Religiosity Prediction by Gender with Artificial Intelligence in 2020–2025 in Turkey

Yapay Zekâ ile 2020-2025 Yıllarında Cinsiyete Göre Dindarlık Durumunun Tahmini

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Abstract

Religiosity continues to be the subject of both qualitative and quantitative studies in many branches of science. In this context, the dimensions of religiosity and its relationship with other variables are discussed. The aim of this study is to predict the future status of religiosity in the context of gender, based on current religiosity data. As a method, Artificial Neural Networks (ANN) technique, which provides both a systematic review description and a prediction for the future, is based on. In the sample of Turkey, a total of 75 master's and doctoral theses which based on quantitative methods were scanned and made ready for processing. Religiosity scores were normalized and converted into a standard scoring system. MATLAB software was preferred to benefit from mathematical algorithms. In ANN, predictions were made for the future by using the Time Series Method. According to the results obtained from the research, the religiosity of male and female students decreased after a certain period of time. In addition, religiosity in male and female adults continues to increase in the general total. Accordingly, it can be stated that the religiosity of young people who receive high school and undergraduate education is affected by the environment and time they live in. In addition, it can be said that there is an increase in the level of religiosity as a result of both the lifestyles of adults and the socio-cultural situation in our country.

Keywords: *Psychology of Religion, Religiosity, Turkey, Systematic Review, Artificial Neural Networks.*

Öz

Dindarlık konusu birçok bilim dalında hem nitel hem nicel çalışmalarla incelenmeye devam ediyor. Dindarlığın boyutları ve diğer değişkenlerle ilişkisi, ele alınan temel konular arasındadır. Bu çalışmanın amacı mevcut dindarlık verileri üzerinden dindarlığın cinsiyet bağlamında, gelecekteki durumunu tahmin etmektir. Yöntem olarak hem sistematik derleme hem de Yapay Sinir Ağları (YSA) tekniği esas alınmıştır. Türkiye örnekleminde toplam 75 adet nicel yönteme dayalı yüksek lisans ve doktora tezi taranıp, işleme hazır hale getirilmiştir. Elde edilen dindarlık puanları normalize edilerek, standart bir puanlama sistemine çevrilmiştir. Matematiksel algoritmalardan faydalanmak için MATLAB yazılımı tercih edilmiştir. YSA'da Zaman Serileri Yöntemi kullanılarak geleceğe yönelik tahminde bulunulmuştur. Araştırmadan elde edilen sonuçlara göre, kız ve erkek öğrencilerin dindarlıkları belli bir dönem arttıktan sonra düşüşe geçmiştir. Ayrıca erkek ve kadın yetişkinlerde ise dindarlık dip toplamda artarak devam etmektedir. Lise ve lisans eğitimi alan gençlerin dindarlığı yaşadıkları çevreden etkilendikleri yorumlanabilir. Ayrıca yetişkinler hem yaşam biçimleri hem de ülkemizdeki sosyo-kültürel durumun sonucu olarak dindarlaştıkları söylenebilir.

Anahtar Kelimeler: *Din Psikolojisi, Dindarlık, Türkiye, Sistematik Derleme, Yapay Sinir Ağları.*

INTRODUCTION

Religiosity is a dynamic process in which religious beliefs and teachings are transferred to life by individuals, groups and society at certain times and conditions with various attitudes and behaviors. It is a concept that expresses the importance of religion in the daily life of an individual or group, and indicates the degree of belief and commitment to religion.[1] Religiosity, which characterizes the relationship between the individual and God, has been reduced to certain typologies in modern times and has begun to be studied empirically.[2] However, it is controversial

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[1]   Muhammed Kızılgeçit, *Din Psikolojisinin 100'ü* (Ankara: Otto Yayıncılık, 2017), 16.
[2]   Necdet Subaşı, "Türk(iye) Dindarlığı: Yeni Tipolojiler", *İslâmiyât* 5/4 (2002), 17.

to measure the belief styles of the participants with standardized questionnaires and to expect these styles to develop in a course within the framework of statistical procedures because religiosity includes an inherent belief beyond individuals' description, and therefore it is difficult to assess it.[3] While the early scale studies on religiosity were considered one-dimensional, multidimensional religiosity scales were developed after the 1960s, when it was noticed that religion does not have a one-dimensional structure. In the first scales trying to measure the level of religiosity of the individuals in Turkey, generally single-question scales on the frequency of ritual participation were used. In recent studies, it has been observed that single-question scales are not a valid method to measure the level of religiosity of an individual.[4] Today, scales are developed in accordance with the dimensions that Western researchers such as Glock and Stark or Faulkner and Dejong, King and Hunt; Guttman and Likert introduced.[5]

Although many scales have been developed on this subject, measures of religiosity cannot reflect the general population because there is no unity in the scales across the country. In addition, a very wide scale was created across the country.[6] The ambiguity of the concept of religion and the multidimensional and multifaceted nature of religiosity do not allow for a complete unity or standardization on the theoretical and empirical level.[7] Reasons such as the validity of the scale dimensions, the fact that typologies and differences do not have the power to represent the reality have also an effect on this.[8] Nevertheless, new studies on scales and typologies may provide progress on the subject.[9] In order to do this, it is necessary for experts to do the necessary conceptual studies within the framework of religious principles, taking into account the social and individual differences. Religion is not just the sum of beliefs and values. Since the surveys are focused on researching attitudes and opinions, it restricts the study of religion as a whole. After all, it is difficult to say that these methods, which are new in terms of human history, are the only and correct way. For this reason, it is a matter of debate whether belief can be fit into the items of the scale. Religiosity measurements are also based on atti-

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[3]   Petruta Rusu - Maria Turliuc, "Ways of Approaching Religiosity in Psychological Research", *The Journal of International Social Research* 4/ (2011), 361.

[4]   Volkan Özbek et al., "Concurrent Validity of Different Religiosity Scales Used in Researches of Marketing Ethics and a Proposal for a New Religiosity Scale", *Anadolu Üniversitesi Sosyal Bilimler Dergisi* 13/ (2013), 16.

[5]   Ünver Günay et al., *Dindarlığın Sosyo-Psikolojisi* (Adana: Karahan Kitabevi, 2006), 44; Yahya Turan (ed.), *Din Psikolojisi Güncel Durum Analizi* (Ankara: Nobel Akademik Yayıncılık, 2020), 263.

[6]   Mehmet Erkol, "Türkiye'de Dini Hayatı Anlamlandırmak: Dindarlık Olgusu ve Dindarlığın Ölçülmesi", *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi* 17/2 (8 February 2016), 132.

[7]   Günay et al., *Dindarlığın Sosyo-Psikolojisi*, 39.

[8]   Celaleddin Çelik, *Geleneksel Şehir Dindarlığından Modern Kent Dindarlığına: Dindarlığın Değişen Kentsel Görünümleri* (İstanbul: Hikmetevi Yayınları, 2013), 176.

[9]   Erol Erkan, "Türkiye'de Dindarlığın Tespiti İle İlgili Çalışmalar Ve Tahkikî Dindarlığın Ölçülmesiyle İlgili Öneriler", *Ekev Akademi Dergisi* 18/60 (2014), 138.

tudes towards behavior. However, religiosity is a phenomenon that derives its motivation from internal beliefs along with the dimension of rituals for behavior. For this reason, its measurement is not as easy as it might seem, and it often becomes more difficult to measure this internal dimension.[10] Despite all this, scales are indispensable for describing the field. According to a particularly relevant data preceding the quantitative studies to obtain, using methods and techniques with a suitable approach, and also making the necessary analyses provide important information about the universe.

