appreciates the diversity and unpredictability of potential futures and observes one's environment with a critical mind-set and understands the complexity of their society and actions, the question is what are they going to do with it? What kind of future should one aim for? The fifth building block of Futures Consciousness draws together the characterizations that reflect values, morals and ethical thinking.

Polak (1971) asserts that, in essence, future consciousness requires a person to be preoccupied with the direction they want the future to take, and he calls on us to develop our *choice-consciousness*. Although making choices about the future is clearly not a value-free proposition, there is no consensus on globally shared universal values. Sande (1972) suggests that values in the context of future consciousness refer to what a person wants to see realized in the future. In his studies, the values that were accepted by majority of respondents were peace and disarmament; values that would highlight the realization of a better future for all of humanity, not just for oneself. Similarly, it has been emphasized that the ethics of care and responsibility should be central in the context of futures thinking and research, since at present people need to make responsible decisions in a context of radical uncertainty (Groves, 2009).

Futures research as a scholarly and applied field has a strong tradition of normativity (Bell, 2004; Flechtheim, 1966; Mannermaa, 1986). Many futurists share the idea of aiming towards a *better*, or a *preferable* future, instead of just observing the development towards any future. As Bell argues, if any future is a good future, then there is no reason to be too concerned about the issue (Bell, 1997). Another commonly accepted value in the context of future consciousness can be derived from the concept itself: protecting the welfare of future generations. Thus, this dimension emphasizes the capacity for being concerned about and committing oneself to bettering not only one's own future, but the future of others, of society, and even the future of generations yet unborn as well.

6 Discussion

As the literature review above suggests, it is mainly psychologists who are interested in finding out if a concept like future consciousness or future orientation is empirically observable and measurable. Futurists, instead, mainly discuss the concept from either a philosophical-speculative, methodological or pragmatic-instrumental point of view. Our attempt to develop a simple and pragmatic conceptualization of Futures Consciousness aims to bridge this gap and bring the discussion within the futures field into a fruitful dialogue with empirical research in psychology and other related fields.

Future consciousness is a difficult subject due to the varying scope of definitions and the network of similar concepts in different scholarly fields, as was discussed in sections two and three. There are two possibilities for conceptual confusion. First, authors may describe similar phenomena using different vocabularies or 'dialects'. Second, authors may use the same term, such as future consciousness, while they are discussing different concepts. For these reasons, our stated interest lies in developing a simple, pragmatic, generally

applicable and analytically sound conceptual model of Futures Consciousness that could be applied to various contexts and purposes.

Compared to the previous work on future consciousness and the neighbouring concepts presented in sections two and three, the contribution of this conceptualization of Futures Consciousness comes from focusing on Futures Consciousness as a general capacity and by outlining a relatively simple structure with five dimensions which may be operationalized in different ways for different purposes. In the five-dimensional structure, the 'systems perception' and 'concern for others' dimensions are the most obvious new contributions of this Futures Consciousness model. The omission of the 'concern for others' dimension in many of the other concepts is deliberate, since they are intended as ethically neutral concepts that do not focus on ethics and desirable futures. In our view, ethical concern for the future of others is an integral part of Futures Consciousness.

A general conceptual model of Futures Consciousness assumes that a futures-oriented consciousness can be studied separately from its substantive content, from particular contexts, images of the future, or scenarios. We suggest that the dimensional structure of Futures Consciousness is similar in different environmental, cultural and historical contexts. The level of Futures Consciousness in individuals or organizations, on the other hand, may differ between persons or contexts. By developing an approach for the study of Futures Consciousness in athenatic terms, it should be – at least theoretically – possible to develop a universal tool for measuring it. Many of the current empirical measurement tools are strongly related to specific cultural contexts and they cannot be easily applied to different contexts. With an athenatic approach, cultural and contextual differences could be identified and studied. For example Seth, an Indian futures researcher, emphasizes different cultures and their different understandings of future consciousness, due to different variations in their perceptions of time and change (Seth, 1989). According to him, it is the duty of futurists to develop an analytical tool to help improve our understanding of these processes. Further empirical studies are needed to study how stable the dimensional structure is in different contexts.

