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Editorial

The OPUS Journal of Society Research (OPUS JSR) brings together a diverse range of theory, practice, and research in the pursuit of understanding human behavior in its social context. The interdisciplinary viewpoint lays the groundwork for presenting and establishing a holistic relationship with other disciplines, concepts, and methods. The OPUS JSR allows researchers to use an interdisciplinary approach to present different interpretations and alternative points of view. The theoretical frameworks that underpin the analyses and interpretations of the subjects under study are as important as the intersection of disciplines. This framing can lead to greater clarity of multiple, even contradictory findings, allowing for a better understanding of social dynamics that would otherwise be invisible if scholars concentrated on a single set of theoretical dynamics.

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RESEARCH ARTICLE

Demographic Microsimulation Model For Türkiye[1]

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Abstract

This paper focuses on the use of microsimulation methodology to generate reliable population estimations for Türkiye. Microsimulation closely mimics life course dynamics and is therefore well-suited for predicting demographic changes. Using data from the 2018 Türkiye Demographic Health Survey, we developed a new microsimulation method that allows for greater customization and accuracy without relying on external patterns or models. The resulting population simulation includes age, education, marital status, usual residence, and labour force status for each individual until 2030. Our study demonstrates the flexibility and adaptability of microsimulation for demography and argues that it provides a coherent and meaningful way to estimate and project population attributes that other tools cannot provide. Ultimately, the dynamic simulation model has the potential to inform important policy decisions related to the population in Türkiye.

Keywords: *Data Matching, Fertility, Household Labour Force Survey, Microsimulation, Türkiye Demographic and Health Survey.*

Öz

Bu makale, Türkiye için güvenilir nüfus projeksiyonları oluşturmak amacıyla mikrosimülasyon metodolojisini kullanmaktadır. Mikrosimülasyon, yaşam seyri dinamiklerini yakından taklit ettiğinden demografik değişiklikleri tahmin etmek için oldukça uygundur. Çalışma kapsamında, 2018 Türkiye Nüfus Sağlığı Araştırması verilerini kullanarak, harici kalıplara veya modellere dayanmadan özelleştirmeye olanak ve doğruluk sağlayan yeni bir mikro simülasyon yöntemi geliştirilmiştir. Çalışmamız, mikrosimülasyonun demografi için esneklik ve uyarlanabilirlik sağladığını, nüfusun özniteliklerini tahmin etmek ve projeksiyon yapabilmek için diğer araçların sağlayamadığı tutarlı ve anlamlı sonuçları sağladığını savunmaktadır. Sonuç olarak, dinamik simülasyon modeli Türkiye'deki nüfusla ilgili önemli politika kararları için güvenilir bilgi sağlama potansiyeline sahiptir.

Anahtar Kelimeler: *Doğurganlık, Hanehalkı İşgücü Araştırması, Mikro simülasyon, Türkiye Nüfus ve Sağlık Araştırması, Veri Eşleştirme.*

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[1] *This paper is based on unpublished PhD thesis "An Alternative Approach to Population Projection in Turkey: Reconsidering Population Policies using Dynamic Microsimulation Model".*

Introduction

The study of population has been of great importance since the beginning of human history, as it has been observed that societies that have been able to structure their population in a planned way have tended to dominate other groups (Robinson, 2014). To promote prosperity, development, and growth, societies must plan, organize, and manage their population in a way that takes into account the resources available to them. As a result, predicting the impact of decisions, policies, and plans on the population has become a priority for forward-thinking systems.

Microsimulation is a methodology that allows researchers to mimic the behavior of a real or imaginary population using a model, which is especially useful when the system is complex and difficult to analyze in its real environment (Epstein & Axtell, 1996). By choosing a sample or synthetic population to represent the system, microsimulation can provide detailed information about the future composition of the population to policy makers. This study aims to establish a customized microsimulation with the Turkey Demographic and Health Survey (TDHS) to produce consistent estimation on age, sex, education, labour force, and population.

The origins of microsimulation can be traced back to the inception of dynamic microsimulation, which was influenced by the publication of Orcutt's (1957) paper. In the early 1970s, Orcutt and other researchers developed the Dynamic Income Simulation Model (DYNASIM), one of the earliest microsimulation models that utilized the dynamic microanalytical simulation approach. Developed nations commonly employ microsimulations as a tool for decision-making. To illustrate, Germany employed a dynamic microsimulation model in the 1970s to assess the demographic impacts and professional activities. Subsequently, this model underwent enhancements and was utilized to analyze household formation and earnings for pension reform purposes (Li & O'Donoghue, Autumn 2013).

In their study, Thomas et al. (2017) concentrates on fertility and introduce FamilyScape 3.0, a microsimulation tool designed for modeling family formation and child well-being. The research demonstrates the model's accurate simulation of sexual activity, contraceptive behavior, pregnancy outcomes, as well as maternal and child results.

Population scientists have used microsimulation for many years to predict and project populations and their characteristics. Microsimulation requires detailed and varied data from multiple sources in order to be accurate and consistent. Macro-level population projections can produce estimates about basic population structures, but for more detailed characteristics such as education, household composition, and labour force, separate estimation studies must be carried out.

Microsimulation can help researchers examine the impact of alternative macro scenarios on individuals and households and can be especially useful when studying diverse and complex populations with reciprocal relationships between variables. In this regard, we aim to provide estimates for various components such as education, fertility, labour force, income, economic activity, marital status, and household type. This microsimulation study is the first for Türkiye which reveals the cross-relationship of previously mentioned components.

Microsimulation models are powerful tools used by researchers to model and predict population dynamics. The dynamic microsimulation model used in this study allows for a more accurate reflection of reality by considering the changing circumstances of an individual's life. This study used a dynamic microsimulation model that takes into account the changing circumstances of an individual's life to provide a more accurate reflection of reality.

Methods

There are two types of microsimulation models in literature, static and dynamic. Static microsimulation is a straightforward approach that models a population at a single point in time, without considering any changes that may occur over time. This type of simulation is useful for estimating the distribution of various characteristics, such as education levels, in a given

year. However, static microsimulation cannot account for changes that may occur over time, such as demographic shifts or changes in economic conditions (Merz, 1994).

Dynamic microsimulation is a more complex approach that models the population over time, taking into account changes in demographics, socioeconomic status, and other factors. In dynamic microsimulations, events trigger other events in a cause-and-effect relationship. Dynamic microsimulation uses longitudinal data and can simulate changes in the population over a specified time. This approach is useful for forecasting future trends, such as the projected distribution of income or the impact of demographic changes on a particular population (Dekkers, 2015). These changes are modelled using a stochastic process known as Markov Chains (Kijima, 1997). Based on life course observations, probabilities of an individual transitioning from one state to another are derived, making it an accurate representation of reality.

In this study, the continuous closed microsimulation approach, the closed system framework utilized in our analysis does not incorporate external interventions and excludes the consideration of international migration. This decision was made due to the inherent challenges associated with obtaining precise assumptions and comprehensive data on international migration, particularly within the Türkiye context. The lack of detailed and reliable data on international migration limits our ability to establish consistent estimations and reliable outcomes.

Model used

In this study, a dynamic continuous-time micro-simulation was carried out, using a Markov chain methodology to maintain continuity, which is a process that has a discrete state space (Kijima, 1997). This property, called the Markov property;

$$P\left(X_{t_{n+1}} \in A \,|X_{t_0} = x_0, \ldots, X_{t_n} = x_n\right) = P(X_{t_{n+1}} \in A \,|X_{t_n} = x_n)$$

for all times $0 = t0 \leq t1 \leq \cdots \leq tn \leq tn + 1$ and all $x0, \ldots, xn$ in the state space.

$$p_{st}(x, A) := P(X_{s+t} \in A \,|X_s = x)$$

denotes the likelihood that the model takes a value in A at time t according to its value x at time s (Serfozo, 2009).

The CTMC is stochastic and assumes that the current state, rather than the past trend, influences the probability of possible events. In this case, the stochastic process becomes a CTMC with the following conditions $\{X(t): t \geq 0, t \in \mathbb{Z}\}$;

$$P(X(s + t) = j|X(s) = i, X(r) = i_r, r \in A_s s \subseteq [0, s)) = P(X(s + t) = j|X(s) = i)$$

where i and j denotes states, s and t denotes time. On the left side of the equation, r represents the past time and s represents the present time. As in addition to the value at the "present" time s. The conditional probabilities $P(X(s + t) = j|X(s) = i)$ are called the transition probabilities.

The notation of the CTMC transition probabilities matrix, in which $v_i, for\ i \in S$, the exponential distribution of the exposure rate of a system after entering the i state, and then the probability $m_{ij}, for\ i, j \in S$ of the system to enter the j state, is as follows.

$$v_i = \sum_{k \neq i} p_{ik} = -q_{ik}, \text{ for all } i$$

$$P = [m_{ij}] = \frac{p_{ik}}{\sum_{k \neq i} p_{ik}}, \text{ for all } i \neq j$$

The model used in this study is a dynamic model that uses the continuous-time Markov chain. It is necessary for the microsimulation model to be dynamic for time to pass, and there is randomness in the event while passing from one state to another. In this study, life events are anticipated to progress historically. The Monte-Carlo method is used to generate new cases from the probability distribution, where the waiting time is computed using the exponential inverse distribution function of transition rates derived from observation data. The inverse exponential distribution function used in the model for the computation of waiting times for each event and record is denoted as;

$$P(T \leq t) = F(t) = 1 - e^{-\lambda t}$$

where, λ ($\lambda \in U[0,1]$) denotes random value from the uniform distribution (Willekens, 2011).

Unlike discrete-time models, where the duration of events is defined, continuous-time models allow for the modelling of events occurring

at any time, adding to the randomness and dynamic nature of the model. To ensure the continuity of the dynamic microsimulation and to maintain randomness, the cross-sectional microdata from the previous year is sequenced with the current year's microdata.

We developed a package in R to implement the model we used in this study. The syntax written in R, contains 970 line, is used to simulate demographic characteristics for a specific population. The required data for the package was designed to be prepared in excel format, including variables such as base year population, death rates, marriage and divorce rates, fertility rates, educational transition rates, labor force transition rates, birth order transition rates, and migration transition rates. For instance, the decision phase of deaths has been shown below, where the deathrates are assigned to the baseline population and the implementation of the decision as presented using the formula (6);
POP<-
merge(POP,DEATH_R,by.x=c("YEAR","REGION", "AGE","SEX"),all.x=TRUE)   POP$DEATH_WT<-(-1)*log((1-runif(nrow(POP),0,1)))/(
log(1POP$RATE))POP$DEATH_DATE<-
ifelse(POP$DEATH_WT<1,i+POP$DEATH_WT,0)

Assumptions

There are several assumptions and limitations that need to be considered while interpreting the results. The accuracy of the simulation model relies on the quality of the input data used, which may be subject to sampling errors, confidence intervals, and biases. Household formation and dissolution due to movements were not specifically simulated due to the lack of data apart from marriage and divorce. This means that household changes due to education, work, or other reasons were not taken into account.

To address this limitation, the method simulated household migration instead of individual migration by selecting random households while preserving the age, sex, and size of total migrants.

Fertility rates were assigned according to age and region. The total number of births were distributed in accordance with education level and birth order of women.

Finally, newlyweds were assumed to leave their parental home and form a new family in a new household, due to a lack of data on family formation behavior.

Data

To conduct microsimulation, at a minimum, certain essential data components are typically required. These include baseline data comprising demographic characteristics, as well as longitudinal data concerning educational and labor force status transitions or exposure rates, such as fertility and mortality rates. These data serve as the foundation for calculating the transition rates associated with these characteristics.

To ensure that the dataset used for microsimulation is rich and diverse, two datasets namely TDHS and Household Labour Force Survey (HLFS) datasets were integrated and used.

The main data source of the simulation in this study is the TDHS, which collects data on household characteristics and lists all household members (DHS Program, 2022). The data set is enriched with HLFS (TurkStat, Household Labor Force Survey, 2019) microdata using data integration techniques. The obtained dataset is used as the baseline population, with the household members being used as the representation of all individuals.

The data integration process involves merging datasets into a single, consistent dataset using data matching techniques. Typically, this is done by using a common or similar variable as a key identifier (Gabriella et al., 2014). However, in our case, the data to be matched did not have a common identifier. To achieve more precise and detailed matching, we used more than one field to match the data, harmonizing similar fields to a common denominator.

In the study, we employed an equality-based record matching technique, wherein two records are considered a match if some or all the fields are equal or nearly equal. This matching technique was applied based on individual characteristics.

In order to accurately match the data from TDHS and HLFS, we utilized common variables that represented 5 different attributes of individuals (NUTS-1 region, 5-year age group, sex, marital status, and educational level attained). These variables (Table 1) were adjusted to have the same categories, ensuring that they could be compared. We then compared the distributions of the variables to determine if they measured the same characteristic with similar outputs.

Table 1. Categories of common variables

Marital Status	Education Level	Regions	Sex	Age group
Never married	No / Primary school	NUTS-1 12 regions	Male	5-year age group
Married	Middle school		Female	
Divorced	High school			
Widowed	University			

It is important to note that this technique has a limitation as it assumes that individuals with similar characteristics will have similar labor force variables, which may not always hold true in real-life scenarios.

Before performing the matching, the researchers needed to ensure that both datasets revealed similar distributions for Türkiye. In datasets that do not show similar distribution, the matching may occur below the expected level (unassigned records), some categories may not be matched at all, and the distribution obtained according to the matching may present a completely different picture.

In this article, we compared the population distribution of two datasets, TDHS and HLFS, with the Address Based Population Register System (ABPRS) population distribution. ABPRS is a population database that was established by the Turkish government to provide accurate and up-to-date information on the population of Türkiye.

The database is constructed on a national address database, which is updated regularly by the Ministry of Interior using data from local municipalities. Figure 1 presents the comparison,

as the output of the microsimulation we conducted will be compared with ABPRS-based indicators. Our analysis revealed that both TDHS and HLFS datasets displayed population distributions similar to the ABPRS population distribution for
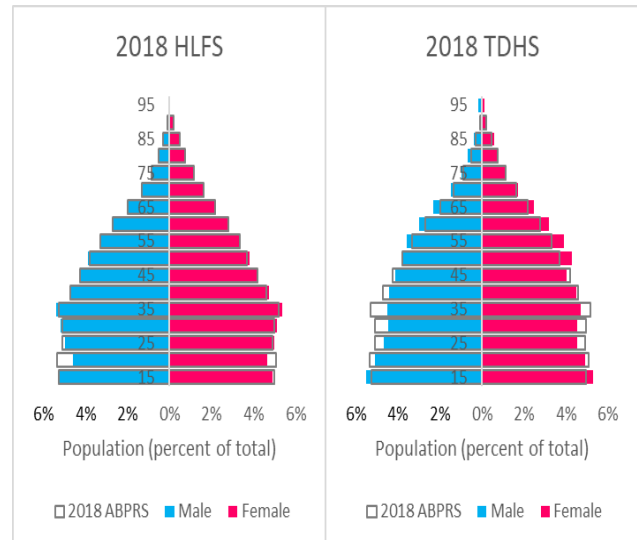
Türkiye.

Figure 1. Population pyramids, 2018 TDHS and 2018 HLFS

Although differences in certain age groups are obvious between TDHS and HLFS, distributions of variables have been compared to assess if variables measure the same characteristic with similar outputs. To this end, the Hellinger distance function is used to assess the similarity of distributions in TDHS and HLFS, and the score obtained for each variable remains below 5%, which is considered a cut-off line for an indication of good fit (Figure 2).

After finding that the TDHS and HLFS datasets are suitable for matching, the household labour
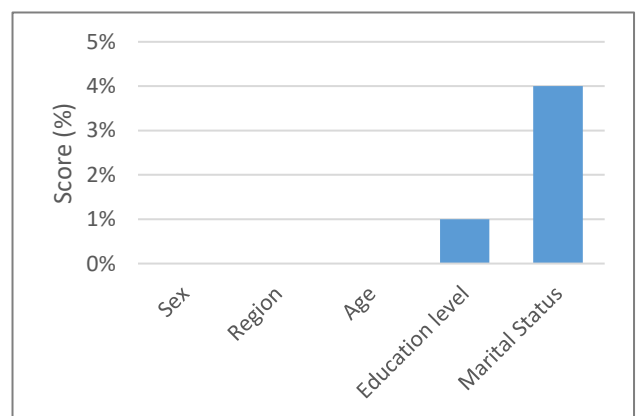
Figure 2. Hellinger distance of the common variables (%)

force survey dataset containing 374 thousand records was aggregated by region, age group, sex, education level, marital status, and transition from one state of the labour force to another, containing 9980 rows. From the derived new dataset, the labour force variable was converted into probabilities by considering the labour force status a year ago. Here, the category consists of each singular case of the new dataset's variables excluding labour force status.

By combining these two datasets and using their respective variables, we were able to generate a robust base year population that accurately reflects the demographic and socioeconomic characteristics of the Turkish population. The 2018 TDHS Household Member Data Set provided us

state to another. Therefore, estimating event exposure rates from longitudinal datasets is easier than from cross-sectional data (Zagheni, 2015). Transition rates must be selected and computed rigorously to ensure a consistent and coherent simulation. Figure 3 illustrates the transition rates and their respective sources, accompanied by the reference period.

Transition probabilities for childbearing were calculated using 2018 TDHS datasets (Table 3), fertility rates by educational level and birth order were produced. From the HLFS dataset, previous year and current employment status were taken into account to calculate transition rates. Mortality

Fertility rates TDHS 2018	Labour force: 2018 HLFS microdata	Education: TurkStat, Education Statistics, 2018-2019	Mortality: TurkStat, Mortality Statistics, 2018
• Region • Education • Fertility rates • Birth Order	• Employment Status • Economic Activity • Status in Employment	• Age • Sex • Region	• Age • Sex • Region

Figure 3. Source of transition rates

with important demographic information on individuals, including their address number, age, sex, education, marital status, region, relation to the head of the household, weight, and number of children. We also used the HLFS micro dataset to obtain information on individuals' employment status, economic activity, and status in employment.

Table 2. Baseline data sources and variables

TDHS-2018: Household Member Data	2017-2019 LBS microdata
Address No	Employment Status
Age	Economic Activity
Sex	Status in Employment
Education	
Marital Status	
Region	
Relation to Head of HH	
Weight	
Number of Child	

Microsimulation requires data on the population's demographic indicators and their status in each variable, as well as transition probabilities to determine how long it takes to switch from one

data was derived from official records of 2018 deaths stratified by region, age, and sex, which were published by TurkStat (TurkStat, Vital Statistics, 2022) to determine deaths.

The probabilities of transitioning between different education levels were calculated by applying formula (5) to the number of individuals who have transitioned between 2018 and 2019, considering their age, sex, and region. The data used for this calculation is maintained in the National Education Statistics Database and provided by TurkStat upon our formal request.

However, the dataset used in microsimulation contains a limited number of rare events, such as giving birth to a sixth child or widowed women with kids finding a job. To overcome this limitation, the dataset has been expanded by duplicating individual records 10 times with the same attributes but different IDs and addresses.

This replication method ensures that microsimulations can be carried out with a large number of individuals and households without compromising on age, sex, education, marital status, or any other distribution (Dupriez, 2017).
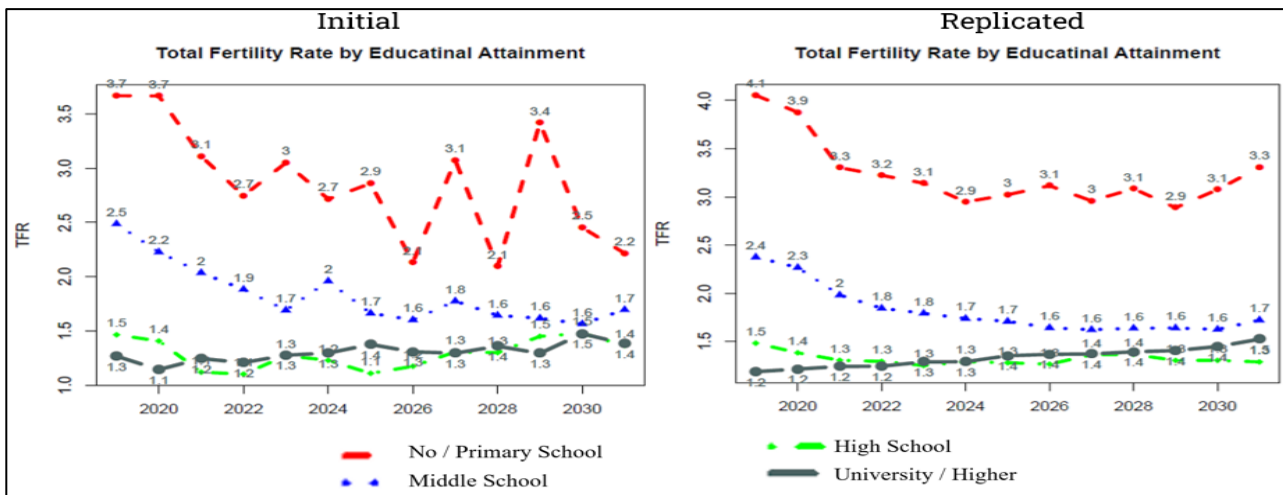
Figure 4. *Results comparison of initial and replicated sample*

The smooth transition and consistency observed (Figure 4) in the trend of the indicators obtained from the simulation result using the duplicated baseline were only possible because the transition probabilities were calculated over the population of Türkiye.

