

Reading the Modernity and Postmodernity Conditions and Hierarchies of Turkish Cities with PCA and Cluster Analysis: Using SEDI and Developing a New Set of Indicators

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Abstract

This study aims to investigate modernity and postmodernity conditions and hierarchies of Turkish cities. The conceptual framework of modernism and postmodernism concerning space has been discussed, and it has been tried to develop indicators suitable for the quantitative analysis of the modernity/postmodernity conditions of the cities. The post-1990 Turkish Socio-Economic Development Index (SEDI) data sets were used as secondary data, and a new set of indicators was developed to rank the levels of modernity and postmodernity hierarchies of cities. 12 criteria defining modernism and 22 criteria defining postmodernism were determined under the headings of "organizational/managerial", "economic", "social/ethical", and "spatial". Cities are clustered by evaluating 34 criteria obtained by Principal Component Analysis (PCA) and Cluster Analysis methods. The method used here, and the field research findings are candidates to fill the gap in understanding modern and postmodern urban space in Turkey and are expected to contribute to balanced urban development and hierarchy studies in the field of city and regional planning in future studies.

Keywords: City planning; modernity-postmodernity; city hierarchy; PCA-cluster analysis

Citation

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Lectura de las condiciones y jerarquías de la modernidad y la posmodernidad de las ciudades turcas con PCA y análisis de clústeres: uso de SEDI y desarrollo de un nuevo conjunto de indicadores

Resumen

Este estudio tiene como objetivo investigar las condiciones y jerarquías de la modernidad y la posmodernidad de las ciudades turcas. Se ha discutido el marco conceptual del modernismo y posmodernismo en torno al espacio y se ha intentado desarrollar indicadores adecuados para el análisis cuantitativo de las condiciones de modernidad/posmodernidad de las ciudades. Los conjuntos de datos del Índice de Desarrollo Socioeconómico Turco (SEDI) posteriores a 1990 se utilizaron como datos secundarios y se desarrolló un nuevo conjunto de indicadores para clasificar los niveles de jerarquías de modernidad y posmodernidad de las ciudades. Se determinaron 12 criterios que definen el modernismo y 22 criterios que definen el posmodernismo bajo los encabezados de "organizacional/gerencial", "económico", "social/ético" y "espacial". Las ciudades se agrupan mediante la evaluación de 34 criterios obtenidos mediante los métodos de análisis de componentes principales (PCA) y análisis de conglomerados. El método utilizado aquí y los hallazgos de la investigación de campo son candidatos para llenar el vacío en la comprensión del espacio urbano moderno y posmoderno en Turquía y se espera que contribuyan a estudios de desarrollo urbano y jerarquía equilibrados en el campo de la planificación urbana y regional en estudios futuros.

Palabras clave: Planificación urbana; modernidad-posmodernidad; jerarquía urbana; PCA-análisis de clústeres

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1. Introduction

Modernism and postmodernism create traces that need to be analysed with their administrative, economic, sociological, cultural, and spatial influences as well as the conditions of their emergence. Although there is a wide range of literary content for the two movements in managerial, economic, sociological, architectural, and cultural contexts, studies dealing with urban-spatial impacts and interactions are limited. These studies cover analyses of sociological and current forms of capitalism. It was also emphasized that the processes of globalization, which started in the 1980s and gained intensity in the 1990s, led to the change of modernist accumulations and a process that evolved into postmodernism; and the phenomenon of postmodernism was discussed as the conceptual framework of social reconstruction (Jameson, 1984; Foucault, 1987; Harvey, 1996; Lyotard, 1998; Bauman, 2000; Baudrillard, 2016).

Along with these conceptualizations, counter-discourses also took an important place in modernism. It was underlined that postmodernism would be understood as the private collective time and space within the comprehensive-time and space of modernism and brings a comprehensive criticism of postmodern thought (Habermas, 1994; Jameson, 1984; Giddens, 2000; Eagleton, 2004; Harvey, 2012; Melas, 2020). It was argued that postmodernism brings along changes in the urban areas' economic, cultural, and social organization forms.

The fact that the following changes experienced in the transition from modernism to postmodernism had a prominent role in the development process of cities by affecting the dynamics of economic and social development was defined as essential milestones in the studies: decline in state authority, change of production dynamics, liberalization of capital, formation of new social values (Aslan & Yılmaz, 2001; Elliot & Lemert, 2006; Kaygalak & Işık, 2007; Baudrillard, 2016). It has importance to address the creation/change process of the components affecting the spatial dynamics of the urban areas that form the subject of this study and the regional inequalities of urbanization based on modernism-postmodernism.

In Table 1, the studies deemed to affect the cities directly or indirectly and define the managerial/organizational, economic, and social/ethical structure were subjected to literature analysis through Scopus and Web of Science. A cascade process was followed in the analysis (Malecki, 2017). Based on the results obtained, keywords were developed with the content that would allow access to publications dealing with the study subject.

The keywords providing a conceptual understanding of modernism and postmodernism are illustrated in detail in the footnotes, and the analysis results are presented below. In the analysis, studies started in the 1970s showed the first upward abrupt increase in 1990-2000 in line with the postmodern initiatives of the 1990s, the second upward break, however, occurred between 2010 and 2020.

The number of publications belonging 2010-2020 constitutes approximately 40% of the total studies on this subject. It was witnessed that studies and conceptualizations about the interaction of modernism and postmodernism with management, economy, and social fields maintain their places and up-to-dateness, even progressively. This research aims to concretely demonstrate the impacts of changing organizational/managerial mechanisms, economic organizations, social structure/ethical understandings and spatial constructions of modernism and postmodernism on urban dynamics based on quantitative indicators and to provide an empirical explanation of the extent to which Turkish cities experience modernist and postmodernist processes.

The study has four parts. First, the theoretical analysis aimed at defining the components of modernism and postmodernism that affect space is summarized.

In the second part; as to the 40-year change process from the early 1980s to the 2020s, which is agreed as "the transition from modernism to postmodernism" in the literature, the data and results of the Turkish Socio-Economic Development Index (SEDI) studies, which were re-conducted in the years 1996, 2003, 2011 and 2017 in Turkey, which demonstrate the development level of the cities in the economic and social context and allow to establish a relationship with space, were evaluated in line with modernism and postmodernism. In the third part, the criteria for defining the modern and postmodern periods were established thanks to the data obtained from the evaluation of the theoretical content and SEDI studies, and modernity and postmodernity levels of Turkish cities were analysed through the PCA and cluster analysis method.

Table 1. Survey Results Conducted within Scopus and Web of Science (WoS) in April 2020 (18-29 April)

Years	Modernism					
	Managerial/Organizational ^a		Economic ^b		Social/Ethical ^c	
	Scopus	WoS	Scopus	WoS	Scopus	WoS
1970-1980	0	0	0	0	1	0
1980-1990	1	0	5	0	4	0
1990-2000	29	3	36	19	37	16
2000-2010	145	14	80	19	63	25
2010-2020	316	72	169	118	195	145
Total	494	89	290	156	300	186
Years	Postmodernism					
	Managerial/Organizational ^d		Economic ^e		Social/Ethical ^f	
	Scopus	WoS	Scopus	WoS	Scopus	WoS
1970-1980	0	0	0	0	0	0
1980-1990	0	0	2	0	3	0
1990-2000	25	14	28	30	99	35
2000-2010	45	12	43	18	129	56
2010-2020	26	26	81	56	163	117
Total	96	52	144	104	394	208

Source: Produced within the scope of the study using Scopus and Web of Science database.

2. Conceptual framework: the urban context of modernism and postmodernism

Modernism is the conceptualization of a way of life dominated by specialization, rationalization, complex network-type organizations, contractual relations, scientific knowledge, and technology (Simmel, 1978; Aslan & Yılmaz, 2001; Durkheim, 2006; Weber, 2016). These concepts covered by modernism have produced their own values system by advocating the contemporary against traditional society (Weber, 1961; Rousseau, 1999; Marx, 2003; Bozdoğan, 2008; Aydın, 2018; Ritzer & Stepnisky, 2018). In Table 2, the organizational/managerial, economic, social/ethical value system and venue setup, which are thought to be influenced by modernism in cities, are illustrated.

^a Search terms: "Nation state policy AND modernism" or "Modernism policy AND state" or "Modernism and administrative management".

^b Search terms: "Modernism AND economic development" or "Modernism AND economic structure" or "Modernism AND economic organization".

^c Search terms: "Modernism AND social structure" or "Modernism AND social morality" or "Modernism AND social ethics".

^d Search terms: "State policy AND postmodernism" or "Postmodernism AND policy structure".

^e Search terms: "Postmodernism AND economic development" or "Postmodernism AND economic structure" or "Postmodernism AND economic organization".

^f Search terms: "Postmodernism AND social structure" or "Postmodernism AND social morality" or "Postmodernism AND social ethics".