A simple model of a complex concept may of course be criticized for omitting certain dimensions. For example, behaviour has been omitted because we wish to *predict* behaviour from Future Consciousness. As such, to include behaviour into the concept and then explain behaviour by using the same concept would be circular reasoning. Affective aspects, in turn, are problematic for a general concept of Futures Consciousness, because emotions are more likely to concern particular imagined futures than the future as such. In general, we would argue that the motivational, emotional and cognitive processes are all intertwined in the five dimensions; further analysis of their interplay would require deeper and more thorough analysis than what is possible within this paper.

Finally, an observation from the analysis of the characterizations of futures concepts. It is interesting that understanding and appreciating history did not appear as a dimension in the literature search that was related to future consciousness, although parallels between historiography and futures research have been examined previously (AUTHOR, 2015; Staley, 2002). One aspect of time perspective, particularly on the collective level, is historical consciousness, which refers to a shared understandings of history among ordinary people as well as historians (Seixas, 2006). One is tempted to seek parallels between different

types of historical and futures thinking: history/past and 'the future' refer to actual events, historiography and futures research refer to scholarly research on the past and futures, and historical consciousness and future consciousness refer to common understandings of the past and futures. However, such parallels may be deceptive. In futures thinking, the perspectives of decision-making and openness to alternatives are important, and they have no clear parallels in history apart from counterfactual imagining, which nevertheless does not alter actual historical events. In addition, the concept of historical consciousness is predominantly thematic, focusing on the content of the past, while the Futures Consciousness concept is defined as a general capacity rather than a consideration of what may happen in the future.

7 Conclusions

As the result of literature review and analysis, we have come to the following understanding of Futures Consciousness. Futures Consciousness is the capacity that an organization or an individual has for considering future consequences, having a sense of empowerment towards influencing their courses of action, openly assessing alternative courses, approaching problems from a holistic and systemic point of view, and striving for a better future not only for the self but for all of humanity. Futures Consciousness builds on personal or organizational features and its manifestations may vary depending on historical, cultural or environmental contexts. It is a capacity that can be developed through awareness-raising activities and education. Futures Consciousness may explain actions or behaviours, but the concept itself does not focus on action. Instead, it focuses on the prior conditions that allow future-oriented behaviour to take place. In addition, our definition of Futures Consciousness is universal: it does not take into account the content of individual thoughts on the future, such as concrete images or plans, but rather concentrates on the processes that produce them.

The five-dimensional model of Futures Consciousness presented in this paper consists of three actor-centred dimensions – the time perspective, agency beliefs and openness to alternatives – and combines them with two dimensions that focus on the larger societal level: systemic perception and concern for others. These five dimensions of Futures Consciousness form a unified basis for further research on understanding and developing the way that humans approach the future. We present this model as a starting point for further theoretical elaboration and refinement.

Based on this model of Futures Consciousness, we see subsequent research heading in two potential directions. First, the construct may be operationalized for different purposes: for measuring Futures Consciousness on the individual, organizational or societal level. Second, the conceptual model can be used as a frame for qualitative studies on future-related discourses, such as strategy documents, newspaper articles, and research interviews. Starting from the conceptualization of Futures Consciousness, there are many interesting research questions. For instance, how has Futures Consciousness developed over time in a specific setting? Which aspects of Futures Consciousness are emphasized in current discussions at the expense of others? Which aspects of Futures Consciousness are emphasised in different cultures and historical times? What explains the differences behind individual level variations in the level of Futures Consciousness? If increasing the level of Futures Consciousness is one of the tasks of futures studies, which dimensions should we focus on as futurists?

The authors are currently preparing conceptual research on the psychological features of the five-dimensional model of Futures Consciousness, as well as a psychometric tool to measure it at an individual level.