The number of studies in the field of data mining such as artificial intelligence, deep learning and artificial neural networks is increasing day by day. Accordingly, the proliferation of data stores in social sciences reveals the necessity to benefit from data mining. Although religious coping with artificial neural networks has been anticipated before,[11] there are no studies on prospective estimation from time series. In these studies, predictive data can be produced by using machine learning and ANN. Detailed prospective estimation studies can be performed by taking larger samples with models based on religiosity metadata.

What are Artificial Neural Networks?: Artificial neural networks (ANN) are computer systems developed with the aim of automatically realizing abilities such as generating new information, creating and discovering new information through learning, which is one of the characteristics of the human brain, without any help. It is very difficult or impossible to realize these capabilities with traditional programming methods. Therefore, it can be said that ANN is a branch of computer science that deals with adaptive information processing developed for events that are very difficult or impossible to program.[12] ANN is one of the applications developed in this machine learning field. General judgments or results are tried to be produced by using sample data. Only the existing examples are given to the network established on the computer by the implementer, and the network is asked to perform the learning process by looking at the results with these examples without any further information. The network realizes learning by using its own system, and in the next stage, it produces solutions or results by using the information it has learned for examples that it has never seen. We can compare this to an exam system. For example, a teacher instructs the lesson, solves examples, does studies and thus enables students to learn. He then examines similar questions he has not solved before to see if the students have comprehended. If the students have learned well, they will be able to answer the questions, but if they have not learned,

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[10] Yahya Turan (ed.), *Din Psikolojisi Güncel Durum Analizi*, 280.
[11] Muhammed Kızılgeçit - Murat Çinici, "Koronavirüs (Covid-19) Sürecinde Yapay Sinir Ağları Yöntemiyle Bireylerin Dini Başa Çıkma Düzeylerinin Tahmini", *İlahiyat Tetkikleri Dergisi* 54 (31 December 2020), 60.
[12] Ercan Öztemel, *Yapay Sinir Ağları* (İstanbul: Papatya Yayıncılık, 2012), 29.

they will not be able to solve the questions easily.[13] These systems, which try to imitate the working mechanism of the human brain, work with silicon logic gates produced by today's technology, whose unit processing time is at the level of nanoseconds. However, they are far from the functionality of the neurons of the human brain, whose unit processing time is in the order of milliseconds, when considered collectively. Although artificial neural networks have not yet passed the stage that can compete with the human brain in terms of decision speed, their application areas are expanding day by day due to the precise realization of complex mappings and their structural robustness.[14]

What are the Processing Steps of ANN?: The steps of ANN operations can be listed as follows:

Step 1: Defining the problem

Step 2: Determining the variables related to the problem

Step 3: Collecting data

Step 4: Pre-processing the data

Step 5: Designing the neural network (Network structure and learning rule selection, Creation of Training and Test Sets)

Step 6: Training the network (Artificial Neural Network Architecture)

Step 7: Checking the validity of the network and detecting errors.[15]

1. PURPOSE, PROBLEM, QUESTIONS AND METHOD OF THE RESEARCH

This study aims to make a prediction for the future with a situation determination based on the data of religiosity. This study is needed because there are no comprehensive religiosity studies in the form of time series in Turkey. This study provides an opportunity to describe a general result obtained from the many and varied samples presented by both systematic review studies and to make a prediction for the future. Artificial neural networks technique, which is one of the deep learning and artificial intelligence methods that are alternative to traditional methods, was used in this study.

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[13] Fatma Sönmez Çakır, *Yapay Sinir Ağları Matlab Kodları ve Matlab Toolbox Çözümleri* (Nobel Akademik Yayıncılık, 2019), 4.

[14] Önder Efe - Okyay Kaynak, *Yapay Sinir Ağları ve Uygulamaları* (İstanbul: Boğaziçi Üniversitesi, 2000), 1.

[15] Çakır, *Yapay Sinir Ağları Matlab Kodları ve Matlab Toolbox Çözümleri*, 32; Burak Çelik, *Yapay Sinir Ağları Metodolojisi Ile Zaman Serisi Analizi : Teori ve Uygulama* (İstanbul: Marmara Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, 2008), 96; Clark Hu, *Advanced Tourism Demand Forecasting: Artificial Neural Network and Box -Jenkins Modeling* (USA: Purdue University,Marketing, Economics, Recreation, Artificial intelligence, Doktora Tezi, 2002), 137.

1.1. Research Questions

The questions to be answered in the research are as follows:

1) Can an estimated score for 2020-2025 be made for the religiosity scores of male and female students?

2) Can an estimated score for 2020-2025 be made for the religiosity scores of male and female adult participants?

3) Is there a relationship between male and female students and adult male and female piety?

4) Are predictions made according to time in the field of psychology of religion with artificial neural networks?

1.2. Limitations and Acceptances of the Research

The limited number of studies conducted in the 1990s is the limitation of the study in making comparisons with the following years. The limitations of religiosity studies are that they are cross-sectional at the sample level, include individuals who are in the education process, and exclude other segments of the society. Although the universe is accepted as the whole of Turkey, the samples of the studies do not include all cities. The small number of non-religious or less religious people in the samples is among the limitations of the study. It was accepted that the religiosity status of young people and adults would not be the same, and the data of young people and adults were handled separately in the studies. Since information such as the highest and lowest score that can be obtained, how many Likerts are used, etc. of the scales used in some studies, it was accepted that they were scored according to the information in the original, based on the name of the scale. Since the implementation date was not given in some studies, the implementation date was accepted as the year before the research date was published.

1.3. Data Collection

Grouping similar studies on a topic, theme or field of study under certain criteria and combining the quantitative findings of these studies was previously a matter of concern in systematic review studies.[16] All the resources of the study were collected with an approach similar to a systematic review study. For this research, postgraduate theses on the relationship between religiosity and gender were included.[17] The studies that are open to access from the Council of Higher Education National Theses Center were scanned with the "religiosity" index, some of them

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[16]   Serkan Dinçer, *Eğitim Bilimlerinde Uygulamalı Meta-Analiz* (Ankara: Pegem Akademi, 2014), 4.
[17]   Theses/ Systematic review data used are given in Table 9.

were excluded and the rest were included in the study. The reasons for exclusion of some theses are as follows:

• There is no significant difference between gender and religiosity in the scale, or its scoring is not given in the table.

• There are scores with extreme values. These values are not taken on the grounds that they are far from the average.

• It is not available to reach some studies in the Theses Center. In addition, some of them did not examine the relationship between gender and religiosity.

• Some studies do not show normal distribution, or rank averages are given instead of average scores.

The scales of religiosity in the study are different from each other. Continuous variables in the data tend to be distributed in different intervals. This distribution of variables may arise from the difference in measurement units. For this reason, the effect caused by the range difference should be eliminated by applying transformation to the data.[18] For this purpose, normalization methods are used. Normalization is the process of scaling variable values into smaller ranges. The ability to standardize the effect of large-range variables outweighing small-range variables makes normalization particularly useful for distance-based classifiers.[19] Minimum-maximum normalization transforms the minimum value and maximum value into the minimum and maximum value of a new smaller range by applying a linear transformation to the data. After minimum-maximum normalization, relationships between original data values are preserved. Research data is normalized to the range of 0-1. After the data were normalized, male and female participants were tried to be estimated temporally by artificial neural networks method. Both genders were evaluated as output first together and then separately. The performance was examined over the highest network and the analysis was completed.

Multi- paradigm numerical computing software and the fourth generation programming language Matlab were used in the analysis of the data. There are many alternative programs for artificial neural networks prediction. Estimation was made with "Neural Network Time Series" tool in Matlab R2017b program. In addition, IBM SPSS 22 package program was used to establish a relationship.

1.4. Process Steps

1- Normalized values were imported.

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[18] Daniel T. Larose - Chantal D. Laroz, *Discovering Knowledge in Data: An Introduction to Data Mining* (New Jersey: John Wiley & Sons, 2014), 16–50.