Table 3. Transition rates of women for Istanbul region

Age group	Death rate	ASFR (no or primary school graduates)	Labour force status (from unemployed to employed)
0	0.00697		
1-4	0.000318		
5-9	0.000136		
10-14	0.00016		
15-19	0.000187	0.0000	0.232
20-24	0.000209	0.1983	0.225
25-29	0.000217	0.1163	0.071
30-34	0.000322	0.0478	0.070
35-39	0.000442	0.0504	0.079
40-44	0.000677	0.0138	0.053
45-49	0.001145	0.0000	0.026
50-54	0.002065		0.048
55-59	0.00344		0.000
60-64	0.006184		0.000
65-69	0.010501		0.000
70-75	0.018363		0.000
75-79	0.036102		0.000
80-84	0.066046		
85+	0.145297		

If the transition probabilities were also calculated from the DHS data, the breakdowns of indicators would be underrepresented due to the low number of observations. However, by using the statistics that TurkStat calculates taking into account the whole country as observations, each transition probability is derived from more observations, which results in a more accurate simulation. In essence, the duplication of the baseline data increases the number of observations and brings the simulation results closer to real-world distribution. Validation and consistency are crucial for any simulation model, and our study is no exception. Researchers have suggested that the results obtained from the dynamic microsimulation model should be compared with observed data to validate the results (Merz, 1994). However, it is important to note that the results obtained from simulation may differ from statistics to a certain extent due to differences in methodology.

Results

In this study, the simulation method applied assumed a closed migration system and did not take into account the institutional population, which led to a lower estimate of the population size between 2019-2021 compared to data from the ABPRS. A considerable portion of the institutional population comprises students residing in dormitories, and statistical data indicates that this group exhibits a higher growth rate compared to the household population (Ministry of National

Education, 2022). Nevertheless, the population growth rate remained relatively stable at around 5 per thousand. Projections based on the simulation suggest that population is expected to reach 86.6 million by 2030 (Figure 5).
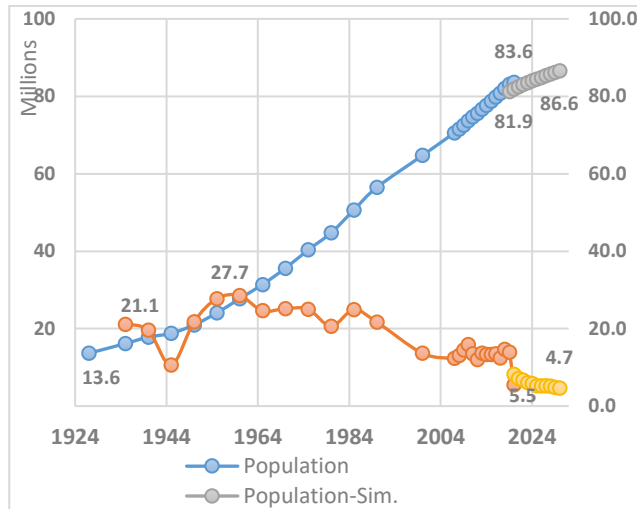
Figure 5. *Population and growth rate, 2007-2021 TurkStat, 2019-2030 Simulation*

In this research, we compared the population size estimated by our simulation to projections made by the United Nations (UN) and the Turkish Statistical Institute (TurkStat) in Figure 6. It's noticeable that our simulation started with a lower population level than the other projections, as it only considered household populations, while the UN and TurkStat projections accounted for both household and institutional populations. However, despite the initial difference in population size, our simulation produced similar

trends to those observed in the Address Based Population Registration System (ABPRS) results. This indicates that our simulation methodology was effective in capturing the key demographic trends in Türkiye, despite the limited scope of the simulation.

Table 4 presents the projected changes in population across NUTS1 regions in Türkiye from 2019 to 2030. The table shows a downward trend in the population of Istanbul (TR1), West Marmara (TR2), Aegean (TR3) regions, and upward trend in the other regions with the highest in Southeast Anatolia Region (TRC), which is projected to experience a steady increase in population. The largest decline is expected in Istanbul Region (TR1), which is projected to decrease from 15.4 million in 2019 to 13.9 million in 2030. The main reason for this decrease is that, according to TurkStat migration statistics, Istanbul's net migration has been consistently negative in 2016, 2017 and 2018. In Turkey, the patterns of internal migration are influenced by the timing of parliamentary and local administration elections. The elections held in 2018 for the parliamentary seats and in 2019 for local administration positions have notably disrupted the migration rates, particularly in İstanbul and this is reflected in the model. These findings suggest a concentration of the population in large urban areas, particularly in the western and southern regions of Turkey. The implications of these projections are significant for public policy, particularly for infrastructure planning and resource allocation in the country.
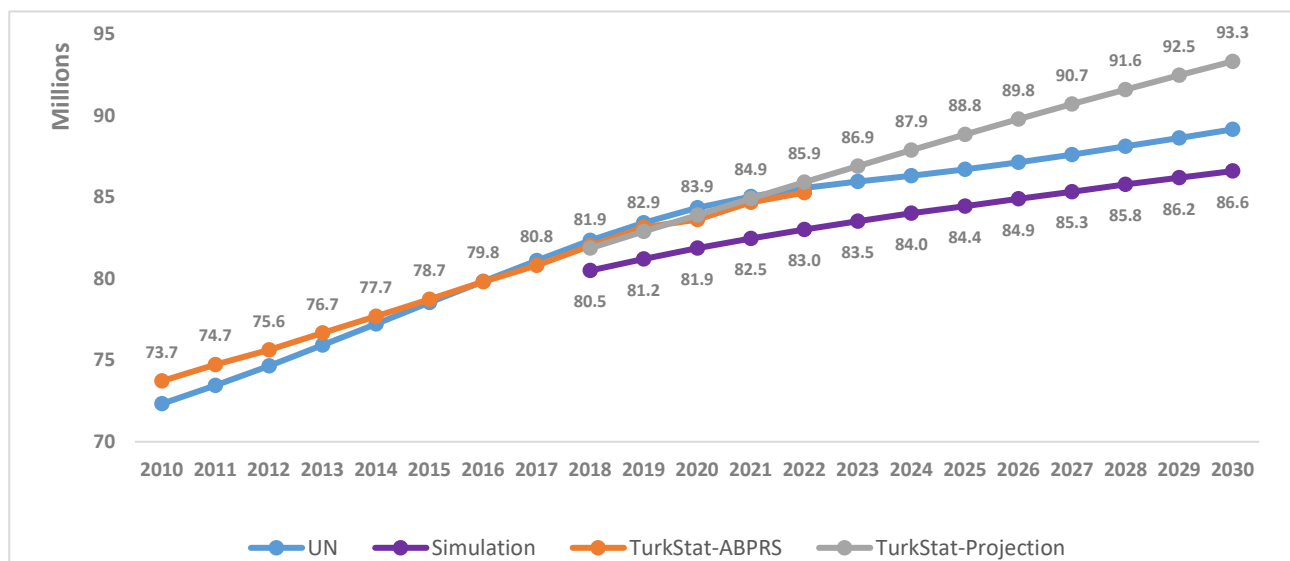
Figure 6. Population by selected estimations, 2018-2030

Table 4. Population estimation by NUTS-1 Regions, 2019-2030

	2019	2021	2023	2025	2027	2030
TR1	15,365,821	15,259,591	14,872,185	14,627,642	14,353,750	13,896,713
TR2	3,586,109	3,621,017	3,631,865	3,647,722	3,622,747	3,578,374
TR3	10,301,512	10,224,367	10,152,781	10,060,706	9,922,056	9,756,682
TR4	7,673,240	7,784,874	7,878,615	7,952,589	8,046,727	8,197,683
TR5	7,989,689	8,073,680	8,171,552	8,218,650	8,335,326	8,494,503
TR6	10,346,170	10,533,186	10,739,762	10,895,337	11,064,492	11,317,811
TR7	3,994,400	4,042,454	4,113,012	4,199,480	4,266,754	4,360,403
TR8	4,463,869	4,540,337	4,652,509	4,691,742	4,742,902	4,760,683
TR9	2,202,667	2,297,659	2,393,282	2,456,035	2,474,894	2,489,214
TRA	2,136,340	2,241,542	2,357,373	2,476,722	2,582,468	2,712,564
TRB	4,064,174	4,239,378	4,418,820	4,581,172	4,724,698	4,951,223
TRC	9,121,171	9,620,319	10,144,583	10,620,229	11,142,423	12,007,388

In comparison to the assumptions made by the United Nations (UN) and TurkStat population projections (Figure 7), the total fertility rate (TFR) observed in TurkStat statistics is lower than their predictions. However, in contrast to this trend, the TFR calculated through the simulation estimates the closest value and approaches official statistics over time.

The estimated total fertility rate (TFR) for Türkiye was found to be 2.1 in 2019, indicating a moderate level of fertility. However, our projections reveal a significant decline in the TFR to 1.6 by 2030, indicating a downward trend in fertility rates. Specifically, when analyzing the sub-regions,

İstanbul displayed a TFR of approximately 2 in 2019 (Figure 8). However, our projections indicate a substantial decline in the TFR, reaching 1 by 2030. This decline suggests a significant reduction in fertility levels within the İstanbul region.

In Southeast Anatolia, the TFR was notably higher at 2.9 in 2019, indicating relatively higher fertility rates compared to other regions. However, our projections indicate a gradual decrease in the TFR, reaching 2.2 by 2030. Despite the decline, the region is expected to maintain a relatively higher in fertility levels within of 1.1 in 2019. However, our projections suggest a noteworthy increase in the TFR, reaching 1.8 by the East Black Sea region.considerably lower TFR 2030. This upward trend indicates a potential rise fertility rate compared to other regions in Türkiye. Conversely, the East Black Sea

Figure 9 reveals that there is a demographic shift influencing the educational composition of the population. The population of individuals with no school or primary school education are ageing and not being replaced by younger generations with similar educational backgrounds. In contrast, the number of individuals with university and higher education degrees is increasing,
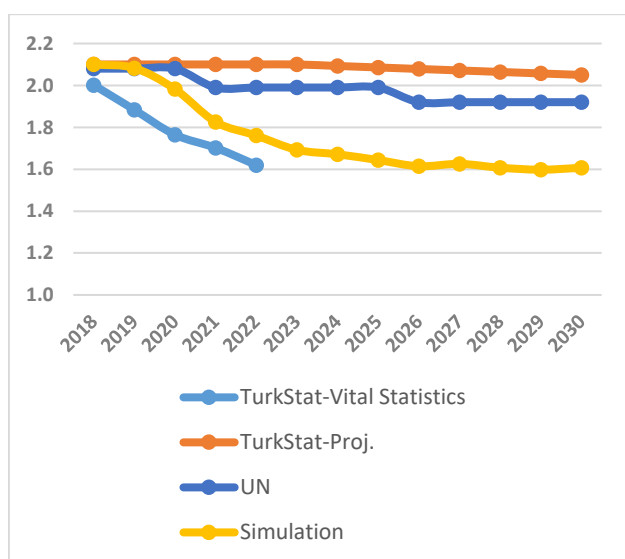
Figure 7. *Total Fertility Rates of selected estimations*
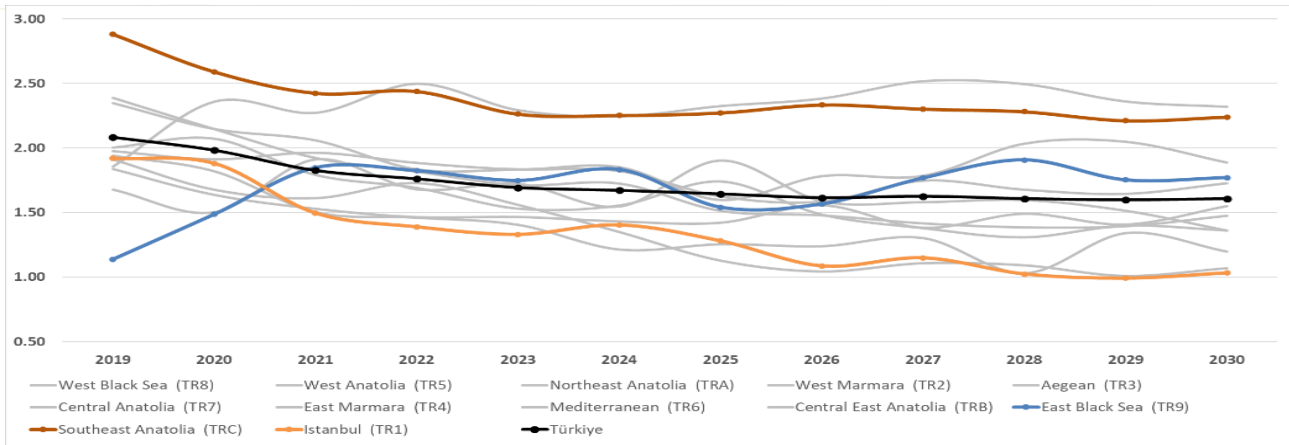
Figure 8. Total fertility rate by regions, 2019-2030

particularly among women. This shift in educational levels may have various implications for society. For example, it could influence the types of jobs available, the skillsets required in the workforce, and the overall level of economic development. Additionally, it may affect social and cultural norms and values, as well as the distribution of power and privilege in society.

decade, indicating a sense of predictability and stability for those entering or already in the workforce. At the same time, the predicted increase in women's employment is a positive development and is in line with the global trend of more women participating in the labour force (Elder & Dorothea, 2004).
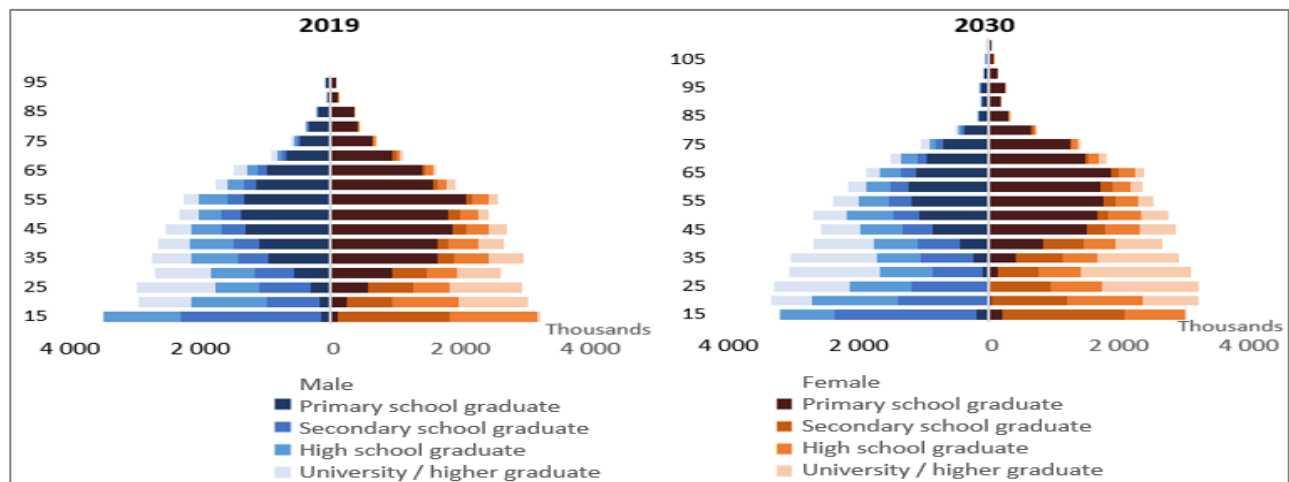
Figure 9. Population pyramid by completed educational level, 15+ age, 2019, 2030

It is important to note that these findings may be influenced by a variety of factors, such as government policies, cultural norms, and economic conditions. Further research and analysis would be needed to fully understand the underlying causes and potential consequences of this shift in educational levels.

Results indicate that the labour force market will experience relatively stable conditions without significant changes (Table 5) by 2030. However, it is expected that the employment rate for women will see a slight increase during this period.These findings suggest that the job market will remain relatively consistent over the next

It's important to note that these projections are subject to change and can be influenced by various factors such as technological advancements, shifts in industry demands, and economic policies. Nonetheless, these findings provide some insights into what the labour market could look like in the near future. Overall, our findings demonstrate that the simulation method we used provides a valuable tool for estimating population size and projecting demographic trends, particularly for household populations, and can serve as a beneficial complement to other projection methods.

Table 5. Employment rate by age group and sex (%), 2019-2030

	Male		Female	
	2019	**2030**	**2019**	**2030**
15-19	25.4	14.9	15.3	13.9
20-24	59.5	59.8	32.0	26.4
25-29	74.2	73.7	35.6	34.8
30-34	81.1	76.9	37.2	40.0
35-39	83.3	76.6	38.5	41.2
40-44	83.2	73.8	41.9	42.9
45-49	79.3	70.7	40.0	39.5
50-54	64.6	63.4	27.4	32.5
55-59	55.7	54.5	20.2	24.9
60-64	40.4	42.7	13.2	18.4

Conclusions and recommendations

In conclusion, the findings of this study are consistent with the mainstream judgement (Bakar et al., 2017, Levent, 2002, Ergöçmen, 2012, Eryurt, 2018, Eryurt & Koç, 2012), which predicts a decline in fertility and an increase in investment per child, education, and health quality. The microsimulation approach used in this study provides more consistent estimates even for key indicators than macro-level projections.

The simulation approach also generates nuanced information on demographic events, such as age, sex, region, and educational attainment, and labour force status by age, and sex. Future research can integrate more sophisticated models to analyze the full distributive effects of policies and other macro-shocks.

The results highlight the importance of taking regional differences into account in planning to improve employment, income, and education levels. Targeted interventions can be more effective and efficient by covering problematic sub-segments rather than the entire population.

Lastly, while our demographic microsimulation methodology allows detailed and realistic demographic projections, it still faces limitations in terms of data demands and quality. Data accessibility is improving, but the lack of appropriate data can hinder the use of microsimulation models.

It is important to note that our analysis focused exclusively on socioeconomic catachrestic, as the consideration of international migration was excluded due to the challenges associated with obtaining accurate and consistent data and feasible assumptions in this context. The absence of international migration in our analysis represents a limitation. The lack of detailed and reliable data on international migration made it challenging to incorporate this factor into our microsimulation model. Future studies should aim to address this limitation by considering the complexities of international migration within the Türkiye context, thereby providing a more comprehensive understanding of migration dynamics in the country.

In addition, data quality issues, especially in internal migration, data can cause skewed results. To improve the model, it would be ideal to have a socioeconomic population database with administrative records of social and economic characteristics to further understand migration behavior.

The software developed in R has served its purpose, but it should be developed, interfaced, and adapted to standard data sets for use in future population studies. The matching strategy proposed can also be improved by trying different models with more characteristic features. Future research should focus on addressing these limitations to create more realistic demographic projection models.

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RESEARCH ARTICLE

Thinking about Visuals: Investigating Classroom Visuals in Turkish Preschools

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Abstract

Visuals, are significant instructional tools that facilitate children's learning, provide an aesthetic perspective, and contribute to classroom management. This study investigated preschool classroom visuals on walls from the perspective of preschool teachers. The data was collected from 58 preschool teachers working in Ankara by using the Demographic Information Form and Classroom Visuals Questionnaire developed for this study. The data were analyzed with content analysis qualitatively. This study has found that generally, the visuals used in preschool classrooms mainly display children's works, basic concepts, and classroom rules. There are limited visuals representing diversity, especially for people with special needs and most of the teachers use visuals related to diversity and people with special needs during special days and weeks. Finally, the majority of static and non-static visuals are created by the teachers for their classrooms. The findings of this study, which provide a snapshot of classroom visuals from the perspective of preschool teachers, yield interventionists and researchers who work on classroom environments and learning methods, emphasizing the importance of visuals in the development, and learning of young children.

Keywords: *Classroom Environment, Visuals, Displays, Diversity*

Öz

Çocukların öğrenmesini kolaylaştıran önemli eğitim araçlarından biri olan görseller, çocuklara estetik bir bakış açısı sağlamakta ve sınıf yönetimine katkıda bulunmaktadır. Bu çalışmada, öğretmenlerin görüşlerine göre, okul öncesi sınıfların duvarlardaki görseller incelemiştir. Veriler, bu çalışma için geliştirilen Demografik Bilgi Formu ve Sınıf Görselleri Formu aracılığı ile Ankara'da çalışan 58 okul öncesi öğretmeninden toplanmıştır. Veriler, içerik analizi ile nitel olarak analiz edilmiştir. Bu çalışmada, genel olarak okul öncesi sınıflarda kullanılan görsellerin çocuk ürünlerini, temel kavramları ve sınıf kurallarını kapsadığı bulmuştur. Özellikle özel gereksinimli olan bireyler başta olmak üzere farklılıkları temsil eden görsellerin sınırlı olduğu ve çoğu öğretmenin bu görselleri, belirli gün ve haftalarda kullandıkları görülmüştür. Son olarak, öğretmenlerin büyük bölümü sınıfları için statik ve statik olmayan görselleri kendileri hazırlamaktadır. Öğretmenlerinin bakış açısı ile okul öncesi sınıflardaki görsellere ilişkin bir anlayış sunan bu çalışmanın bulguları, görsellerin küçük çocukların gelişimi ve öğrenmesi için önemine dikkat çekerek, sınıf ortamı ve öğrenme yöntemleri ile ilgili çalışan araştırmacıları ve uygulamacıları yönlendireceği düşünülmektedir.