Acknowledgements

We are grateful to Enrico Wensing from the Columbia University and Titta Tapiola from Finland Futures Research Centre for extensive and intensive discussions on future consciousness. We also want to thank colleagues at the Finland Futures Research Centre, especially Sirkka Heinonen, Markku Wilenius and Liisa Haapanen for valuable comments. We are also grateful to Alain Quiamzade from the University of Geneva for support as well as Sam Parwar from the University of Turku for proof-reading.

Funding: This work was supported by the Tiina and Antti Herlin Foundation and the University of Turku Graduate School. The funding sources had no involvement in the conduct of this research.

References

- Baumeister, R. F., & Vohs, K. D. (2016). Introduction to the special issue: The science of prospection. *Review of General Psychology, 20*(1), 1–2. <https://doi.org/10.1037/gpr0000072>
- Beal, S. J. (2011). *The Development of Future Orientation: Underpinnings and Related Constructs*. University of Nebraska-Lincoln. Retrieved from <http://digitalcommons.unl.edu/psychdiss/32>
- Bell, W. (1997). *Foundations of Futures Studies: Human Science for a New Era. Vol. 1, History, Purposes and Knowledge*. New Brunswick, N.J.: Transaction Publishers.
- Bell, W. (2004). *Foundations of futures studies : human science for a new era. Vol. 2, Values, objectivity, and the good society*. New Brunswick, NJ: Transaction Publishers. Retrieved from </vwebv/holdingsInfo?bibId=1189498>
- Berntsen, D., & Bohn, A. (2010). Remembering and forecasting: The relation between autobiographical memory and episodic future thinking. *Memory & Cognition, 38*(3), 265–278. <https://doi.org/10.3758/MC.38.3.265>

Bootz, J.-P. (2010). Strategic foresight and organizational learning: A survey and critical analysis.

Technological Forecasting and Social Change, 77(9), 1588–1594.

<https://doi.org/10.1016/j.techfore.2010.06.015>

Buckner, R. L., & Carroll, D. C. (2007). Self-projection and the brain. *Trends in Cognitive Sciences*, 11(2), 49–57. <https://doi.org/10.1016/j.tics.2006.11.004>

Capoccia, G., & Kelemen, R. D. (2007). The Study of Critical Junctures: Theory, Narrative, and Counterfactuals in Historical Institutionalism. *World Politics*, 59(03), 341–369.

<https://doi.org/10.1017/S0043887100020852>

Creswell, J. W. (2007). *Designing and conducting mixed methods research*. SAGE Publications.

de Jouvenel, B. (1967). *The Art of Conjecture*. New York: Basic Books Inc.

Durance, P. (2010). Reciprocal influence in future thinking between Europe and the USA. *Technological Forecasting & Social Change*, 77, 1469–1475.

Emirbayer, M., & Mische, A. (1998). What Is Agency? *American Journal of Sociology*, 103(4), 962–1023.

<https://doi.org/10.1086/231294>

Flechtheim, O. K. (1966). *History and Futurology*. Meisenheim am Glan: Verlag Anton Hain.

Gilbert, D. T., & Wilson, T. D. (2007). Propection: Experiencing the Future. *Science*, 317(5843), 1351–1354.

<https://doi.org/10.1126/science.1144161>

Godet, M., & Roubelat, F. (1996). Creating the Future: The Use and Misuse of Scenarios. *Long Range Planning*, 29(2), 164–71. [https://doi.org/10.1016/0024-6301\(96\)00004-0](https://doi.org/10.1016/0024-6301(96)00004-0)

Groves, C. (2009). Future ethics: risk, care and non-reciprocal responsibility. *Journal of Global Ethics*, 5(1), 17–31. <https://doi.org/10.1080/17449620902765286>

Heinonen, S. (2013). Neo-Growth in Future Post-Carbon Cities. *Journal of Futures Studies*, 2013(18 (1)), 27.

