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Futures

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Operationalization of space/time perspectives of individuals—Theory and empirical results from Turkey

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ARTICLE INFO

Article history:

Available online 21 November 2008

ABSTRACT

The overall aim of the research is to provide an evaluation of differences in time and space perspectives of individuals in Turkey in order to understand the different approaches, perspectives or priorities that they may bring to futures studies.

An empirical study aimed to collect information about the varying differences in time and space perspectives among participant individuals (undergraduate and PhD students at Yeditepe University and managers at Siemens-Turkey) and any other possible factors affecting the participants' choices. Two sets of statements are generated representing the time and space perspectives of participants using the modified constructs found in the literature such as "Time Strata", "Space-Time Graph", and "Different Time Frames and Activities".

Our sample population of 185 individuals indicated a time horizon of 4.8 years and space horizon of 530 km. Majority of the sample population is observed to be concerned with issues that affect only their close environment over a short time period of "next week", along with their larger geographical area as the "city". A few of the sample population indicated to have a global perspective on time and space that can further reach into the future.

Literature suggesting different individuals having different perspectives on time and space, depending on culture, past experience and the nature of the problems are instrumentalized in our study by relating it to the foresight tools and methodologies. Such varying perspectives may explain individuals/managers' time and space horizon in which they think and act/execute.

Based on the analysis of space/time preference of participant individuals, policy makers will benefit from incorporating the diversity of time and space dimensions into their strategic thought and national policy roadmaps.

This exploratory study is comprised of the assessment of differing definitions and approaches to the future via individuals' space and time perspectives. It aims to contribute to foresight methodologies and approaches, as well as bringing a significant impact on the quality and success of the national foresight project results.

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1. Introduction

The use of foresight as a decision making tool has increased during 1990s – especially in Western Europe and East Asia – in order to proliferate the competitiveness and innovation of nations,¹ regions, as well as corporations.

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¹ The findings of a study by Javidan [8], based on surveying over 17,000 middle managers in 61 societies, suggest that, the greater a society's future orientation, the higher its average GDP per capita and its level of innovativeness, happiness, confidence and competitiveness.

Foresight studies within businesses have become more important and widespread with its systematic and continuous/participatory approach, based on a variety of methods. However, it is still a *partially* explored area in terms of research. In line with previous research on developing foresight methodology [1,2,17–19] our research aims to provide an evaluation of differences in *time and space perspectives among participant individuals* in order to attempt to understand the different approaches, perspectives or priorities that may bring futures studies.

In the literature, it has been suggested that different individuals have different perspectives on *time and space*, depending on culture, past experience and the nature of the problems faced. Although the perspectives of the world's people vary in their perception of time and space, every human falls somewhere on the space–time graph [14].

Although time is a difficult phenomenon to study, researchers have been aware of necessity to understand time perspective in order to better understand individuals' behavior and their choice of activities allocated, respectively. The perception of time slices allocated to specific activities is brought about by the concept of time itself as a consumer commodity and it is difficult to understand the effect of various time perceptions unless one has actually experienced these perceptions [7].

Various ideas about time are used to construct three basic perception models described by Graham [7];

1. *linear-separable* where time is seen as linear – that is, there is a past, present, and future – and separable into various discrete compartments. It is also thought that time properly spent now will put one in a much better position embodying a heavy future orientation,
2. *circular traditional* where time is not perceived as a straight line stretching from the distant past to the far future, but rather as a circular system in which the same events are repeated according to some cyclical pattern. Hence, those who share a traditional time perspective are often characterized as being oriented to the present and the use of time is not really planned.
3. *procedural traditional* model where the amount of time spent on an activity is irrelevant, as activities are procedure-driven rather than time-driven. Therefore, the activities/tasks are done when the 'time is right' with some other sets of factors that are dependent on the event.

The models of time perception represent a classification of some of the better-known differences among varying time perceptions as reported in the literature. Although there is no time perception universally shared and moreover, individuals switch from one perception to another depending on the task being performed, it does have an important impact on individuals' behavior. Also, we may have different numbers of individuals in organizations having the above-discussed time perspectives, the balance of which may define the actual outcome in organizations and societies.

One concept which will definitely be impacted by the *time perspective* of individuals is strategic planning which is concerned intrinsically with the temporal dimension, especially the future time dimension. Individual orientation toward future, in particular, may differ in terms of relative cognitive dominance of the near versus the distant future. Given a specific future time perspective, this subjective orientation to the future would have a tendency to influence one's general view of how things are going to flow in time. An individual's general view of the nature of future time could potentially constrain choices about such time-related factors as planning cycles or planning horizons [5].

The success of corporate strategy, i.e., body of decisions which identify how the firm will use its resources to achieve its perceived objectives and goals, depends on the capabilities of planners and decision makers to process and use information. Human judgement is needed to interpret the findings and determine their relevance for the future. If such judgments are faulty, efforts at strategic planning are likely to be misdirected [4]. Therefore, differing space and time perspectives may be expected to impact managerial judgments and implications.