Table 2. System of Values in Modernism

Concept	Authors	Content
Organizational / Managerial Values System	Rousseau, 1999 Keyman, 2000 Marx, 2003 Hume, 2017 Aydin, 2018	In the managerial ontology of modernism, the state mechanism has evolved into a nation-state structure. Within the accepted new system, democracy as the only proper form of government has been grew due to the necessity of sharing the power with the people. Thus, the legitimacy ground of the nation-state mechanism was formed by the individual. Elections are the only concrete outcome of this evolution.
	Levinas, 1961 Weber, 1961 Tekeli, 1999 Marx, 2003 Tekeli, 2009	As a requirement of the national identity that the nation-state model encompasses, it is stated that it ignores subcultures by defining ethnological and religious diversities under a single supra-identity. During this period, all kinds of ethnic and religious groups were ignored, and their fundamental rights and freedoms were excluded from the scope of social rights and freedoms. The only result of this situation was interpreted as the restriction of worship and ethnic rights.
Economic Values System	Eraydin, 1992 Wallerstein, 1992 Marx, 2003 Tekeli, 2009	The pre-capitalist understanding organized in the traditional society has transformed into a structure focused on capital development, leaving its place to the rational money economy in the modernist period. However, "Fordism", which is the only tool and the result of the essential acceptance of modernism in the first quarter of the 20th century, has played a fundamental role in achieving accumulation. During this period, with the development of the Fordist system, the development philosophy of the states concentrated on the industrial sector, and capital accumulation was achieved through this sector.
	Marx & Engels, 2003 Weber, 2016	The acceleration of the industrialization process and the popularization of the Fordist system also brought the necessity of shaping the labour-power of the capitalist system. The Fordist system divides the production process into numerous stages and considers individuals who have rarely received or completed primary education as a workforce potential. The only concrete outcome of this situation is the employment structure based on unskilled labour accumulation.
	Blauner, 1964 Chia, 1995 Cupers, 2014 Mariscal González, & Montaña Salazar, 2018	As a result of the industrialization process in the modernist period, professional associations and unionization mechanisms have gained a corporate identity to defend the labour force's rights and provide workers with better working conditions. Cities in this period assumed the characteristic of spatial integrity where industrialization was organized, and capital accumulated. The only result of this situation was the rural-urban migration flow and population accumulation in the cities.
Social / Ethical Values System	Bodur, 1991 Piccone, 1991 Weber, 2016	In the modernist period, the social structure was organized in an environment that the state can keep under its control and regulates the people's moral feelings, just for the continuity of the capitalist system. In the modernist period, the individual was forced to renounce all personal desires and perceive this situation as a responsibility dictated by the system. As the only result of this situation, the individual focuses on production to satisfy her/his consumption desires as per his basic consumption needs.
Spatial Values System	Chia, 1995 Etzioni, 2013 Bauman, 2017 Ritzer & Stepnisky, 2018	The rational mind and equality, developed in the modernist period, caused the state mechanism to be organized to fulfil the needs of the majority. As a result, the state mechanism has become the central responsible institution to provide basic human needs by emphasizing the equality concept.

Source: Obtained within the scope of the study through the 1970-2020 literature analysis.

Postmodernism is a movement of thought that became popular in the last years of the 20th century, during which the desire for a life focused on mass consumption became stronger, state mechanisms suffered the authority gap, and the commercialization of knowledge came to the fore in social life (King, 2005). While postmodernism was being constructed with a critical approach to modernism's basic assumptions, it had adopted discrimination instead of unification; coincidence instead of design; deconstruction instead of holistic; disintegration instead of collectivity; subjectivity instead of objectivity (Hassan, 1985). In this sense, the postmodernist understanding created its value system by producing alternative accumulations against the essential accumulations of modernism.

Table 3 illustrates the postmodernist era's organizational/managerial, economic, social/ethical, and spatial value systems.

Table 3. System of Values in Postmodernism

Concept	Authors	Content
Organizational / Managerial Values System	Chia,1995 Tomlinson, 1999a Tomlinson, 1999b Harvey, 1996 Karakaş, 2000 Akça, 2005 Best & Kellner, 2016	In the postmodernist era, there has been the rejection of totalitarian acceptances and holistic understanding, the popularity of irregularity and confusion; this movement limits the sovereignty rights by making the boundaries of states in economic and cultural terms insignificant. Thus, the understanding of macro theory and macro politics has been dominated by understanding micro theory and micro politics. Postmodernism has paved the way for local governments and local organizations to play an active role in understanding plurality and locality.
	Müller-Rommel, 1989 Tomlinson, 1999b Göktolga, 2015 Eryılmaz, 2015	In the postmodern period, individualism had been discussed as a concept nourished by cultural identities rather than the rational identity created by modernity and its structure that pre-shaped its present and future. In postmodernism, individualism had to carry gender, identity, environment, etc., and daily life practices, which were not perceived politically in the modernist period, to the political sphere. The only concrete outcome of this situation is considered as thematic political parties and NGOs.
Economic Values System	Soja, 1990 Urry, 1995 Lyotard, 1998 Urry, 1999 Baudrillard, 2011 Harvey, 2012 Roscoe, 2014	The standard and mass production logic, which contradicts the ontology of postmodernity, was replaced by post-Fordism, a flexible and demand-oriented particle production mechanism. Thus, the industry-oriented capital accumulation process was also destroyed, and the sectors that contributed to the information development of the society that were focused on it. In this process, capital owner made investments in the tourism and service sector through cities and sought to accumulate more capital.
	Eraydin, 1992 Mitchell, 1998 Williams & Sewpaul, 2004 Herzfeld, 2010 Saklı, 2013	The advancement of information technology and the loss of the Fordist production quality in the postmodernist period have also changed the employee-employer system. Also, the decrease in the regulatory and supervisory responsibility of the state in the economic organization in the postmodern period limited the unionization movements. The transition to flexible production in the postmodern period has caused the skilled workforce to gain importance.
Social / Ethical Values System	Bockock, 1993 Soper, 2008 Roscoe, 2014 Pérez Bourzac, 2018 Yang & Marmolejo, 2020	The postmodernist period creates a consumer society through propaganda globally to direct communities to more consumption. During this period, the phenomenon of consumerism led individuals to hedonistic acts of behaviour. The most concrete outcome of this situation is that consumption places gain publicity.
	Bodur, 1991 Weber, 2016 Piccone, 1991 Zengingönül, 2012 Ritzer, 2015 Postman, 2016	In the postmodernist period, the individual trying to see himself somewhere between consumption means and society continued his search for identity through developing communication and communication tools. Mass media has reached its achievable highest level in the production of "desire for consumption" through TV, advertising, and entertainment sectors in the consumer society of the postmodern era. In this context, visual and print media trigger hedonistic consumption dynamics.
	Featherstone, 1996 Ristock, 2003 Gottdiener, 2005 Giet, 2006 Özbek, 2008 Şenkal, 2016	The postmodern period constructed on the commercial self that individuals rejected all his past accumulations and built his identity in an environment where popular fashion was commodified. In this direction, due to the opposition created by postmodernity, FEMEN movements have emerged since the 1980s. Women have often exhibited in the second position in popular culture products and texts. The images of women displayed solely based on sexuality (body-oriented) have forced women to be included in consumption with their physical characteristics. Thus, the importance of physical appearances, such as "being in good shape", has increased in the consumption processes.

	Kellner, 1991 Debord, 2012 Zengingönül, 2012 Postman, 2016 Biere Arenas & Arellano Ramos, 2017	In the postmodernist period, mass media contributed to the socialization process of consumer culture and lifestyles and reached its achievable level in the production of "desire for consumption" through TV, advertising, and entertainment sectors, in the consumer society of the postmodern era. Media organs, which trigger hedonist consumption norms, also integrate this walk of life into the consumption system by producing desires that will appeal to different age groups in society.
	Sennett, 2016 Gottdiener, 2005 Hochschild, 2012	In the postmodernist period, it is emphasized that private life was destroyed, and believed that individualism was reduced to self-obsession and rampant narcissism. Thus, it is argued that the patriarchal world in which the gender relations of the past years are defined has changed, and the concept of "until death do us part" has become old-fashioned. Also, in the postmodernist period, gender differences became insignificant, and LGBTI+ tendencies gained legitimacy.
Spatial Values System	Eraydın, 1992 Wallerstein, 1992 Fainstein, 1999 Cihangir Çamur, 2009 Saklı, 2013 Roscoe, 2014 Ritzer, 2015 Bosch-Meda, 2021	The state transferred its powers on the economy to autonomous institutions in the globalization process. It adopts regulatory approaches that can be regarded as a kind of referee through these institutions triggered the meeting of society's basic needs by the private sector. In this period, investments were made in the built environment to benefit from urban rents. Thus, the privatization process was accepted as the economic paradigm of postmodernism, and education and health services have also been privatized. These sectors have started to be considered as the private sector-driven fields.

Source: Obtained within the scope of the study through the 1970-2020 literature analysis.

As a product of the literature review on the organizational/managerial, economic, social/ethical structure and spatial setup of modernism and postmodernism, the mentioned results, believed to be affected by two different movements directly or indirectly, are summarized in Table 4.

In Table 4, regarding modernism and postmodernism, six discourses in the organizational/managerial values system, eight discourses in the economic value system, nine in the ethical/social values system and four in the spatial values system are defined. The first phase of the study was completed by summarizing 27 main basic concepts/discourses regarding these two movements.

The discourses defining the modernism movement presented in Table 4 generally focus on organizational and economic accumulations. Industrialization is given priority in modernism and the Fordist production approach is adopted as main mode of production. In addition, the nation state notion is decisive in individual and social movements. In this context, modernism constructs its typical structures in accordance with its ontological realities.

However, postmodernism emphasizes pluralism, locality, emancipation, and subjective knowledge instead of modernism's holistic understanding and rational realities. In the comparison in Table 4, postmodernism comes to life in a critical integrity against modernism by producing arguments against the debated discourses and acceptances of modernity. Postmodernism discourses focus on localities, local economic and social accumulations. In addition, it is emphasized that local identity come to the fore, economic development focuses on the services sector instead of industrial investments, the social structure is fragmented, and the diversity in identity is reflected as positive accumulation.