[19] Jiawei Han et al., *Data Mining Concepts and Techniques* (San Francisco: Morgan Kaufmann Publishers, 2006).

2- "Application year" input to the numeric matrix table, female and male adult and female male student scores were defined as target.

3- All normalized values were transposed.

4- In addition to the implementation year, the years 2020, 2021, 2022, 2023, 2024 and 2025 were analyzed separately in order to be able to predict them. First, religiosity scores for 2020 were estimated with a significant regression value. Then, the year 2021 was predicted in the same way, and through the same method, forecast was made until 2025.

5- The correlation of the relationship between the genders was calculated according to all the actual and estimated values obtained.

2. FINDINGS

2.1. Findings on the Students

One input (time) and two outputs (male-female student religiosity normalized mean scores) data of artificial neural networks are defined. All values of the network trained six times in different formats and values are given in Table-1.

As seen in Table-1, the religiosity scores of the students of 2020 were estimated based on the actual values between 1995 and 2019. Accordingly, 70% of the data were used for training, 15% for verification and 15% for testing. The number of hidden neurons is 10, the input delay is 1, the algorithm used is Levenberg-Marquardt (LM) and the epoch number is 9.

Table 1: Data on Training the Network-1

Students	Training data	Validation data	Testing data	Hidden Neurans	Delays	Algorithm	Epoch	MSE Training	MSE Validation	MSE Testing	R Training	R Validation	R Testing
2020	70%	15%	15%	10	1	L-M	9	2,7	7,6	2,8	8,0	6,2	6,4
2021	70%	15%	15%	10	2	L-M	11	8,6	1,9	5,9	9,4	7,6	6,5
2022	70%	15%	15%	10	2	SCG	27	2,0	2,5	1,7	8,6	6,3	8,0
2023	70%	15%	15%	10	2	SCG	43	1,4	5,4	5,8	8,8	5,9	7,7
2024	70%	15%	15%	10	2	SCG	35	1,3	3,1	3,2	8,9	8,6	5,1
2025	70%	15%	15%	10	2	SCG	24	1,9	2,0	3,3	8,5	9,0	6,5

In addition, [MSE] Mean Squared Error values and Regression (R) values of training, validation and test data are given in the table. Values for other years are included in the same table. When all the predictions until the expected 2025 are

finished, the structures of the network are examined in the last case. Figures for the structure and performance of the network, regression analysis, output values and the response of the input-output for the time series are given below.

The structure of the artificial neural network is shown in Figure 1.

Figure 1: Artificial Neural Network Structure
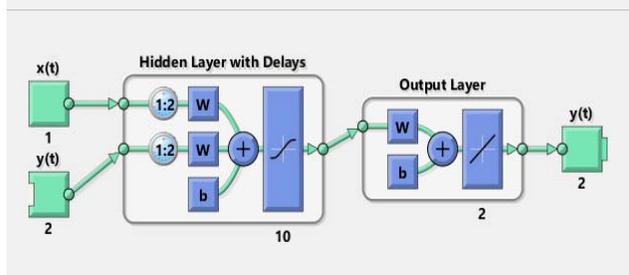
The number of hidden neurons indicates the number of hidden layers between the input and output of the ANN. Nonlinear Autoregressive with External Input (NARX) algorithm has been preferred in the time series. This algorithm is the part that works in modeling the time series y(t) by taking the delayed variables of y(t) and another time series x(t) as inputs. This section allows for nonlinear modeling, similar to the transfer function models in the classical time series literature. Here the assumption is that x(t) has a causal relationship to explain y(t)

Figure 2: Network Performance
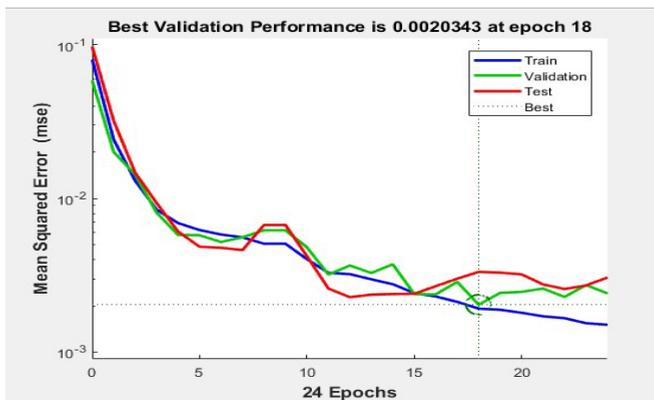
In Figure 2, it is set out that the network has the best performance at the 18th epoch of a total of 24 trials. In other words, it is understood that the education error got smaller after the twenty-fourth iteration, and the validity and test set errors grew after the eighteenth iteration, and the education was interrupted due to the lack of improvement. In table 2, the normalized religiosity and predicted scores of male students are visualized together.

Table 2: Religiosity Scores of Male Students
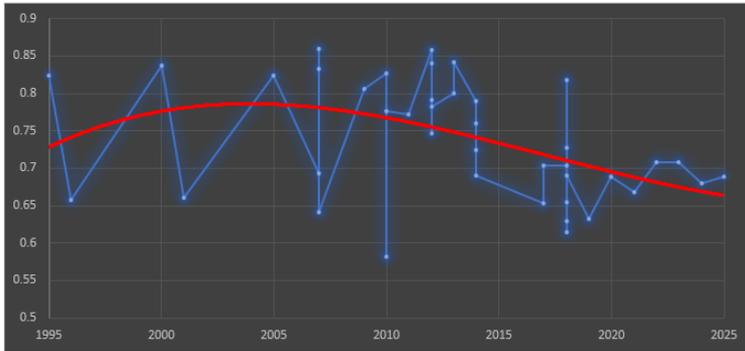
R curves are given in Figure 3. In Figure 4, graphs of the actual values and the estimated values for training, verification and testing are presented by overlapping them.

Figure 3: Evaluation of ANN Performance with R
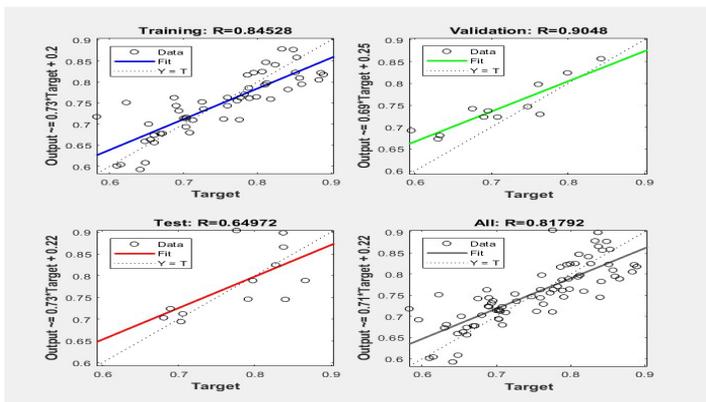
Figure 4: Output Values

According to Figures 4 and 5, 58 out of 75 data were used as training data, 12 as validation data, and 12 as test data. The mean square error of the training data is 1.91 and the R2 value is 8.5. Accordingly, it could be noted that it estimated 85%. The mean square of error of the validation data is 2.03 and the R2 value is 9. Accordingly, we can conclude that it estimated 90% of it. The mean square of error of

the test data is 3.32 and the R2 value is 6.5. Accordingly, we can say that it estimated 65%. It was determined that the entire network predicts 82%.