Anahtar Kelimeler: *Sınıf Ortamı, Görseller, Farklılıklar*

Introduction

The classroom environment including physical, social, and temporal aspects plays a vital role in the learning and development of preschool children (Division for Early Childhood, 2014) and sends positive, neutral, or negative messages to children through its physical attributes (Yu et al., 2016; Favazza et al., 2017). Positive environments, where children feel psychologically and physically safe, facilitate the children'sacademic and social skills (Frenzel et al., 2007; Sandilos et al., 2017)) and promote respect, empathy, and positive relationships among children (Brody & Roach, 2012). The Reggio Emilia approach emphasizes the "environment as the third teacher."; therefore, teachers should consider all aspects of the classroom environment more critically, including the visuals, displays boards, and classroom aesthetics (Gandini, 1998).

There are diverse types of displays or bulletin boards as a part of the classroom the environment in almost every preschool classroom, and they are used for the display of visuals and decoration (Hollestelle & Kelly, 1972). Visuals play a critical role in shaping the emotional, social, and physical environment of the preschool classroom. Based on the Learning Theory, visuals create an environment where teaching and conflicts occur (Skeet Creekmore, 1987). The visuals are not a separate system integrated into the learning environment and are a natural part of most preschool classrooms (Hollestelle & Kelly, 1972). Classroom visuals, also known as displays, refer to various types of materials and visual aids including posters, maps, pictures, charts, diagrams, and others that display around the classroom environment (Almeda et al., 2014). Some visuals are children's works, classroom management, and themes being worked on related to visuals in preschool classrooms (Gayle-Evans, 2004). The visuals could be placed on a wall, cabinet, table, windows, doors, or a combination of them (Skeet Creekmore, 1987; Prescott, 2000); and they should be presented at children's eye level (NAEYC, 1998). The visuals have advantages such as flexibility and reliability and integrate easily into the learning process, and they are accepted as economic (Hollestelle & Kelly, 1972) as with some practical tips (e.g., using neutral colors), they could be easily created (Prescott, 2000).

Visuals are utilized to teach a variety of subjects in an interdisciplinary and cross-curricular way, like modern tools (Sanz et al., 2019). In line with Sanz, Jardón, and Gil (2019), the three purposes of the visuals are a) educational, which refers to transmitting values such as appropriate behaviors and hygiene; b) curricular, which is linked to academic contents; c) comfort-generating which focuses on children's well-being and their comfort through classroom aesthetics. That is, preschool teachers could use the visuals as an instructional tool, gathering children's attention, classroom decoration or daily aesthetic (Hollestelle & Kelly, 1972; Prescott, 2000; Sanz et al., 2019), stimulating children's imagination (Prescott, 2000), regulate children's behaviors with displaying classroom rules (Simonsen, et al., 2008), pedagogical documentation (Şahin, et al., 2022), and representing diversity such as different races, cultures, ethnic groups, and also people with special needs (Prescott, 2000; Gayle-Evans, 2004; Martínez-Bello & Martínez-Bello, 2017). Finally, if they are carefully and effectively planned, visuals offer children the opportunity to engage with different educational materials independently (Hollestelle & Kelly, 1972).

Classroom visuals are considered to be very important not only in preschools but also at all levels of education because visuals possess an inherent and immeasurable communication power (Sanz et al., 2019). Children exhibit a powerful emotional response to visuals and express their attitudes toward them with clarity even if they could not remember the content (Collingford, 1978). There is some evidence to suggest that when classroom visuals are placed by the notion of environmental engineering for enhancement of learning, they might affect children's attention even for children with special needs (Skeet Creekmore, 1987), task performance, and learning outcomes (Harmon et al., 2009; Fisher et al., 2014; Barrett et al., 2013; Barrett et al., 2015;Godwin et al., 2022). For example, word walls as a literacy tool enhance vocabulary learning and word knowledge in preschool, middle, and secondary school classrooms (Harmon et al., 2009; Wingate, Rutledge, & Johnston, 2014). Concerning

children's attention, young children often find themselves in visual environments filled with potential distractions, including too much colorful and visually stimulating displays (Skeet Creekmore, 1987; Fisher et al., 2014; Hanley et al., 2017). According to Skeet Creekmore (1997)'s study, using relevant and uncluttered visuals facilitates learning, whereas over-stimulation led to an increase in "off-task" behaviors and misbehaviors, ultimately hindering learning.

Teachers are encouraged to step back and critically examine the quality and quantity of commercial materials on their walls to determine whether they contribute to children's learning or whether they ultimately silence children (Tarr, 2004). Otherwise, according to existent literature, teachers looking for methods to offer children independent learning opportunities have almost neglected the visuals, and children are only required to passively observe them (Hollestelle & Kelly, 1972). Moreover, visuals, regardless of their academic nature, are not used as effective instructional tools (Collingford, 1978) and, are frequently not related to the current learning process or academic topics (Almeda et al., 2014). Teachers put and put the visuals on the walls (Prescoot, 2000), but they neglect the visuals as an instructional tool (Hollestelle & Kelly, 1972). Sanz, et al., (2019), investigated the visual cultures of three schools including preschool classrooms and elementary classrooms while observing the visuals' function in Spain. They found that visuals are rarely used in children's learning and have numerous artistic and aesthetic weaknesses such as using pre-printed educational visuals and creating few visuals by teachers and children. Regarding the representation of diversities in classroom visuals, most teachers do not use visuals to display diversity related to age, gender, ethnic cultures, and people with special needs (Gayle-Evans, 2004). A significant study by Martínez-Bello & Martínez-Bello (2017) investi-gated the visuals on the walls in terms of gender, age, disability, space, clothing, type of character, and activity level. The findings show that the non-existence body of diversity in the classroom visuals are not contributing to children's understanding of diversity issues like age and disability (Martínez-

Bello & Martínez-Bello, 2017).

Representation of Individual Differences in Classroom Visuals

Children realize the differences before identifying the similarities (Derman-Sparks, 1989). Therefore, teachers should enhance anti-bias education in early childhood settings (Martínez-Bello & Martínez-Bello, 2017) to address human diversity, prejudices, bias, and injustices that affect children (Derman-Sparks & Edwards, 2010). This could be achieved through the creation of inclusive environments that promote diversity (Lin et al., 2008; Martínez-Bello & Martínez-Bello, 2017). The concept of "representation" in schools and classrooms refers to the depiction of differences in various forms, such as books, visuals, play materials, language (sign language or Braille), curriculum, and school programs (Nikolaraizi et al 2005; Favazza et al., 2017). The classrooms, as a primary socializing environment, should provide appropriate opportunities for children to understand the similarities and differences regarding culture, disability, culture, and ethnicity; then, children notice that people are just different not unique (Gayle-Evans, 2004; Prescott, 2000). The classroom visuals are effective material to represent diversity and create an inclusive environment, including people from different races, cultures, ethnic groups, and people with special needs (Gayle-Evans, 2004; Martínez-Bello & Martínez-Bello, 2017). This might promote awareness, acceptance, and inclusiveness, and create a welcoming environment for all children (Martínez-Bello & Martínez-Bello, 2017; Ostrosky, et al 2015). Most teachers do not use visuals to display diversities (Gayle-Evans, 2004), share them on special days (Favazza et al., 2017), are uncomfortable and unwilling to discuss differences and do not recognize the significance of talking about diverse groups (Cannella & Reiff, 1994; Manning, 2000; Gayle-Evans, 2004). Regarding the representation of diversities in classroom visuals, most teachers do not use visuals to display diversity related to age, gender, ethnic cultures, and people with special needs (Gayle-Evans, 2004). They share them on special days

(Favazza et al., 2017), are uncomfortable and unwilling to discuss differences, and do not recognize the significance of talking about diverse groups (Cannella & Reiff, 1994; Manning, 2000; Gayle-Evans, 2004). A significant study by Martínez-Bello & Martínez-Bello (2017) investigated the visuals on the walls in terms of gender, age, disability, space, clothing, type of character, and activity level. The findings show that the non-existence body of diversity in the classroom visuals are not contributing to childrens understanding of diversity issues like age and disability (Martínez-Bello & Martínez- Bello, 2017).

Visuals are rarely investigated as resources (Errázuriz & Portales, 2018), although classroom visuals displayed on the walls play a considerable role in the learning processes, anti-bias education, and inclusion and send powerful messages. These are also emphasized on web pages designed for teachers to find and create resources on visuals (e.g.https://www.responsiveclassroom.org/displaying-student-work-2/; https://www.teachstarter.com/us/resour-ce-type/bulletin-board-displays/; https://www.earlylear-ninghq.org.uk/earlylearninghq-blog/the-advantages-of-classroom-displays/).

Considering all this evidence, it seems that visuals are critical in preschool classrooms, and they should be investigated deeply. There are some studies about visuals in Türkiye and their content related to visual arts (e.g., Avcı & Sağsöz, 2018; Özkan & Girdin, 2014), visual perceptions (e.g., Akaroğlu & Dereli, 2012), and visual literacy (e.g., Alpay & Okur, 2021). Therefore, it could be said that no studies have yet directly investigated the preschool classroom visual environment and representation of diversities in classroom visuals in Türkiye. By considering teachers' decisions regarding the visuals in preschool classrooms more systematically, we could gain insights into which overall choices have positive effects, and potentially create visual design patterns that most effectively foster an inclusive learning environment. There are two primary aims of this study: 1) To investigate preschool classroom visuals on walls and 2) To ascertain the representation of diversity in classroom visuals on walls.

Method

The current study carried out the basic qualitative research design, which is appropriate given the exploratory nature of the method and the study's aim to explore individual experiences and the meanings attributed to them by the participants (Creswell, 2015; Merriam, 2013; Willig, 2013). The focus of this study was to explore visuals in preschool classrooms based on the experiences and perspectives of preschool teachers.

Participants

The participants of the study consist of 58 preschool teachers working in the province of Ankara. Considering that the principles of being preschool teachers in Türkiye are the norm, it is supposed that there are no significant differences regarding their characteristics among preschool teachers. Therefore, the participants of this study might represent the Ankara case. The demographic information about the 58 preschool teachers and the characteristics of children with individual differences in their classrooms is included in Table 1.

The largest 67,2% of participants have bachelor's degrees and 81% of teachers are working in public preschools. 44,8% of them are working with preschool children aged 60 months. Their professional experience years range from 1 to 31 and among the participants, there is only one male teacher. In the classroom of 74% of teachers, there are children with individual differences, and these differences are presented in Table 1. According to 51,7% teachers, there are children without any diagnoses but with different characteristics from their peers in their classrooms.

Data Collection Tools

Demographic Information Form

This form was used to gather information about the participant teachers and children in their classrooms, including teachers' gender, age, education level, professional experience, type of school as well as characteristics of children with individual differences in teachers' classrooms.

Classroom Visuals Questionnaire (CVQ)

The researcher developed a questionnaire to investigate visuals in the preschool classroom environment for this study. Questionnaires are self-report data collection instruments filled out by the participants and could be used to collect qualitative, quantitative, and mixed data (Johnson & Christensen, 2014).

Then, expert opinions were received, and the questionnaire was revised based on the feedback. Finally, the pilot study of the questionnaire was conducted with 10 teachers on the Web and then the questionnaire was finalized.

The CVQ includes open-ended, close-ended, and contingency questions and consists of three parts which are a) the areas where the visuals are displaced, b) the characteristics of the visuals, and c) how the visuals are used.

Table 1. The demographic characteristics of the teachers and characteristics of children with individual differences

		N	%
Type of school	Public	47	81
	Private	11	19
Gender	Women	57	98,3
	Man	1	1,7
Education	Associate degree	7	12
	Bachelor's degree	39	67,2
	Master's degree	12	20,7
The working age group of children	36 months	6	10,3
	48 months	10	17,2
	60 months	26	44,8
	72 months	6	10,3
	Mix ages	10	17,2
	X	**SD**	**Range**
Teachers' age	34	7,4	21-52
Teachers' years of professional experience	10,5	6,9	1-31
		N	**%**
Characteristics of children with individual differences in the classrooms (according to teachers)	Children without any diagnoses but with different characteristics from their peers	30	51,7
	Children with special needs	21	36,2
	Refugee children	10	17,2
	Children with different mother tongues	6	10,3
	Children from different ethnicities	3	5,2
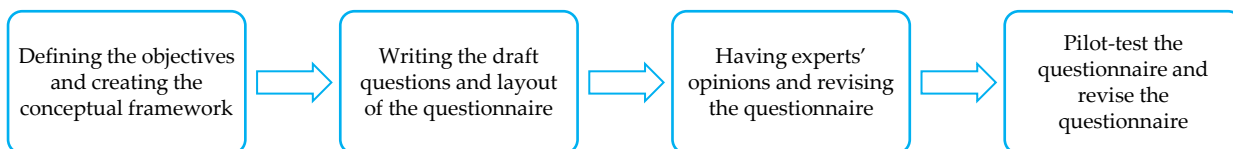
Figure 1. The Development Process of the Questionnaire

The researchers developed the CVQ following the principles stated by Johnson and Christensen (2014). It could be seen in Figure 1 that the questionnaire is constructed in four steps. Firstly, the draft questions were written regarding the research objectives and conceptual framework.

Data Collection and Analysis

The data were collected between December 2022 – January 2023 in two months. Firstly, researchers transposed the questions to the Web and got the link to the questionnaire invitation. Then, the

questionnaire link was sent to the preschool

at children's eye level (8)
not at children's eye level (11)
a large enough area(23)
not a large enough area (24)
not a purposive area (6)
a purposive area (4)
The Areas of the Visuals
children's works (56)
classroom rules and routines (42)
related to individual differences (41)
basic concepts (37)
Atatürk learning center (17)
tentative visuals (11)
calender (9)
attendance sheet (6)
weather chart (5)
daily schedule (4)
Visuals
Types of the Visuals
in accordance with the educational program (25)
all images are fixed (11)
some images are fixed (10)
weekly (9)
every day (4)
monthly (4)
on special days and weeks (3)
two to three times a week (3)
semimonthly (2)
when the material wears out (1)
How often visuals are changed

Figure 2. The Areas, Types, and Frequency of Changing the Visuals

teachers with snowball sampling (Johnson & Christensen, 2014). Volunteer teachers visit a Web site and fill out the self-administered questions. Thanks to the Web, contingency questions could be programmed to take place on automatic, and teachers did not see the skipped questions (Fowler, 2013; Johnson & Christensen, 2014). The data were analyzed with content analysis qualitatively using MAXQDA (Creswell, 2015). The author read and code all data regarding the classroom visuals' literature, research questions, and the research design. After that, the codes were brought together into themes and named meaningfully and clearly (Creswell & Poth, 2018). Finally, the codes and themes were presented as figures to be reader friendly for the reporting.

Trustworthiness

The author and an expert specialized in special education and early childhood education independently analyzed the data. The author and an expert discussed, organized, and revised the themes, sub-themes, and codes while analyzing the data for trustworthiness (Johnson & Christensen, 2014). Moreover, throughout the data

analysis process, the researcher reviewed the data multiple times to clarify the codes within the data (Creswell, 2015). Biases were monitored by considering alternative explanations in peer debriefing meetings, and detailed descriptions of the development of the questionnaire, data collection process, and analysis were provided for transferability (Creswell & Poth, 2018; Johnson & Christensen, 2014).

Findings

The results of the study are presented following the three sections a) the availability of the areas for the visuals, b) the types of the visuals, and c) using the visuals. The analysis of the close-ended and open-ended questions was integrated and presented visually. The figures include the sub-themes and codes. The numbers in parentheses are the frequency of the teachers in the figures.

The availability of the areas for the visuals

Teachers shared their views on the areas where the visuals are displaced. They mentioned the size of the area, its practicality, and its appropriateness for children (Figure 2).

Almost half of the teachers pointed out that the

size of the areas is not enough for educational practices. One teacher stated that "*I don't have enough area. The existing areas are not appropriate*" (T47). Some of them specified that the areas are not at children's eye level. A teacher (T10) expressed that "*maybe it doesn't work well enough because the boards are higher than the children's eye level.*"

Finally, a group of teachers said that the area is not practical for placing any kind of visuals. One teacher (T55) pointed out that "*Boards are high areas, and they are useless. Kids are not tall enough to use them properly.*".

The types of visuals

physical characteristics of individuals are the most represented, whilst special needs and unique abilities are the least presented in these visuals.

One teacher (T2) mentioned that: "*Children in wheelchairs, blind children, glasses, and walking sticks, etc., who seem to be disabled.*" Several teachers noted visuals related to the characteristics of individuals and the tools such as glasses, canes, walkers, and culturally specific clothes reflecting the individual differences presented on the walls of their classrooms. Teachers specified how often they change the visual materials and most of them change the visuals in line with the educational program. A teacher stated that "*There are images that I change when the subject changes.*" (T23). A couple of teachers have indicated that they

Figure 3. How Teachers Obtain the Visuals

Participant teachers listed the visuals in their classrooms. It could be seen in Figure 2 that basically, four groups of visuals are presented on the preschool walls; children's works, the classroom rules and routines, and basic concepts related to the national program and individual differences. For example, one teacher (T31) expressed that "*There are visuals related to the concepts included in the monthly plan.*" Genders and

regularly change their classroom visuals (e.g., weekly, monthly, semimonthly). A teacher (T40) shared that "*I take care to hang a new poster every month while refreshing the bulletin board weekly.*" A few teachers pointed out that they never changed the visuals, meaning these visuals are static. To illustrate, *I haven't changed anything.*" (T11). Only one teacher (T59) specified that she changes the visuals when the materials wear out.

Using the visuals

Obtain the visuals

Teachers shared how they select and supply the visuals Figure 3.The majority of teachers follow the educational program and make a point of being developmentally appropriate while selecting the classroom visuals. One teacher stated that *"I pay attention to whether simplicity and complexity match the children's developmental level."* (T2). 19 of them stated that they are selecting visuals that can attract children's attention. For example, *"I am making an effort to ensure that the visuals are attention-grabbing for children."* (T40). Teachers select visuals that are easy to understand (eight teachers) and visuals created with long-lasting materials (two teachers). Only one teacher (T26) pays attention to the character of multi-sensory (Figure 3).

visuals from stationery. One teacher stated that *"I get it from other teachers' posts on the internet and social media."* (T32). Only one teacher gets support from parents for supplying the visuals.

Purpose of the visuals

Responding to the question of the CVQ related to what purposes the teacher uses the visuals. (Figure 4).The majority of teachers stated that all visuals in the classroom are used to support the learning process and facilitate children's learning. For example, one teacher noted that *"I use visuals while teaching new concepts during the activity."* (T52). The other teacher's purpose is to explore the children's interests through visuals. She said: *"I use the wall of interest to determine themes. I work on themes that are of children's interest and it is more effective."* (T38).
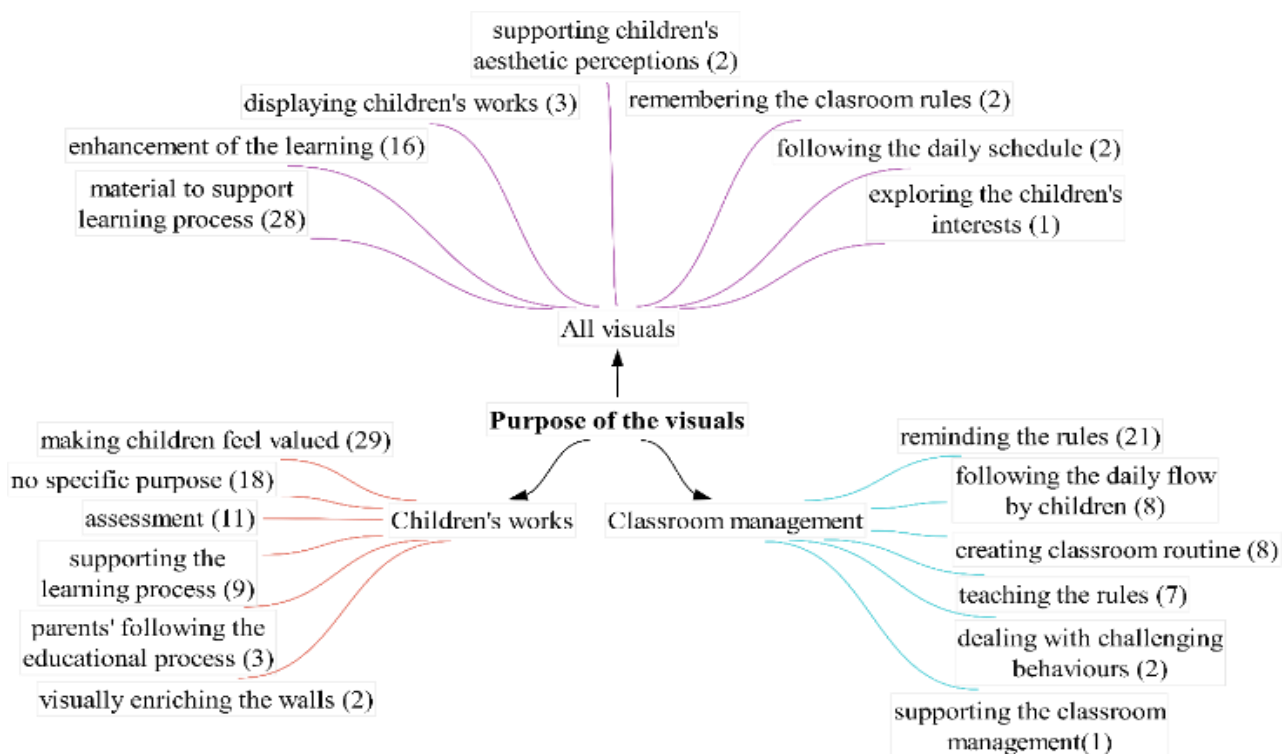
Figure 4. Teachers' Purpose of Displaying the Visuals

As to how teachers supply the visuals for their classrooms, most of them reported that they create visuals about basic concepts regarding the educational program. One teacher shared that *"I create the visuals with waste materials considering the learning objectives, themes, and weekly bulletin"* (T16). Some teachers find the visuals on the internet and print out them while some of them purchase the

The other purposes of the visuals varied based on the types of the visuals, such as children's works and visuals regarding classroom management. For teachers, the main reason for displaying children's work is to make children feel valued. A teacher expressed that *"I display it to show that I value their works and that each of their works is beautiful in its own way."* (T38). On the other hand, a group of teachers does not have any

specific purpose to display children's work. In addition, approximately 90% of the teachers use visuals including classroom rules, classroom routines, challenging behaviors, and daily routines for classroom management purposes. For example, one teacher explains the visuals related to classroom rules and routines *"I use it to remind children about the rules and our daily routine……..and they talk about their routines by looking at the visuals."* (T30).