As a conclusion, the "organizational, economic, social and spatial values" that define the two intellectual currents are in harmony with the intellectual assumptions of these movements, and modernism and postmodernism clearly defend the opposite axes.

Table 4. Modernism and Postmodernism Literature Review

Indicator Title	Modernism	Postmodernism
	Literature Discourse	Literature Discourse
Organizational / Managerial Values System	-Defining Ethnological Diversity Under a Single Supra-Identity Framework -Construction of the Legitimacy Grounds of the National State (Adoption of the Democracy Concept)	-Positive Representation of Cultural Diversity -Micro Theory Acceptance and Micro Policy Understanding -Strengthening of Local Governments -Construction of Global Particular Political Discourse
Economic Values System	-Capital Investment Concentration in Industrial Sector -Encouragement of Rural Workforce to Migrate to Cities -Assessing Individuals with Basic Education as Labour Force -Representation of Labour Force -Standardization in Organization and Ensuring the Representation of the Professional Groups' Rights -Development of Economic Organization on Highway and Rail System	-Capital Investment Concentration on Services and Tourism Sector -Increase in the Labour Force's Education Quality -Privatization (Loss of Keynesian Policies) - Destruction of the Unionization Process
Social / Ethical Values System	-Voluntary Practice of Strict Self Discipline, Avoiding Material and Spiritual Pleasures	-Desire to Live Consumption Oriented -Female Perception / Bringing Sexuality into the forefront -Change of Gender Representation -Construction of Consumerism Special for Age Groups -Spread of Individualization and Isolation -Media Perception and Spread of Hedonist Morality -Construction of Virtual Life Presentation -Change of Family Concept
Spatial Values System	-Meeting Basic Humanitarian Needs by the State by Standardization -Providing Urban Services	-Construction of Consumption Areas -Privatization of Basic Services

Source: Obtained within the scope of the study through the 1970-2020 literature analysis.

3. Research method

In the first phase of the study, literature review and literature analysis were performed. Then, it is aimed to generate a set of indicators to explain the impacts of modernist and postmodernist periods on urban dynamics and to measure the level/hierarchy of experiencing the modernism/postmodernism processes of Turkish cities.

In the generation of indicator set, the transformation process of Turkey from the early 1990s to the 2020s and the transition period from modernism to postmodernism has been evaluated according to the relevant literature with SEDIs (Sosyo-Economic Development Indicators). SEDIs are studies aiming to define the effective components in socio-economic development and formation of urban space. There are five SEDI studies performed in 1996, 2003, 2004, 2011, and 2017 in Turkey.

These SEDI studies carried out by the SPO (State Planning Organisation) in 1996, 2003 and 2004, and by the Ministry of Industry and Technology in 2011 and 2017. In 1996 and 2003, three SEDIs were carried out under ten headings (demographic, employment, health, education, industry, agriculture, construction, financial, infrastructure and other welfare variables) with 58 criteria by SPO.

The following studies were conducted with the features mentioned below: the survey in 2004, under eight headings (excluding construction and infrastructure) with 32 criteria; the study in 2011, similarly

under eight headings (competitive and innovative capacity indicators, accessibility indicators and quality of life indicators were added, excluding industry and agriculture), with 61 criteria by changing the content; the study in 2017 with eight headings and 52 criteria. Since the SEDI study of 2004 was performed on a district basis, it was excluded from this study. PCA (Principal Component Analysis) method was used in the SEDI studies (<https://www.sbb.gov.tr/> and <https://www.sanayi.gov.tr/bolgesel-kalkinma-faaliyetleri/strateji-belgeleri>). PCA is a method used to measure the development level by socio-economic development indices with more than one variable (economic growth, education, health, culture, accessibility, commercial capacity, communication) (Temiz, 2011).

SEDI studies, created by covering many variables, reflect the social structure and the economic structure. They include quantitative and qualitative variables together and reveal the development level of the settlements in a content that allows establishing a relationship with space. At the last stage of the study, because of SEDI studies' evaluation and the content presented by the literature together, the modern and postmodern socio-economic content was defined by establishing a relationship with the spatial components. For this, criteria were defined under the sets of "organizational", "economic", "social / ethical" and "spatial" indicators. Indicator sets' data utilized in these studies were included in the analysis as secondary data.

The changes that the data sets underwent during the process were evaluated within the scope of the transition period from modernism to postmodernism. As a result of the evaluation, a set of indicators was created to evaluate Turkish cities' modernity and postmodernity levels and reveal the differences of hierarchy between cities, taking as reference the criteria predicted to bear the impacts/consequences of modernism/postmodernism movements. Finally, the indicator set was subjected to PCA and cluster analysis, and as a result, the index values of modernity and postmodernity were obtained.

3.1. *SEDI research and developing a new set of indicators*

Socio-Economic Development Index (SEDI) research are series of studies used in determining the development levels of settlements based on provinces and regions. SEDIs were used herein as follows: They contain content for defining the effective components in the formation of the space through socio-economic development indicators. In socio-economic development studies, processes such as modernization, industrialization and urbanization can be examined at the level of countries, regions, and cities. In this regard, Giddens (2000) and Kalaycıoğlu et al. (2008) states that the factor that can best reflect the processes above is the socio-economic situation. Erkenekli et al. (2012), however, says that since socio-economic studies can determine the socio-cultural norms of countries or regions, they are shaped by the combination of cultural and social norms and many elements such as economy, law, technology, politics, and science of the period. Şolt (2018) also states that socio-economic development indicators transform the perception of life on the individual.

As the first socio-economic development study of Turkey, in the 1996 SEDI research, 58 criteria were evaluated under social and economic indicators. Demographic, employment, health, and education variables were used as the social indicators of the study. Industrial, agriculture, construction, financial, infrastructure variables and other welfare variables were used in the economic indicators, which are the other indicator titles of the study. In the 2003 SEDI research, 58 criteria were evaluated under social and economic indicators in parallel with the 1996 SEDI research. In the study, unlike in 1996, telephone credits per person were added to the "other" welfare indicators, and the per capita fax criterion considered within the "other" welfare components in 1996 was removed. (State Planning Organization, 1996; State Planning Organization, 2003).

Sixty-one criteria were considered in the 2011 SEDI survey as demographic, employment, education, health, competitive and innovative capacity, financial, accessibility and life quality indicators. An indicator set different from the 1996 and 2003 criteria was used in the study.

The underlying reason for this change in the study was explained as the economic change process experienced by the country in the last decade, the weight of technological development in socio-economic development, and the increased importance of accessibility and environmental awareness. As for 2017, SEDI indicators exhibit similar characteristics with the SEDI study conducted in 2011, and criteria number decreased (Ministry of Industry and Technology, 2011; 2017). The indicators used in the SEDIs have been deemed as the studies in which the reflections of modernism and postmodernism movements are explicitly seen in Table 5 below in line with the socio-economic development components of that period.

As a result of this analysis presented in the table; in the SEDI studies, which have been carried out since the 1990s, representing the transition years from modernism to postmodernism and offer a continuity, although the criteria/indicators/components for testing concepts were not systematically addressed; it was observed that the SEDI studies carried out in 1996 and 2003 had a content/identity related to modern periods, and the SEDI studies in 2011 and 2017, however, clearly bears the traces of the shift to postmodernism.

Table 5. Comparison of Modernism and Postmodernism. Literature Discourse with SEDIs and New Indicator Set

Modernism			
Indicator Title	Literature Discourse	SEDI Tested Criteria	New Indicator Set Criteria
Organizational Value System	Defining Ethnological Diversity in a Single Supra-Identity Framework		Out-of-Service Maintenance of Worship Sites for Minority
	Construction of the Legitimacy Ground of the Nation State (The Democracy Phenomenon)		Participation Rate in Elections
Economic Value System	Encouraging Rural Workforce to Migrate to Urban Areas	Urbanization Rate Population Density	Urban Population Rate
	Standardization in Organization and Representation of Professional Groups' Rights	Insured Employee Rate in Employment	Professional Chambers' Number
	Concentration of Capital Investments on the Industrial Sector	Industry Sector Ratio	Industry Sector Ratio
	Evaluating Individuals with Basic Education as Labour Force		Graduate Rate Under High School Education in Employment
	Labour Force's Representation		Unionization Rate
	Development of Economic Organization and Urbanization Based on Road Transport	Asphalt Road Ratio	Automobile Ownership Rate
Ethical-Social Structure System	Voluntarily Practicing Strict Self Discipline by Avoiding Material and Spiritual Pleasures		Basic Needs Consumption Rate in Consumption Expenditures
	Meeting Basic Human Needs by the State		
Spatial Values System	Meeting Basic Human Needs by the State	Literacy Rate Schooling Rate Hospital Bed Number Per Person Physicians Number Per Person	Public School Ratio to All Schools Housing Number Ratio Produced by the State to the Number of All Houses Produced Public Hospital Ratio to Total Hospitals

Postmodernism				
Indicator Title	Literature Discourse	SEDI Criteria	Tested	New Indicator Set Criteria
Organizational Value System	Positive Representation of Cultural Diversity			Minority Worship Areas Being Open to Service
	Adoption of Micro Theory and Micro Policy Understanding and Strengthening of Local Governments			Municipal Budget for Ten Thousand People (TL)
	Construction of Global Particular Political Discourse			Number of International Civil Society Organization Representation Offices Green Party Representation
Economic Value System	Concentration of Capital Investments on Services and Tourism Sector	Number of Beds in a Tourism Certified Business		Services Sector Ratio Number of Hotel Beds per Ten Thousand People
	Increasing the Education Quality of the Labour Force	Graduate Rate from Postgraduate Education		University Graduate Rate in Employment
	The Destruction of the Unionization Process			Unionization Rate
Ethical-Social Structure System	Consumption Oriented Life Desire			Luxury Consumption Spending Rate
	Changing Gender Representation			Number of LGBTI + Representatives Number of International Fashion Events
	Woman Perception / Sexuality Demonstration			Aesthetics Salon for Ten Thousand People
	Change in the Concept of Family			FEMEN Action Number, Marriage Rate Divorce Rate
	Construction of Child Consumerism			International Licensed Toy Company (Lego)
	The Propagation of Individualization and Isolation	Crude Suicide Rate		Crude Suicide Rate
	Media Perception and Spread of Hedonist Ethics			Movie theater
Spatial Values System	Construction of Consumption Areas			Entertainment-Fashion Magazine Consumption Rate
	Privatization of Basic Services			Number of Malls

Source: Obtained within the scope of the study by examining the 1996-2017 SEDI studies.