The paper is structured as follows. After the initial introduction where some background about the research area, the motivations for the research and the research objectives are covered, Section 2 will introduce the literature review on "Time and Space Perspective". Questionnaire developed for the measurement of the research questions, scope and the structure of the questionnaire, sample selection and sampling along with the profile of the participants will be introduced in Section 3 as a part of the methodology. The collected data will be presented and the results of the study will be examined in Section 4. Finally, Section 5 will examine the research outcomes, possible application fields along with the limitations of the research study and further research recommendations.

2. Literature review

2.1. Time and space perspective

Time has been of interest to researchers from a range of disciplines, such as psychologists, economists, philosophers as well as futurists. Topics of interest include people's awareness, perceptions, contractual and experience of time; the relevance of time within broad domains of social psychology inquiry; the development and impact of future-oriented thinking in decisions with important personal and social ramifications; delay of gratification; and intertemporal choice [cf. 29].

Time perspective is defined as "*The totality of the individual's views of his psychological future and his psychological past existing at a given time*" [10]. Nuttin [16] defined time perspective as "*the temporal zone to which a person's mental view*

virtually extends itself when considering the objects of a conscious determinants of behavior". In a more economical thinking, Koopmans et al. [9] highlighted that the term 'time perspective' is derived from an analogy with perspective in space: *As the timing of the differences between any two consumption programs is made to recede into a more distant future, the utility difference between the programs diminishes, in an appropriate representation of the ordering.*

Some studies have observed that males are more *present-oriented* and reported that males take more risks than females, while females are more *future-oriented*. Zimbardo et al. [30] introduced *time perspective* as an indicator of risky driving. People are observed to have different focuses on time (past, present, or future) with different tinges (positive or negative). Although their discussion centers on implications for education based on understanding the psychological dynamics of time perspective and links to general risk-taking and self-regulation, it is observed that males are more *present-oriented* and reported that males take more risks than females, while females are more *future-oriented*. *Present-oriented* people are defined as relying on the immediate, salient aspects of the stimulus and social setting when making decisions and taking actions whereas the decisions of *future-oriented* individuals tend to be based on anticipated consequences of imagined future scenarios, while those of *past-oriented* individuals tend to rely on recall of reconstructed past scenarios.

Age is also another factor affecting people's time and space perspective. Nurmi [15] discusses that time orientation develops over the lifespan. In his research on how adolescents see their future is reviewed with reference to the three basic processes (motivation, planning, and evaluation) involved in orientation to the future suggest that adolescents' goals and interests concern the major developmental tasks of late adolescence and early adulthood, reflecting anticipated lifespan development. He also adds that such anticipation accounts for a sizeable number of the age, sex, socioeconomic status, and cultural differences in the content and temporal extension of future orientation. This review also showed that the levels of planning and internality concerning the future increase with age. Family context was also found to influence adolescents' future-oriented interests, plans, causal attributions, and affects.

Theoretical descriptions of time choice (Fig. 1) predict age differences in the rate at which people discount the future, however, when *one* theory predicts that discounting will decrease over the lifespan, so that young people will discount more than the middle-aged or elderly (Green, 1994; Trostel and Taylor, 2001; cited in [20]), *another* suggests it will increase over the lifespan (Rogers, 1994; cited in [20]), yet *another* suggest that the middle-aged will discount less than either the young or the old (Sozou and Seymour, 2003; cited in [20]).

Another study (Fig. 2) observed systematic but relatively complex relationships between discounting and age, where the results supported the view that older people discount more than younger ones and that the middle aged people discount less than either elderly or young people [20].

Meadows et al. [14] suggests that different individuals have different perspectives on time and space, depending on culture, past experience and the nature of the problems faced. Although the perspectives of the world's people vary in their perception of time and space, every human falls somewhere on the space–time graph. These different levels of human concern about their space and time perspectives are represented in Fig. 3. The graph has two dimensions, time and space. Depending on how much geographical space it includes and how far it extends in time, people have varying perspectives located somewhere on the space–time graph.

Most of the people are concerned with issues that affect only their close environment (i.e. family or friends) over a short time period, whereas others look further ahead in time or over a larger geographical area—a city or a nation. The latter perceive the pressures about the future involving not only themselves but also the community with which they identify. A few of people has a global perspective that can reach far into the future. *"Most people must have successfully solved problems in a smaller area before they move their concerns to a larger one. In general the larger the space and the longer the time associated with a problem, the smaller the number of people who are actually concerned with the problem"* [14].