Visuals displayed on special days

days. One teacher explained the visuals as "*Images describing that individuals with special needs are just like us."* (T37).

A few teachers mentioned that they ask children's views about the visuals and eight of them make a connection between visuals and daily life while sharing the related visuals with children. One teacher (T30) indicated that "*I am asking about the existence of people with special needs in their immediate surroundings as they see in the image."*
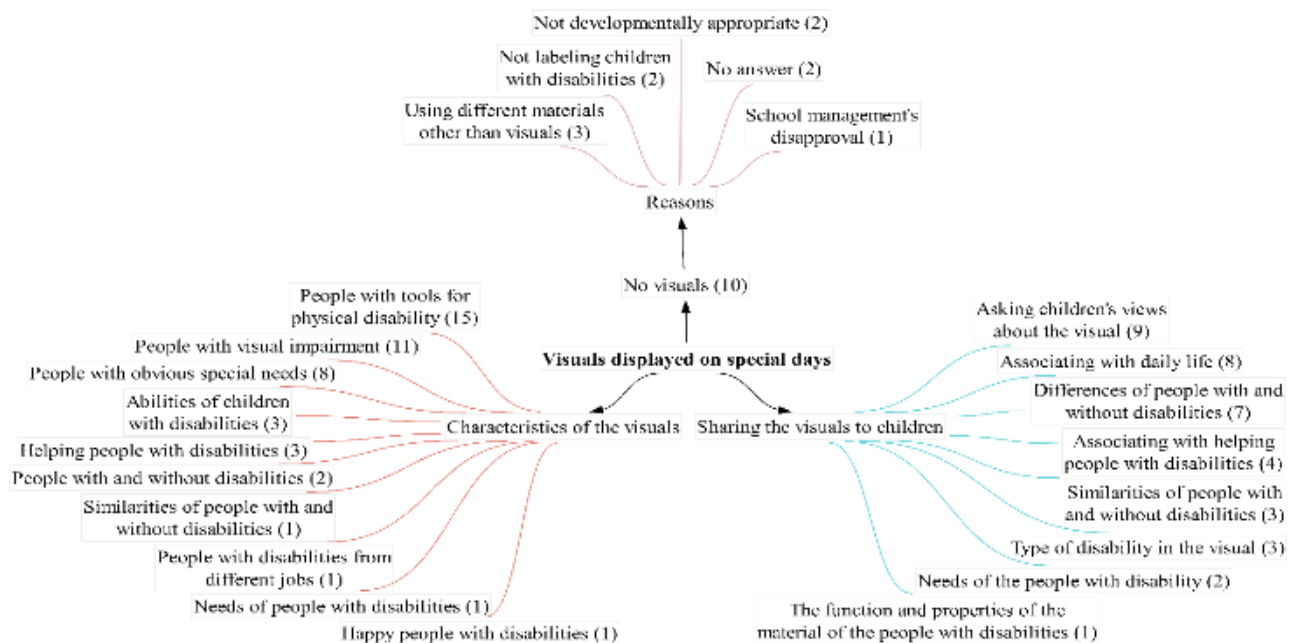
Figure 5. Visuals Displayed on Special Days to Aware People with Special Needs

The teachers mentioned the visuals represented on special days related to people with special needs such as International Day of Persons with Disabilities and Disability Week which are accepted as important days for increasing the awareness of children pertinent to individuals with special needs and their involvement in the communities. Figure 5 shows that 48 teachers display visuals representing individual differences on special days. Most of them represent mostly visuals including people with tools for physical disability and people with visual impairment. One teacher (T58) mentioned "…*visuals of people with different special needs such as individuals in a wheelchair, with a cane, or with crutches…"* Visuals with differences and similarities of people with and without special needs are the least on special

A few teachers make differences between people with and without special needs a current issue and bring up similarities while sharing the visuals with children. For example, a teacher expressed that "*Children look through the images. I want them to describe the similar and different characteristics of the person from themselves they see. Then, I emphasize that we are different but the same."* (T1).

A handful of teachers noted that visuals representing individual differences are not displayed on special days since they believe that the visuals should not be used for labeling children with special needs and that commercial ones are not developmentally appropriate. One teacher pointed out that "*I don't only display on those days. Just like I display other visuals, I display visuals related to children with special needs. I believe that children*

with special needs should be at the forefront of every child every day, not on special days. I think that the activities on these days cause segregation." (T13).

Discussion and Conclusion

The current study offers a snapshot and initial exploration from the perspective of preschool teachers regarding the visuals displayed on preschool classroom walls and the diversity of these visuals in Türkiye. The findings showed that the visuals hanging on the walls in preschool classrooms mainly focused on children's works, basic concepts, and classroom management issues. This is in accord with a study indicating that bulletin boards were used to exhibit children's work, current themes, or visuals related to classroom management (Gayle-Evans, 2004). According to the Turkish literature, visuals are used for various purposes by teachers, for example, Karabay and Asi (2015) indicated that one of the methods for teachers to teach rules to children is to use visual representations of the rules and remind them in Türkiye. Moreover, in their review regarding classroom management in preschool classrooms, Meran and Sucoğlu (2022) mentioned that preschool teachers express their behavioral expectations to children by using visuals indicating classroom rules and routines.

The current study indicates that there are no visuals that include early reading, technology, geography, notice boards (e.g., emergency information, procedures, menus), aesthetics, interactive displays, pedagogical documentation, etc. in the preschool environment. The reason for this may be the lack of awareness and skills among teachers regarding which types of visuals should be present and used in the classroom, and how to effectively use visuals. However, the classroom visuals both educate and engage the children while providing valuable information and aesthetic experience (Prescott, 2000; Errázuriz & Portales, 2018). Based on the related literature, it becomes evident that it is important for preschool teachers to use visuals with various characteristics in their classrooms (Gayle-Evans, 2004; Sanz, Jardón, & Gil, 2019). By acquiring knowledge and experience in this area, they can effectively use visuals to enhance children's learning (Hollestelle

& Kelly, 1972; Skeet Creekmore, 1987). There is, therefore, greater efforts are needed to ensure the diversity of types of visuals by preschool teachers.

Responses to the question related to types of visuals revealed that limited visuals are showing individual differences, especially for people with special needs in Turkish preschool classrooms. These results reflect those of Martínez-Bello and Martínez-Bello (2017) who also found that the bodies depicted in the visuals of preschool classrooms are shown wearing regular clothing and invisibility of individuals with special needs. It is crucial for teachers to offer materials like different appearances, clothing, language, thoughts, or eating habits so, children could actively participate and meet diversity for successful inclusion (Midobuche, 1999; Manning, 2000; Salmon & Akaran, 2001; Gayle-Evans, 2004). Additionally, visual representation on the walls of classrooms could play a role in fostering acceptance of differences among children (Martínez-Bello & Martínez-Bello, 2017), and limited representation of children with different characteristics in classroom materials can lead them to feel alienated (UNESCO, 2020). In this study, most of the teachers use visuals related to individual differences and people with special needs for a short period during special days and weeks. A possible explanation for this might be that teachers follow the national curriculum to create their educational program including a list of special days and weeks such as Disability Week and Autism Awareness Day aiming to increase awareness regarding people with special needs (Ministry of National Education, 2013). On the other hand, a small number of our teachers do not display visuals on special days related to special needs. These teachers might be uncomfortable and unwilling to discuss individual differences and they do not recognize the importance of talking about diverse groups (Cannella & Reiff, 1994; Manning, 2000; Gayle-Evans, 2004). Moreover, as noted in previous research, teachers express a lack of knowledge regarding how to represent children with special needs in the classroom (Yu et al., 2016).

Eleven teachers use only static visuals hanging on the walls throughout the year, and the other ten teachers have both static and dynamic / non-static

visuals on their classrooms. The frequency of changing visuals on walls and bulletin boards in the classroom directly impact children's learning and engagement (Almeda et al., 2014). Keeping visuals current and captivating fosters a positive educational environment because worn-out visuals send a message to children that these visuals are not critical (Prescott, 2000). Based on the finding of this study, it is believed that about half of the participating teachers might be unaware of the importance of using dynamic visuals instead of static ones in their classrooms for children's learning. It is therefore likely that refreshing the visuals, checking the visuals for damage, and evaluating whether the children's needs and what they have learned is suitable for the subject/concepts should be teachers' agenda.

Most participant teachers express that visuals facilitate children's learning, some teachers have reported that they do not use visuals for a specific purpose or do not want to have them in their classrooms due to factors such as visuals distracting children's attention, and lack of suitable areas for visuals in their classrooms. It seems that these findings may be due to teachers not being aware of the importance of visuals and not knowing how to use visuals effectively. On the other hand, many teachers have stated that they create the visuals themselves because of the limited budget for purchasing commercially available visuals on the market, whereas some of them reported that they are not able to prepare the visuals while paying attention to children. According to Prescott (2000), teachers could create attractive and effective visuals with enthusiasm, imagination, and practical guidance. However, when the visuals are not esthetically appropriate for the children, they cause a waste of time and money, and the expected benefits from the visuals cannot be achieved. According to Hollestelle and Kelly (1972), visuals can provide children with the chance to interact with various educational materials on their own, but this is only possible if they are planned, and used carefully and effectively. However, the results of this study indicate that a significant number of teachers use visuals only as material that contributes to the learning process only. It seems possible that

visuals are not being effectively used as qualified instructional tools in preschool classrooms and that teachers seem to lack knowledge on the benefits of visuals on children's behaviors and learning and how to use visuals potently.

The findings of this study provide a first look from the perspective of preschool teachers in the preschool visual environment, using classroom visuals, and the representation of diversities in preschool settings. This study's findings could be used to develop targeted interventions aimed at the professional development of teachers. These should emphasize the advantages of visuals, the presence of visuals in the classroom within the framework of developmentally appropriate practices for children, and how to use visuals effectively as instructional and assessment tools. Furthermore, schools should provide teachers with visuals that have the necessary and appropriate aesthetic features. Accordingly, it is believed that children's attention will increase, their learning will be facilitated, their off-task behaviors will decrease, and teachers' classroom management will improve.

Limitations and Future Studies

It is important to note that this study had several limitations and has thrown up many questions in need of further investigation. *Firstly*, the data consists of self-report statements made by the teachers, so we only know what the teachers have written about the classroom visuals, and, unfortunately, the study did not include the effectiveness of visuals on children's learning. We found that classroom visuals are mostly related to the educational program and teachers use them in the learning process. Further research should be carried out to investigate what actually happens in the classroom environment with observational studies and exploring how the visual content, size, location of the visuals, and organization of classroom walls affect children's learning could be of great value. *Secondly*, the study is limited by the lack of information on how teachers display, talk, or share visuals with children. More broadly, research is also needed to determine how visuals presented differences using in the learning

process. Observational or case studies on this topic will provide information on both how visuals are used and children's reactions and engagement with visuals. *Finally*, the study did not evaluate how to represent the characters in the visuals such as stereotypical, active, or passive roles of the male, female, older adults, children, and people with special needs. Misrepresenting or stereotyping individuals with differences within the classroom environment perpetuates social prejudices and underestimates the role and place of these in society (UNICEF, 2013), and bodies that are different from one's own mustn't be treated as exotic (Lane, 2008). The next phase of research could concentrate on better understanding why these are absent on the visuals, as well as how teachers approach the social construction of the differences. We found that many classrooms include classroom rules and routine visuals and teachers use them as a reminder. Further studies need to be carried out to answer these questions within the framework of classroom management.

Despite its limitations, the study certainly adds to our understanding of preschool classroom visuals. While a limited number of previous studies have highlighted the significance of classroom environment on learning, as far as we know, this study is the first from the perspective of preschool teachers to present a preschool classroom visual environment. Our findings represent a small step in assessing visuals in preschool classrooms with a focus on the representation of individual differences. Considerably more work will need to be done to investigate classroom visuals and the representation of differences in visuals.

Acknowledgments

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RESEARCH ARTICLE

A Proposed Service Quality Measurement Model using Sentiment Analysis and Text Mining: The Case of Water and Sewerage Services

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Abstract

This study proposes a new model for service quality measurement using sentiment analysis and text mining techniques. This model aims to overcome traditional methods' time, cost and implementation difficulties and provide a more dynamic and efficient approach to service quality measurement. In addition, in this model, instead of the dimensions used in service quality measurements, such as SERVQUAL or SERVPERF, it is shown how to determine new categories and keywords specific to the service sector in which the model is used by text mining. Thus, it is aimed at something other than reaching more accurate results in service quality measurement. To achieve the model's purpose, it aims to develop a service quality measurement model using social media data processed by text mining and sentiment analysis. To find an answer to this question, the keywords "flood", "meter", "rain", "irrigation", "infrastructure", "sewerage", "sewage", "maintenance hole ", "aski", "waterless", "water" were extracted from 109.844 tweets sent to the Twitter account of a municipality between 2016 and 2022 by text mining method. Service quality was measured by subjecting 5766 tweets containing the keywords extracted to sentiment analysis. As a result of the service quality measurement, 1922 negative, 973 positive and 2871 neutral tweets were identified. The average negative score was 0.51, the average positive score was 0.11, and the average neutral score was 0.38.

Keywords: *Sentiment Analysis, Text Mining, Service Quality, Twitter Data Analysis*

Öz

Bu çalışmada, duygu analizi ve metin madenciliği teknikleri kullanılarak hizmet kalitesi ölçümü için yeni bir model önerilmiştir. Bu model, geleneksel yöntemlerin karşılaştığı zaman, maliyet ve uygulama güçlüğünün üstesinden gelmeyi ve hizmet kalitesi ölçümüne daha dinamik ve verimli bir yaklaşım sağlamayı amaçlamıştır. Ayrıca bu modelde SERVQUAL veya SERVPERF gibi hizmet kalitesi ölçümünde kullanılan boyutların yerine metin madenciliği ile modelin kullanıldığı hizmet sektörüne özel yeni kategoriler ve anahtar kelimelerin nasıl belirleneceği gösterilmiştir. Böylelikle hizmet kalitesi ölçümünde daha doğru sonuçlara ulaşılması hedeflenmemiştir. Çalışmada önerilen modelin amacına ulaşabilmesi için metin madenciliği ve duygu analiziyle işlenen sosyal medya verilerinden hizmet kalitesi ölçüm modelinin nasıl geliştirileceği sorusuna yanıt aranmıştır. Bu soruya yanıt bulabilmek için bir belediyenin Twitter hesabına 2016-2022 yılları arasında gönderilen 109.844 tweet'den metin madenciliği yöntemi ile belediyenin vermiş olduğu su ve kanalizasyon hizmetleriyle ilgili olarak "sel", "sayaç", "yağmur", "sulama", "altyapı", "kanalizasyon", "lağım", "rögar", "aski", "susuz", "suya" anahtar kelimeleri çıkartılmıştır. Çıkartılan anahtar kelimelerin geçtiği 5766 tweet duygu analizine tabi tutularak hizmet kalitesi ölçümü gerçekleştirilmiştir. Yapılan hizmet kalitesi ölçüm neticesinde 1922 olumsuz, 973 olumlu ve 2871 nötr tweet tespit edilmiştir. Ortalama olumsuz puan 0,51, ortalama olumlu puan 0,11 ve ortalama nötr puan 0,38 olarak hesaplanmıştır.

Anahtar Kelimeler: *Duygu Analizi, Metin Madenciliği, Hizmet Kalitesi, Twitter Veri Analizi*

Introduction

Social media, which emerged with the introduction and development of the Internet, has affected human life in all areas. New phenomena in human life have changed the behaviour of all organisations and institutions. Just as human life is affected by social media, the institutions and organisations created by people have been and continue to be affected by this digital revolution. Organisations that cannot keep up with the transformation that occurs due to emerging paradigms or that keep up incorrectly cannot fulfil their functions and fail. The model proposed by the researchers is a new proposal for organisations to keep pace with digital change.

With the development and spread of technology, people's accessibility to technology and the time spent with technology have increased. Internet traffic grew 30 times between 2000 and 2014, connecting four out of ten people worldwide (Kotler et al., 2017). By 2022, it is reported that nearly five billion people will have an internet connection, and more than four billion people will use social media (Kemp, 2022). Considering the rapid increase in usage rates over the years and today's usage rates, the communication paradigms of people with each other and with organisations have changed. With advances in communication technology and better access to social networks, people are more likely to express their opinions and feelings with their friends on social media platforms. Users can communicate their positive or negative views about the products and services they purchase or use daily to their followers, friends, and direct contacts through Twitter, a social media platform. With this radical change in communication paradigms, widely used social networking sites such as Twitter have started to be used as business tools. (Levy & Birkner, 2011).

Analysing websites containing large amounts of data in terms of content and usage is essential for both users and organisations. They are analysing the content created by users on the Internet interests many sectors, such as politicians, companies, public institutions, and organisations. For these reasons, the analysis of data created on

the internet has attracted the attention of researchers (Aydogan & Ali Akcayol, 2016). Organisations maintain and improve their service quality by considering user reviews and complaints. Since complaints from users are written in natural language expressions, especially in social media, there are difficulties in extracting and processing meaning from these messages (Islami et al., 2021). Researchers use sentiment analysis techniques to process social media data to overcome these challenges.

Sentiment analysis analyses people's opinions, emotions, evaluations, appraisals, valuations, attitudes, and feelings about products, services, companies, individuals, tasks, events, topics, and their characteristics (Alnawas & Arıcı, 2018). Sentiment analysis is used in many political, social, science, and technology disciplines, including public health, history, art, and economics. Companies use sentiment analysis to measure the reputation of their brands and understand their customers (Andrea et al., 2015). Similarly, product managers use sentiment analysis to improve user experiences and satisfaction scores and examine product and service quality (Fang & Zhan, 2015).

Text mining techniques are also used to process social media data. Text mining is a sub-branch of data mining, defined as accessing previously unknown information by computer by processing documents written on the subject (Akyüz & Gülten, 2022). Text mining is a study carried out using data on the internet network (Artsin, 2020).

Texts constitute the data source in text mining. First, a source selection suitable for the purpose should be made, and ineffective words should be separated from the texts and made suitable for processing. After this process, text data are statistically evaluated at the presentation stage and subjected to weighting processes called term frequency and reverse document frequency. Finally, new information discovery is made using classification, clustering, and sentiment analysis (Beşkirli et al., 2021).

The success of services is checked by measuring them with service quality measurement tools. Most existing research on service quality uses traditional survey-based techniques such as AHP, SERVQUAL, or SERVPERF. These survey-based

approaches have limitations due to a lack of temporal analysis and limitations in respondents' recall of past events. As customers' use of social media becomes more widespread, more consumers share their shopping or service experiences on social media using websites, blogs, Facebook, and Twitter (He et al., 2018).

This study proposes a new service quality measurement model using sentiment analysis and text mining. In order to present this new model, the official account of a municipality was labelled, and 109.844 tweets created by users between 2016 and 2022 were subjected to text mining. As a result of text mining, 5766 tweets were identified as related to the municipality's water and sewerage services. The related tweets were scored with the sentiment analysis method on the Microsoft Azure Cognitive Services platform to measure the quality of the service. It has been observed that the success of Azure language services in negative comments is better than IBM Watson NLU and Google Cloud (Ermakova et al., 2021).