In the set of indicators determined for the study, criteria were selected to test the concepts discussed commonly in the literature, taking some criteria as a reference in SEDI studies. TURKSTAT's data system, public or private institutions with legal organizations, were utilized during the criteria selection.

The set of indicators determined in this direction is as follows: 12 criteria defining modernism and 22 criteria defining postmodernism were selected under the headings of "organizational/managerial", "economic", "social/ethical", and "spatial" indicators. While eight criteria among 34 were well-matched with the SEDI studies of different years, 22 new criteria were produced within the scope of the study.

3.2. Establishing the analysis model

The quantitative analysis method used in the set of indicators to determine the modernity and postmodernity hierarchy of cities in Turkey was established parallel to national and international literature, based on variables selected from social and economic areas. "PCA" or "Cluster Analysis" method was preferred in determining the socio-economic development levels of regions, provinces, and districts, and in ranking them.

PCA is known as a method for analysing many variables in terms of a certain quality and deals with extracting the essential information from different variables. Furthermore, it is considered an analysis that establishes an independent relationship between different variables in studies with large data sets.

The variables do not affect the load values between each other. Cluster analysis, however, is a collection of methods used to divide units or variables, or both, natural grouping units of which are not precisely known, into subsets that are like each other. Thus, it enables a group of the study universe by dividing it into sub-parts. In this context, PCA and cluster analyses were proper as the analysis method of the study. In Table 6 and 7; PCA and cluster analyses were performed separately for modernist and postmodernist variables, and the weights of the variables were calculated.

Table 6. Modernism and Postmodernism Factor Load Values

Component Matrix (Modernism)						
Component	1st	2nd	3rd	4th		
Participation Rate in Elections (2018 Presidential Elections)	,524	,485	,395	,085		
Graduate Rate Under High School Education in Employment	,512	-,403	,478	,104		
Housing Number Ratio Produced by the State to the Number of All Houses Produced	-,065	-,351	-,194	,834		
Public Hospital Ratio to Total Hospitals	,708	,347	-,054	,278		
Public School Ratio to All Schools	,810	,039	,283	,025		
Number of Cars Per Ten Thousand People	,179	,438	,553	,336		
Unionization Rate	,437	,399	-,471	,161		
Numbers of Professional Chambers	,851	-,224	,032	,086		
Industrial Sector Ratio in Employment	,573	,359	,025	-,035		
Basic Consumption Rate in Total Consumption	-,201	-,581	,310	-,169		
No Worship Places for Minorities	,564	-,305	-,351	,135		
Planning Activity in the Single Party Rule Period	,468	-,151	,275	,272		
Component Matrix (Postmodernism)						
	1st	2nd	3rd P	4th	5th	6th
Services Sector Ratio in Employment	,519	,223	-,294	-,231	-,152	,216
Luxury Consumption Rate in Total Consumption	-,025	,260	,296	,519	,428	,342
Crude Suicide Rate	-,050	,498	,206	,497	-,076	,187
Crude Divorce Rate	,505	,607	,073	-,107	-,290	,162
Urban Population Rate	,460	,001	-,763	,291	,092	,040
Municipal Budget Per Ten Thousand People	,893	-,261	,183	,034	-,026	-,008
Number of Companies with Foreign Capital Per Ten Thousand People	,535	,302	-,632	,121	,270	-,238
Higher Education Graduation Rate in Employment	,722	,240	-,264	-,009	-,428	,056

Number of Movie Theaters Per Ten Thousand People	,838	-,266	,266	,010	-,071	-,016
Number of Hotel Beds Per Ten Thousand People	,488	,459	,184	-,163	,110	-,457
Crude Marriage Speed	,088	,040	,068	-,545	,515	,481
Number of Malls Per Ten Thousand People	,380	,396	,023	-,163	-,402	,269
Aesthetics Salon Per Ten Thousand People	,880	-,353	,122	,175	-,072	,062
Magazine Fashion Shopping Journal Ratio	,178	,691	,332	,289	,193	,005
Private Schools Number /Total School Number Ratio	,833	,082	-,036	-,129	-,145	,028
Private Hospital Number /Total Hospital Number Ratio	,568	,161	,050	-,571	,220	,108
Provinces with FEMEN Protests	,741	-,350	,463	,094	-,103	,079
Provinces with LGBTI + Representatives	,546	,092	,031	-,061	,313	-,371
Provinces with Greenpeace Representatives	,649	,092	,419	-,141	,008	-,340
Provinces with Green Party Representatives	,848	,072	-,091	,084	,255	-,144
Provinces with Fashion Week	,849	-,237	-,072	,226	,063	,113
Provinces with Licensed Lego Stores	,877	-,287	-,066	,248	-,031	,088
Cities with Worship Places for Minorities	,585	-,134	-,134	-,048	,296	,284

Source: Modernism and Postmodernism Factor Load Values were produced within the scope of the study.

Since the criteria/variables have different measurement types (as some variables are ratio, some are number and some are of categorical type), all data were first standardized in the analysis process. Also, standardization with the Z score was also made in the study so that the extreme values do not affect the search result with the period. Standardization is achieved by subtracting the arithmetic mean of the variable from the numerical values of each variable and then dividing it by its standard deviation. Thanks to the standardization process, over or under weighting of variables in different units and different sizes was prevented.

Thus, because of obtaining clear data values of the criteria in the indicator sets, the amount of deviation in the calculation method was minimized. With the standardized data, separate PCA was performed for modernity and postmodernity variables, and the weights of the variables in the 1st principal component were calculated. The 1st principal component was the major factor that affects all variables simultaneously and jointly or was affected by the variables. Therefore, the first principal component has been evaluated as the "periodic causal factor" that can be used to define the periodization of cities in terms of modernity and postmodernity. In consequence, the factor loads to be used for the index calculation are illustrated in the table. These values are multiplied by the standardized data matrix and used to obtain the weighted coefficient to calculate the index values. Accordingly, the common factor variances of modern and postmodern variables, that is, the values indicating the weight of each variable were found to be between the ranges of -0.025 to 0.893. Out of a total of 34 variables, 25 variables had a value higher than 0.50.

Table 7. Modernism and Postmodernism Final Cluster Centre Load Values

	Cluster					
	1	2	3	4	5	6
Participation Rate in Elections	89,27	88,08	89,18	85,64	88,02	88,4
Graduate Rate Under High School Education in Employment	56,49	56,15	54,12	57,27	55,33	50,66
Housing Number Ratio Produced by the State to the Number of All Houses	7,18	5,82	7,68	12,60	4,16	78,9
Public Hospital Ratio to Total Hospitals	90,49	74,50	96,86	53,44	44,17	55,63
Public School Ratio to All Schools	96,81	95,64	95,65	83,87	85,86	93,8
Number of Cars Per Ten Thousand People	1,20	1,34	1,21	1,09	1,06	1,26
Unionization Rate	17,78	14,82	19,91	12,62	11,37	15,17
Numbers of Professional Chambers	0,72	1,21	0,78	4,20	2,56	1,55
Sectoral Distribution (Industry)	15,01	23,83	23,85	31,00	28,17	22,19
Basic Consumption Rate	67,30	67,03	67,39	67,00	67,20	67,88
1	Cluster					
	1	2	3	4	5	6
Sectoral Distribution (Services)	75,30	67,00	67,50	46,89	51,92	54,34
Luxury Consumption	7,35	7,00	6,90	7,17	6,84	6,80
Crude Suicide Rate	4,43	4,31	4,26	3,60	3,89	2,88
Crude Divorce Rate	2,88	2,38	2,13	1,33	1,53	1,92
Urban Population Rate	100,00	91,7	65,69	60	55,57	33,45
Municipality Budget per ten thousand people	24,15	9,21	3,27	0,58	0,52	1,8
Number of Foreign Capital Companies per 10.000 People	26,38	43,01	1,22	0,21	0,13	0,00
Higher Education Graduate Rate in Employment	29,80	35,70	24,80	20,5	19,69	18,33
Number of Movie Theaters for Ten Thousand People	31,55	7,95	4,06	1,42	0,51	0,57
Number of Hotel Beds per 10.000 People	0,82	2,13	37,93	0,70	0,32	12,69
Crude Marriage Rate	6,70	6,08	6,74	6,16	6,54	6,53
Number of Malls per 10.000 People	1,19	2,39	2,45	1,19	1,18	2,58
Number of Aesthetic Salon Per Ten Thousand People	1,56	25,00	0,00	0,00	0,00	50,0
Fashion / Shopping Magazine Consumption Rate	2,71	1,25	22,22	4,69	3,02	5,43
Private Schools Number Ratio to the Total School	8,20	22,94	13,22	3,61	4,66	28,21
Private Hospital Number Ratio to the Total Hospital Number	48,45	42,53	62,23	14,31	17,53	70,59

Source: Modernism and Postmodernism Factor Load Values were produced within the scope of the study.