Figure 5: Response to Input-Output for Time Series
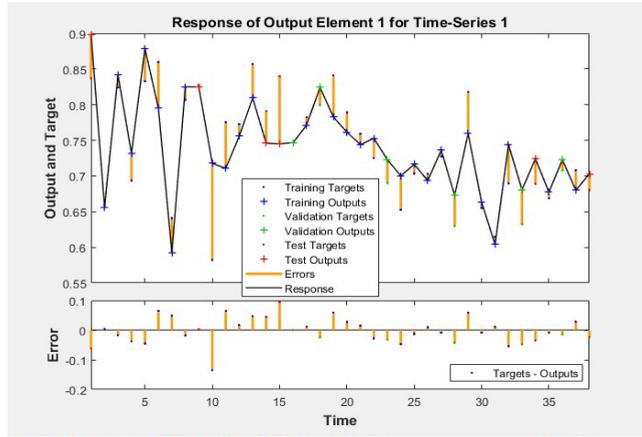
Figure 5 shows the actual and estimated values in the same table. In addition, the error margins of the values of the training, validation and test data appear according to the time series. It is noteworthy that the margin of error has decreased in recent years.

Table 3: Religiosity Scores of Female Students
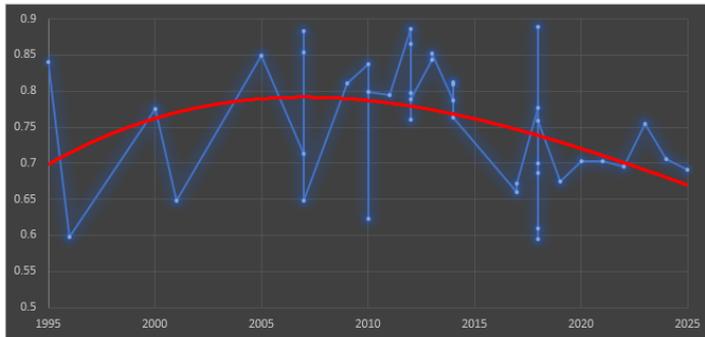
In table 3, normalized religiosity and predicted scores of female students are visualized together.

2.2. Findings on the Adults

One input (time) and two outputs (male-female adult religiosity normalized mean scores) data of artificial neural networks are defined. All values of the network trained six times in different formats and values are given in Table-4.

Table 4: Data on Training the Network-2

Adults	Training data	Validation data	Testing data	Hidden Neurans	Delays	Algoritma	Epoch	MSE Training	MSE Validation	MSE Testing	R Training	R Validation	R Testing
2020	50%	25%	25%	15	1	L-M	10	2,8	3,2	1,1	7,6	7,3	6,7
2021	70%	15%	15%	10	1	L-M	9	3,4	1,1	4,7	6,8	7,9	6,4
2022	60%	15%	15%	10	2	L-M	13	5,4	9,3	4,3	8,9	5	7,5
2023	70%	20%	20%	10	2	L-M	8	1,7	6,5	2,4	7,4	6,6	6,4
2024	70%	15%	15%	10	1	L-M	8	5,5	4,2	2,5	5,7	6	7,9
2025	65%	25%	10%	15	1	SCG	20	3,7	3,9	6,9	6,3	7,4	6,5

As can be seen in Table-4, the religiosity scores of adults for 2020 were estimated over the real values between 1998 and 2019. Accordingly, 50% of the data was used for training, 25% for validation and 25% for testing. The number of hidden neurons is 15, the input delay is 1, the algorithm used is Levenberg-Marquardt (LM) and the epoch number is 10. In addition, [MSE] Mean Squared Error values and Regression (R) values of training, validation and test data are given in the table. Values for other years are included in the same table. When all the predictions until the expected 2025 are finished, the structures of the network are examined in the last case.

Figure 6: Structure of the Artificial Neural Network
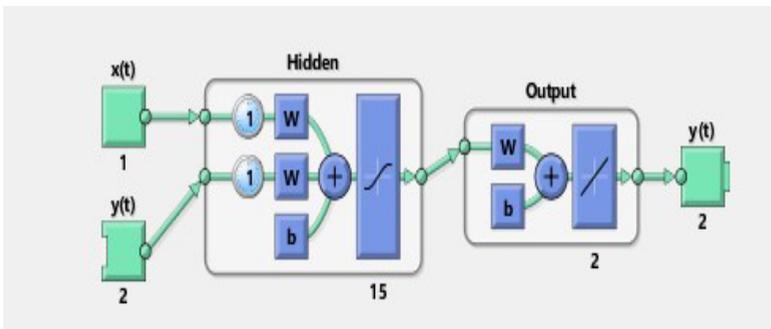
Figures for the structure and performance of the network, regression analysis, output values and the response of the input-output for the time series are given below. The structure of the artificial neural network is shown in Figure 6. The number of hidden neurons indicates the number of hidden layers between the input and output of the ANN.

Figure 7: Network Performance
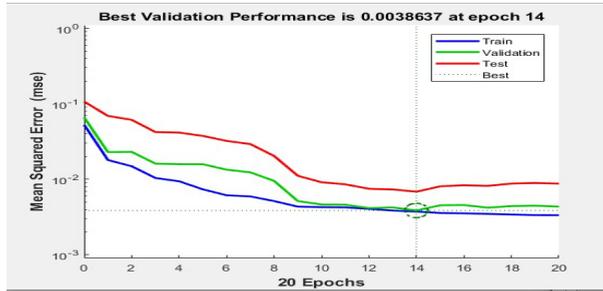
In Figure 7, it is shown that the network has the best performance at the 14th epoch of a total of 20 trials.

Table 5: Religiosity Scores of Adult Men

In table 5, normalized religiosity and predicted scores of adult male are visualized together.

Figure 8: Evaluation of ANN performance with R
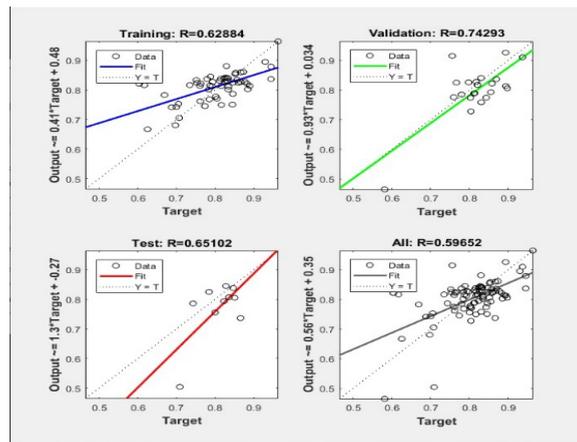
R curves are given in Figure 8 (Training: Training, Validation: Validation, Test: Testing, All: All). The graphs of the actual values and the estimated values for training, validation and testing are presented by drawing one above the other. According to Figure 8, the R^2 value of education is 6.3. Accordingly, it is said that he estimated it as 63%. The R^2 value of the validation data is 7.4. Accordingly, it can be said that he predicted it as 74%. The R^2 value of test data is 6.5. Accordingly, it is set out that he estimated it as 65%. We can say that the entire network estimates as 60%.

Figure 9: Response to Input-Output for Time Series
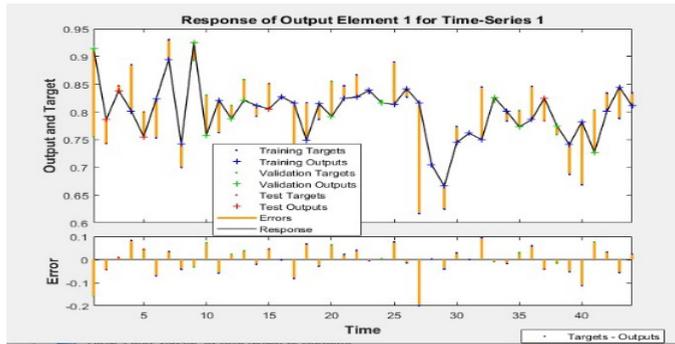
Figure 9 shows the actual and estimated values in the same table. In addition, the margin of error of the values of the training, verification and test data is seen according to the time series.