Related Works

With the increasing use of social media and the rapid processing of social media data, sentiment analysis has become essential for analysing users' thoughts. With the sentiment analysis technique, businesses aim to measure the quality of their service to their customers faster. For this reason, it was tried to determine the airport service quality by analysing the data of London Heathrow Airport's Twitter account with the sentiment analysis method. As a result of their analysis using 4392 tweets, the researchers identified 23 characteristics that can be compared with airport service quality scales. They stated that their findings have features that can improve airport service quality and carry new insights that can be implemented for airport management (Martin-Domingo et al., 2019).

Stating that the content created by online users on social media websites for reasons such as consumer experience, user feedback, and product review is the primary data source for both consumers and businesses, the researchers analysed 70.103 opinions with sentiment analysis

method to measure hotel service quality based on the SERVPERF model. According to the findings, they categorised opinions according to the SERVPERF model's five dimensions: physical assets, reliability, enthusiasm, assurance, and empathy. They scored them with sentiment analysis (Duan et al., 2016).

Twitter data of three sizeable retail pharmacy organisations in the United Kingdom were collected, and sentiment analysis was conducted to determine the social media usage of pharmacies and the most discussed topics by consumers and to contribute to business intelligence by identifying the key points that need to be improved as a result of sentiment analysis. The study processed the data collected with application interfaces with text mining, sentiment analysis, and data mining methods. After processing the data, product, marketing, technology, pharmacy, customer relations, drug treatment, waiting time, store operation, shopping, and additional service topics and the elements related to these topics were revealed. Tweets collected according to the identified topics were subjected to sentiment analysis, and three different pharmacy retailers were compared with each other (Zhan et al., 2021).

Suggesting that despite the increasing opportunities for managers to use social media in their decision-making processes, social media has not been examined much with sentiment analysis for public services due to the large volume and noisy nature of big data; the researchers used a Python program to collect tweets about the UK National Health System and classified them according to SERVQUAL dimensions to monitor perceived service quality. This method identified keywords for SERVQUAL service quality dimensions by measuring public perceptions of NHS healthcare quality. The researchers found similar results by comparing the sentiment analysis measurement with the traditional service quality measurement survey method. They concluded that this method is a complementary tool for more expensive national-scale surveys and is valuable as a new method combining text mining with SERVQUAL (Lee et al., 2021).

Twitter data of two large companies operating in the US retail sector were analysed, classified

according to service quality components, and subjected to sentiment analysis. In this way, the process of collecting social media data, turning it into big data, and processing it into helpful information for businesses has been revealed. A better understanding of customers was provided by evaluating the information obtained regarding service quality. Researchers who argue that the perception of service quality revealed by data collected with traditional data collection methods such as surveys and focus groups is static due to the time-consuming and more difficult data collection methods argue that data can be collected more dynamically and quickly through social media and can be processed effectively with text mining and sentiment analysis (He et al., 2018).

In China, which has had the largest share in the automobile market since 2009, a proposal is presented to create a competitive advantage by developing quality management and marketing strategy by analysing customer opinions through sentiment analysis and classification. Researchers suggest that analysing user-generated content with sentiment analysis better reflects customer opinions than traditional product performance analysis based on manufacturers' internal data and expert opinions (Liu et al., 2019).

Researchers point out that social media data is very diverse, and different data is obtained from different sources, which is often overlooked. Therefore, they propose a framework that dynamically processes and analyses social media data according to its characteristics. This framework includes collecting data from social media, cleaning noise data, sentiment analysis, opinion analysis, and text analysis and presenting it to the user (Ali et al., 2022).

Researchers who analysed the data about the Hilton hotel through the Trip Advisor application, where hotels can be rated to reveal customers' opinions about hotels and to create insights for businesses and help decision-making, stated that users use negative words such as "rude", "terrible", "broken", "dirty" to express their dissatisfaction. By using these words, they analysed the comments on a word-based basis. (Chang et al., 2019).

Researchers collect relevant user comments from various social media platforms through different programs and plugins when the studies are examined. The collected comments are processed with sentiment analysis techniques and text mining to extract meaningful data. Using these techniques, researchers can quickly analyze users' opinions and their opinions about the area where they receive service. The analyses provide recommendations for service quality measurement.

In some studies on service quality measurement, the data collected were analysed according to the dimensions of classical scales such as SERVQUAL and SERVPERF used in service quality measurement. In some studies, researchers analysed emotions according to the words they determined according to the dimensions of service quality measurement.

Sentiment Analysis and Its Use with Twitter

Sentiment analysis, which has been very popular in recent years, is based on people's habits of expressing emotions, sharing opinions, and discussions through social media, and is a data mining technique used to measure a consumer's emotional state and attitude towards a particular topic (Sailunaz & Alhajj, 2019; Gitto & Mancuso, 2017). Sentiment analysis is a subfield of artificial intelligence that uses natural language processing and machine learning techniques to explain and classify thoughts and emotions from subjective data (Hasan et al., 2018). The primary function of sentiment analysis is determining what people think about specific topics and their opinions (Yu et al., 2013).

There are two different approaches for sentiment analysis, one is machine learning, and the other is a dictionary-based semantic approach. The dictionary-based semantic approach is made by determining the emotional loadings of words according to a dictionary with predefined meanings. In the machine learning method, on the other hand, the data needs to be trained by classifying the data as positive, negative, or neutral and extracting the features (Hasan et al., 2018). The training set needs to be created to build text-based models that use machine learning techniques as parameters in automatic data analysis. Semantic
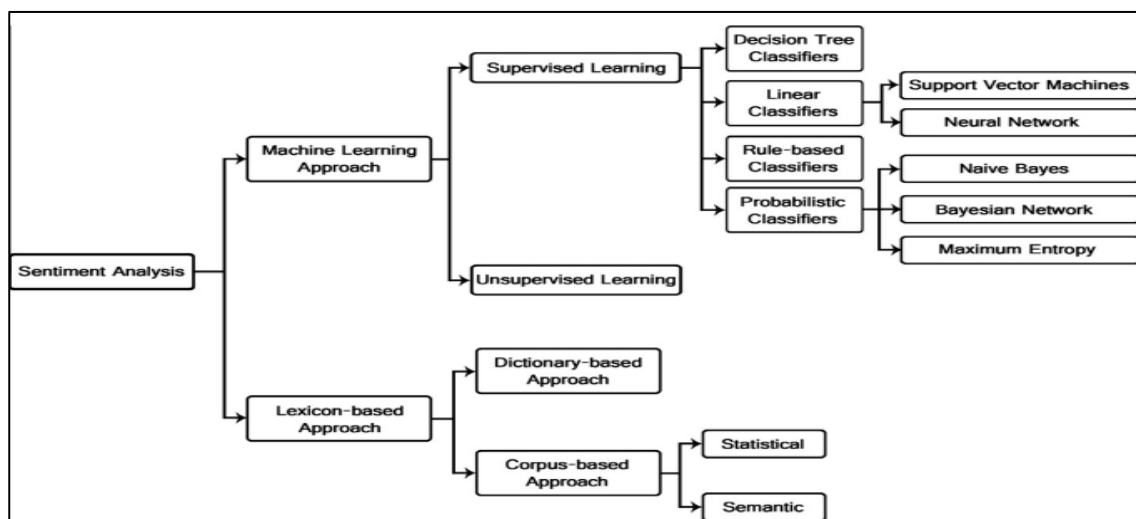
Figure 1. Sentiment classification techniques (Medhat et al., 2014)

orientation involves applying a pre-generated set of positive and negative words, and sentiment analysis determines how often these terms are used in sentences (Ghiassi et al., 2013).

Figure 1 shows the classification of sentiment analysis techniques (Medhat et al., 2014). Twitter, which has Web 2.0 internet features, is defined as a social networking site by some authors and a micro-blogging site by others. Twitter, founded in 2006, is an online website where users open a post called a tweet, usually limited to 140 characters, to other users and where information is shared formally and informally (Flores & Rezende, 2018). Twitter is the social media site most used by government officials (Mainka et al., 2014).

The number of users on social media sites reaches billions. The content users create is very high and contains elements that make it difficult to process. Content such as texts, photos, and videos created by users on social networks constitute heterogeneous data (Yang et al., 2014). Since this content is increasing daily and is heterogeneous, it is difficult to understand and analyse. Due to this massive volume of data, there are challenges for natural language processing and categorising content into topics, associating them with quality elements, and analysing them (King et al., 2013).

Twitter data is suitable for sentiment analysis because sentiment analysis is based on natural language processing. Twitter data is generally used in sentiment analysis studies. Figure 2 shows

an example of a developed system for processing Twitter data in a cloud system and presenting it to the user (Tedeschi & Benedetto, 2015). An application interface key is needed to communicate with Twitter servers to collect Twitter data. The key is adapted and executed in programs used in data analysis, such as Python or R.
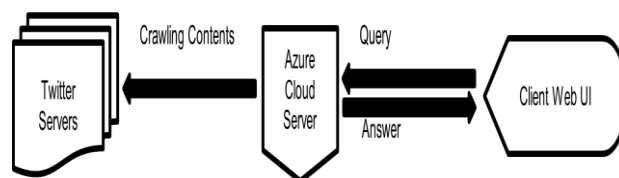
Figure 2. Cloud system data processing (Tedeschi & Benedetto, 2015)

Text Mining

Text mining is the process of extracting hidden information from written data that does not have a straightforward form and formatting irregular data. Text mining results from joint research with natural language processing and information retrieval systems (Oğuzlar, 2011).

The techniques used in data mining are also used in text mining. Data mining relates to machine learning, statistics, database systems, information technologies, and visualisation (Cemaloğlu & Duykuluoğlu, 2020). Today, text mining is processing user-generated content from web pages or social media sites using information

communication technologies with statistical science and natural language processing techniques using data mining steps. Due to the use of computer applications in text mining, computerised text analysis is also used in the literature (Artsin, 2020).

Text mining is used in situations such as creating the working logic of translation programs, analysing social posts, detecting plagiarism in

methods such as word frequency, term frequency, word frequency, ranking, alignment, author recognition, and text classification are applied (Akyüz & Gülten, 2022). In text mining, keywords can represent the text from which they are extracted after being scored according to their frequency, degree of usage, and frequency ratio of their degree of usage.

In this study, tweets sent by tagging a

Figure 3. Textual data mining process (Losiewicz et al., 2000)

scientific studies, analysing the speeches made by politicians, and determining the satisfaction levels or complaints of individuals (Altunkaynak, 2022).

The text mining process is divided into three main steps: data collection, warehousing, and discovery (Losiewicz et al., 2000). The data collection step involves source selection and retrieval of text from the source. Source selection requires awareness of available sources, domain knowledge, and an understanding of the goals and objectives of data mining. Text selection is the process of discovering and retrieving texts from sources. This process can sometimes be done automatically or interactively by a domain expert. In data warehousing, the association is made with texts formatted as necessary for data storage and mining. This process saves the processed and associated texts and data models from facilitating further processing. The data discovery step consists of data mining and presentation steps. Data mining is the process of fitting models to data. The presentation phase is the process of assessing data quality, evaluating the appropriateness of the chosen model, and visualising the data mining results to support the interpretation of the model. Statistical results, syntax, and semantic inference are used to associate and make sense of texts.

Keywords, defined as a sequence of one or more words, can represent the content of a document. Keywords are frequently used to define queries in information retrieval systems because they are easier to identify, review, and remember (Rose et al., 2010). To achieve text mining objectives,

municipality's Twitter account were classified according to term frequency and their relationship with each other. Service quality dimensions for the municipality were determined.

Service Quality

Quality is a concept that differs for products and services. The method of service delivery affects the service quality that customers perceive and expect when evaluating the quality of the service they receive (Meral & Baş, 2013). Service quality is a concept related to the ease of receiving service, the politeness of service providers, the business expertise and knowledge of employees, their ability to put themselves in the customer's shoes, and the extent to which customer needs can be met (Kayan Ürgün & Çilingir Ük, 2022).

In order to provide quality service, it is necessary to understand what the customer expects. The determinant of the customer's perception of service quality and satisfaction is their expectations. For this reason, learning customer expectations in service delivery is essential. Measuring the level of meeting the expectations of the service offered and making the necessary interventions in cases where it does not meet the expectations provides a competitive advantage (Mutlu & Ermeç Sertoğlu, 2018). Measuring service quality is essential for success (Jun et al., 1998).

It is stated that high service quality will provide more customer satisfaction, and service

quality is directly related to customer satisfaction (Ramanathan & Karpuzcu, 2011). Providing excellent service quality that results in high levels of customer satisfaction is extremely important and a significant challenge for service industries (Hung et al., 2003).

There are different approaches to service quality measurement in the literature. Service quality measurement studies start with the Grönroos model developed by Grönroos in 1984. The SERVQUAL model was developed by Parasuraman, Zeithaml and Bery in 1985, and the SERVPERF model was developed by Cronin and Taylor in 1992; the model was developed by Dabholkar, Thorpe and Rentz in 1996 to measure the service quality of retail stores, There are various models such as the hierarchical approach model developed by Brady and Cronin in 2001, the E-TailQ model developed by Wolfinbarger and Gilly in 2003 for the online retail sector, and the E-S-QUAL model developed by Parasuraman, Zeithaml and Malhotra in 2005 for electronic services (Akıncı et al., 2009).

There are ten dimensions in the SERVQUAL service quality measurement model (Parasuraman et al., 1985). These elements are; "Reliability", which includes the concepts of billing, keeping records, performing the service on time, "Eagerness", which includes the attitude of serving the customer, "Competence", which includes having the necessary equipment to fulfill the service, "Access", which includes the appropriate working hours, the availability of the service, the waiting time to receive the service, "Courtesy", which includes the staff being polite in communication, and the explanation of the service, "Communication", which includes the interaction with the customer in situations such as specifying the cost; "Credibility", which includes the reputation, credibility and honesty of the organization; "Security", which includes physical, financial security and confidentiality; "Understanding/Knowing the Customer", which includes understanding the customer's specific needs; and "Tangibles", which includes the appearance of the staff, the physical plant and the tools and equipment used to provide the service. In their later studies, these ten dimensions were

discussed in five dimensions: tangibles, reliability, enthusiasm, assurance, and empathy. In the Grönroos service quality model, technical and functional quality is considered in two dimensions, expected and perceived (Grönroos, 1984). Researchers who stated that the SERVQUAL model could not fully measure service quality by claiming that the customer will not have any expectations without using the product proposed the SERVPERF model (Cronin & Taylor, 1992).

Similarly, different service quality measurement models exist for different sectors in the literature. Some of these models have emerged by re-adapting the dimensions of the SERVQUAL Service Model to the sectors, while others have emerged by adopting the Grönroos Service Quality Model. Some service quality models have also been developed by linking service product, service delivery and service environment (Brady & Cronin, 2001).

Compared to the past, expectations in public services have increased, and citizens evaluate these services by comparing them with the services provided by the private sector (Sezer, 2008). Citizens' expectations of performance, quality, and transparency in public services have led to the new public administration approach. Performance measurement in public administration and applying private sector techniques are seen as a requirement of the new public administration approach (Eryılmaz, 2013). In recent years, reasons such as the increase in citizens' demands and expectations and the discussion of good management practices in the public sector require public administration to provide quality services (Hood & Dixon, 2013). For this reason, service quality has become an essential factor for public services. In the literature, service quality measurements related to public services have been made on health services, municipalities, nursing homes, and higher education institutions (Ay & Büyükkeklik, 2016). Many researchers have used the SERVQUAL service quality scale in their studies (Filiz et al., 2010; Gümüşoğlu et al., 2003; Usta & Memiş, 2010; Mbassi et al., 2019; Yildirim et al., 2019).

The fact that the SERVQUAL service quality model focuses only on process quality does not

make comparative service quality measurement and that researchers working on service quality measurement in the literature state that quality dimensions should be changed for different business areas show that this service quality measurement model is not fully adequate (Ramanathan & Karpuzcu, 2011).

There are different definitions and approaches to service quality measurement in the literature. Researchers make various suggestions for the development of service quality measurement models. Most of the proposed models are based on classical questionnaires and scales, and data collection and implementation are disadvantageous in terms of time and cost. Today's technology offers various opportunities to use artificial intelligence-assisted techniques. Data and analysis techniques generated by users on social media provide the necessary infrastructure for creating new service quality measurement models. Figure 4 shows a proposal for service quality measurement using social media data (Duan et al., 2016).
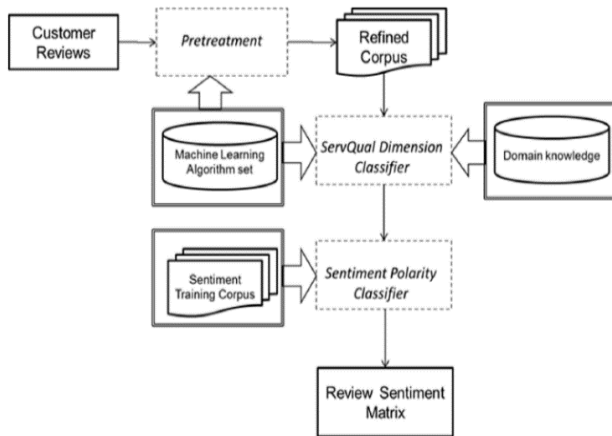
Figure 4. Service quality measurement with sentiment analysis (Duan et al., 2016)

When the studies are examined, it is seen that it is possible to measure service quality with sentiment analysis. In contrast to Duan et al. (2016), Martin-Domingo et al. (2019) and Lee et al. (2021), in this study, the words were determined from social media posts created by people using municipal services.

Method

The study seeks to answer how to develop a service quality measurement model from social media data processed with sentiment analysis and text mining methods. Twitter was preferred in the study because official institutions, organisations, political parties, and municipalities also prefer Twitter in social media communication and its usage rates. Local people express their opinions through tweets due to the service they receive. The research aimed to reach a rich sample of data by collecting Twitter data between 01.01.2016 and 30.04.2022. To collect historical data on Twitter, an academic research application is required.

For this reason, a project application named "Analysis of social media accounts of Municipalities with artificial intelligence" was made on Twitter. Thus, an academic application key was obtained, which allowed the collection of 10 million tweets per month for data collection. In the specified date range, 109.844 tweets were obtained by tagging a municipality's Twitter account with the Python program. Tweepy library is used to get data from Twitter in the written Python program. The obtained tweets were subjected to sentiment analysis using Azure Language services. In addition, the related tweets were analysed by text mining methods with MAXQDA, and service quality dimensions for the municipality's water and sewerage services were identified. To identify service quality dimensions, a keyword study was conducted by considering The Municipal Law No. 5393 and The Metropolitan Municipality Law No. 5216 which regulate the powers and responsibilities of municipalities.
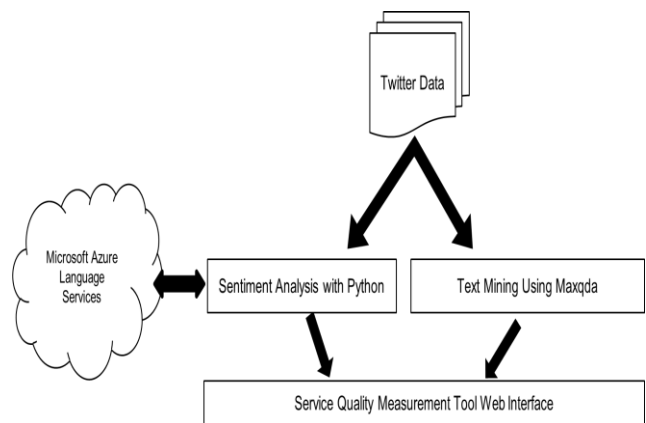
Figure 1. Service quality measurement model system design

The necessary Language Services have been created on Microsoft Azure to process the data coming from Twitter with sentiment analysis on the cloud platform. This language service performs sentiment analysis with the model developed by Microsoft with a supervised machine-learning technique on 01.10.2022.

A program written in Python in the Anaconda Navigator compiler sends relevant Tweets to the Microsoft Azure platform.

Using sentiment analysis, it scores the Tweets as positive, negative, and neutral. Scored Tweets are tagged and saved in the computer environment. The F1 score of the model used was calculated as 0.82692. Figure 5 illustrates the working system of the service quality measurement model.

Microsoft Azure Language Services performs tagging, as shown in Table1, during sentiment analysis. If a Tweet contains more than one sentence, it scores each sentence separately according to its sentiment and then labels it according to the overall average.

Table 1. Microsoft Azure Language Services Sentiment Analysis Method

Sentence sentiment	Returned document label
At least one positive sentence is in the document, and the rest are neutral.	Positive
At least one negative sentence is in the document, and the rest are neutral.	Negative
All sentences in the document are neutral.	Neutral

Tweets sent by tagging the Twitter account of the municipality are analysed in Table 2.

Table 2. Example of Tweet sentiment analysis

Sample Tweet	Positive Score	Negative Score	Neutral Score	Tweet Label
"@ankarabbld Aski 0312 616 23 54 has not answered for days... who should I complain to? Help me please..."	0,0	0,87	0,13	Negative
"@ankarabbld We request that the necessary action be taken to eliminate the danger posed by the sewage pit next to the foot of the overpass in the Istanbul direction of the Istanbul Road metro stop."	0,06	0,2	0,74	Neutral

"@ankarabbld @askiankara @mansuryavas06 Hey mashallah how beautiful it is raining thank God" — 0,62, 0,27, 0,11, Positive

With the Python program, as shown in Figure 6, Tweets were retrieved from Twitter at one-month intervals, and sentiment analysis was performed.