Slaughter [25] defined past, present and future to be richly interconnected and found their flow of relationships no to be separated: *"Our history, identity and achievements in the past affect our perception, understanding and focus in the present which, in turn, influence our plans, projects and goals for the future."* He identified these connections to be richer since the flow was not

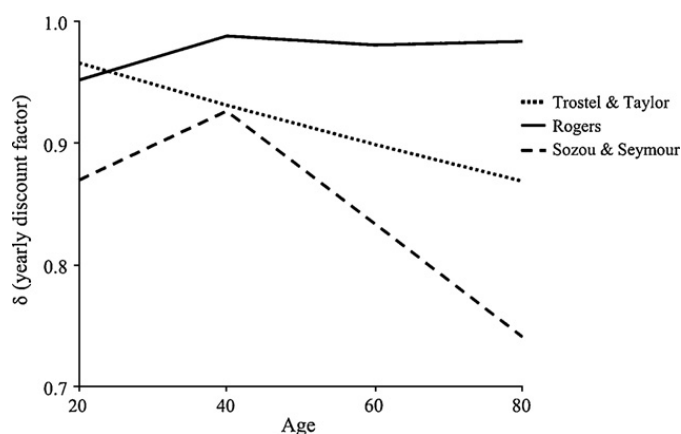


Fig. 1. Patterns of time discounting over the lifespan as predicted by Rogers (1994), Trostel and Taylor (2001), and Sozou and Seymour (2003); cited in [20].

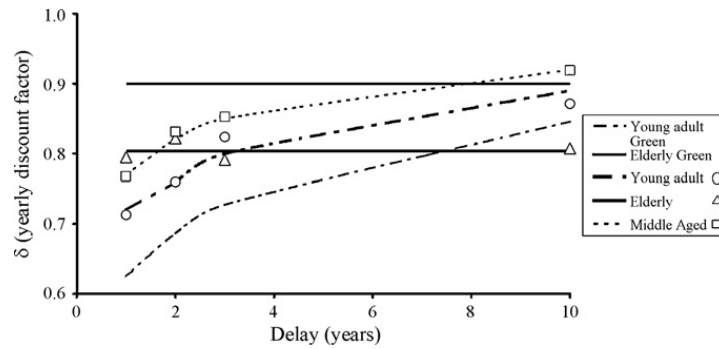


Fig. 2. Comparison of δ delays of different length. The lines labeled “Green” show results predicted from the best-fitting functions described by Green et al. (1994). The shapes (circles, triangles and squares) show data collected by Read and Read [20] along with their associated best-fitting line.

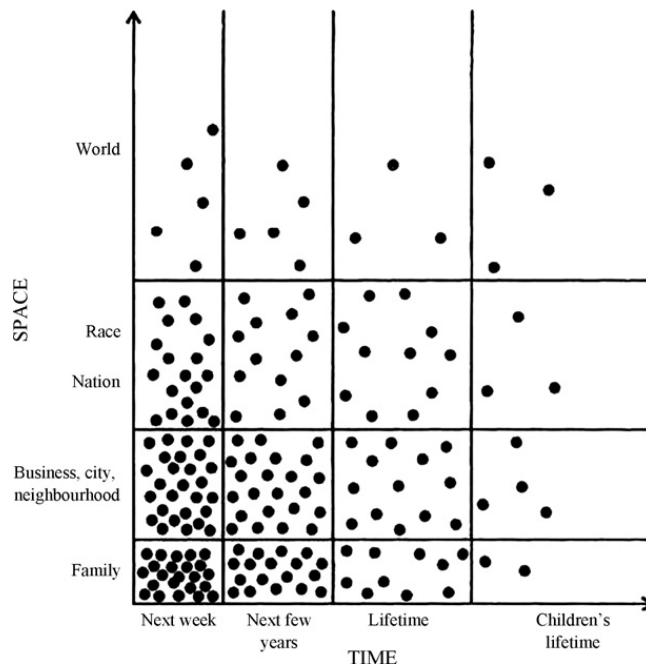


Fig. 3. Space–time graph [14].

unidirectional. Thus, he labeled two processes centrally involved in constructing the present. “One is the interpretation of past experience. The other is the anticipation of possible futures. . . They are mutually reinforcing, mutually necessary in supporting normal consciousness.” However, Slaughter [25] recognized present as not a fixed period of time but rather as varying according to perception and need. Present derived from past and future that is; “from memory and prevision, from experience and goals, from identity and purpose.” Based and extended on the work of Slaughter [26–28], Alsan and Öner [1] described the characteristics of the “presents” in Table 1.

Different time frames are discussed by Slaughter [26] by elaborating on the extended “present” (Fig. 4). He defined “present” depending on the activities carried by the human beings therefore different activities required different “presents”. The distinction between different activities and time frames can help in defining the content of foresight studies for different goals and objectives [1]. As seen in Fig. 4, Slaughter [26] defined six “presents” as seconds, minutes, hours, days, weeks, years, centuries and millennia.

In order to understand the time concept, he suggested for a tangible need of the term “extended present” by which we created by the virtue of our deep connections both with the past and future: “We require a notion of the present which recognizes that we are, first rooted in the past; second, responsible for creating our near-term futures; and third, responsible for protecting future generations.” Thus, typing and driving were given as two examples of activities that required detailed coordination and hence concentration within a fairly narrow span of time [26]. On the other hand, he recognized that there were other situations which required “reflection, suspension of judgment, careful preparation or forethought” and extended over millennia.