In the study, the cluster population number of the cluster analysis was considered based on the homogeneous regional hierarchy of the provinces, which are used within the scope of the New Incentive System, which was introduced with the Council of Ministers Decree dated 15/06/2012 and numbered 2012/3305.

Analyses made based on five homogeneous level regions in 1996 and 2003 SEDIs were composed of three main levels and three sub-levels as high, medium (close to high, close to average, close to high and close to low) and low level in the SEDIs of 2011 and 2017 and were evaluated at six levels in total (Ministry of Industry and Technology, 2011). Thus, it was ensured that the hierarchies of Turkish cities obtained herein can be compared with the SEDI studies. In the following section, the findings reveal the six levels of the modernity/postmodernity conditions and hierarchies' analysis of cities, and the outcomes were discussed.

4. Findings and discussion

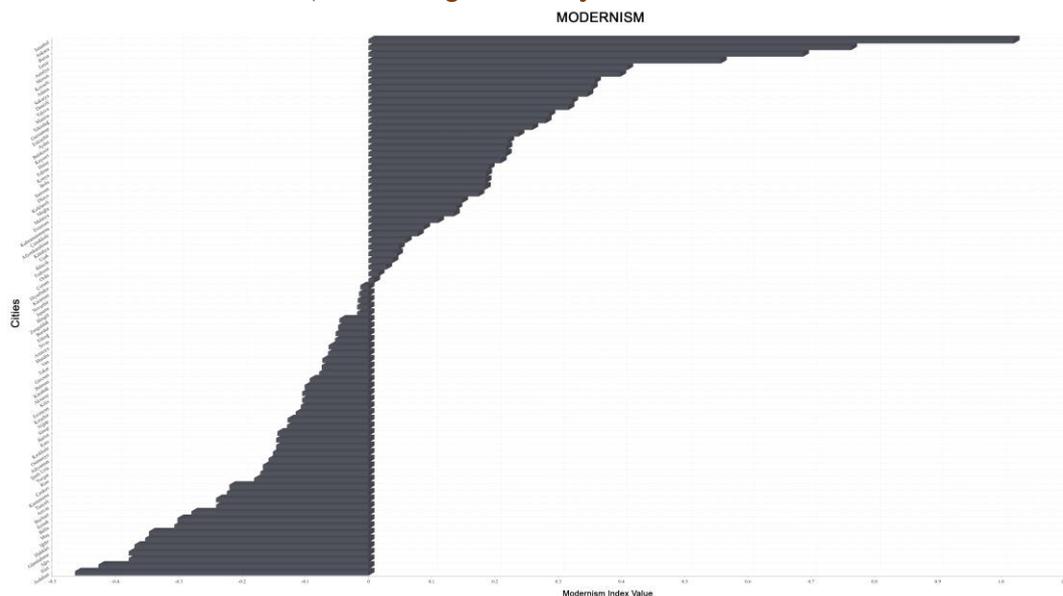
Starting from the concluding remarks in section 3, and according to the analysis results in section 4, the modernity and postmodernity hierarchy cluster groups of Turkish cities are illustrated in Table 8, and the modernity and postmodernity situations are presented below in Graphs 1 and 2.

Table 8. 81 Modernity and Postmodernity Indices of the Cities, Ranking and Cluster Groups

Modernism Hierarchy Order	Modernism Homogeneous Group	Index Value
1	High	ED > 0,501
2-5	Middle	0,501> ED >- 0,160
2	Close to High	0,501> ED > 0,25
3	Close to Average	0,25 > ED > -0,009
4	Low Close to Average	-0,009 > ED > -0,160
5	Close to Low	-0,160 > ED > -0,310
6	Low	-0,310> ED
Postmodernism Hierarchy Order	Postmodernism Homogeneous Group	Index Value
1	High	ED > 0,501
2-5	Middle	0,501> ED >- 0,188
2	Close to High	0,501> ED > 0,100
3	Close to Average	0,100 > ED > -0,003
4	Low Close to Average	-0,003 > ED > -0,095
5	Close to Low	-0,095> ED > -0,188
6	Low	-0,188> ED

Source: Modernism and postmodernism index value was produced within the scope of the study using cluster analysis.

Graph 1. Ranking of Cities by Modernism Index Value

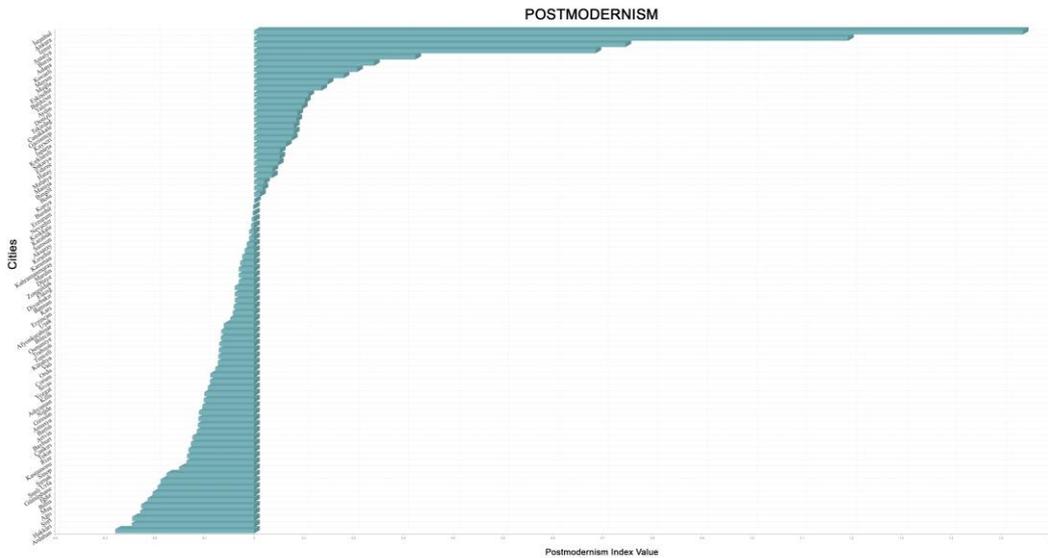


Source: Modernism and postmodernism index value was produced within the scope of the study using PCA and cluster analysis.

At this point, it would be useful to briefly answer the question "how is the concept of homogeneous city determined and how do different levels differ" presented in detail above. In the cluster analysis, the homogeneous city term is used for items with the same characteristics.

Cluster analysis classifies common features by identifying cities with similar results on a given set of indicators within a given cluster. The main difference between the scores of the indicators determined based on provinces emerges because of the cluster analysis. Accordingly, 6 different homogeneous clusters with similar characteristics emerged and the following subtitles were created in this context. The findings presented under these 6 subtitles describe the coefficients and hierarchies that emerged because of the cluster analysis and principal component analysis of the new indicator set developed in the 3rd part.

Graph 2. Ranking of Cities by Postmodernism Index Value



Source: Modernism and postmodernism index value was produced within the scope of the study using PCA and cluster analysis.

4.1. 1st level homogeneous cities according to modernity and postmodernity index value

There are 4 cities within the homogeneous region defined as 1st level cities and whose modernity index value is greater than 0.501. These cities are respectively Istanbul, Ankara, Bursa, and Izmir. These cities which have the highest modernity index constitute approximately 35% of the country's population. Regarding the ranking of postmodernity, there are 4 cities in the region with an index value higher than 0.501 and defined as the 1st level homogeneous region. These cities are respectively Istanbul, Ankara, Izmir, and Antalya. In the postmodernity index ranking, the four cities which have the highest index value of the country constitute approximately 33% of the country's population. As can be noticed, while Izmir, Ankara and Istanbul preserved their place in this ranking, Antalya surpassed Bursa at the postmodern level and rose to the first rank. The underlying reason for this differentiation is the varying economic and social / ethical structure of Antalya and Bursa.

As a result of the analysis conducted with PCA and clustering method based on the modernist and postmodernist values system, Istanbul shows up as the only city with both modernist and postmodernist index value higher than 1. As the leading sector in the modernist period's capital investment process, industry ranks 10th in the country with an employment rate of 31.8%. However, since four of the top ten cities in the industrial sector are in the Marmara region, the industrial decentralization process that occurred in the city in the postmodern period was effective and the globalization demand and desire of Istanbul were effective in the transition from industrial investments to the services sector.

Thus, it is thought that postmodernist values are effective in these developments. Additionally, in line with the tested criteria, the following factors played a prominent role in increasing the value of the modernist and postmodernist index: the fragmentation of the social structure, the privatization of basic services, the organization of today's consumption norms in the city and the development of the organized movement mechanism in the industrialization process.