Table 6: Religiosity Scores of Adult Women
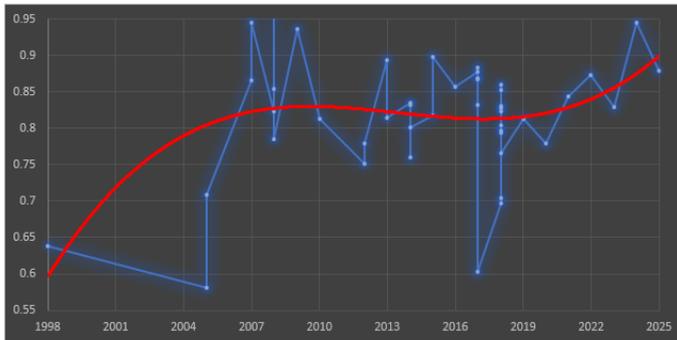
In table 6, normalized religiosity and predicted scores of adult women are visualized together.

2.3. Examining the Relationship between Groups

The data on the relationship between the religiosity scores of male and female students are given below.

Table 7: Correlations of Male and Female Students

		male_student	female_stude nt
male_student	Pearson Correlation	1	,917**
	Sig. (2-tailed)		,000
	N	41	41
female_student	Pearson Correlation	,917**	1
	Sig. (2-tailed)	,000	
	N	41	41

**. Correlation is significant at the 0.01 level (2-tailed).

According to Table 7, the correlation between the actual and predicted values of male and female students (n = 41) is significant and .92.

Table 8: Correlations of Male and Female Adults

		male_adult	female_adult
male_adult	Pearson Correlation	1	,803**
	Sig. (2-tailed)		,000
	N	46	46
female_adult	Pearson Correlation	,803**	1
	Sig. (2-tailed)	,000	
	N	46	46

**. Correlation is significant at the 0.01 level (2-tailed).

According to Table 8, the correlation between the actual and predicted values of adult male and female (n = 46) is significant and ,80.

DISCUSSION AND CONCLUSION

Research question-1: Can an estimated score for 2020-2025 be made over the religiosity scores of male and female students?

When the change in religiosity scores obtained from secondary school (high school) and undergraduate male students according to years is examined, it is seen that there was an increase from 1995 to 2005, and then a decrease until 2019. Considering the estimated scores between 2020 and 2025, it can be interpreted that there will be no major change. However, considering the whole time period from the 1990s to 2025, it can be said that there is a decrease in the level of religiosity. Considering the changes in religiosity scores obtained from secondary education and undergraduate female students by years, it is presented that the decrease started after an increase from 1995 to 2005. It can be set out that between the years 2020 and 2025, the estimated religiosity scores are decreasing. However, considering the

whole time period from the 90s to 2025, it can be said that there is a decrease in the level of religiosity.

The results obtained are similar to those obtained by Yapıcı with the systematic review study. As a matter of fact, according to the results obtained from the studies taken until 2008 in the relevant research, Turkish youth became more religious between 1998 and 2008 compared to the previous period.[20] Although it is a controversial approach, it is effective in the approach of adolescents to religiosity in particular, called generation Z, and all young people in general. Adolescence is a sensitive period when it is psychologically open to external influences.[21] Particularly the religious tendency of young people is under the influence of high school and undergraduate education; education curriculum, course contents, teacher approaches, province-district where they live, religious/anti-religious groups they engage in, transformation brought about by digitalization, social media, family and social structure, circle of friends, the cultural structure, the political view and perspective on politics. There are many reasons such as individual differences and upbringing. It is expected that these reasons will change the level of religiosity of the youth. According to Hökelekli, adolescents have a desire to understand the meaning of religious beliefs and the nature of religious facts mentally and to reconcile them with the life lived. However, this process brings many problems for the adolescent.[22] As a matter of fact, according to a large-participant study conducted in our country, while young people tend to be "neither religious nor am I not religious" among age groups, this expression has been replaced by "I am quite religious" as the age increases.[23]

Male students adopt a tendency to live according to their needs in the relevant period, just before moving on to adulthood, which is the next developmental stage. First of all, they want a profession or job with a good financial return in order to earn money and to keep their family in a more prosperous life. Considering the effect of migration from rural to urban in Turkey over the years, the profile of young men who need to support themselves in modern city life comes to the fore. Therefore, it is a fact that in less urban life, individuals have duties such as living together and protecting the values of the family rather than working. Based on the fact that values and tradition are protected more in closed societies, today's young men, compared to those of yesterday, gives importance to money and reputation,

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20 Asım Yapıcı, "Modernleşme-Sekülerleşme Sürecinde Türk Gençliğinde Dinî Hayat: Meta-Analitik Bir Değerlendirme", *Çukurova Üniversitesi İlahiyat Fakültesi Dergisi (ÇÜİFD)* 12/2 (2012), 16.

21 Mustafa Koç, "Gelişim Psikolojisi Açısından Ergenlik Dönemi ve Genel Özellikleri", *Erciyes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi* 1/17 (1 December 2004), 231–238; Atalay Yörükoğlu, *Gençlik Çağı* (Ankara: Türkiye İş Bankası Kültür Yayınları, 1987).

22 Hayati Hökelekli, *Din Psikolojisi* (Ankara: Türkiye Diyanet Vakfı Yayınları, 2005), 267–271.

23 *Türkiye'de Dini Hayat Araştırması* (Ankara: Diyanet İşleri Başkanlığı, 2014), 239.

not to values and tradition. This has affected the attitude of young men to religion and religiosity over the years in our country as well as in developing and modernizing countries.

The adolescent individual's search for identity continues through ways such as emancipation, identification, modeling, interest in arts or sports, and establishing new relationships.[24] However, for adolescents; there is an opinion that family, school and related culture, religion and their perception of religion constrain them. Despite this restriction, there may have been a decrease in the religious life of high school and undergraduate female students. The tendency to be free on the one hand and responsible on the other, may lead to diversity in young girls' perspective on religion. Expectations such as taking family responsibility or fulfilling the duty of motherhood in later adulthood, just as in male youth, may push the young individuals to tend to have religion as a value to be exploited.

It can be said that the main difference that distinguishes the individuals of the generation Z from the individuals of the previous generation is to take pleasure, to believe in the usefulness of the commodity and to have a tendency to consume quickly. Whether or not religion provides support to a young person seeking meaning to cope will make him/her interested/uninterested. The answer to the question of which side of the tension is religion will be important in the young person's view of religion between the spiritual tensions s/he is in and the social conflicts outside. As a matter of fact, this raises the issue of religiosity and spirituality. In summary, the tendency to perceive religion as a spiritual force can be mentioned.

Many cases such as digitalization, internet culture, the spread of social media, the tendency to become a phenomenon, easy participation in platforms such as Facebook, Instagram, Twitter, YouTube without the need for intermediaries to appear in the public space, search engines can produce smart results to access information, virtual education loses the monopoly of traditional learning channels are evident in the period of the youth. Mass media have an undeniable effect in the learning process of religion.[25]

One of the most valid theories on religion (narrowness) in previous periods was social learning. This also took place primarily within the family.[26] We can present that as the influence of family, religious groups and traditional religious learning channels diminishes, young people have begun to have a perception of religiosity according to the perspective of people who are phenomenal. It is an issue that

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[24] Betül Aydın, *Çocuk ve Ergen Psikolojisi* (Ankara: Nobel Akademik Yayıncılık, 2015).

[25] Fatih Kandemir, "Ekolojik Kuram Bağlamında Dinî Gelişim Psikolojisi", *Cumhuriyet İlahiyat Dergisi* 22/3 (15 December 2018), 1449.