Heinonen, S., & Balcom Raleigh, N. (2015). *Continuous Transformation and Neo-Carbon Energy Scenarios* (Vol. 10). Retrieved from http://www.utu.fi/fi/yksikot/ffrc/julkaisut/e-tutu/Documents/eBook_10-2015.pdf

- Hideg, É., & Nováky, E. (2010). Changing attitudes to the future in Hungary. *Futures*, 42(3), 230–236.
<https://doi.org/10.1016/j.futures.2009.11.008>
- Huber, B. J. (1977). [Review of *Review of Images of the World in the Year 2000: A Comparative Ten Nation Study*, by H. Ornauer, H. Wiberg, A. Sicinski, & J. Galtung]. *Contemporary Sociology*, 6(6), 744–745.
<https://doi.org/10.2307/2066408>
- Krawczyk, E., & Slaughter, R. (2010). New generations of futures methods. *Futures*, 42(1), 75–82.
<https://doi.org/10.1016/j.futures.2009.08.011>
- Lombardo, T. (2006). Thinking Ahead: The Value of Future Consciousness. *The Futurist*, 40(1), 45–46, 48–50.
- Lombardo, T. (2007). The evolution and psychology of future consciousness. *Journal of Futures Studies*, 12(1), 1–24.
- Lombardo, T. (2008). *The Evolution of Future Consciousness: The Nature and Historical Development of the Human Capacity to Think about the Future*. Bloomington, Ind.: AuthorHouse. Retrieved from
[/vwebv/holdingsInfo?bibId=1476675](http://vwebv/holdingsInfo?bibId=1476675)
- Lombardo, T. (2011). Creativity, wisdom, and our evolutionary future. *Journal of Futures Studies*, 16(1), 19–46.
- Lombardo, T. (2014). The future evolution of consciousness. *World Future Review*, 6(3), 322–335.
<https://doi.org/10.1177/1946756714552135>
- Lombardo, T. (2016). Future Consciousness: The Path to Purposeful Evolution—An Introduction. *World Futures Review*, 8(3), 116–140. <https://doi.org/10.1177/1946756716673636>
- Lombardo, T. (2017). *Future Consciousness: The Path to Purposeful Evolution*. Changemakers Books.
- Lombardo, T., & Cornish, E. (2010). Wisdom Facing Forward: What It Means to Have Heightened Future Consciousness. *The Futurist; Washington*, 44(5), 34–42.
- Luukkanen, J. (2016). The role of systems models in research and planning. Constructing a novel dialectic comprehensiveness. In O. Kuusi, S. Heinonen, & H. Salminen, *How Do We Explore Our Futures?* The Finnish Society of Futures Studies.

- Malaska, P. (2001). A futures research outline of a post-modern idea of progress. *Futures*, 33(3–4), 225–243. [https://doi.org/10.1016/S0016-3287\(00\)00069-0](https://doi.org/10.1016/S0016-3287(00)00069-0)
- Mannermaa, M. (1986). Futures research and social decision making. *Futures*, 18(5), 658–670. [https://doi.org/10.1016/0016-3287\(86\)90038-8](https://doi.org/10.1016/0016-3287(86)90038-8)
- Mannermaa, M. (1991). In search of an evolutionary paradigm for futures research. *Futures*, 23(4), 349–372. [https://doi.org/10.1016/0016-3287\(91\)90111-E](https://doi.org/10.1016/0016-3287(91)90111-E)
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, 41(9), 954–969. <https://doi.org/10.1037/0003-066X.41.9.954>
- Masini, E. (1993). *Why futures studies?* London: Grey Seal Books.
- Meadows, D. H. (2008). *Thinking in Systems: A Primer*. (D. Wright, Ed.). White River Junction, Vt: Chelsea Green Publishing.
- Meadows, D. H., Meadows, D. L., & Randers, J. (1972). *The Limits to Growth*. New York: Universe Books.
- Mermet, L., Fuller, T., & van der Helm, R. (2009). Re-examining and renewing theoretical underpinnings of the Futures field: A pressing and long-term challenge. *Futures*, 41(2), 67–70. <https://doi.org/10.1016/j.futures.2008.07.040>
- Miller, R. (2007). Futures literacy: A hybrid strategic scenario method. *Futures*, 39(4), 341–362. <https://doi.org/10.1016/j.futures.2006.12.001>
- Miller, R. (2015). Learning, the Future, and Complexity. An Essay on the Emergence of Futures Literacy. *European Journal of Education*, 50(4), 513–523. <https://doi.org/10.1111/ejed.12157>
- Miller, R., Poli, R., & Rossel, P. (2013, May). *The Discipline of Anticipation: Exploring Key Issues*. Retrieved from http://www.academia.edu/3523348/The_Discipline_of_Anticipation_Miller_Poli_Rossel_-_DRAFT
- Miller, R., Poli, R., & Rossel, P. (2014). *The Discipline of Anticipation: Exploring Key Issues*. UNESCO, The Rockefeller Foundation.
- Mische, A. (2009). Projects and Possibilities: Researching Futures in Action. *Sociological Forum*, 24(3), 694–704. <https://doi.org/10.1111/j.1573-7861.2009.01127.x>