Ankara ranks 2nd with its modernist index of 0.763 and its postmodernity index value of 1.193. The state itself has an important role in the fact that the city ranks 2nd in two different movements. Within the scope of the modernist understanding, Ankara's gaining the title of capital caused it to be functionalized as the most important city where the modernist accumulations of the nation-state were reflected (Tankut, 1988). The fact that the state has a specific position in the capital accumulation regime since the foundation of the republic, the state assumes a supervisory / regulatory role and is authorized to directly influence a large part of the gross national product, has allowed Ankara to host state-run industrial investments, thus preventing the private enterprise's investment area Trujillo and Joseph (2015) In the postmodernist period, the localization of the state and the hotly-debated globalization phenomenon has developed under the control of the central government in Ankara.

Ankara bureaucracy's urbanization adventure during the modernist period has evolved into the capitalization process of the bureaucracy in the postmodernist period and as a result, urban development has been achieved through public and political capital. Ankara experiences an economic change process like Istanbul. However, considering the managerial accumulation of two different movements, Ankara comes to the forefront. While Istanbul directs its own region in terms of the economic hinterland, Ankara develops it in line with managerial/organizational accumulations. In Ankara, modernism ranks 12th in terms of the participation rate in elections held to define the legitimacy of the nation-state (representation of democracy).

However, cities such as Çorum, Kırıkkale, and Çankırı around Ankara have influenced the formation of the legitimacy perception of the state mechanism, which is considered as one of the accumulations of modernism. However, it is understood that the surrounding cities are in the middle and last ranks in terms of economic accumulations, and they couldn't keep up with Ankara's economic accumulations. Namely, Ankara's economic hinterland has lower influence when compared to its organizational and managerial knowledge to the surrounding cities.

With its modernist index value of 0.557 and a postmodernity index value of 0.776, Izmir ranked under the 1st level homogeneous zone. As the reason for Izmir to be in the first group in the modernity index ranking, it can be argued that the state mechanism supported the city with public investments from the early republic period to the early 2000s. Although there have been increasing central-local government conflicts in recent years, it is seen that the city has the highest rate in terms of the criteria defined for the social policies of the state (health, education, housing) in the 1st level homogeneous region.

However, the economic accumulations developed within the framework of the controlling and regulatory function of the state in the modern period turned into market-oriented accumulations in the postmodern period and caused an increase in the index level of Izmir. While Izmir, which has been exposed to local-central administration conflicts during the modern period, has experienced problems in providing organizational and economic accumulations, in the postmodernist period, the market economy has developed in line with the supply-demand relationship. The tourism sector, emerging in this period and is called the smokeless industry, developed in the city, and became the main item of postmodern economic accumulation.

For labour quality, it has adopted post-Fordism in terms of production accumulation with a higher education graduation rate approaching 30%. In terms of "foreign capital investment per ten thousand people" selected to measure the role of global capital within the context of market-oriented economic accumulations, the city ranked second after Istanbul with a rate of 1.72%. Another postmodernist economic accumulation characteristic of the city is that it has a structure focusing on the tourism sector. The number of hotel beds per ten thousand people in the city exceeded 22, allowing it to hold 4th place after Antalya, Muğla, and Istanbul (Ministry of Industry and Technology, 2017).

It is a remarkable result that Bursa is in front of Izmir in terms of modernist experiences. As a reason, it can be argued that the organizational and economic accumulations of the modernist period were created from the late Ottoman period and that increasing this accumulation with industrial policies as of the early Republic period brought Bursa to the forefront. The Trujillo and Joseph (2015) listed Bursa among the World's Ten Fastest Growing Metropolitan Cities for 2014 and defined the city as "Turkey's Detroit." Moreover, the conservative attitude of the city towards minority groups (the absence of worship places for minorities) caused it to rank high in terms of modernist accumulations. Antalya, however, has risen to the 1st level in the postmodernist period and is replaced by Bursa, even though it was in the 2nd level in the modernist period due to its pluralist ethnic structure in the postmodernist period, the continuation of the capital process in the tourism and services sector, and the capital-oriented advancement of basic humanitarian needs. According to the SEDI studies of 1996 and 2003 (State Planning Organization, 1996; State Planning Organization; 2003), the cities in the 1st level generally concentrated at the Marmara Region, and in the studies of 2011 and 2017, the cities from the Mediterranean and Aegean regions were added to the 1st level homogeneous region group (Ministry of Industry and Technology, 2011; 2017).

As can be seen in Figure 1, while Istanbul, Ankara, Izmir, and Bursa kept their places in the ranking in all SEDI studies, the surrounding provinces of Istanbul were also ranked first in some studies. It has also been suggested that: Istanbul, one of these cities, is located at the centre of both the country and the Marmara Region, Ankara is the capital city of the country and the service and trade centre of the Central Anatolia Region, Izmir is the economic centre of the Aegean Region, and it has enabled the surrounding cities to cluster in the second level. Finally, it was explained that Bursa and Kocaeli were integrated into the first level region because of the spreading tendency of industrial areas in the hinterland of the Istanbul metropolitan region.

In SEDI studies of 2011 and 2017, Eskişehir, Muğla and Antalya, in addition to Istanbul, Ankara, Izmir, Kocaeli and Bursa, were among the first-level cities (Ministry of Industry and Technology, 2011; 2017). As the reason for Antalya and Muğla to enter the first level, it was stated that advanced tourism opportunities as an international attraction centre plays a significant role. For Eskişehir, it was stated that the improved educational infrastructure and the development of human capital compared to other metropolitan cities were the main factors in being among the first-level cities.

4.2. 2nd level homogeneous cities according to modernity and postmodernity index value

There are 10 cities within the homogeneous region defined as 2nd level cities with an index value of modernity between 0.501 and 0.25. These cities are Antalya, Mersin, Kocaeli, Adana, Sakarya, Denizli, Yalova, Manisa, Tekirdağ and Gaziantep according to the index value order. Except for Yalova, all cities have a population of over 1 million. Furthermore, all cities except Yalova are holding metropolitan status among 10 cities. In terms of geography, all cities except Gaziantep are in the west of the country in the second level homogeneous region, which concentrated at the Mediterranean and Marmara Region.

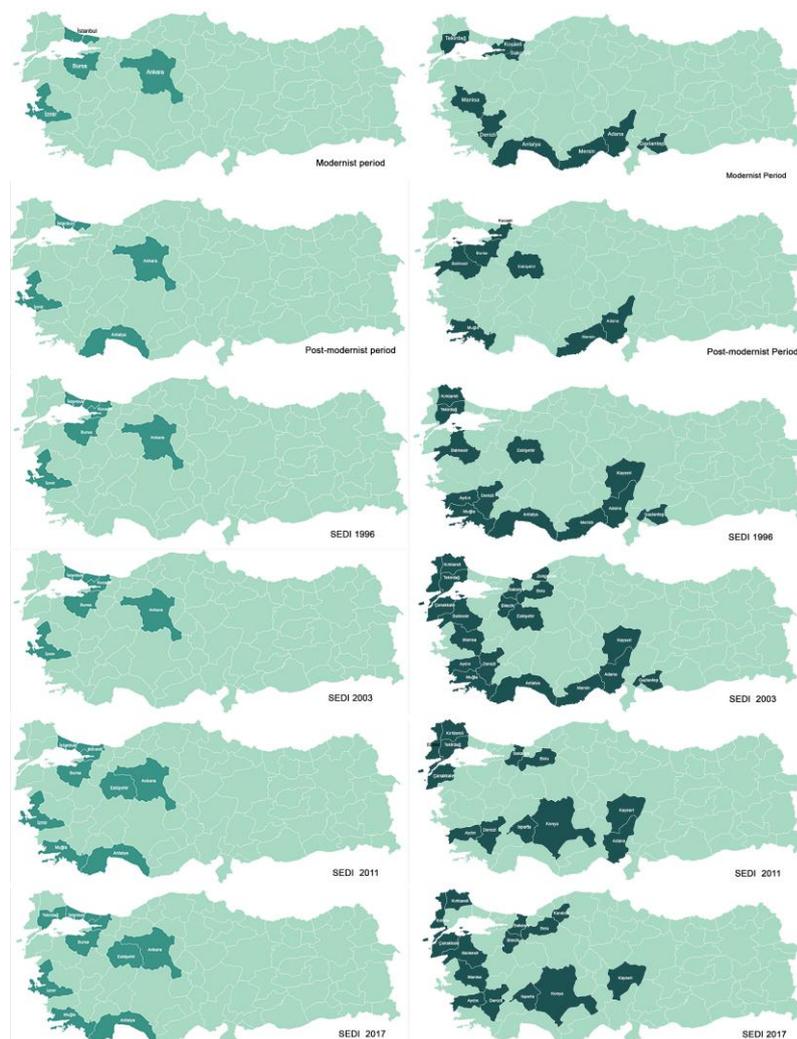
There are 8 cities in the region, whose postmodernity index value is between 0.501 and 0.100 and defined as the 2nd level homogeneous region. These cities are Bursa, Adana, Kocaeli, Mersin, Muğla, Eskişehir, Balıkesir and Yalova, respectively. Within the 2nd level homogeneous zone, the cities except for Eskişehir generally are the cities around the metropolitan area of Istanbul, around the Izmir metropolitan area, and in the Adana-Mersin-Antalya metropolitan region.