[26] Antoine Vergote, "Ergenlikte Din", trans. Erdoğan Fırat, *Ankara Üniversitesi İlahiyat Fakültesi Dergisi* 1/1 (1981), 583–592; Yapıcı, "Modernleşme-Sekülerleşme Sürecinde Türk Gençliğinde Dinî Hayat", 17.

needs to be investigated to what extent traditional teaching styles such as religious and theology education teachers have recently provided religious services for young people in social media (especially opening channels on YouTube), TV channels and even digital platforms.

According to many studies, adolescence is the age to doubt.[27] Doubt leads to believing. This is because a healthy person cannot continue his life with doubts. Therefore, it can be said that while increasing suspicion among young people over the years causes a decrease in religiosity in the same period, it will cause a higher tendency to become religious in the following stages. Religiosity has more than one dimension. The research was conducted on the whole of religiosity in general. But in particular, when the dimensions of religiosity such as belief, expression, feeling, knowledge and influence are evaluated, different explanations are needed. The religiosity of young people can be examined in terms of belief and worship according to time. As a matter of fact, it is known that there are many people who express belief even though they do not worship. Therefore, the decrease in religiosity tells us that "the youth of Turkey are becoming secularized" does not lead to its conclusion. According to Nişancı and Aysan, panel data are needed to measure the level of religiosity of individuals at different stages of their lives in order to see whether the level of religiosity in society in general has decreased or to determine how religiosity has changed with aging.[28]

According to the studies, the relationship of Turkish youth with institutional religion continues strongly.[29] According to Yapıcı, young people have three styles of attitudes towards religion: criticizing institutional religion, preferring either individual religion or spirituality, or turning to atheism or not.[30] Can we explain the decreasing trend in religiosity of our country's youth over the years as a reaction to institutional religiosity? That is, the adolescent between childhood and adulthood tends to preserve tradition on the one hand and reject it on the other.[31] Value of questioning that elevates them occasionally, but adults, as former adolescents, faced the secular, profane and positivist things and their life choice might react to the institutionalization of religious influence. However, it can be said that the gene that reacts to the institution tends to be individual religious about the understanding of religion in adulthood. This situation may lead us to the result of an increase in religiosity in the next stages.

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[27]   Vergote, "Ergenlikte Din", 589.

[28]   Zübeyir Nişancı - Ümmügülsüm Aysan, "Türkiye'de Sosyodemografik ve Sosyokültürel Göstergelere Göre Dindarlık Seviyeleri", *İstanbul University Journal of Sociology* 39/2 (2019), 321.

[29]   Laurence Steinberg, *Ergenlik* (Ankara: İmge Kitabevi Yayınları, 2017); Yapıcı, "Modernleşme-Sekülerleşme Sürecinde Türk Gençliğinde Dinî Hayat", 13.

[30]   Asım Yapıcı, "Şüphe ve İnanç Kıskacında Gençlerin Din ve Dindarlık Algıları", *İlahiyat Akademi* 12 (2020), 13.

[31]   Vergote, "Ergenlikte Din", 586.

Research question- 2: Can an estimated score for 2020-2025 be made over the religiosity scores of male and female adult participants?

Considering the changes in religiosity scores obtained from male adults by years, it was determined that after an increase from 1998 to 2008, there was a decrease until 2018 and then an increase began. It is seen that the estimated religiosity scores have increased between 2020 and 2025. Considering the whole time period from the 90s to 2025, it can be shown that there is a significant increase in the level of religiosity. Considering the changes in religiosity scores obtained from female adults by years, it is presented that there has been a continuous increase from 1998 to the 2020s. It can be set out that between the years 2020 and 2025, the estimated religiosity scores increased significantly. Considering the entire time period from the 90s to 2025, it can be said that there has been a significant rise in the level of religiosity.

In general, it can be set out that the level of religiosity increases among adults. So, what are the reasons for this rise? Most of the studies in the field show the superior level of women's religiosity. In the systematic review study conducted by Kızılgeçit on the sample of the inhabitants of the Eastern Black Sea Region, the partial increase in the level of belief from 2002 to 2015 was interpreted as the effects of returning to religion/sacred.[32] Stating that the higher the level of income, the lower the severity of religious life; Kurt interpreted that there would be a certain decrease in religious devotion as she moved towards the upper layers.[33]

Turkish society has experienced radical changes in many economic, social and cultural areas under the influence of the West. In Turkish society, where the Islamic belief prevailed with the changing understanding of consumption and the dominance of the consumption culture, the understanding of belief as a virtue and excessive consumption as waste has left its place to the understanding of consumption and even to the sense of existence with this understanding of consumption.[34] Arvas makes a comment that today's perceptions and experiences of religiosity take a more formal and formalistic form and move away from producing and nurturing values. As a matter of fact, with a perspective that emerged as a handicap of the modern period, the view of religion as a situation limited to certain periods of time and certain rituals has also affected Islamic societies. This, on the other hand, has reduced the influence of religion in worldly/daily life almost to nothing. Although religious teachings established a system of values and helped the moral/human

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[32]   Muhammed Kızılgeçit, "Dindarlık Üzerine Meta-Analitik Bir Çalışma: Doğu Karadeniz Örneği", *İnsan ve Toplum Bilimleri Araştırmaları Dergisi* 5/ (2016), 1154.

[33]   Abdurrahman Kurt, "Dindarlığı Etkileyen Faktörler", *Uludağ Üniversitesi İlahiyat Fakültesi Dergisi* 18/2 (1 June 2009), 23.

[34]   Gulnihal Topay - Ramazan Erdem, "Türkiye'de Tüketim Kültürünün Gelişimine Dair Kavramsal Bir İnceleme", *Süleyman Demirel Üniversitesi Sosyal Bilimler Enstitüsü Dergisi* 35 (31 December 2019), 178.

values system to function with orders, prohibitions and recommendations, it is shown that religion cannot fulfill this function sufficiently today. This means the weakening of the sanction power of religion regarding values.[35]

Which religiosity can be explained by the fact that the Turkish citizen, who received both a secular and lay and a positivist education, became more religious in adulthood? As a religious phenomenon, religiosity can be used to express both intrinsically motivated religiosity and extrinsic religiosity, since it is religiosity. In this context, religions accept the sincerity and sincerity of religiosity and deny and condemn the other. The conspicuous religiosity type (or conspicuousness as a religiosity type) can be handled within the extrinsic or extroverted religiosity model. In extrinsic religiosity, the religion is not the primary determinant of the religious behavior, but a tool for other purposes.[36] Is it possible to talk about self-seeking religiosity for adults in Turkey? As a society, adults mostly respond to scale or interview questions regarding the perception of religiosity as "religious". Because expressing oneself as "irreligious" may mean not being reliable in social perception. As a matter of fact, studies have presented that people, including those from different backgrounds, find those who state that they "do not belong to any religion" more unreliable than members of other religions.[37] Among those who answer that "religious affiliation is out of question", there may be adults who think that they will be excluded because of their beliefs and who say "I am religious even though they are not religious" and who say "I believe even though they do not believe". A different reflection of this situation takes place on the plane of religion and spirituality. Especially in the Western experience, the way these two concepts are pronounced on the ground of contradiction points to a new situation. Okumuş mentions the existence of individuals in the USA who give importance to spirituality despite being unbelievers, define themselves as Rumi and read the Masnavi book. He states that there may be a possibility of "invisible irreligion", and this may be more common among adults. It can also be explained by the fact that they do not want to hide their atheism, disrupt the order, and disturb people's peace. It can be said that living in a society and having a family requires being spiritual. In addition, irreligion can also be considered a religion. 12.7% of the world's population described themselves as irreligious.[38] It is known that there are individuals who have religious acts and carry out these, although they are irreligious.[39] Are these individuals truly

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[35] Fatma Balcı Arvas, "Kişisel Değerler ve Dindarlık İlişkisi Üzerine Bir İnceleme", *İnsan ve Toplum Bilimleri Araştırmaları Dergisi* 7/5 (29 December 2018), 58.