Figure 2. Processing tweets in Python

In the data from Twitter, 3186 words that do not concern the quality of service dimensions, such as advertising links, irrelevant person, and topic tagging, which may cause interference in text mining with MAXQDA, were excluded from providing better results in text analysis. With the exclusion of parasitic words, 109.844 Tweets were divided into 865,261 words. From the 865.261 words, the keywords "flood", "meter", "rain", "irrigation", "infrastructure", "sewage", "drainage", "maintenance hole", "aski", "waterless", and "water" related to municipal water and sewerage services were extracted. Five thousand seven hundred sixty-six tweets with these keywords were coded, as shown in Figure 7.

Figure 7. MAXQDA Code System
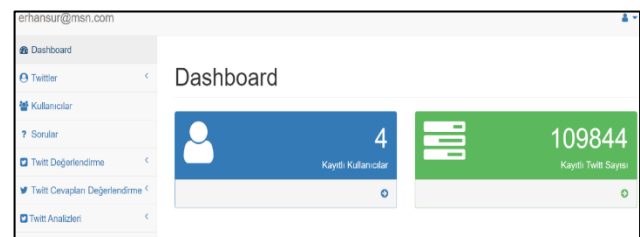
Figure 3. The web interface of the service measurement tool

The web interface can be re-tweeted anytime, and different authorised users can also use the platform. Figure 9 shows an example of the analysis of the keyword aski, which constitutes the municipality's water and sewerage service dimension.
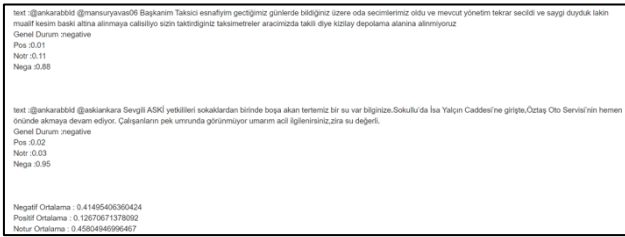
Figure 4. Aski keyword analysis example

Results and Discussion

When the literature is examined, it is seen that service quality measurement tools such as SERVQUAL and SERVPERF applied for businesses are also applied for municipalities. social media and internet technologies, which are widely used, have started to be used in service quality measurement for various sectors. It is recommended that the methods applied by businesses to be more successful should also be applied in public services as a requirement of the new public administration approach.

The studies show that social media data can measure service quality for various sectors. In this study, unlike other service quality measurement models, it is proposed to determine the service quality dimensions from the Tweets using the text mining method by considering the frequency of terms and the relationship between terms. When the Tweets tagged with a municipality were analysed, a total of ten dimensions were identified: funeral services, agricultural services, fire brigade services, water, and sewage services, social services, construction waste disposal services, police services, road maintenance and repair services, zoning services, and transportation services. The keywords flood, meter, rain, irrigation, water, infrastructure, sewerage, sewer, maintenance hole, waterless, and aski constitute the dimension of water and sewerage services.

Water and sewerage services are discussed in the research.

Table 3. Average scores for the keywords water and sewerage service quality

Keyword	Frequency	Negative Mean Score	Positive Mean Score	Neutral Mean Score
Flood	392	0,41	0,14	0,45
Meter	214	0,66	0,09	0,25
Rain	761	0,63	0,09	0,28
Irrigation	530	0,59	0,1	0,31
Water	942	0,5	0,11	0,39
Infrastructure	323	0,60	0,1	0,3
Sewerage	180	0,68	0,06	0,26
Sewage	42	0,57	0,1	0,33
Maintenance Hole	103	0,51	0,11	0,38
Waterless	379	0,56	0,08	0,36
Aski	1900	0,42	0,12	0,46

The Maxqda programme shows the relationship between words in qualitative data analysis. It creates visual maps according to the position and co-occurrence of words (Guetterman & James, 2023). The frequency of co-occurrence of the keywords identified in Table 3 and their relationships with each other are shown in the map created in the MAXQDA program, as shown in Figure 10. The relationship table frequencies of keywords are also given in Table 4.
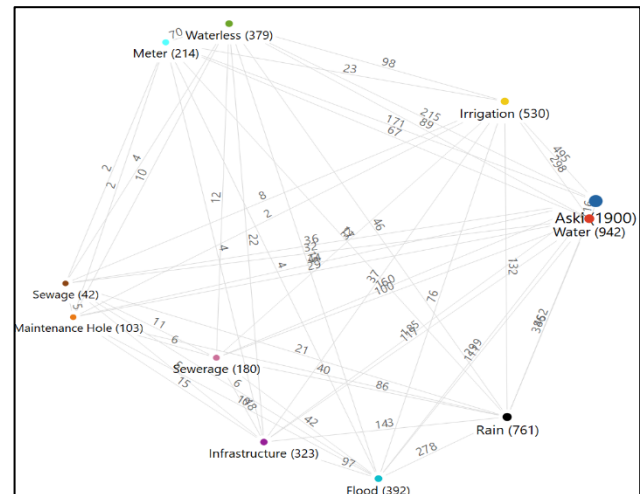
Figure 10. Water and sewerage services keyword relationship map

The distribution of 5766 tweets according to keywords is shown in Figure 11. According to

Figure 11, the word aski constitutes 33% of the service quality dimension. This word represents the relevant general directorate where water and sewerage services are provided.

Table 4. Frequencies of keywords

	Meter	Rain	Sewage	Infrastructure	Sewerage	Water	Maintenance Hole	Irrigation	Waterless	Flood	Aski
Meter	0	17	2	4	0	67	2	23	70	4	171
Rain	17	0	21	143	86	386	40	132	46	278	452
Sewage	2	21	0	5	11	32	5	8	4	6	36
Infrastructure	4	143	5	0	48	117	15	37	22	97	185
Sewerage	0	86	11	48	0	100	6	32	12	42	160
Water	67	386	32	117	100	0	29	298	89	111	716
Maintenance Hole	2	40	5	15	6	29	0	2	10	10	44
Irrigation	23	132	8	37	32	298	2	0	98	76	495
Waterless	70	46	4	22	12	89	10	98	0	15	215
Flood	4	278	6	97	42	111	10	76	15	0	299
Aski	171	452	36	185	160	716	44	495	215	299	0

The distribution of 5766 tweets according to keywords is shown in Figure 11. According to Figure 11, the word aski constitutes 33% of the service quality dimension. This word represents the relevant general directorate where water and sewerage services are provided.
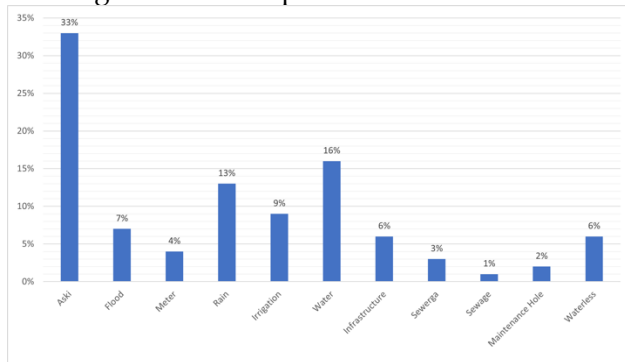
Figure 5. Water and sewerage service keyword percentage distribution

Positive, negative, and neutral ratings of keywords are shown in Figure 12.

Of the Tweets obtained, 1922 were labelled as negative, 973 as positive, and 2871 were neutral. The average negative score of the Tweets was 0.51, the average positive score was 0.11, and the average neutral score was 0.38. The percentage of sentiment tags for the analysed Tweets is shown in Figure 13.
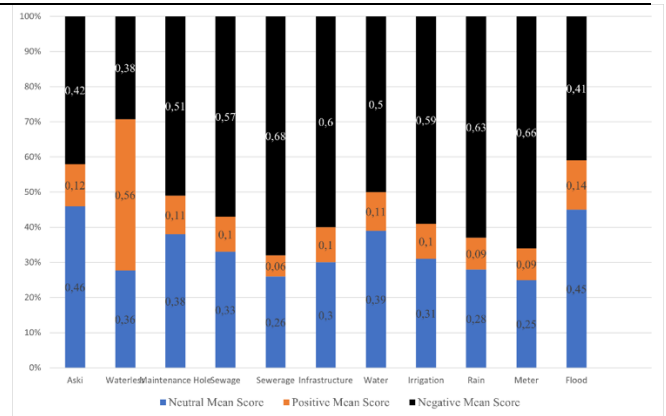
Figure 6. Keyword Sentiment Score Averages
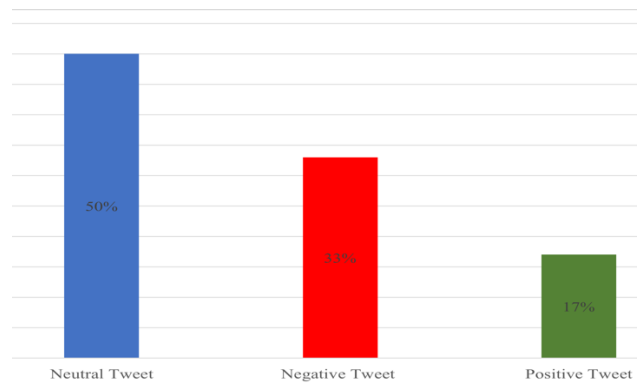
Figure 7. Percentage of sentiment tags

Conclusion

This study proposes a service quality model that can be made with text mining and sentiment

analysis methods using social media data instead of survey-based service quality measurement models. In addition to the service quality measurement models with sentiment analysis encountered in the literature, the text mining method is added to determine the service quality dimensions. Thus, a sector-specific measurement model can be presented by identifying keywords that are directly related to the service itself, which are revealed by text mining.

In the service quality measurements in the literature, service quality is measured according to the five dimensions of SERVQUAL and SERVPERF models. The proposed model determined ten dimensions related to the powers and responsibilities of the municipality and 11 keywords related to water and sewerage services. The proposed service quality model enables the municipality to evaluate its services and plan better for the services it will perform. The fact that the data collection method of the proposed service quality measurement model is effective makes the model flexible and advantageous.

In the application part, the water and sewerage services of the municipality are discussed. With the same model, the quality of other services of the municipality will be tried to be measured, and a comparison will be made. With the developed Web interface, this model will be used for different sectors.

Conflict of Interest Statement

The authors declare that there is no conflict of interest between them.

Researchers' Contribution Rate Declaration Summary

The authors declare that they have contributed equally to the article.

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RESEARCH ARTICLE

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A Case of Informal Deal: Merger of Turkish Sugar Companies in 1935

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Abstract

Sugar, which causes political tensions, has been the subject of many studies in the history of Turkey. Especially, the first half of the 1930s was a period when this tension was felt the most and the problem was brought to the newspapers and the parliament. The year 1935, when the sugar companies were merged, was a turning point in terms of the debates. The new company established as a result of the merger and the price reduction created a strong legitimization ground for the government. Nowadays, the issue of merger is frequently analyzed in studies on sugar companies. Even today, it is possible to see the affirmative power of the legitimacy ground created in these studies dominated by a developmentalist language. However, the 'merger text' that is the source of the studies in the literature does not have a legal record. Moreover, Law No. 2785, the only legal regulation associated with price cuts and mergers, is neither related to prices nor to mergers. This study argues that the merger of sugar companies was a de facto capitalization transaction, a bargain-based financial operation carried out in the informal field. The illusion created by the aforementioned unrelated law provided a perception of legitimacy to the extent that it rendered invisible the informal bargain with the shareholders of the companies, while on the one hand, it ensured a price decrease accompanied by strict measures. This informal bargaining process, in which the value increases achieved through capitalization were redistributed among shareholders, was formalized through the establishment of Türkiye Şeker Fabrikaları A.Ş.

Keywords: *Veblen, Capitalization, Sugar*

Öz

Siyasal gerilimlere sebep olan şeker, Türkiye tarihinde pek çok araştırmaya konu olmuştur. Özellikle 1930'ların ilk yarısı, bu gerilimin en fazla hissedildiği dolayısıyla sorunun gazetelere ve meclise taşındığı bir dönemdir. Yaşanan tartışmalar açısından şeker şirketlerinin birleştirildiği 1935 yılı dönüm noktasıdır. Birleşme sonucunda kurulan yeni şirket ve yapılan fiyat indirimi hükümete güçlü bir meşruluk zemini yaratmıştır. Günümüzde şeker şirketlerine ilişkin yapılan çalışmalarda birleşme konusu sıklıkla işlenmiştir. Kalkınmacı bir dilin hâkim olduğu bu çalışmalarda yaratılan meşruluk zemininin olumlayıcı gücünü bugün bile görmek mümkündür. Ancak literatürdeki çalışmalara kaynaklık eden 'birleşme metninin' yasal bir kaydı yoktur. Ayrıca fiyat indirimi ve birleşmeyle ilişkilendirilen ve tek yasal düzenleme olan 2785 Sayılı Kanun ne fiyatlarla ne de birleşmeyle ilgilidir. Bu çalışmada şeker şirketlerinin birleştirilmesinin, enformel alanda gerçekleştirilen pazarlığa dayalı finansal bir operasyon olarak, de facto bir kapitalizasyon işlemi olduğu iddia edilmektedir. Sözü edilen ilişkisiz yasayla yaratılan illüzyon, bir yandan sıkı tedbirler eşliğinde fiyat düşüşü sağlamış diğer yandan şirketlerin hissedarlarıyla girişilen enformel pazarlığı görünmez kıldığı ölçüde meşruluk algısı oluşturmuştur. Kapitalizasyonla sağlanan değer artışlarının hissedarlar arasında yeniden dağıtıldığı bu enformel pazarlık süreci formalize edilerek Türkiye Şeker Fabrikaları A.Ş. kurulmuştur.

Anahtar Kelimeler: *Veblen, Kapitalizasyon, Şeker*

Introduction

Sidney W. Mintz, in his study titled Sugar and Power, emphasised the power of sugar in determining national policies by stating that "there is no other foodstuff that is subject to as many political games as sugar in the world market" (1997, p. 268). Moreover, he claimed that it was a foodstuff with the power to influence the 'political future' (p.72). Similarly, Albert and Graves argued that sugar was 'the most political product' and that European producers often relied on intensive state protection (1988, pp.3-4). Sugar, which can be so influential in the shaping of the political sphere, has had a position in Turkey, especially in the early republican history when sugar production started, which has been mentioned a lot with a nationalist discourse and has caused the most political tension to this extent.

The establishment and structuring processes of sugar companies in Turkey were completed in the first half of the 1930s. In this period of time, which was not without controversy, the subject of sugar was frequently discussed both in the works of the period and today. Under the influence of the developmentalist discourse, 'rationality' was the most important concept that came to the forefront in studies that emphasized 'factories' rather than companies. In terms of the ongoing debates, 1935, when the companies were merged, is a turning point. This process, which the government legitimized by lowering sugar prices, was announced in all publications of the period, accompanied by police measures on prices. This study argues that the merger was an example of de facto capitalization as a result of an informal bargain with the shareholders of the companies. The merger transaction, which is a financial operation within this framework, increased the assets of the new company and allowed for the redistribution of the resulting shares.

In the study, the literature on the subject is first analyzed. In this framework, both the studies of the period and the works of contemporary authors are analyzed and the common aspects and conclusions of the studies are criticized. In the following section, the causality relationship is determined by approaching the issue from a theoretical perspective. After the section analyzing the relationship between banks and sugar companies, which constitutes the background of the issue in Turkey, the merger process and the findings obtained are discussed in the last section of the study.

Method

This study is typically a qualitative case study: a case of 'sugar' during a period between the early years of the Republic until 1935 in Turkey. Document analysis is a type of qualitative research in which the researcher interprets documents to provide information on a certain topic (Bowen, 2009). Documents being valuable sources of information in qualitative research it uses document as a tool of analysis. Written documents provide an in-depth understanding of the past and its socio-political and economic relations. In this study, which aims to provide a historical, qualitative and critical analysis of 'the sugar' issue, written documents from primary and secondary sources were analyzed in order to understand and reveal the political and economic relations between actors and institutions of the period. Primary sources were obtained from the Ankara Chamber of Commerce Archive, Istanbul Chamber of Commerce Archive, Cumhuriyet Archive, Minutes of Minutes and registered trade newspapers. In this study, the decisions, discourses and intentions of the rulers and all the other actors of the period, as historical figures, were critically analyzed to reveal the results of the decisions.

Literature review

The first studies on the subject were written by various authors of the period. Although they are viewed from different perspectives, it is seen that they are mostly based on variables such as prices, costs and rationalization (Nafiz, 1930; Süreyya, 1932; Süreyya, 1933; Süreyya, 1934; Abidin, 1934; Tahsin, 1934; Tahsin, 1935; Mikusch, 1934; Gedik, 1955). What most of them agree on is the concept of 'rationalization'. Where they differ is on the sources of rationalization. According to the studies, the fact that 'factories' do not work rationally leads to inefficient beet production and

high prices (Nafiz, 1930, p.225-227). In another study, while inefficient production was accepted, it was claimed that the absence of "statist economic control" and a "national regulation plan" was the main problem that beet prices were not high (Süreyya, 1932, pp.14-15). While the common point of some studies was the high profit rates and depreciation of the companies (Süreyya, 1933, pp.11-15; Süreyya, 1934, pp.47-48; Tahsin, 1934, p.19), another one pointed to the "balance sheet games" of the companies (Tahsin, 1935, p.330). There were also studies that explained this 'irrationality' with high beet prices and suggested a tax on farmers (Mikusch, 1934, p.47). The most distinctive criticism of the period, albeit at a later date, is that the company in Uşak was collapsed by various commercial tactics through Turkish Bank of Industry and Mines (*Türkiye Sanayi ve Maadin Bankası*) and İş Bank circles (Gedik, 1955, pp.7-8). This situation has been extensively analyzed in a recent study (Şeker, 2015).

The sugar issue is also frequently observed in studies outside the authors of the period. Although each of them provides valuable and important details, the common feature in the studies is the developmentalist language similar to that of the writers from the period, without criticizing the companies (Veldet, 1958; Akıltepe et al., 1964; Taygun, 1993; Karayaman, 2010; Karayaman, 2012; Damlıdağ, 2017a; Damlıdağ, 2017b; Damlıdağ, 2018; Mert, 2018; Aydemir, 2019; Önder and Oğur, 2019; Özer, 2021; Ayan, 2022). In most of the studies, developmentalist elements are presented as success stories of 'meeting the needs of the people' and 'common good', either in the works published by the sugar company itself (Veldet, 1958; Akıltepe et al., 1964; Taygun, 1933) or in independent works (Karayaman, 2010, p.191-192; Karayaman, 2012, p.80; Damlıdağ, 2017a, p.142; Damlıdağ, 2017b, p.173; Mert, 2018, pp.236-238; Aydemir, 2019, p.39; Önder and Oğur, 2019, pp.33-47; Özer, 2021, pp.106-107,119) or as a narrative of complete failure (Ayan, 2022). On the other hand, it is also possible to find studies addressing the irregularities of sugar companies, especially Istanbul and Trakya Şeker Fabrikaları T.A.Ş (*Alpullu Company*) (Damlıdağ, 2017a, pp.148-149; Karayaman, 2012, pp. 71-72; Ayan, 2022). Some studies have reached opposite conclusions.

According to Aydemir (2019), 'Successful performance' led to the establishment of new sugar companies and therefore the companies were merged in 1935 (p.39), while according to Damlıdağ (2017a), 'astonishingly decreasing sugar prices' made the operation of the factories difficult and left 'little space for profit of private sector'. The solution was to 'nationalize' the companies to reduce costs (p.150). Veldet's study, which contains detailed information, is the main source used in many other studies. It is almost the only source on the merger of sugar companies, which is also the subject of this study (1958, pp.558-575). The 'Sugar Rationalization Committee' report and the 'İnönü Project', which included the formal merger procedure of the companies and resulted in the enactment of Law No. 2785, were largely explained directly or indirectly based on the relevant source (Karayaman, 2012, pp.80-81; Damlıdağ, 2018, p.154; Damlıdağ, 2017a, p.147; Mert, 2018, pp.206-212; Özer, 2021, p.110; Ayan, 2022, p.87). Moreover, including studies not directly related to sugar, the merger process was interpreted as a 'nationalization' practice (Apak et al., 1952, pp.238-239; Tekeli and İlkin, 2009, p.205; Karayaman, 2012, p.87; Damlıdağ, 2017a, p.147,150; Özer, 2021, p.120).

The unit of analysis in all studies on sugar is the 'going plant' as Commons (2017, p.187) puts it. However, companies are not 'going plants' but 'going concerns'. The sole purpose of a 'going concern', which is to produce exchange values, is profit. Therefore, companies are merely financial entities. The concept of 'factory' (Zabıt Ceridesi [ZC], 12 Haziran, 1935) and the developmentalist language that is an extension of it, which were used by the state officials of the period partly to represent their views on the subject and partly as a legitimizer, were accepted without question, as shown in the studies. However, sugar companies are financial units whose balance sheets are composed of debts and equities, have shareholders, make profits and even resort to the 'balance sheet game' (Tahsin, 1935, p.330) to hide high profits. Furthermore, the 'committee report' and the 'project text' in Veldet (1958), which were written by actors who directly benefited from the process, were taken as if they were independent of these actors. However, as shown in this study, the

'committee' or 'project' is a product of informal negotiations with sugar company actors. Most of today's publications reproduce the same developmentalist discourse in these texts (Apak et al., 1952; Tekeli and İlkin, 2009; Karayaman, 2012; Damlıdağ, 2017a; Damlıdağ, 2018; Mert, 2018; Özer, 2021).