Seth [24] on the other hand stated that “differing perceptions of time, change, progress, modernization and development” would lead people to different perceptions of the future. Therefore, there raised a need to examine, in the context of peoples and cultures, perceptions of the characteristics of time and relate it to the foresight tools and methodologies.

Table 1
Present characteristics.

1 year	The time it takes planet earth to circle the sun once Cycle of seasons Unit of time measurement for human lives Farming and crop rotation
10 years	Sizeable chunk of a human lifetime Long enough to provide insight into dynamic processes Ideal for noting environmental and ecological factors A reasonable horizon for testing new products and services The time it takes to plan and build major infrastructure items
20 years (Alsan and Öner [1])	Cycle of generations for human beings: (Veterans, 1922–1943); (Baby Boomers, 1943–1960); (Generation Xs (1960–1980); The Nexters (1980–2000)) Long enough to observe the economics and social impact of strategic R&D activities, e.g. the identification of CFCs scientifically and the sign of the international contract to take precautionary measures (1974–1990)
50 years	Incorporates some major concerns of a technologically advanced culture Culturally significant period to understand trends and change processes Enough to judge the impacts and implications of existing and new technologies
100 years	Boundary of a single lifetime Long cycles can be distinguished The rise and fall of regions, industries and ecosystems Theories and history and futures begin to flourish
200 years	Ideal time frame for cultures in transition A time with which generations are linked Enough to develop intergenerational biography and dialogue The rise and fall of cultures, empires and entire ecosystems Macro-view of history; the panorama of the centuries

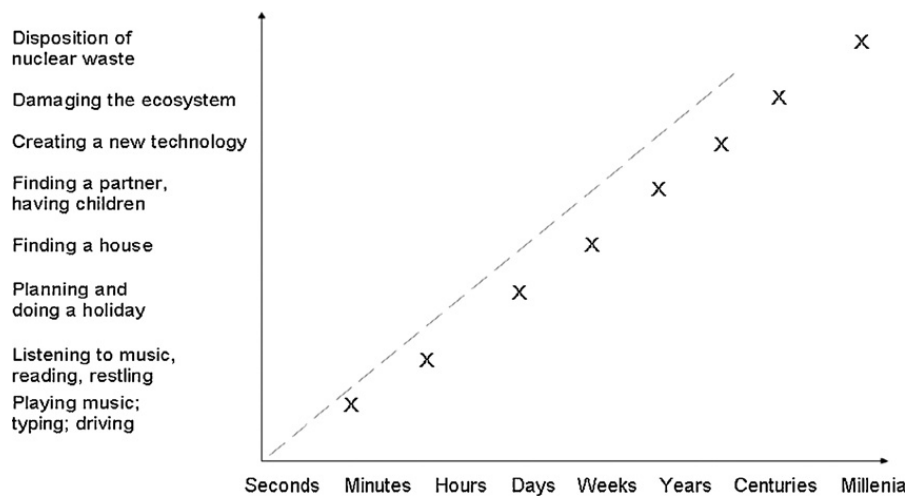


Fig. 4. Different time frames and activities [26].

Jaques (1986; cited in [11]) created a *time strata* (Fig. 5) in order to explain a person's time horizon in which he/she can plan and execute specific, ongoing, goal-directed activities. He identified seven "*time strata: windows on the future*" for organizing people in which persons can see themselves in formulating goals and carrying them to completion: "*the maximum time span a person can work with measures and defines that person's level of cognitive power. I call this measure a person's time horizon.*" According to the same *time stratum* defined by Jaques, a person with time horizon of 3 months or less is rather rule-anchored whereas a person with a time horizon that reaches out to 10 years or more begins to think beyond the rules and to establish his/her own criteria.² The vision of a person in accordance to his/her executing specific, ongoing and goal-directed activities are defined as CEO/4-star general with the maximum time span of 50 years, and shop floor personnel/troops with a time span of 3 months, respectively.

² Here, we may also refer "his/her own criteria" as "his/her own future".

Vision Building Skills

	3 mos.	1 yr.	2 yrs.	5 yrs.	10 yrs.	20 yrs.	50 yrs.	
7								CEO/ 4 - star general
6							Group head/ 3-star general	
5							Subsidiary head/ 2-star general	
4							General manager/ Brigade commander	
3							Unit head/ Battalion commander	
2							Section head/ Company commander	
1							Shop floor personnel/roops	

Fig. 5. "Time strata" (Jaques, 1986; cited in [11]).

Lynch and Kordis [11] highlighted the important milestone in the development of forward-seeing where linear thinking and circular thinking begin to conjoin. Therefore, widened and expanded time horizons bring out anticipatory abilities and qualities of such:

1. The viewing of uncertainty as a resource.
2. Thinking outside the rules.
3. Willingness to generate theories.
4. The use of contradictory information.
5. Openness to all sources.
6. Paying attention to what's left unsaid.
7. Looking for more than one answer (Jaques, 1978; cited in [11]).