[36] Ejder Okumuş, "Gösterişçi Dindarlık", *Dinbilimleri Akademik Araştırma Dergisi* 6/3 (1 June 2006), 22.

[37] Büşra Kılıç Ahmadi, "Kendini Aldatma Ve Dindarlık İlişkisi", *Uludağ Üniversitesi İlahiyat Fakültesi Dergisi* 26/2 (20 September 2017), 64; Will M. Gervais et al., "Do You Believe in Atheists? Distrust Is Central to Anti-Atheist Prejudice", *Journal of Personality and Social Psychology* 101 6/ (2011), 1200.

[38] *Religions* (2000).

[39] Ejder Okumuş, "Görünmeyen Dinsizlik", *Ankara* (1 April 2021).

spiritual or not religious? New studies are needed due to the insufficiency of the studies on this subject in Turkey. In summary, based on these data, can a typology called "Turkish religiosity" be mentioned? To answer this question, both quantitative and qualitative studies with broad participation are needed.

Research question-3: Is there a relationship between male and female students / adult male and female religiosity?

Based on the meta-data obtained, it is shown that there is a positive significant relationship between the averages of religiosity scores of both adult male and female students and male and female students by years. As a matter of fact, Korkmaz draws attention to the fact that women are more religious than men according to the data obtained from postgraduate theses conducted in Turkey in his systematic review study.[40] According to systematic review findings obtained from researches, women in Turkish society appear to be more religious than men. However, no difference was observed between genders in the general religiosity analysis.[41] The religiosity scores of both women and men vary in a meaningful and proportional relationship with each other depending on situations such as women and men living together in society, women's taking more place in social life, roles moving away from traditional patterns and gender being put in the background in the distribution of duties.

Research question-4: Is it possible to produce predictions based on time in the field of psychology of religion with artificial neural networks?

The data of this study, which was prepared with an effort to estimate the level of religiosity of Turkish society between the years of 2020-2025, is theoretically meaningful. However, the years will show us how accurate the predictions will be. With this study, it has been seen that it can be done in a short time and successfully by using artificial neural networks in the field of psychology of religion. Selecting the appropriate algorithms and using the data from other religiosity studies in addition to the existing data, thus training the network with these data will provide more successful results. Artificial neural networks can open up new research areas in the field by making predictions in the psychology of religion, sociology of religion and religious education. In artificial neural networks, the estimation of the dependent variable with the independent variables, the estimation of another time period (not only the future time but also the past or lost time) over the time distribution of the data, classification and clustering studies can be done based on the number of

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[40]   Sezai Korkmaz, "Cinsiyete göre dindarlık: bir meta-analiz çalışması", *Bilimname* 2020/43 (2020), 449.
[41]   Yapıcı, "Modernleşme-Sekülerleşme Sürecinde Türk Gençliğinde Dinî Hayat", 24.

meaningless data. Previously, dependent variable estimation study in the field[42] and time estimation has been done with this study.