Theoretical Framework

Veblen defines the corporation not as an 'industrial unit' but as a 'business concern' (1923, p.82). In other words, companies whose purpose is to make private profit are inherently monetary institutions. As Commons states "the going plant is a producing organization furnishing a service to the public, but the going business is a bargaining organization obtaining prices from the public (2017, p.182). For this reason, for Veblen, business and industry are seen as two separate fields. While the industrial sphere defines the activities in which production knowledge is socially produced and mechanized, business operates through property and power. Therefore, while industry is built on the use of technology, business can only exist and profit from intangible assets, i.e. intangible relationships between people that are independent of production and based on control, such as property, monopoly and patent rights that are outside of industry. In reality, the reason for the existence of an industrial enterprise is immaterial assets (Veblen, 1932, p.143). Since ancient times, the best known of intangible assets is 'good-will'. With capitalism, the current meaning of 'good-will' has transformed into assets that have value in the market, including various monopoly rights, franchises, trademarks, trade-secrets (Veblen, 1919a, p.71-72). Therefore, along with the tangible assets defined as 'going plant', intangible assets are also considered as capital. Both intangible and tangible assets are capital. In other words, they are parts of capitalized wealth. Both categories of assets represent expected income streams, which have a property that allows them to be valued in percentage terms (Veblen, 1919b, p.373). It is the monetary gain that determines the value of capital, which is not a physical quantity. Therefore, the value of capital is equal to capitalization, which is the present monetary value of expected future income streams. More precisely, capital is the quantitative property rights over tangible/intangible assets that are expected to generate income streams (Cochrane, 2011, p. 92).

Veblen also gave credit an important place in modern business finance as an apparatus of capitalization. Just like other categories of assets, credit is a value capitalized in proportion to earnings. "The corporation is an incorporation of credit, capitalized on the basis of the funds invested and to the amount of its prospective earning capacity" (1923, p.93). In reality, a corporation is an organization in which each of the participants - employees, lenders (debt), shareholders (equity) - is a creditor, even though their positions on the balance sheet (assets/liabilities) are different. "Each is but a creditor of the going business as a unit, while the going business, as the identical unit, is the debtor." (Commons, 2017, p. 161). The 'good-will' that constitutes the core of capitalization functions as collateral shown in the use of credit that exceeds the tangible assets of the enterprise. Especially in cases where the lenders are also the owners of the company, a large debt profile is often encountered during the establishment phase of companies (Veblen, 1932, pp.116-119). In this sense, according to the perspective of the company built on the indebtedness relationship, all funds consisting of debt and equity, including credit instruments, are capitalized with the privilege of intangible assets. Therefore, credit expansion plays a critical role in Veblen's logic of corporate finance.

Credit expansion performs a similar capitalization mechanism in mergers, but with a much broader specific function. Mergers are by their very nature not only a structural transformation of the company but also a financial transaction. The buying and selling of capital through mergers give it a monetary value. In short, capital itself becomes a saleable commodity (Nitzan, 1998, p.191). Credit is the most important instrument that mediates this sale process. The reorganization of a large-scale company is the mobilization of an important business strategy that requires a high level of responsibility and capability. Such a strategy is built on extensive credit relationships such as financial support, acquisition, leasing, issuance and transfer of debts

and equities (Veblen, 1932, p.121). The objective of those who manage the process through this financial operation is to obtain a credit-based bonus with the merger. Veblen stated that this operation was a routine and usual method for business.

The bonus which so lay at the root of these early reorganisations of industrial business habitually took the shape of a block of corporation securities representing new capital values added to the total capitalisation in the operation of recapitalising the underlying properties; the capitalised value--face value, book value-of these properties being thereby augmented by that much (Veblen, 1923, p.344).

The 'bonus' received by the organizers of the process and 'bonus' included in the total capitalization is not a new acquisition of capital or a new addition to tangible assets. It appears on the balance sheet in the form of debts added to the total of the company's securities resulting from the recapitalization. The result is a simple credit transaction in which a new loan is created. In other words, such a financial operation is the expression of a process by which old values are redistributed under the cover of imaginary new assets (Veblen, 1923, p.345). Underlying this type of operation may also be the function of concealing the high indebtedness of the merged companies. Even more than that, if the merged company is in insolvency, the debts evaporate through 'good-will'. "Every merger transmuted net liabilities into fictitious assets. This is accounting alchemy. Every dollar of goodwill made a dollar of insolvency disappear" (Black, 2005, p.29).

Banks and Sugar Companies

The need for a bank and credit came to the forefront as a prominent demand in the İzmir Economic Congress in the form of both a 'main bank for trade' and a bank that could provide 'industrial credit' (Ökçün, 1997, pp.339,356-357). The first of these demands was realised with the establishment of *İşbank* (1924) and the second with the establishment of *Türkiye Sanayi ve Maadin Bankası* (1925). *Ziraat Bank*, established in 1888 for agricultural credit, was transformed into a joint stock company in 1926. (Atasagun, 1939, pp.21,33).

The 1929 Depression-induced accumulation crisis brought about the effective intervention of the state in the process within a 'plan'. The most important apparatus of the plan to be implemented was the banks. However, the participation of *İşbank*, which had been involved in the sugar business since 1926, in the sugar companies that were excluded from the plan was made possible through the invented category of 'national enterprises' (Tekeli and İlkin, 2009, pp.188,191).

The first company established in Uşak in 1923 was *Uşak Terakki Ziraat T.A.Ş.* (Uşak Company), which, although started its operations at a later date, was not affiliated with *İşbank* and its team, but in the following days entered into an obligatory loan-debt relationship with *Turkish Bank of Industry and Mines* (Türkiye Sanayi ve Maadin Bankası) (Karayaman, 2010, p.15). *Sümerbank* (1933), which was established to replace *Turkish Bank of Industry and Mines*, *İş Bank*, which established the second company, *İstanbul ve Trakya Şeker Fabrikaları A.Ş.* (Alpullu Company) in 1926, and *Ziraat Bank*, which had been associated with the company since its foundation, played an active role in organizing the sugar business, which had been kept out of the plan, in the form of a company. Just like its predecessor, *Turkish Bank of Industry and Mines* and *Sümerbank*, which, according to Article 11 of its founding law, was empowered to corporatize the enterprises it took over and, if necessary, to establish company partnerships that could be outside the plan through subsidiaries, established partnerships in various fields other than sugar throughout the period, especially with *İş Bank* (RG, 11 Haziran 1933, 2424).

Founded with 50 partners, Uşak Company's capital was 300 thousand Liras. The company's capital was increased to 1.2 million liras in 1925 and 1.5 million liras in 1926 (Karayaman, 2010, pp.15,74). 250 thousand liras of the capital was sold to the Czechoslovak Skoda company, which had set up the factory, on the condition that it would be bought back in six equal installments (Şeker, 2015, p.76). The shares held by the Skoda company were later transferred to Turkish Bank of Industry and Mines. The company suffered continuous losses between 1925 and 1930 and was decided to be liquidated in 1931 and was transferred first to the *Turkish Bank of Industry and Mines* then to the State

Industry Office in 1933 and to *Sümerbank*, which was established in the same year (Karayaman, 2010, pp.111-114). While the initial capital of the Alpullu Company was 500 thousand, this capital was increased to 750 thousand and 3 million in 1927 and 1933, respectively (RG, 3 Aralık 1933, 2568). According to the information provided by Nafiz (1930, p.221), the company capital was 750 thousand, of which 300 thousand Liras belonged to *İşbank*, 100 thousand liras to *Ziraat Bank*, 310 thousand liras to private individuals and 40 thousand Liras to the provinces of Kırklareli and Edirne. Probably these share ratios did not change until the company was liquidated. On the other hand, even though the nominal capital of the company appears to be 3 million Liras, 1.875.000 liras of this capital was paid until 1935 when the company was liquidated (Veldet, 1958, p.304). The third sugar company established in 1933 with monopoly rights granted in designated cities (RG, 24 Nisan 1933, 2383) was named *Anadolu Şeker Fabrikaları T. A. Ş.* (Anadolu Company), with 30 thousand shares of 100 liras and a capital of 3 million Liras, one fourth of which was paid. The company's shares were divided among *İşbank* (1.52 million liras), *Ziraat Bank* (725 thousand liras), and Sümerbank (735 thousand liras). The remainder of the capital was given to *Muhammer Eriş* and *Mümtaz Bey* with 10 thousand liras each (Ankara Ticaret Odası, 1933). The last company, *Turhal Şeker Fabrikaları T. A. Ş.* (Turhal Company), was established in 1934. Just like the *Anadolu Company,* the company was established with monopoly rights and privileges (RG, 27 Kasım 1933, 2563) in designated cities. 1.38 million liras of the company's capital belonged to *İşbank* and 1.5 million liras to *Ziraat Bank.* The remaining capital was divided among the board of directors of the banks, each with 10 thousand liras (Ankara Ticaret Odası, 1934).

Although there is not enough data to make a detailed determination, it is observed that companies have credit relations with banks to an extent that far exceeds their allocated capital shares. The table below shows this relationship between companies and banks, and hence the state, in terms of subsidiaries and loans. The volume of sugar companies is clearly visible in the table for both *İşbank* and state banks. In 1935, the

year of the merger, the sugar companies had reached an indisputable volume in terms of total shareholding.

Table 1: Banks and Companies' Indicators

	İş Bankası	Sümerbank	Ziraat
Sugar Subsidiaries / Total Subsidiaries %			
1934	26,70	32,20	45,59
1935	41,45	82,27	72,68
1938	39,89	39,05	52,42
Sugar Subsidiaries / Bank Capitals %			
1934	73,00	5,59	8,71
1935	146,68	40,96	24,84
1938	146,68	17,82	22,27
Sugar Profit / Total Profit %			
1934	106,42	43,87	47,76
1935	56,13	36,49	59,53
1938	64,74	79,98	29,52
Credits (Current Debtors) (Million TL)			
1934	16,41	4,45	22,93
1935	13,67	6,23	15,65
1938	26,41	5,60	26,41
Krediler	Alpullu	Anadolu	Turhal
1934	6,78	6,03	3,77

Kaynak: İş Bankası Bilançoları, 1934, 1935, 1938; Ankara Ticaret Odası, 1933, 1934; UMH, 1938a, 1938b, 1941, 1940; Veldet, 1958, s. 159; Karayaman, 2010, s.51.

For *İşbank*, which 'participated' in 74 companies other than sugar companies throughout the 1930s, with or without state affiliation, the share in its total subsidiaries reaches 40 percent. The power of sugar companies is also quite evident in terms of the individual capital of banks. In particular, sugar subsidiaries, which exceeded 70 percent of *İşbank*'s capital before the merger, exceeded 46 percent of the bank's own paid-in capital after the merger. For *Sümerbank*, the same ratio reaches 40 percent. Net profits from sugar companies, on the other hand, strongly feed the net profits of all related banks, and as in the case of Sümerbank, the ratio rises to 80 percent. Again, for *İşbank*, the merger led to a dramatic decline in profitability. In fact, for *İşbank*, which earned more profit from sugar companies than it did from its own banking activities before the merger, there was a dramatic decline (from 106

percent to 56 percent). Nevertheless, it continues to receive more than half of its banking profits from sugar companies. In terms of loans, *Sümerbank* was in the weakest position. This issue was frequently brought up in the delegation reports and it was stated that most of the insufficient resources were transferred to the institutions with which the bank was associated (UMH, 1938a, p.28; UMH, 1940, p.34). Debt totals, which show the current accounts in the liabilities of the companies, were quite high. There is insufficient data on the debts borrowed largely from the same banks.

Merging Sugar Companies through Informal Capitalization

As the first half of the 1930s came to an end with high prices, high company profits and the constant news of black marketeering, *Bayar*, the Deputy Minister of Economy, tried to justify the reactions on prices and profits in general. To this end, he defended the activities of the companies in the parliamentary debates on high prices, 'abnormal profits' and the share of the treasury. He stated that sugar production was a very risky and 'dangerous' business and that the *Uşak Company* had caused problems for years and the *Alpullu Company* had suffered losses for years due to drought. *Bayar* continued, "Now they are in the profit period. This year's profit is unusual". He also cited from one of the shareholders of the Alpullu factory, of which they speak of high profits, that he was "worried about the high profits and that the factory would not only overwork and the depreciation they had allocated would not be enough, but that it would be necessary to rebuild the factory by allocating new facility costs" (ZC, 21 Nisan 1934, p.105).

He also stated that he himself did not understand the calculating cost prices as it was a technical task and therefore invited an expert to the country and asked him questions (ZC, 21 Nisan, 1934, pp.105-106). *Mikusch*, who legitimized Bayar's views and the activities of the companies to a great extent with his report, was asked to answer questions about the state of the sugar industry in Europe, beet prices, sugar quality and prices, the amount of taxes, forms of patronage, profits and their comparison with Turkey, the cost of sugar in the country and the reduction of this

cost, and taxes. Accordingly, *Mikusch* mentioned "overproduction", which was frequently emphasized in the report by the "committee" whose opinion would be requested the following year and stated that beet production in Turkey was alarming at the point of "overproduction" (1934, pp. 15,44). According to *Mikusch*, in connection with the overproduction, "the factories may even be completely ruined due to the excessive accumulation of stocks." Elsewhere in the report, the expert, referring to prices, stated that beet prices were high and suggested taxing the farmers. He also stated that sugar prices were not high and that the public should make sacrifices for the establishment of such an industry (1934,47,50-53).

The expert's report does not appear to have been satisfactory. There were various criticisms of the report. *Sait Tahsin* carried out two different studies on this subject. The first one (1934) was on the relationship between beet and sugar prices and the second one was a response to *Mikusch*'s *report* (1935). The author stated that beet prices were not high in Turkey based on international comparisons and criticized the fact that beet prices were considered as direct income when all costs, including high depreciation, were deducted when calculating the profits of sugar companies (Tahsin, 1934, p. 19). In the second study (1935, p. 330), Tahsin criticized the expert's report and stated that sugar companies were "playing with the figures in the balance sheet" and underestimating their profits with high depreciation. The issue of depreciation is also critical in the report to be prepared by the 'committee' after the 'overproduction'. As a result, the discontent created by high profits and high prices, as well as corporate activities that did not meet social needs, in the case of sugar, became a concrete reality in the first half of the period. This situation manifested itself throughout the period as the incompatibility of social needs with the profitability criterion that "commercial activity can bear" mentioned by Veblen (2011, p. 64).

Merging Conditions of Companies

A team of seven people, including *Şakir Kesebir* and *Muhammer Eriş*, largely composed of MPs and bank executives, published a report under the

name 'Sugar Rationalization Committee'. Based on this report, the so-called 'İnönü Project', which was stated to reflect the 'government view', was put into practice. The most important issue emphasized in the report was the issue of 'overproduction'. "A situation of overproduction, which could easily occur, could cause a dangerous shake to the national wealth invested in this industry" (Veldet, 1958, p. 558). "Our factories [...] have the obligation to produce limited quantities [...] if this is not respected, a situation of overproduction would result" (Veldet, 1958, p. 562). Again, in another part of the report, as a result of the cultivation of illegal beets with illegal seeds, "factories [...] are obliged to produce sugar and in this way, a situation of overproduction is easily reached" (p. 567). In order to solve this 'problem', sugar production was restricted. Accordingly, 65,000 tons was accepted as a 'normal' capacity and 75,000 tons was projected as total annual consumption, including 10,000 tons of imports. This constraint was reinforced by a flexible tax scheme that penalized production (UMH, 1943, p.10).

Another issue in the report is the matter of interest, capital and depreciation. The report states that until then, the companies had been operating with an insufficient amount of capital that did not even cover their fixed capital, and that this deficit was covered by banks through interest payments. It was stated that since the new company would have a capital equivalent to fixed assets, the need for external financing would be reduced and costs would decrease through the reduced amount of loans and interest rates (Veldet, 1958, p.568). On the other hand, the report also specified the conditions regarding the liquidation of the companies and the capital composition of the new company. Accordingly, it was stated that the capital of the company to be established with the equal capital of the three banks could be accepted as 22.5 million and that the banks could transfer as much of their shares as necessary to the founders and members of the board of directors, thus liquidating the shares of the Alpullu Company belonging to individuals. It was also stated that the banks would retain their right to purchase shares in proportion to the fixed assets they would bring to the new company (Veldet, 1958, p.561). Again,

regarding depreciation, the report explicitly stated that the old practices should not be taken into consideration. Therefore, in the calculation of the fixed assets of the old companies that would be transferred to the newly established company as capital, it was stated that the previous depreciation rates should 'in no way be taken into consideration' (1958, p.560). Regarding the formation of the new company capital, the merger method required for the merger of companies and the establishment of a new one is also explained in the report. The 'holding' form was seen as an obstacle to 'rational' production and it was argued that it would serve the 'narrow interests of the companies' rather than the needs of the country. Other forms of merger were also deemed inappropriate and instead it was stated that it would be more beneficial to liquidate the old companies and establish a new company. For this purpose, all sugar companies would be liquidated and the Uşak factory, which was not a company, would be separated from Sümerbank. The share prices of the new company would either be based on the assets of the old companies or, if necessary, paid in cash (1958, p.559).

The Position of Anadolu and Turhal Companies

In the extraordinary general assembly meeting held on June 27, 1935, the Anadolu Company dissolved and liquidated the company and resolved that "the depreciation and all assets and liabilities written in our 1934 balance sheet will be transferred to the new company as they are". Accordingly, all assets, receivables and liabilities of the company would be transferred to the new company as a whole. In another article, the company stated that 4,255,999 liras would be paid 'in cash and in advance' in return for the transfer, taking into account the capital and reserves (Anadolu Şeker Fabrikaları, 1935). The Turhal Company also decided to dissolve and liquidate the company and join the newly established company at the extraordinary general assembly held on the same date. Accordingly, the total amount of the company's debts and depreciation was calculated as 10,389,022 liras, and the total amount of its facilities, buildings, land and fixtures as 13,642,026 liras. Thus, the difference between the sum of all assets and liabilities shown in the

balance sheet, amounting to 3,253,004 liras was determined as the transfer price to the new company. It is also stated in the general assembly report that half of the determined amount (1,626,502 liras) was deposited into an account opened at *İşbank* and the other half was deposited at *Ziraat Bank*. In the event that the sale price is equally distributed to the shareholders of the company, it is calculated that 108.43 liras will be allocated for each 100 liras of shares. It was stated that this price could be paid as of 25.11.1935 without applying Article 451 of the Commercial Code (Turhal Şeker Fabrikaları, 1934).

The Position of Alpullu Company

The extraordinary general assembly of the Alpullu Company convened on July 8, 1935 under the chairmanship of *Hayri İpar* with the agenda of dissolution and liquidation of the company. As a result of the general assembly, it was decided to dissolve and liquidate the company and transfer it to the newly established Turkish Sugar Factories Inc. (TSFI) (*Türkiye Şeker Fabrikaları A.Ş.*) However, according to the Commercial Code of the period, the company appears to have gone bankrupt.

"The liquidators have decided to liquidate all receivables and payables, i.e. assets and liabilities, belonging to our company together with the depreciation written in our balance sheet dated December 31, 1934 for 2,321.699.97 liras to TSFI, which was formed by Türkiye İş, Ziraat and Sümer banks [...] Pursuant to Article 444 of the Commercial Code, it is hereby announced that all receivables are obliged to pay their liabilities as of 1.8.1935 [...] without notice." (Istanbul Sicilli Ticaret, 18 Temmuz, 1935, p.2).

It is noteworthy that Article 444 of the Commercial Code No. 865 of 1926 regulates the bankruptcy of companies. According to the article, "The *dayins* (creditors) of the company may apply to the court and request the dissolution of the company that has lost two-thirds of its capital." The nominal capital of the company appears to be 3 million liras, but according to Veldet (1958, p. 304), "1,875,000 liras of these three million capitals was collected until the liquidation of the company". For example, in 1933, the total sum of various debt items was approximately 9.5 million

liras, while the company's profit was 1,217,833 liras (Istanbul and Trakya, 1934). In 1934, when the company was declared bankrupt, its debts increased to approximately 12 million liras and its profit was 698,248 liras (UMH, 1941; Veldet, 1958, p.262). In the report of the merger year of TSFI, it was stated that all debts of Alpullu Company were collected in the liabilities of the new company (Türkiye Şeker Fabrikaları, 1936, p.8-9). Accordingly, most of the debts of the Alpullu Company, which amounted to 12 million, probably belonged to *İşbank*. During the transfer, *İşbank* converted these debts of Alpullu Company, which had declared its bankruptcy in its board of directors, into receivables and transferred them to the newly created sugar company. In other words, Alpullu Company was saved from bankruptcy and its debts were transformed into the receivables of *İşbank* in the liabilities of the new company. Thus, the bankruptcy of the Alpullu Company was covered by the assets of the new company established after the merger through a massive credit expansion mentioned by Veblen.