In order to help teams and organizations via revisiting Jaques' *time strata*, Lynch and Kordis [11] stated that people with narrow time horizons tend to give the locus of control away.³

In the pursuit of the questioning the differences in time perspective in our study, the earlier attention needs to be given to the intertemporal⁴ choices of individuals involving tradeoffs among costs and benefits occurring at different times. The joint determinants of time preference were promoted or limited by the following factors (Rae, 1834; cited in [6]):

1. The bequest motive (the prevalence throughout the society of the social and benevolent affections).
2. The propensity to exercise self-restraint (the extent of the intellectual powers, and the consequent prevalence of habits of reflection, and prudence, in the minds of the members of society).
3. The uncertainty of human life.
4. The excitement produced by the prospect of immediate consumption, and the concomitant discomfort of deferring such available gratifications.

In the development of the economic perspective on spatial choice, a new motive was added to those above factors arguing that humans suffer from a systematic tendency to underestimate future wants (Böhm-Bawerk, 1889; cited in [6]). Böhm-Bawerk approached intertemporal choice as an allocation of consumption among time periods as opposed to explaining intertemporal choices in terms of motives that are uniquely associated with time. Fisher⁵ (1930) formalized the intertemporal consumption decision and further enhanced the four motives described by Rae (1834) and included *foresight* (*the ability to imagine future wants*) and *fashion* to the personal factors affecting time preference.

Those first four factors described by Rae (1834) were the indicators of two fundamental different views: assuming that people only care about their immediate utility and explaining *farsighted* behavior by postulating utility from the anticipation of future consumption (Jevons, 1888 and Jevons, cited in [6]) and assuming equal treatment of present and future (zero

³ This is also called as "external locus of control".

⁴ In our study, we prefer using "space" instead of "temporal".

⁵ Samuelson [21] introduced the *discounted utility model (DU)* in order to offer a generalized model of intertemporal choice that was applicable to multiple time periods as opposed to Fisher's graphical indifference-curve analysis that was difficult to extend to more than two time periods, however it had concerns about its descriptive realism and was never empirically validated as the appropriate model for intertemporal choice [6].

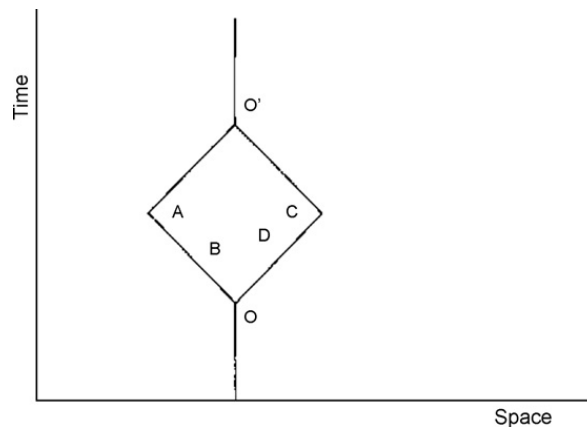


Fig. 6. The time–space domain (Thrift, 1977; cited in [23]).

discounting) as the natural base for behavior, and attributing the overweighing of the present to the miseries produced by the self-denial required to delay gratification (Senior, 1836; cited in [6]).

Spatial (intertemporal) behaviors may be dramatically influenced by people's level of understanding of how their preferences change—by their “meta-knowledge” about their preferences (O'Donoghue and Rabin, 1999; Loewenstein, O'Donoghue and Rabin, 2000; cited in [6]) and suggest *multiple-motive approach* being more important in understanding intra-individual differences [6].

Time representing the transition from one event to another has structural and behavioral elements. In terms of its structure, the starting- and ending-points, and its behavior, the movement between these points, time is subjective, namely, defined through individual perceptual processes [23]. Similarly, like the element of time, “*space represents the location at which events take place, and have real physical characteristics and perpetual characteristics of those passing through them and those observing the sequence of events.*” Each individual will have a different definition for space and that definition will change through time [23].

The situational determinants of an individual's time and space activities/events are defined by Thrift (1977) in Fig. 6. The shape of the prism is described by the individual's speed of travel to the destination and time required to complete any activity at any of the stations in the prism such as a, b, c, or d. “*Prism are not only of use at the individual level, but enable one to analyze time allocation and spatial allocation .*” (Thrift, 1977, p. 433; cited in [23]).

Finally, the perception of time and space are affected by the flows of information, and both the quantity and quality of information affect the perceptions about time and space (Savitt [23]). Thus, it is important to realize those changes in the perceptions of people in order to help shaping our own future.

3. Methodology

The empirical body of research tried to address the issue of whether there is a difference in time and space perspectives among participant individuals in order to help us in bringing different approaches, perspectives or/and priorities to foresight studies.