- Nováky, E., Hideg, É., & Kappéter, I. (1994). Future orientation in Hungarian society. *Futures*, 26(7), 759–770. [https://doi.org/10.1016/0016-3287\(94\)90043-4](https://doi.org/10.1016/0016-3287(94)90043-4)
- Nurmi, J.-E. (2005). Thinking About and Acting Upon the Future: Development of Future Orientation Across the Life Span. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time: Theory, research, and application* (pp. 31–57). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Nuttin, J., & Lens, W. (1985). *Future time perspective and motivation*. Leuven, Belgium: Leuven University Press and Erlbaum.
- Ogilvy, J. (2011). Facing the fold: from the eclipse of Utopia to the restoration of hope. *Foresight*, 13(4), 7–23. <https://doi.org/10.1108/14636681111153931>
- Patomäki, H. (2006). Realist ontology for futures studies. *Journal of Critical Realism*, 5(1), 1–31.
- Polak, F. L. (1971). *Prognostics: a science in the making surveys and creates the future*. Amsterdam, New York: Elsevier.
- Polak, F. L. (1973). *The Image of the Future*. (E. Boulding, Trans.). Amsterdam: Elsevier.
- Poli, R. (2010). The many aspects of anticipation. *Foresight*, 12(3), 7–17. <https://doi.org/10.1108/14636681011049839>
- Poli, R. (2011). Ethics and futures studies. *International Journal of Management Concepts and Philosophy*, 5(4), 403–410. <https://doi.org/10.1504/ijmcp.2011.044985>
- Poli, R. (2014a). Anticipation: A New Thread for the Human and Social Sciences? *Cadmus*, 2(3), 23–36.
- Poli, R. (2014b). Anticipation: What about turning the human and social sciences upside down? *Futures*, 64, 15–18. <https://doi.org/10.1016/j.futures.2014.10.003>
- Poli, R. (Ed.). (2017a). *Handbook of Anticipation*. Springer, Cham. https://doi.org/10.1007/978-3-319-31737-3_1-1
- Poli, R. (2017b). *Introduction to anticipation studies* (Vol. 1). Springer.

- Rhisiart, M., Miller, R., & Brooks, S. (2015). Learning to use the future: developing foresight capabilities through scenario processes. *Technological Forecasting and Social Change*, *101*, 124–133.
<https://doi.org/10.1016/j.techfore.2014.10.015>
- Sande, Ö. (1972). Future Consciousness. *Journal of Peace Research*, *9*, 271–278.
<https://doi.org/10.1177/002234337200900307>
- Sardar, Z. (2010). The Namesake: Futures; futures studies; futurology; futuristic; foresight—What's in a name? *Futures*, *42*(3), 177–184. <https://doi.org/10.1016/j.futures.2009.11.001>
- Seginer, R. (2009). Future Orientation: A Conceptual Framework. In R. Seginer, *Future Orientation* (pp. 1–27). Boston, MA: Springer US. Retrieved from http://link.springer.com/10.1007/978-0-387-88641-1_1
- Seijts, G. H. (1998). The Importance of Future Time Perspective in Theories of Work Motivation. *The Journal of Psychology*, *132*(2), 154–168. <https://doi.org/10.1080/00223989809599156>
- Seixas, P. (2006). What is historical consciousness? In *To the Past: History Education, Public Memory, and Citizenship in Canada* (pp. 11–22).
- Seligman, M. E. P., Railton, P., Baumeister, R. F., & Sripada, C. (2013). Navigating Into the Future or Driven by the Past. *Perspectives on Psychological Science*, *8*(2), 119–141.
<https://doi.org/10.1177/1745691612474317>
- Seth, S. C. (1989). Futures consciousness: Technology – society nexus and varying perceptions of the future. *Futures*, *21*(5), 508-513.
- Sharpe, B., & Hodgson, A. (2017). Anticipation in Three Horizons. In R. Poli (Ed.), *Handbook of Anticipation* (pp. 1–18). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-31737-3_82-1
- Sharpe, B., Hodgson, A., Leicester, G., Lyon, A., & Fazey, I. (2016). Three Horizons: A pathways practice for transformation. *Ecology and Society*, *21*(2). <https://doi.org/10.5751/ES-08388-210247>