It was observed that the cities in the 2nd level homogeneous region developed because of the industrialization process in general, and economic accumulation comes to the fore in the high index of modernity. The foundations laid in the middle of the 19th century had also a great impact on the formation of modernist accumulations in Antalya, Mersin, and Gaziantep among 10 cities. It was understood that Denizli and Gaziantep came to the fore in modernist accumulations with industrial breakthroughs introduced as Anatolian Tigers during the Republic period. It is clearly seen that the cities in the Marmara and Aegean Regions reflect both modernist and postmodernist accumulations in an economical aspect, while the Aegean and Mediterranean Regions have more explicit reflections of the postmodernist social/ethical structure compared to other regions. However, it was observed that the Anatolian Tigers, who made modernist accumulations with the industrialization process, transferred to the 3rd or 4th level in terms of postmodernist accumulations.

Another remarkable result in the second homogeneous level region is that Antalya, Mersin, and Adana in the Mediterranean region have gained the identity of metropolitan areas such as Istanbul, İzmir and Ankara. It was observed that the modernity index levels of these cities have similar proportions and that they affect the cities in and around their own region. Another result is that four cities within 10 cities in the 2nd level homogeneous region are around Istanbul and thanks to Istanbul they have achieved their modernist accumulations. Namely, the economic and organizational hinterland of Istanbul played a significant role in creating the second level region. In the SEDI studies of 1996, 2003, 2011 and 2017, although the cities in the 2nd level generally concentrated at the Marmara, Aegean and Mediterranean Regions, the cities exhibit some differences. In the study in 1996, the second-level cities clustered in the hinterland area of Istanbul and on the Mediterranean coast. In the study in 2003, Istanbul expanded its hinterland area and other surrounding cities entered in the group of second-level cities. In the study in 1996, Kırklareli, Balıkesir and Tekirdağ were mentioned in the hinterland area of Istanbul, and in the study of 2003, it was seen that Edirne, Sakarya, Bilecik and Çanakkale were also included. In 2011, it was understood that Tekirdağ, Kırklareli, Çanakkale and Sakarya were under the sphere of influence of Istanbul and the cities included in previous studies transferred to the first or third level homogeneous region. As the final study of 2017, Balıkesir and Bilecik fell into the second level region (State Planning Organization, 1996; State Planning Organization, 2003; Ministry of Industry and Technology, 2011; 2017).

When we look at the Mediterranean Region, it was seen that Antalya, Mersin and Adana were in the second level in the studies of 1996 and 2003, Antalya moved up to the first level in the studies in 2011 and 2017, and Adana and Mersin fell to the third level. The share of the Aegean Region among the second-level cities in the studies between 1996 and 2017 varies. While only Muğla, Aydın and Denizli were among the second-level cities in 1996 and 2011, Manisa was included in these cities in the studies of 2003 and 2017. In all SEDI studies, some of the cities called Anatolian Tigers entered the second level cities. While Bolu, Gaziantep and Kayseri were mentioned among the second-level cities in the studies of 1996 and 2003, on the other side, Gaziantep fell to the third level in the studies of 2011 and 2017, and Konya entered the second-level cities. In all studies brought forward, the importance of economic and human capital in determining second-level cities was emphasized. Moreover, in SEDI studies, the education and health infrastructure of the cities included in the second-level homogeneous region has been well-established, and the industry and tourism sector has been developed.

Figure 1. 1st and 2nd level homogeneous cities in terms of modernity and postmodernity



Source: The maps were produced within the scope of the study.

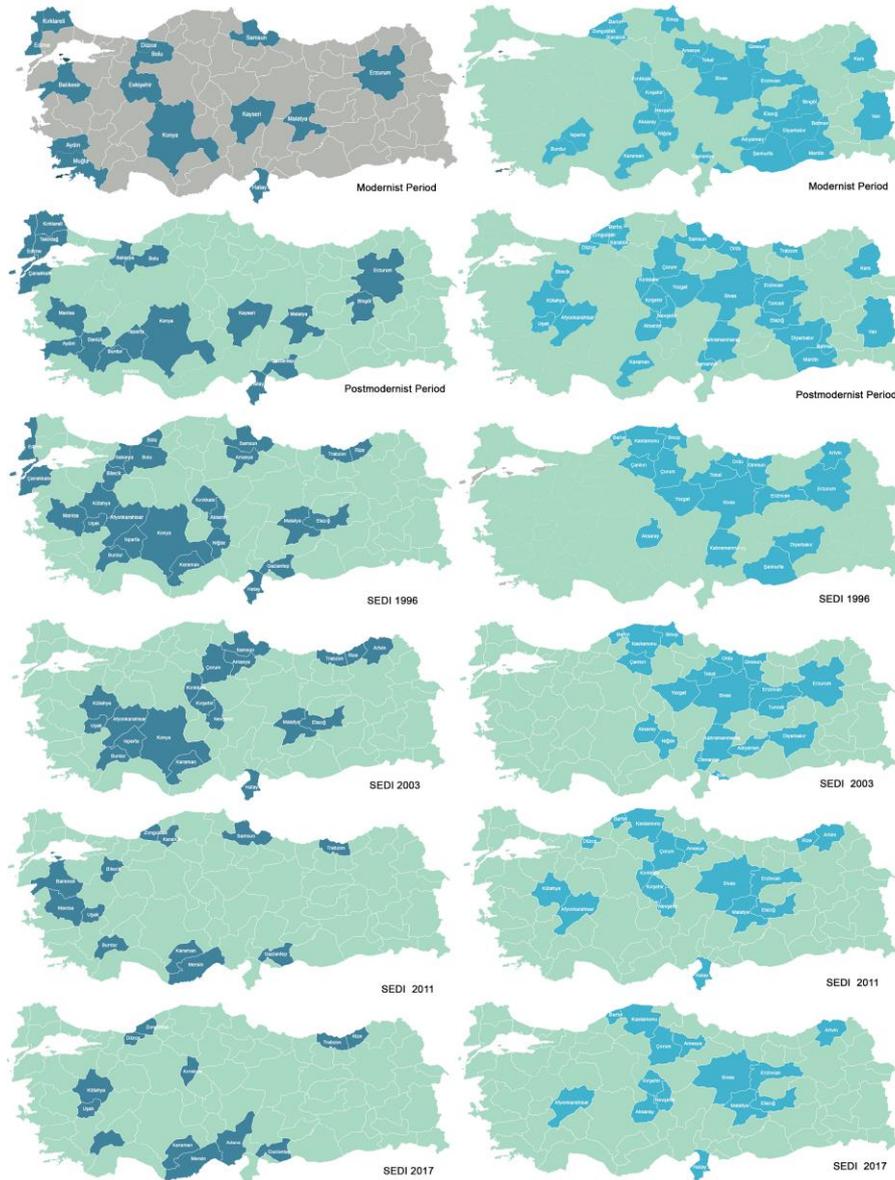
4.3. 3rd level homogeneous cities according to modernity and postmodernity index value

Among the modernist 3rd level cities revealed herein are Kırklareli, Düzce and Edirne located in the hinterland area of Istanbul; and Aydın and Muğla from the Aegean Region. Eskişehir and Konya from Western Anatolia; Hatay from the Mediterranean Region; and Erzurum, Malatya, and Samsun, which are the regional centers, entered the third level modernist cities. Aydın, Denizli, Tekirdağ, Çanakkale, Kayseri, Isparta, Kırklareli, Sakarya, Edirne, Hatay, Malatya, Manisa, Bingöl, Bolu, Konya, Burdur and Erzurum are included in the postmodernist 3rd level cities.

While Samsun fell to the fourth level in the postmodern period, Bingöl rose to the third level thanks to its heterogeneous cultural structure. Erzurum and Malatya, which preserved their regional center characteristics in the postmodern period, took place in the third level. The modernist and postmodernist cities mentioned in the 3rd level are generally regional centers or clustered around Istanbul and Izmir, and metropolitan cities located in the Marmara/Aegean Region.

As seen in Figure 2, according to 1996 and 2003 SEDI studies, level 3 cities are generally concentrated in Western Anatolia, Central Anatolia, and Aegean Region. The central cities in the Black Sea and Eastern Anatolia Region entered the 3rd level. While Sakarya, Bilecik, Çanakkale and Edirne in the Marmara Region in the SEDI study of 1996 were in the third level, they rose to the second level in the 2003 study. While Kütahya, Uşak, Isparta and Burdur in the Aegean and Mediterranean Regions took part in the 3rd level in the study of 1996 and 2003, Isparta rose to the second level in the study of 2011 and 2017 (State Planning Organization 1996; State Planning Organization 2003; Ministry of Industry and Technology, 2011; 2017).

Figure 2. 3rd and 4th level homogeneous cities in terms of modernity and postmodernity



Source: The maps were produced within the scope of the study.

According to the study of 1996, Bolu, located in the hinterland area of Ankara, was able to enter the third level, and in 2003 Nevşehir, Kırşehir, Kırıkkale, and Çorum also moved up to the third level.

However, in 2011 and 2017, all cities except for Kirikkale fell to the fourth level. Samsun, Trabzon, Erzurum, Elazığ, and Malatya, which were considered central cities in the Black Sea and Eastern Anatolia Region in 1996 and 2003 SEDI studies, were mentioned among the third-level cities, while Erzurum, Malatya, and Trabzon fell to the fourth level in the 2011 study. In 2017, Samsun fell to the fourth level, and Trabzon, which is a regional center, rose to the third level again (State Planning Organization, 1996; State Planning Organization 2003; Ministry of Industry and Technology, 2011; 2017).