Table 9: Theses Used in Practice - Systematic review Data

#	Researcher-Time	Type	Application Date	Highest Value	Lowest Value	Men's Religiosity Score	Women's Religiosity Score	Male Normalized Value	Female Normalized Value	Number of male participants	Number of female participants	Sample	Applied City
1	MEHMEDOĞLU (1999)	PhD Thesis	1998	48	12	36,69	34,97	0,685833333	0,638055556	504	358	random	İstanbul
2	ARSLAN, Z. (2006)	PhD Thesis	2005	5	1	4,0221	3,3241	0,755525	0,581025	84	66	teachers	İstanbul-İzmit
3	KOÇ, M. (2008)	PhD Thesis	2005	45	9	35,75	34,51	0,743055556	0,708611111	253	222	25-45 years	Bursa
4	AYDEMİR, R. E. (2008)	Master Thesis	2007	125	25	109,7	111,61	0,847	0,8661	118	136	20-35 years	Samsun
5	ŞENGÜL, F. (2007)	Master Thesis	2007	5	1	4,54	4,78	0,885	0,945	124	210	random	Sakarya
6	AYTEN, A. (2009)	PhD Thesis	2008	4	1	3,4	3,47	0,8	0,823333333	461	450	random	Türkiye
7	CEVİZ, F. H. (2009)	Master Thesis	2008	4	1	3,26	3,56	0,753333333	0,853333333	56	114	Middle Ages and older	Denizli-İstanbul
8	GÜVEN, H. (2008)	Master Thesis	2008	4	1	3,79	3,89	0,93	0,963333333	41	259	random	İstanbul
9	YOĞURTÇU, F. (2009)	Master Thesis	2008	4	1	3,0991	3,3558	0,6997	0,785266667	137	163	random	İstanbul
10	DAĞLI, E. N. (2010)	Master Thesis	2009	69	0	61,63	64,64	0,893188406	0,936811594	97	115	over 60 years old	Konya
11	KIZILGEÇİT, M. (2011)	PhD Thesis	2010	87	10	73,93	72,64	0,830025974	0,813506494	566	437	random	Erzurum
12	ÇURUM, E. E. (2015)	Master Thesis	2012	125	25	101,26	100,16	0,7626	0,7516	129	106	private and public employees	Samsun
13	SEVİNDİK D. (2015)	Master Thesis	2012	125	25	106,162	102,912	0,81162	0,77912	259	125	40-60 years	Denizli
14	AKBOLAT, A. (2014)	Master Thesis	2013	69	0	59,2	61,67	0,857971014	0,893768116	129	91	over 60 years old	Şanlıurfa
15	ATÇEKEN, M. (2014).	Master Thesis	2013	125	25	104,2	106,5	0,792	0,815	59	86	married	İstanbul-Kocaeli
16	ÇAKIR, B. (2015)	Master Thesis	2014	125	25	110,09	108,57	0,8509	0,8357	127	127	teachers	Ordu
17	EKMEKÇİ, S. (2016)	Master Thesis	2014	4	1	3,477	3,4956	0,825666667	0,831866667	146	164	random	Denizli
18	ÖZKAN, O. (2016)	Master Thesis	2014	100	20	78,76	80,84	0,7345	0,7605	155	150	teachers	Isparta
19	YAKUT, S. (2016)	PhD Thesis	2014	150	30	127,97	126,22	0,816416667	0,801833333	158	271	teachers	Ankara
20	DEMİR, M. (2017)	Master Thesis	2015	4	1	3,36	3,45	0,786666667	0,816666667	217	204	random	Malatya
21	VURAL, M. E. (2016)	Master Thesis	2015	5	1	4,42	4,59	0,855	0,8975	146	169	random	İstanbul
22	GEZENLER, A. (2019)	Master Thesis	2016	115	23	100,92	101,88	0,846956522	0,857391304	153	117	35-55 years	Amasya
23	ARSLAN, D. A. (2019)	Master Thesis	2017	125	25	111,641	112,773	0,86641	0,87773	167	167	random	Gaziantep
24	GEÇİOĞLU, A. R. (2018)	PhD Thesis	2017	121	33	106,34	106,19	0,833409091	0,831704545	233	186	married	Adana
25	GENCER, N. (2019)	PhD Thesis	2017	5	1	4,2822	4,4766	0,82055	0,86915	111	94	patients	Çorum
26	IŞIK, H. (2018)	Master Thesis	2017	4	1	3,67	3,65	0,89	0,883333333	249	251	random	Artvin
27	KILIÇ, A. A. (2019)	Master Thesis	2017	4	1	3,48	3,6	0,826666667	0,866666667	58	144	random	İstanbul
28	TÜRKER, N. Y. (2018)	Master Thesis	2017	4	1	2,85	2,81	0,616666667	0,603333333	230	231	random	Türkiye
29	AKSOY, E. (2019)	Master Thesis	2018	72	18	56,18	55,65	0,707037037	0,697222222	186	114	random	Gaziantep
30	AYDIN F.E. (2019)	Master Thesis	2018	5	1	3,5	3,82	0,625	0,705	91	99	190 lawyers	İstanbul
31	ÇELİK, R. B. (2019)	Master Thesis	2018	150	30	122,82	126,583	0,7735	0,804858333	256	144	random	Antalya
32	DOKUR, A. S. (2019)	Master Thesis	2018	72	18	59,13	60,86	0,761666667	0,793703704	140	140	20-40 years	Osmaniye
33	GÜVEN, F. (2019)	Master Thesis	2018	5	1	4,38	4,44	0,845	0,86	382	441	random	Türkiye
34	GÜVEN, M. (2019)	PhD Thesis	2018	5	1	4,27	4,32	0,8175	0,83	1142	1415	random	Türkiye
35	KELEŞ, A. (2019)	Master Thesis	2018	4	1	3,35	3,47	0,783333333	0,823333333	291	119	Religious Officials	Sivas
36	TURA, H. (2019)	Master Thesis	2018	5	1	4,21	4,19	0,8025	0,7975	158	192	random	İstanbul
37	USLU M. (2019)	Master Thesis	2018	69	0	58,38	58,81	0,846086957	0,852318841	107	270	doctor+nurse	Konya
38	YORULMAZ, M. (2019)	Master Thesis	2018	69	0	54,11	57,14	0,784202899	0,828115942	194	106	random	Samsun
39	ZENGİN, A. Ç. (2019)	PhD Thesis	2018	45	9	36,33	36,58	0,759166667	0,766111111	294	306	random	Sivas
40	TOPRAK, B. (2019)	Master Thesis	2019	5	1	3,75	4,25	0,6875	0,8125	30	30	cancer patients	İstanbul
41	ŞAHİN 1999	PhD Thesis	1995	69	0	56,81	57,95	0,823333333	0,839855072	486	412	undergraduate	Konya
42	YILDIZ 1998	PhD Thesis	1996	69	0	45,35	41,21	0,657246377	0,597246377	360	195	undergraduate	İzmir
43	APAYDIN 2001	PhD Thesis	2000	155	31	134,8	127,2	0,837096774	0,775806452	158	157	undergraduate	Samsun
44	ATALAY 2002	PhD Thesis	2001	69	0	45,55	44,68	0,660144928	0,647536232	403	263	high school	Diyarbakır
45	ÇAPÇIOĞLU, İ. (2008)	Master Thesis	2005	45	9	38,6699	39,5517	0,824163889	0,848658333	348	210	undergraduate	Türkiye
46	ÇAPAR, B. (2008)	Master Thesis	2007	69	0	47,86	49,17	0,693623188	0,712608696	282	263	high school	İzmir
47	HASANKAHYAOĞLU	Master Thesis	2007	69	0	57,4834	58,8822	0,833092754	0,853365217	211	314	random	Konya
48	Kımter, N. (2008)	PhD Thesis	2007	4	1	3,58	3,65	0,86	0,883333333	309	322	undergraduate	Bursa
49	KIRAÇ, F. (2007)	Master Thesis	2007	40	10	29,23	29,44	0,641	0,648	247	214	undergraduate	Ankara, Kayseri
50	ÇETİN, Ü. F. (2010)	Master Thesis	2009	150	30	126,782	127,366	0,806516667	0,811383333	178	268	high school	Isparta
51	GÜRSU, O. (2011)	PhD Thesis	2010	69	0	57,08	57,79	0,827246377	0,837536232	501	508	high school	Konya
52	SÖNMEZ, O. (2012)	Master Thesis	2010	10	1	6,24	6,45	0,582222222	0,622222222	370	502	undergraduate	İstanbul
53	TOKAT O. (2012)	Master Thesis	2010	77	22	64,659	65,928	0,775618182	0,798690909	182	319	high school	Denizli
54	YAKUT, S. (2012).	Master Thesis	2011	5	1	4,09	4,18	0,7725	0,795	418	292	high school	Ankara
55	ALICIKUŞU, M. (2013)	Master Thesis	2012	92	23	82,1467	84,1264	0,857198551	0,885889855	225	182	high school	Kahramanmaraş
56	ÇOBAN, R. (2013)	Master Thesis	2012	5	1	4,164	4,189	0,791	0,79725	236	228	high school	Burdur
57	DAĞCI, A. (2014)	Master Thesis	2012	69	0	57,95	59,76	0,839855072	0,866086957	225	270	undergraduate	Bayburt
58	MUTLU. E (2013)	Master Thesis	2012	45	9	35,9	36,4	0,747222222	0,761111111	66	74	undergraduate	İstanbul
59	ÖZTÜRK, E. E. (2013)	Master Thesis	2012	92	23	76,99	77,4	0,782463768	0,788405797	257	496	undergraduate	İstanbul
60	ÇAMUR, Z. (2014)	Master Thesis	2013	20	4	16,79	17,49	0,799375	0,843125	247	344	undergraduate	Samsun
61	KAVUN, Y. (2014)	Master Thesis	2013	69	0	58,06	58,75	0,841449275	0,851449275	332	306	high school	Bursa
62	ALTUN, R. (2015)	PhD Thesis	2014	125	25	103,64	103,64	0,7892	0,7864	380	499	undergraduate	sinop
63	ÇITIR, Y. Y. (2016)	Master Thesis	2014	40	8	32,3	34	0,759375	0,8125	198	222	high school	İstanbul
64	SEZGİN, K. (2016)	Master Thesis	2014	3	1	2,45	2,62	0,725	0,81	295	290	undergraduate	Diyarbakır
65	ŞENTEPE, A. (2016)	Master Thesis	2014	4	1	3,07	3,29	0,69	0,763333333	398	694	undergraduate	Sakarya
66	ACAT,B.(2019)	Master Thesis	2017	5	1	3,61	3,64	0,6525	0,66	236	235	high school	İstanbul
67	EMRE, Y. (2019)	PhD Thesis	2017	50	10	38,14	36,85	0,7035	0,67125	252	325	undergraduate	Çukurova
68	AKYILDIZ, Y. Ö. (2019)	Master Thesis	2018	4	1	3,11	3,33	0,703333333	0,776666667	50	190	undergraduate	İstanbul
69	ERDEN, M. (2019)	Master Thesis	2018	5	1	3,9082	3,7486	0,72705	0,68715	224	224	high school	Diyarbakır
70	KURNAZ, S. (2019)	Master Thesis	2018	5	1	3,52	3,38	0,63	0,595	111	169	undergraduate	Isparta
71	OMAY.Z.M (2019)	Master Thesis	2018	3	1	2,636	2,779	0,818	0,8895	55	145	undergraduate	İstanbul
72	SAĞIR, R. (2019)	Master Thesis	2018	5	1	3,62	3,68	0,655	0,7	291	259	high school	İstanbul
73	ULUSAL, R. (2019)	Master Thesis	2018	50	10	34,59	34,38	0,61475	0,6095	240	257	high school	Ankara
74	YOZGAT, B. (2019)	Master Thesis	2018	69	0	47,6	52,4	0,689855072	0,75942029	202	222	undergraduate	Malatya
75	YILDIRIM, E. (2019)	Master Thesis	2019	5	1	3,53	3,7	0,6325	0,675	164	232	undergraduate	Sivas

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42   Kızılgeçit - Çinici, "Koronavirüs (Covid-19) Sürecinde Yapay Sinir Ağları Yöntemiyle Bireylerin Dini Başa Çıkma Düzeylerinin Tahmini".

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