- Slaughter, R. (1996a). Futures Concepts. In R. Slaughter (Ed.), *The knowledge base of future studies. Vol. 1, Foundations* (Vols. 1–Book, Section, p. 87). Melbourne: Futures Study Centre/DDM Media.
Retrieved from /vwebv/holdingsInfo?bibId=1460376;
- Slaughter, R. (Ed.). (1996b). *The knowledge base of future studies. Vol. 1, Foundations*. Melbourne: Futures Study Centre/DDM Media.
- Slaughter, R. (2009). The state of play in the futures field: a metascanning overview. *Foresight*, *11*(5), 6–20.
<https://doi.org/10.1108/14636680910994932>
- Staley, D. J. (2002). A History of the Future. *History and Theory*, *41*(4), 72–89.
<https://doi.org/10.1111/1468-2303.00221>
- Suddendorf, T., & Corballis, M. C. (1997). Mental time travel and the evolution of the human mind. *Genetic Social and General Psychology Monographs*, *123*(2), 133–167.
- Szpunar, K. K. (2010). Episodic Future Thought: An Emerging Concept. *Perspectives on Psychological Science*, *5*(2), 142–162. <https://doi.org/10.1177/1745691610362350>
- Szpunar, K. K., Spreng, R. N., & Schacter, D. L. (2016). Toward a Taxonomy of Future Thinking. In *Seeing the Future: Theoretical Perspectives on Future-Oriented Mental Time Travel* (pp. 21–35). Oxford University Press.
- Toffler, A. (1970). *Future Shock*. New York: Bantam Books.
- Trommsdorff, G. (1983). Future Orientation and Socialization. *International Journal of Psychology*, *18*(1–4), 381–406. <https://doi.org/10.1080/00207598308247489>
- van der Helm, R. (2005). The future according to Frederik Lodewijk Polak: finding the roots of contemporary futures studies. *Futures*, *37*(6), 505–519. <https://doi.org/10.1016/j.futures.2004.10.017>
- Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, *77*(6), 1271–1288.
<https://doi.org/10.1037/0022-3514.77.6.1271>
- Zimbardo, P. G., & Boyd, J. N. (2009). *The Time Paradox: The New Psychology of Time That Will Change Your Life* (35089th edition). New York: Atria Books.