The questionnaire aimed to collect information about the varying differences in time and space perspectives among participant students and any other possible factors affecting the participants' choices.

3.1. Time and space perspective

Two sets of statements are generated representing the time and space perspectives of participants using the modified “*Time Strata*” of Jaques (1986; cited in [11]), “*Space–Time Graph*” of Meadows et al. [14] and “*Different Time Frames and Activities*” of Slaughter [26]. The use of our selected time intervals in this study fit to the temporal characteristics of futures studies, where near term future is 1 year from now; short range future is considered to range from 1 to 5 years from now; middle range future is 5–20 years from now; long range future is 20–50 years from now and far future is considered to be 50 plus years from now [12].

The first set of statements reflected the respondents' perspective toward time, whereas the second set reflected perspective toward space. The participants were asked to divide the total sum of 100 points among their varying time and space perspectives, depending on their focus on different time intervals and geographic areas.

The dimensions of time strata included the terms of “*next week*”, “*next month*”, “*next 3 months*”, “*next 1 year*”, “*next 2 years*”, “*next 5 years*”, “*next 10 years*”, “*next 20 years*” and “*next 50 years*”. The dimensions of space, depending on how much geographical space included in participants' preference were defined as “*current residence*”, “*district/province*”, “*city*”, “*nation*” and “*world*”. The statements were pre-tested to eliminate ambiguous or problematic wording.

3.2. The scope and the structure of the survey questionnaire

The developed survey instrument of the questionnaire sought feedback from managers of Siemens AG in Turkey, as well as PhD and undergraduate students of Yeditepe University in order to provide information upon their *time and space perspectives*. The survey questionnaire also requested a brief demographic profile of the participants.

Due to the comparable advantages of electronic surveys rather than the traditional printed ones, we distributed an electronic survey instrument via using varying e-groups and reached to approximately 9 managers and 235 students between April and May of 2007.

A *pilot study* was conducted to refine the research instrument. Participants were asked to identify any ambiguity of questions, measurements, and scenarios and modifications were made accordingly (e.g. wording, deleting unnecessary questions).

3.3. Sample selection, sampling

Sampling is a survey-based research where the researcher needs to analyze the sample about a population to answer the research questions or meet the research objectives [22].

In our study we used convenience sampling – part of non-probability sampling – among the PhD and undergraduate students at Yeditepe University, as well as managers at Siemens-TR. Convenience sampling is used in exploratory research where the researcher is interested in getting an inexpensive approximation of the truth. The sample is selected because they are convenient. This non-probability method is often used during preliminary research efforts to get a gross estimate of the results, without incurring the cost or time required to select a random sample [22].

3.4. Profile of the respondents

Our study of the undergraduate program at Yeditepe University was conducted among the e-group members of “yeditepelife” with a total population of 3.518. – Same questionnaire was used with 30 PhD students at Yeditepe University, Business Administration Program who were e-research group members of imtes-tr (manufacturing and technology strategies research group discussion list) with a total population of 46 people, as well as 9 managers at Siemens-TR – 9 of the total population represented the managers of whom were the CEO, CFO, group managers and managers of important staff departments and initiated corporate foresight project in order to foresee the future of Siemens-TR in 2015.

The questionnaire was advertised by e-mail and participants were invited to access a web site and to fill in an on-line questionnaire. Adopting this approach observes netiquette and means that respondents can remain anonymous and, of equal importance, are unable to modify the questionnaire (Witmer et al., 1999; cited in [22]).

Our exploratory research study on foresight studies was responded by a total of 185 participants from three groups; 146 undergraduate and 30 PhD students at Yeditepe University and 9 managers at Siemens-TR. After careful filtering of those respondents who have completed the questionnaire till the end, – without missing any items – 146 undergraduate and 30 PhD students and 9 managers at Siemens-TR have met our qualifications, out of whom we have conducted the analysis upon.

In Table 2, the descriptive analysis of those 185 participants is presented—bold characters indicating the highest frequency rates.

50.8% ($n = 94$) of the sample population are male, 49.2% ($n = 91$) are female. The respondents between the age of “20–29” (69.2%, $n = 128$) and “40–49” (0.5%, $n = 1$), along with “60 and more” (0.5%, $n = 1$) accounted for the highest and lowest number of responses, relatively.

Of the 185 respondents, the majority were found to have no children under their guardianship (91.9%, $n = 170$).

4. Results

4.1. Space perspective

According to the dimensions of space, depending on how much geographical space included in participants' preference were defined as “*current residence*”, “*district/province*”, “*city*”, “*nation*” and “*world*”. The majority of our sample population was found to be giving higher concern for their “*city*” and lowest concern for the “*world*” with means of 3.18 and 2.44, respectively (Tables 3a and 3b).

In order to calculate the space horizon of the participant individuals, we recoded each of their space preference into space horizon by multiplying the relative weighted mean value with the values (in km) used to convert choices to distances for statistical analysis. According to our proposed space horizon calculation (Table 3c), our sample population with 146 undergraduate, 30 PhD students and 30 managers from Siemens-TR indicated a space horizon of 530 km (max. = 2501.5 km, min. = 1 km; $n = 185$).