4.4. 4th level Homogeneous cities according to modernity and postmodernity index value

According to the SEDI studies of 1996 and 2003, the cities in the 4th level generally concentrated at the Black Sea, Eastern Anatolia, Central Anatolia, and South-eastern Anatolia Regions. In the study of 2011 and 2017, some cities in South-eastern Anatolia and Eastern Anatolia Region fell to the fifth level. The study revealed that the fourth-level modernist cities clustered around Ankara and were regional centers. Moreover, the study suggests that some cities in the inner part of the Aegean Region were also in the fourth level. Finally, most cities in the South-eastern Anatolia Region were mentioned to be at the fourth level.

In the studies of 1996 and 2003, it was pointed out that most of the employment is mainly agricultural in the general framework regarding fourth-level cities, but the agricultural product production per rural population was below the country average (State Planning Organization 2003). It was mentioned that the basic social indicators and the literacy rate of fourth-level cities were low. In line with this data, according to the report, the schooling rates were also low. In the report of the study of 2003, the employees' insured employment rate in the manufacturing industry and the rate of automobile ownership per person were under the national average.

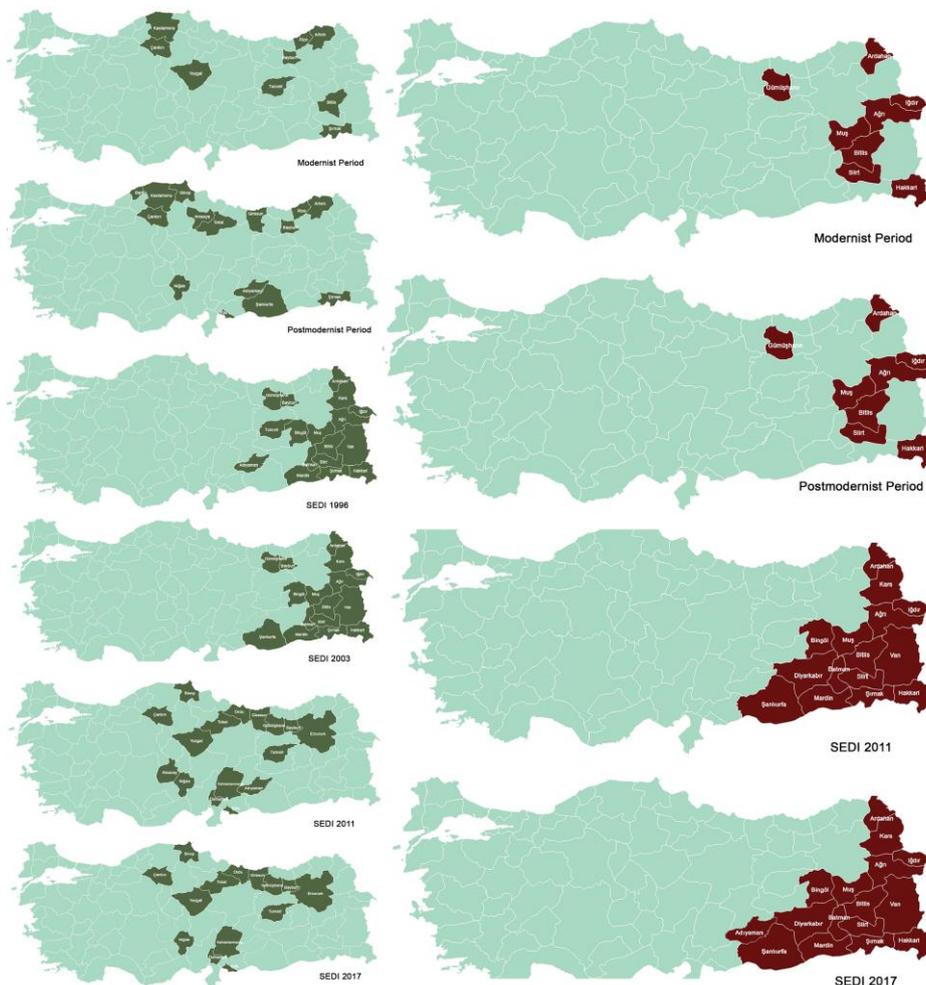
4.5. 5th level homogeneous cities according to modernity and postmodernity index value

As seen in Figure 3, in the 1996 and 2003 SEDI studies, the fifth level cities are generally concentrated in the Southeast Anatolia Region and clustered in Central Anatolia and Northeast Anatolia in 2011 and 2017. All cities except Aksaray had similar characteristics, and the fifth-level modernist cities revealed herein concentrated at the east of the country and clustered around regional centers. The Black Sea Region cities concentrated in the postmodernist fifth level homogeneous region. Regarding fifth-level cities in SEDI studies of 2011 and 2017, it was stated that demographic and educational development indicators had low values. Along with the low literacy rate, this cluster had a female literacy rate below the country average, and the female employment rate was low too.

4.6. 6th level homogeneous cities according to modernity and postmodernity index value

Since SEDI studies of 1996 and 2003 evaluated Turkey in five levels, sixth-level cities were examined based on the 2011 and 2017 SEDI studies and it was observed that these cities concentrated at the South-eastern Anatolia and the North-eastern Anatolia Region. According to the 2011 and 2017 SEDI studies, there was no change in the list of sixth-level cities except for Adıyaman, their share in the country's exports remained at a very low level, they did not have sufficient infrastructure in terms of OIZ (Organized Industrial Zones) and SIA (Small Industrial Area), and they had problems in terms of skilled labour workforce. Also, demographic and education development indicators had low values (State Planning Organization 1996; State Planning Organization 2003, Ministry of Industry and Technology, 2011; 2017).

Figure 3: 5th and 6th level homogeneous cities in terms of modernity and postmodernity



Source: The maps were produced within the scope of the study.

In the study, there was no change except Gümüşhane in the list of sixth-level cities that revealed as modernist and postmodernist and included in the SEDI studies. The cities at the sixth level are still rural in character and have not been able to institutionalize economically. In addition to this point, sixth-level cities suffer from security problems in SEDI studies, and within the scope of the study, their social life norms are close to the traditional society.

5. Conclusion

This study aimed to explain the impacts of modernist and postmodernist movements on urban dynamics and the level of Turkish cities' experiencing-realizing modern/postmodern processes. Based on the analysis results, and the findings, the following evaluations have been made. The cities that were not affected by the modernism movement were also unaffected or weakly affected by the postmodernism movement and could not be a part of the postmodernist accumulation process. Thus, it has been confirmed that although the two trends have emerged based on opposite values, they have come into the picture in sequential phases and cannot be considered independently from each other.

Accordingly, sectoral specialization is effective in the spatial reflections of modernist and postmodernist accumulations, and economic development preferences also determine the social structure / ethical understanding. Remarkably, the cities, which shape their economic development by industrial sector, generally had a high level of modernity index, but their postmodernity levels were low. In addition to this point, although the modernity level of the cities with developed services and tourism infrastructure was weak, the postmodernity index levels had increased. It was revealed that cities with a high modernity index and a low level of postmodernity had a conservative social structure/ethical understanding. In contrast, cities with a low level of modernity and a high level of postmodernity adopt a secular experience. Thus, an ontological contradiction in the adoption of modernism and postmodernism movements in Turkey appears relevant.

Except for the Marmara Region, Aegean Region, Mediterranean coastline, and metropolitan cities, it can be suggested that the cities in Turkey lag in adopting the accumulations of two movements. It was found that Istanbul played a dominant role in embracing modernism and postmodernism in the Marmara Region cities.

The sphere of influence of Izmir in the Aegean Region affects the surrounding cities in terms of the accumulation of postmodernist components. Antalya-Mersin and Adana in the Mediterranean coastline have influenced metropolitan regions and formed a development corridor along the Mediterranean. However, Ankara, the capital, failed to control its surrounding, although it ranks second in adopting modernist and postmodernist accumulations both.

It was demonstrated that the cities in the first level were generally integrated into the globalization process. In contrast, the cities in the second level clustered surrounding the first level or strengthened their accumulation with their internal dynamics (Anatolian Tigers). It was brought forward that third-level cities had low-population around the cities that made efforts to take an active role in the globalization process and had the characteristics of regional centres. However, the fourth-level cities were found to be former regional centres clustered around regional centres—fifth-level cities clustered around cities with the attributes of former regional centres. Finally, sixth-level cities generally suffered security problems and concentrated in the Southeast / Northeast Anatolia region.

In the light of these findings, this study, designed to scrutinize the levels of Turkish cities being affected by modernism and postmodernism movements, to adopt these movements and to determine the levels of accumulation because of the internalization of these impacts, aims to contribute to the literature with its detailed analysis following the literature that defines the spatial dynamics of modernism and postmodernism. In addition, with a better understanding of modern/postmodern space, future studies that will address urban spatial dynamics, formation/change processes, and development inequalities will contribute to the development of progressive alternative urbanization policies/planning methods.

As a closing remark, it may be emphasized to what extent has the aim of the study been achieved and what are the limitations of this study. Limitations of this study, that may provide different perspectives for future studies, can be assembled under two main headings. The first limitation is the lack of historical continuity in the data used in SEDI research in Turkey and the inaccessibility of data with the same content that would enable current comparisons.

The second main constraint is lack of local and qualitative data that was inaccessible due to the pandemic closures and would enable the newly created set to be more representative than the city scale, (e.g., district and neighbourhood scales). When access to local/new data is enabled, a similar study can reveal the differences between postmodern and modern discourses/movements with spatial representations closest to the reality.

Author Contributions

Both authors contributed to all parts of the research. The first author conceptualized and developed the general structure of the article. The second author analysed the data, produced the graphs and maps, and wrote the paper. The authors jointly discussed and finalized the writing.

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