Table 1. Lists of characterizations identified through literature review	
<p>Dimensions of future consciousness (Sande, 1972)</p> <ol style="list-style-type: none"> 1. Length 2. Level of interest 3. Optimism 4. Influence 5. Expectations 6. Values 	<p>Heightened future consciousness (Lombardo & Cornish, 2010)</p> <ol style="list-style-type: none"> 1. Sense of time, of past and future linked together 2. Optimism about the future 3. Sense of contemporary trends and challenges; 4. Creativity, imagination, and curiosity regarding future possibilities; 5. Courage and enthusiasm in the face of the adventure and uncertainty of the future; 6. Sense of ongoing personal growth and purpose involving long-term, goal-directed thinking and behaviour; 7. Future-oriented self-narrative 8. Self-efficacy and self-responsibility in determining one's future.
<p>Conceptualization of future orientation (Beal, 2011; Trommsdorff, 1983)</p> <ol style="list-style-type: none"> 1. Dimensions of content of future oriented cognition <ul style="list-style-type: none"> ○ Extension ○ Domain ○ Affect ○ Detail 2. Moderators related to outcomes <ul style="list-style-type: none"> ○ Motivation ○ Control ○ Sequence of events ○ Number of cognitions 	<p>Basic virtues for developing a prospective attitude (Gaston Berger, quoted in Durance, 2010)</p> <ol style="list-style-type: none"> 1. Being calm, self-control 2. Imagination and innovation 3. Team spirit 4. Enthusiasm 5. Courage 6. Sensitivity
<p>Prospective attitude (Gaston Berger, quoted in Godet & Roubelat, 1996)</p> <ol style="list-style-type: none"> 1. Look far away 2. Look breadthwise (interactions) 3. Look in depth 4. Take risks 5. Take care of humanity 	<p>Cumulative levels of futures literacy (Miller, 2007)</p> <ol style="list-style-type: none"> 1. Temporal and situational awareness, making values and expectations explicit 2. Rigorous imagining, discovery of the unknown, overcoming limitations imposed by values and expectations 3. Questioning the assumptions used to make decisions in the present, embracing complexity
<p>Dimensions of projectivity (Mische, 2009)</p> <ol style="list-style-type: none"> 1. Reach: short, middle, long term 2. Breadth: range of possibilities 3. Clarity: detail in imagining 4. Contingency: fixed or uncertain/flexible 	<p>Dimensions of the scenaric stance (Ogilvy, 2011)</p> <ol style="list-style-type: none"> 1. Curiosity, willingness to learn, eagerness to experience new frames of reference 2. Capacity for commitment, resoluteness toward action, clarity of follow-through

<ol style="list-style-type: none"> 5. Expandability: expanding or contracting possibilities 6. Volition 7. Sociality: intertwined with others 8. Connectivity: connection between temporal elements 9. Genre: discursive mode 	<ol style="list-style-type: none"> 3. Capacity to balance the two previous dimensions
<p>Elements of a [futures] rationale (Slaughter, 1996a)</p> <ol style="list-style-type: none"> 1. Decisions have long-term consequences 2. Future alternatives imply present choices 3. Forward thinking is preferable to crisis management 4. Future transformations are certain to occur 	<p>Key assumptions of futures studies (Bell, 1997)</p> <ol style="list-style-type: none"> 1. The meaning of time 2. The possible singularity of the future 3. Futures thinking and action 4. The most useful knowledge 5. Future facts 6. An open future 7. Humans make themselves 8. Interdependence and holism 9. Better futures
<p>Four laws of futures studies (Adapted from Sardar, 2010)</p> <ol style="list-style-type: none"> 1. Futures studies deals with complex wicked problems 2. Assuring cultural diversity 3. Scepticism regarding simple solutions and criticism that aims to open pluralistic potentials 4. Relevance of future discourse lies in its impact on the present 	<p>Multiple faces of futures research (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015)</p> <ol style="list-style-type: none"> 1. Long timeframe 2. Multidisciplinarity and multisectorality 3. Complexity, systems thinking, and holistic thinking 4. Participatory approaches (inclusive interaction) 5. Identifying emerging issues, discontinuities, disruptions, tipping points and anticipating surprises 6. Critical thinking and constant questioning 7. Value rationality 8. Taking radical, unorthodox and unconventional views seriously 9. Proactivity and action 10. Alternative thinking and scenario thinking