Table 2
Descriptive statistics of participants' sample profile ($n = 185$).

Characteristics	Frequency	Percentage
People		
Undergraduate Students	146	78.9
PhD students	30	16.2
Siemens managers	9	4.9
Gender		
Female	91	49.2
Male	94	50.8
Age		
Less than 20	28	15.1
20–29	128	69.2
30–39	24	13
40–49	1	0.5
50–59	3	1.6
60 and more	1	0.5
Children under guardianship		
None	170	91.9
1	10	5.4
2	3	1.6
3	1	0.5
4+	1	0.5
Total	$n = 185$	100%

Table 3a
Ranks.

	General mean rank ($n = 185, p = 0.00$)	Undergraduate students ($n = 146, p = 0.00$)	PhD students ($n = 30, p = 0.00$)	Managers of Siemens-TR foresight project ($N = 9; p = 0.00$)
Current residence	3.18	3.19	3.12	3.17
District/province	2.74	2.83	2.43	2.50
City	3.47	3.52	3.53	2.56
Nation	3.16	3.08	3.27	4.28
World	2.44	2.38	2.65	2.50

Table 3b
Test statistics^a.

N	185
Chi-square	55,756
d.f.	4
Asymp. Sig.	0.000

^a Friedman test.

4.2. Time preference

According to the dimensions of time strata including the terms of “next week”, “next month”, “next 3 months”, “next 1 year”, “next 2 years”, “next 5 years”, “next 10 years”, “next 20 years” and “next 50 years”, the majority were found to be giving higher concern for their “next week” and lowest concern for their “next 50 years” with means of 6.28 and 2.52, respectively (Tables 4a and 4b). Managers of Siemens-TR were given relatively different time intervals since the scale was adopted to the corporation's planning horizon as requested by the project liason person.

In order to calculate the time horizon of the participant individuals, we recoded each of their time preference into time horizon by multiplying the relative weighted mean value with the values (in years) used to convert choices for statistical

Table 3c
Values used to convert space horizon choices to distances for statistical analysis.

Space perspective	in km
Current residence	1
District/province	5
City	50
Nation	500
World	2500

Table 4a
Ranks.

	General mean rank ($n = 185$, $p = 0.00$)	Undergraduate students ($n = 146$, $p = 0.00$)	PhD students ($n = 30$, $p = 0.00$)	Managers of Siemens-TR foresight project ($N = 9$; $p = 0.00$)	
Next week	6.28	6.50	6.25	0–next 1 month	3.06
Next month	6.29	6.28	6.58		
Next 3 months	5.61	5.47	6.30	Next 1 month–next 3 months	3.44
Next 1 year	5.98	5.79	6.43	Next 3 months–next 1 year	4.67
Next 2 years	5.43	5.20	5.70	Next 1–3 years	5.33
Next 5 years	5.21	5.35	4.93	N/A	N/A
Next 10 years	4.20	4.40	4.93	Next 10–30 years	3.17
Next 20 years	3.47	3.43	2.88		
Next 50 years	2.52	2.57	2.15	Next 30 years and more	1.33

Table 4b
Test statistics^a.

N	185
Chi-square	391,784
d.f.	8
Asymp. Sig.	0.000

^a Friedman test.

analysis. Our sample population with 146 undergraduate, 30 PhD students and 9 managers from Siemens-TR indicated a time horizon of 4.8 years (max. 49.50, min. 0.02; $n = 185$).

The inferential statistics (independent samples t -test) indicated that there is *significant difference* ($p = 0.008$) among PhD students and Siemens' participant managers, where the managers have longer time horizon than of the PhD students. However, there found *no difference* among participant individuals and their space horizon.

According to the inferential statistics (Cramer's V), there found *no significant association* between time/space horizon and demographics of participant undergraduate and PhD students.

The results of the independent samples t -tests suggest that, *space horizon is indifferent between females and males*, as well as *age groups* among both undergraduate and PhD students.

5. Evaluations and discussions

This study provides an operationalization and evaluation of differences in time and space perspective of individuals and gender roles in Turkey in order to understand the different approaches, perspectives or priorities that they may bring to foresight studies.

The results also suggest a new methodological challenge and a subject of a future paper, as “space/time perspectives” to be crucial factors embedded in corporate, regional and national foresight studies due to their effects on the assessment of possible foresight project results discussed by Öner and Göl [19].

This part discusses the findings made during the course of the project and focuses on the possible application fields and limitations of the study incurred while conducting the research.

5.1. Research outcomes

Results of the research study suggest that “space/time perspectives” of individuals are to be crucial factors to be embedded to national foresight studies.

Our sample population of 185 individuals indicated a *time horizon of 4.8 years* and *space horizon of 530 km* (nation). This time horizon is longer than results of Das [5] where the most appropriate corporate planning horizon according to the planning actors was determined as 2.85 years.