Dimension	Characterizations
Time perspective	<ul style="list-style-type: none"> - Length (Sande, 1972) - Sense of time (Lombardo & Cornish, 2010) - Extension (Beal, 2011; Trommsdorff, 1983) - Look far away (Berger in Godet & Roubelat, 1996) - Temporal and situational awareness (Miller, 2007) - Forward thinking is preferable to crisis management (Slaughter, 1996a) - The meaning of time (Bell, 1997) - Long timeframe (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Reach (Mische, 2009) - Connectivity (Mische, 2009)
Agency beliefs	<ul style="list-style-type: none"> - Optimism (Sande, 1972) - Influence (Sande, 1972) - Optimism about the future (Lombardo & Cornish, 2010) - Courage and enthusiasm (Lombardo & Cornish, 2010) - Sense of personal growth and purpose (Lombardo & Cornish, 2010) - Self-efficacy and self-responsibility (Lombardo & Cornish, 2010) - Affect (Beal, 2011; Trommsdorff, 1983) - Motivation (Beal, 2011; Trommsdorff, 1983) - Control (Beal, 2011; Trommsdorff, 1983) - Team spirit (Berger, in Durance, 2010) - Enthusiasm (Berger, in Durance, 2010) - Being calm, self-control (Gaston Berger, quoted in Durance, 2010) - Future alternatives imply present choices (Slaughter, 1996a) - Futures thinking and action (Bell, 1997) - An open future (Bell, 1997) - Humans make themselves (Bell, 1997) - Proactivity and action (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Volition (Mische, 2009) - Capacity for commitment, resoluteness toward action, clarity of follow-through (Ogilvy, 2011)
Openness to alternatives	<ul style="list-style-type: none"> - Sense of trends and challenges (Lombardo & Cornish, 2010) - Creativity, imagination, and curiosity (Lombardo & Cornish, 2010) - Courage and enthusiasm (Lombardo & Cornish, 2010) - Imagination and innovation (Berger, in Durance, 2010) - Courage (Berger, in Durance, 2010) - Look in depth (Berger in Godet & Roubelat, 1996) - Take risks (Berger in Godet & Roubelat, 1996) - Questioning the assumptions of present decisions (Miller, 2007) - Future transformations are certain to occur (Slaughter, 1996a) - Future alternatives imply present choices (Slaughter, 1996a) - The possible singularity of the future (Bell, 1997) - Scepticism regarding simple solutions and criticism that aims to open pluralistic potentials (Sardar, 2010)

	<ul style="list-style-type: none"> - Identifying emerging issues and anticipating surprises (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Critical thinking and constant questioning (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Taking radical and unorthodox views seriously (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Alternative thinking (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Breadth, contingency, expandability (Mische, 2009) - Curiosity, willingness to learn, eagerness to experience new frames of reference (Ogilvy, 2011)
Systems perception	<ul style="list-style-type: none"> - Level of interest (Sande, 1972) - Look breadthwise (interactions) (Berger in Godet & Roubelat, 1996) - Rigorous imagining (Miller, 2007) - Decisions have long-term consequences (Slaughter, 1996a) - Interdependence and holism (Bell, 1997) - Futures studies deals with complex wicked problems (Sardar, 2010) - Multidisciplinarity and multisectorality (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Complexity, systems thinking, and holistic thinking (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Sociality (Mische, 2009)
Concern for others	<ul style="list-style-type: none"> - Values (Sande, 1972) - Better futures (Bell, 1997) - Take care of humanity (Berger in Godet & Roubelat, 1996) - Assuring cultural diversity (Sardar, 2010) - Participatory approaches (inclusive interaction) (Heinonen, 2013; Heinonen & Balcom Raleigh, 2015) - Value rationality (Heinonen & Balcom Raleigh, 2015)
Miscellaneous	<ul style="list-style-type: none"> - Expectations (Sande, 1972) - Future-oriented self-narrative (Lombardo & Cornish, 2010) - Detail (Beal, 2011; Trommsdorff, 1983) - Domain (Beal, 2011; Trommsdorff, 1983) - Sequence of events (Beal, 2011; Trommsdorff, 1983) - Number of cognitions (Beal, 2011; Trommsdorff, 1983) - Sensitivity (Berger, in Durance, 2010) - The most useful knowledge (Bell, 1997) - Future facts (Bell, 1997) - Relevance of future discourse lies in its impact on the present (Sardar, 2010) - Clarity (Mische, 2009) - Genre (Mische, 2009)