Majority of the sample population is observed (Fig. 7) to be concerned with issues that affect only their close environment over a short time period of “*next week*”, along with their larger geographical area as the “*city*”. A few of the sample population indicated to have a global perspective on time and space that can further reach into the future.

As compared with the results of space–time graph [14] in Fig. 3, there are similar patterns on the varying perspectives of the individuals' space and time horizon of both studies. As seen in Figs. 3 and Fig. 7, most people's worries are concentrated in the lower hand corner of the graphs indicating less effort devoted on problems further out on the space or time axes.

The participant managers at Siemens-TR indicated a time horizon ranging from a maximum of 8.64 to a minimum of 1.26 years (cf. Fig. 5). According to Fig. 8, the average time horizon of managers at Siemens-TR in this study was 5.6 years. This is considerably higher than results of Das [5] where the most appropriate corporate planning horizon according to the planning actors was recorded as 2.85 years.

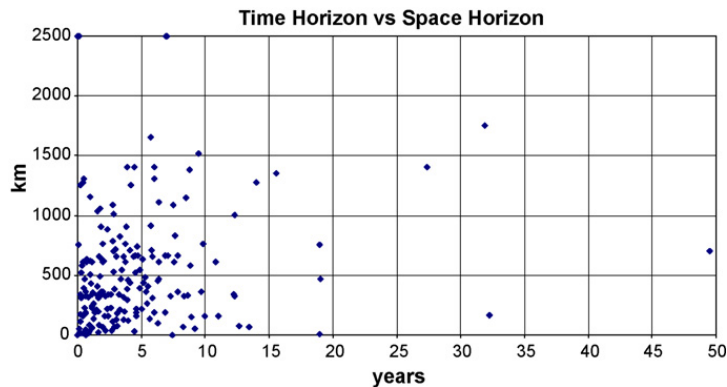


Fig. 7. Time horizon versus space horizon of individuals.

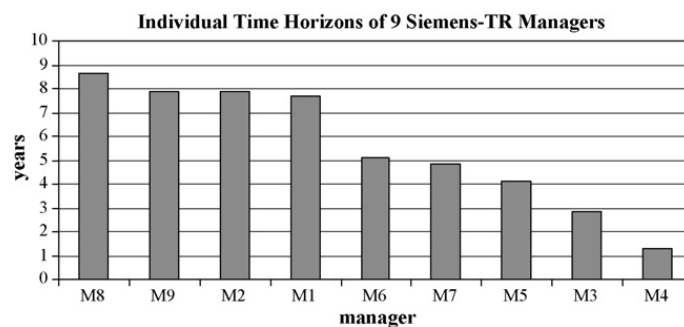


Fig. 8. Time horizon of managers at Siemens-TR.

5.2. Possible application fields

The results of the space/time perspective of the participant individuals indicated a concern falling over a shorter time horizon (next week) along with a rather larger geographical area (nation). However, the choice over of one to the other is assumed to be shaped by the participants' psychological, social, temporal, material, organizational and cultural context within it is embedded.

Simon (1974; cited in [13]) suggests the West beginning to move towards a 'temporary society containing temporary people'. Only a few people had a global perspective that extended far into the future. Literature suggesting different individuals having different perspectives on time and space, depending on culture, past experience and the nature of the problems are instrumentalized in our study by relating it to the foresight tools and methodologies. Such varying perspectives may explain individuals/managers' time and space horizon in which they think and act/execute. Such actions taken are not extended into days but years into the future.

The immediate implication in terms of strategic planning is that the managers with distant future time perspective would be better suited to making the longer-period planning decisions based on an adequate appreciation of time passage in the long-term future [5]. On the other hand, the managers with shorter future orientation would be competent and fit to projects requiring short-term planning. On the other hand, Ancona et al. [3] propose that temporal leadership be rooted in the senior teams's ability to operate simultaneously in the present and the future.

Thus, based on the analysis of space/time preference of participant individuals, policy makers will benefit from incorporating the diversity of time and space dimensions by utilizing it into their strategic thought and national policy roadmaps.

5.3. Limitations

One of the limitations of the study is the use of non-probability sampling which is useful in exploratory studies, yet lacking the complete identification of the population being studied.

The exploratory study may also be of having premature conclusions. However, we believe this research suggests some potentially significant insights for foresight studies and its applications.

5.4. Future research recommendations

Our research initiates the discussion about the operationalization of varying perspectives upon time/space perspectives of individuals, where those differences may bring different approaches, perspectives and priorities to foresight studies.

Varying time/space preferences among individuals may need a special attention within their lifespan. Based on the analysis of space/time preference of participant individuals, we suggest further research on discovering the cultural orientation toward future in order to help policy makers in steering change in their countries.

Besides, the discussion on the relations found between the time/space perspectives of individuals and demographics need to be elaborated with further research on the effects of masculinity/feminity and happiness differences to expand our understanding.

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