The Position of Uşak Factory

The Uşak 'factory' held by *Sümerbank* was transferred to the newly established company, TSFI. However, it is understood that this transfer was most probably not direct. While *Sümerbank* held the Uşak factory as an enterprise, it was also a shareholder of the Anadolu Company. Therefore, there is a web of relations between Anadolu-Sümerbank-Uşak factory. In order to clarify the issue, it is first necessary to look at the decisions of *Sümerbank*'s board of directors in 1935. In the bank's report, Article 11 of the founding law is recalled and it is stated that the existing factories should be transformed into a company. For this reason, "Our Uşak Sugar Factory and our participation in Eskişehir Sugar Factory were transferred to the Sugar Union that was formed on 6.7.1935" (Sümerbank, 1936, p.6). It was also stated that due to the liquidation of the Anadolu Company, in which the bank had participated at the time of its establishment, the bank's subsidiaries account decreased by 735,000 liras. In 1933, the bank disposed of the amount it had paid for its participation shares at their nominal value

and probably sold them to the Anadolu Company. On the other hand, the bank's 'factories account' was stated to have realized "a decrease of 4,428,838.13 liras due to the transfer of Uşak Sugar Factory to TSFI" (1936, p. 7). However, on the same page of the report, the words "from the transfer of our Uşak Sugar Factory to Anadolu Company" indicate that Uşak was transferred to Anadolu and probably from there to TSFI as capital, at a price equal to the decrease in *Sümerbank*'s 'factories account'. Because the same figure (4,428,838.13) appears as capital in the trial balance of the newly established sugar company (Türkiye Şeker Fabrikaları Mizanı, 1935).

Law No. 3082, which was adopted in November 1936 and entered into force on January 2, 1937, is related to the financial consequences of the transfer. The law is an additional expenditure allocation of 3,500,000 liras to be added to *Sümerbank*'s capital. In the preamble of the law, it is stated that the share of participation to be paid by Sümerbank to the sugar company established in partnership with three banks is 7.330.000 liras. Accordingly, it was stated that the bank had received 3,808,728 liras from the sale price of the Uşak sugar factory and the transfer of its shareholding in the Anadolu Company, leaving an unpaid share of 3,521,272 liras.

banks in order to be paid in three years by allocating the necessary amount to the budget each year starting from 1937 (RG, 1937, 3497). In conclusion, when we combine this information with *Sümerbank*'s report, it is understood that the shares of Uşak factory and Anadolu Company held by the bank totaled 3,808,728 liras. When we subtract the Anadolu Company's share from this figure, the sale price of the Uşak factory is 3,073,728 liras. Despite the lack of available data, if the figure in the trial balance of the newly established company is correct, there was an increase in value equal to the difference (1,355,110). In a short period of time, there is an increase in value through merger (from *Sümerbank* to the Anadolu Company and then to the newly established sugar company), or more precisely, capitalized through merger, by merely changing hands through accounting. Despite the contradictory statements in *Sümerbank*'s report, it is likely that this increase in value was added to the capital contributed by the Anadolu Company to the newly established company.

Aggregated Display of Merger Data

As can be seen above, Anadolu, Turhal and Alpullu companies held a general assembly

Table 2: *Transfer Values of the Companies in the Merger*

	Basis Value	Depreciation	Data of Veldet (1958) Transfer Value	Data of the Boards of the Company Transfer Value
Uşak	3.905.307	1.139.298	**2.766.009**	**2.766.009**
Alpullu	8.321.077	2.980.297	5.340.780	2.321.700
Anadolu	6.327.429	1.077.532	5.249.897	4.255.999
Turhal	7.872.413	297.103	7.575.310	3.253.004
Toplam	26.426.226	5.494.230	20.931.996	12.596.712

It was also stated that the draft law was drafted in order to obtain the balance of this shareholding from the treasury on the grounds that it was "materially" not possible for Sümerbank to pay the entire remaining shareholding since the interest and transaction tax to be accrued from the date of the request would be paid with the dividends to be obtained from the shares (ZC, 21 Aralık, 1936). With the published law, it was stated that the remaining balance would be provided by the treasury through loans and current accounts from

meeting on the date determined by them and decided to dissolve and liquidate and merged under the roof of TSFI Only 'Uşak Factory' was transferred first to Anadolu Company as an institution of *Sümerbank* and then to the new company, this time as a company. Table 2 compares the data from Veldet (1958) with the data obtained in this study. The data from Veldet (1958), which are based on the decisions taken by the companies in their own boards, do not match the data from Veldet (1958). All the companies in the table were transferred to the new company at a

price higher than the transfer values in their boards. The Uşak Factory, which was not a company, was included in the new company at a lower value. This discrepancy is also observed in the total company values.

As frequently emphasised in this study, there is no source to verify Veldet's data. However, the new company, with a capital of 22 million, is a real company, formalised by its articles of association. Therefore, Veldet's data can only be verified 'ex-post'. If the limited data available are correct, it is likely that after the general assembly of the companies, an increase in value took place, which is not recorded anywhere, and the company values were approximately equalised to the capital of the newly established company. As a result of this transaction, the company shares were redistributed among the 'new' shareholders, forming TSFI.

As it can be remembered, it was brought to the agenda during the period that Alpullu, in particular, allocated high depreciation in order to underestimate its profits, but despite this, the high profits raised a reaction. In the report of the General Inspection Board on TSFI for 1940, the building and machinery values in the last balance sheet taken as basis in the merger are mentioned.

"The costs of the factories, the costs of the machinery installations, the amounts of their discoveries and the amounts actually paid could not be found. Therefore, they could not be compared, nor could the normalised facility costs corresponding to the production power of each of the four factories be compared" (UMH, 1941, p.11).

On the other hand, the report, referring to the above-mentioned views on 'rationalisation' and 'savings' regarding the merger of companies, states that "it has not been possible to objectively estimate to what extent these useful wishes have been realised". Therefore, it is clearly stated by the institution auditing the companies that there is no evidence that the merger of the companies has led to 'rationalisation' as assumed.

Formalizing the 'Informal' Merger

The companies were merged under the roof of TSFI and a law (No. 2785), ostensibly related to prices, was enacted around the same time. A document found in *Cumhuriyet* (the newspaper) archival documents is quite important in terms of shedding light on the issue indirectly. According to the document dated 1936, during the appellate review of a grocer who was "presumed guilty of selling sugar for more than the price limit", referring to the reduction of sugar prices to 25 kurus, the Chief Public Prosecutor's Office asked the Ministry of Justice for "a copy of the decree issued by the executive deputies committee on the determination of sugar prices". The response to this request was that there was no such decree. "Other than Law No. 2785 on the price of sugar, there is no record of a decree on the determination of prices" (CCA, 8 Temmuz, 1936).

Approximately one year before this ordinary incident, which was not very different from the frequent cases of black marketeering in the first half of the 1930s, the sugar companies were merged. On the same days after the merger, *Bayar*, sent a telegram to all governorships regarding sugar prices and the measures taken, which was also reflected in the newspapers of the day. According to the news, "The bill of law submitted to the Parliament in order to provide our people with cheap and abundant sugar has been approved. It will be possible to publish it in the official gazette on Tuesday, 18/6/1935. As of that date, the following points will be observed." (Akşam, 16 Haziran, 1935, p.1). According to the news article, the factory delivery price of granulated sugar, including all taxes and duties, would be 25 kurus instead of 37 kurus, and cube sugar would be sold at 28 kurus instead of 40 kurus. According to the news report, Bayar stated that retail prices would consist of a customary amount of current and 'normal profit' and that selling above these prices would be considered as *ihtikar* (black marketeering). He also asked governors and mayors to fulfill their duties regarding the control of prices with sensitivity. Among the news reflected in various newspapers were that strict measures were taken regarding prices, the expected law was published in the official gazette on Monday, the retail prices of granulated and cube sugar were determined with a difference of approximately 1.5 kurus as stated by Bayar, and even the Istanbul Municipality made advertisements regarding prices (Cumhuriyet, 16

Haziran 1935, p.1; Tan, 17 Haziran 1935, p.2; Son Posta, 19 Haziran 1935, p.11).

The law Bayar mentioned, which was also reflected in the newspapers after his telegram, was Law No. 2785, which was published in the official gazette on June 17, 1935 (RG, 1935, 3030). According to the law, the annual sugar production amounts were to be determined by the government, an excise tax of 4.10 kurus per kilogram of sugar was to be levied until the production amount reached 55 thousand tons, this tax was to be reduced by 1.4 kurus until sugar sales reached 200 thousand tons, a customs tax of 15 kurus was to be levied on sugar to be imported, the excise tax was to be increased as production increased, and if the dividend to be paid to the companies exceeded 9 percent, the allocation of this excess was to be determined by the government. However, the law does not specify the price of sugar in the slightest. Despite this, *Bayar*'s telegram to the governors, as seen in the newspapers, asked the governors and mayors to show the necessary sensitivity and even take strict measures to ensure that the prices of granulated and cube sugar were adhered to. However, there was no law on price determination. In reality, an illusion was created through Law No. 2785 and prices were *de facto* lowered to the desired level. However, as seen above, when the law was published, the newspapers of the day and everyone involved in sugar shopping thought that this had been achieved through the law.

The most important thing to ask here is why a very formal form of relationship, such as a price, has been informally imposed on many parties who may be the addressees of the issue. This issue, i.e. the need for an informal price determination, is an important development that links the issue to the merger of companies. The price relationship is inherently a power relationship and a subject of bargaining. Since the formation of prices also requires a bargain, the merger of companies is also the product of an informal bargain with company shareholders. The reflection of this informal bargaining led to the informal determination of prices. The *'Sugar Rationalization Committee'* and the subsequent *'İnönü Project'* are the legitimization tools of this informal relationship that is not actually recorded in official records. Law

No. 2785, which does not actually relate to prices, is merely a legal framework for this power and bargaining relationship. The only official document related to this gigantic financial operation involving state institutions and thus banks is the aforementioned law, which consists of a total of eight articles unrelated to the merger. TSFI, with a gigantic financial size like 22 million liras, emerged as a result of this bargain. In many contemporary studies on sugar companies, both the 'committee report' and the 'İnönü Project' are frequently used as a formal and official document accepted as data (Veldet, 1958, pp.559-575; Tekeli and İlkin, 205; Taygun, 1993, p.122; Karayaman, 2012, pp.80-81; Mert, 2018, pp.206-212; Damlıdağ, 2018, p.154). The source cited by most of the studies is Turan Veldet's 1958 study. However, there is no official record of either the 'committee' or the 'project' and thus the merger operation derived from it. The aim here is not to find an official document or to emphasize that the merger was an unregistered transaction. On the contrary, it is to show that power relations and the capitalization and bargaining that derive from it operate across all formal and informal spheres. There are also studies claiming that the sugar company was 'nationalized' with the merger (Atıltepe et al., 1964, p.44; Tekeli and İlkin, 2009, p.205; Karayaman, 2012, p.87; Ayan, 2022, p.46). However, the 'only document available' for such a major 'nationalization' is the aforementioned Law No. 2785 on 'Sugar consumption and customs duties'. However, as stated, the law has nothing to do with sugar prices, nor with the merger process, nor with 'nationalization'.

In 1934, during the debates in the parliament on the increase in the excise tax on sugar, deputy *Hüsnü Kitapçı* stated that the tax increase was being paid by the public by raising the price of sugar, just as it had been two years ago, and that the sugar companies were free to set their prices since they were private institutions, and he told Bayar that these companies would increase their prices with the tax increase in the same way. "Since some of these factories were established with private capital, they are free, it is possible that they will sell more, this is probably their intention." Bayar's response to this criticism was, "I will make them do what I make state institutions do in terms of

accounts, I am capable of it" (ZC, 21 Nisan 1934, p.104). In reality, not only with the recent merger, but even with state-owned banks as shareholders, the functioning of the companies was constantly dependent on informal or de facto situations created in terms of their relationship with the state.

Conclusion

In all studies, sugar companies are considered as industrial units. Therefore, it is from this perspective that the merger process is viewed and 'rationalization' is emphasized. However, companies are not industrial units, but only financial units with their balance sheets, assets and liabilities. Since companies themselves are financial units, the merger process itself is a financial operation. For companies operating in business, a merger or any other financial operation is just a matter of 'deal'. What is merged are not factories or machines, but intangible assets, which are pieces of property of the companies. So, there is nothing new added to the productive parts of the factories by the merger. The financial operations that develop in the form of mergers are relations of power and bargaining. In the case of the sugar companies, this bargaining process that made capitalization possible was done informally. The 'committee' and the 'project' that emerged from the merger have no legal record. The only official document pertaining to this informal, unregistered and in this sense de facto capitalization process is Law No. 2785. This law is neither related to the merger nor to the determination of sugar prices. Through negotiations with the shareholders of the companies, a huge financial operation was carried out and prices were brought down to the determined level through police measures without any legal basis. In this process in which state power was capitalized, the law in question functioned as a cover for this informal bargain, legitimizing the process through the illusion it created and through price decreases. With the merger, the assets of the company in the form of shares were increased through accounting, merged into the capital of the company under the roof of the new company and redistributed to the 'new' shareholders. From a different perspective, even though this was a credit expansion transaction and shares were distributed equally among all parties, the cost of the transaction was largely undertaken by state-owned banks. The debts of the former companies, which were largely owed by İşbank, the main actor in the process, turned into receivables with the merger and became shares of the new merged company, which included the bank. The values capitalised by this process generated the TSFI.

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RESEARCH ARTICLE

A Study on the Moderating Role of Self-Efficacy in the Relationship between Perceived Organizational Support and Work-Life Balance

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Abstract

Although the home working model, which started in the general directorates at first and then emerged in the branches in the banking sector, has some advantages, it disrupts the work-life balance of individuals in the long run. Thus, the present study focused on the moderating role of professional self-efficacy in the relationship between the perceived organizational support and work-life balance of women employed in private banks operating in Turkey and working from home. To this end, data were collected from 403 female private bank employees by the survey method and tested with the help of the Smart PLS 3 analysis program. According to the study findings, women's professional self-efficacy beliefs play a moderating role in the relationship between perceived organizational support and work-life balance. This relationship has been ignored in the literature. Therefore, this study enriches the content related to organizational support theory and social cognitive theory by investigating the relationship between perceived organizational support, professional self-efficacy, and work-life balance in women working in the banking sector from home and thus contributes to theory and practice.

Keywords: *Self-Efficacy, Perceived Organizational Support, Work-Life Balance*

Öz

Bankacılık sektöründe ilk önceleri genel müdürlüklerde başlayan ve daha sonra şubelerde de ortaya çıkan evden çalışma modeli birtakım avantajları içinde barındırsa da uzun dönemde bireylerin iş-yaşam dengesini ortadan kaldırmaktadır. Buradan hareketle bu çalışma, Türkiye'de faaliyet gösteren özel bankalarda istihdam edilen ve evden çalışan kadınların algılanan örgütsel destek ile iş-yaşam dengesi arasındaki ilişkide mesleki öz yeterliliğin düzenleyici rolüne odaklanmıştır. Bu amaçla, 403 kadın özel banka çalışanından anket yöntemiyle veri toplanmış ve Smart PLS 3 analiz programı aracılığıyla test edilmiştir. Çalışmanın bulgularına göre, kadınların mesleki öz yeterlilik inançları, algılanan örgütsel destek ile iş-yaşam dengesi arasındaki ilişkide düzenleyici rol üstlenmektedir. Alan yazında bu ilişki göz ardı edilmiştir. Dolayısıyla bu çalışma, evden çalışan bankacı kadınlar üzerinde, algılanan örgütsel destek, mesleki öz yeterlilik ve iş-yaşam dengesi arasındaki ilişkiyi araştırmakla, örgütsel destek teorisi ve sosyal bilişsel teori ile ilgili içeriği zenginleştirmekte ve böylece teoriye ve pratiğe katkılar sunmaktadır.

Anahtar Kelimeler: *Öz-Yeterlilik, Algılanan Örgütsel Destek, İş-Yaşam Dengesi*

Introduction

Nowadays, along with the development of information and communication technologies and the impact of the COVID-19 pandemic that we have experienced, new business models have begun to develop. The advancement of technology has led to the emergence of home working models, in which people start to work from their homes through computers and other communication tools, by eliminating the necessity of doing the work in the workplace and in a certain time period (Kavi & Koçak, 2010). Such practices have started to become widespread in the banking sector, as in many sectors (Dockery & Bawa, 2020; Turan, 2023). The home working practice brings about numerous advantages for both employers and employees, but it also has disadvantages. Individuals working from home stress that they work flexibly, are not exposed to transportation and traffic problems, and experience advantages such as job autonomy. However, individuals working from home state that their work is constantly interrupted and never finished, they cannot get out of working psychology, physical problems due to sedentary life recur, and they start to become introverted since they stay away from social interaction (Kıcır, 2019).

Although individuals working from home are free in terms of space and time, they experience problems with work-life balance. In other words, the areas of work-family life and family-work life become intertwined, and thus work-life conflicts occur (Kıcır, 2019). Studies have confirmed that the work efficiency of bank employees working from home has decreased due to the family-work conflict experienced (Taşkın, 2021). Hence, an important problem of working from home is the role conflict experienced by individuals. Studies have also revealed that stress levels increase under the effect of role conflict and role ambiguity experienced by individuals working from home (Dockery & Bawa, 2020; Mustajab et al., 2020; Masyhuri, Pardiman & Siswanto, 2021; Elsafty & Shafik, 2022). It is observed that women who work from home, who are married and have children experience role conflicts as the responsibilities of spending time with their children, cooking and doing other household chores become intertwined

with the responsibilities required by their jobs (Tuna & Türkmendağ, 2020; Güler & Nalbant, 2022). At this point, the issue of how women employed in the banking sector and working from home will maintain a work-life balance gains importance.

Such problems bring to mind perceived organizational support (Özgül, Erkmen & Karaarslan, 2020). The perception of organizational support increases when individuals perceive that their efforts will be appreciated and rewarded by the organization, their contributions are considered valuable, and their well-being is cared for (Eisenberger et al., 1986). Employees' perception of organizational support predicts many work and family outcomes such as reduced role conflict and stress, higher job satisfaction, increased commitment to the organization, more positive mood, decreased turnover intention, and increased performance (Greenglass et al., 2001 & Garrett et al., 2001; Rhoades & Eisenberger, 2002). Various studies have shown that both work-family and family-work conflict levels of individuals with a high perception of organizational support decrease (Erdwins et al., 2001; Casper & Buffardi, 2004; Foley et al., 2005).

On the other hand, the concept of self-efficacy, which indicates the level of belief in an individual's ability to successfully perform a particular job or task, draws attention at this point (Bandura, 1977). Self-efficacy belief allows individuals to cope with negative situations and exhibit the desired behavior (Bandura, 1997). Despite the large number of studies on self-efficacy, its relationship with work-life balance has not received adequate attention in the literature (Badri & Panatik, 2020). Few studies have confirmed that self-efficacy impacts work-life balance (Siu, 2013; Polatçı & Akdoğan, 2014; Nina & Fauziah, 2017; Kaplan, 2018; Badri & Panatik, 2020; Akkuş, Najimudinova & Gül, 2020; Parray, Shah & Islam, 2022).

Individuals shape their behaviors with the interaction of personal and environmental factors. Environmental factors indirectly impact most behaviors through cognitive processes. However, individuals cannot be characterized as reactive organisms directed solely by environmental factors and internal forces. Individuals can also organize and direct themselves (Bandura, 2001).

Hence, the interaction of perceived organizational support and self-efficacy belief may be effective in maintaining work-life balance. The study by Arpacı and Tekmen (2020) determined that self-efficacy has a moderating role in the relationship between perceived organizational support and interpersonal constructive deviant workplace behaviors.

From this point of view, in the current study, a conceptual model was developed and analyzed under the assumption that the work-life balance of women employed in the banking sector and working from home would be achieved with perceived organizational support and that professional self-efficacy belief would affect the success of women in establishing work-life balance. After stating the assumption that self-efficacy will play a moderating role in the relationship between perceived organizational support and work-life balance, it should be noted that the hypothesis to be established in this regard was created for the first time because no empirical study was found in the literature review. Therefore, the objective of this study is to provide answers to the questions, "Does perceived organizational support affect the work-life balance of women employed in the banking sector and working from home?", "Do the professional self-efficacy beliefs of women employed in the banking sector and working from home affect their work-life balance?" and "Do the professional self-efficacy beliefs of women employed in the banking sector and working from home play a moderating role in this relationship?" To this end, data were collected from 403 female employees employed in private banks and working from home and analyzed with the help of the Smart PLS analysis program.

Hypothesis Development

Perceived Organizational Support and Work-Life Balance

The act of establishing a balance between an individual's work and private life can be defined as a work-life balance (Poulose & Sudarsan, 2014). In other words, work-life balance refers to the state of establishing a balance between the roles required by professional working life (career and ambition) and the roles required by private life (health, pleasure, leisure time, and family) (Caleb, Ogwuche & Howell, 2020). In this respect, women experience more difficulty in establishing a work-life balance. The main reason for this is that if they cannot meet the demands of their private life, they are exposed to more criticism than men (Özgül, Erkmen & Karaarslan, 2020). The disadvantaged situation of women in establishing a work-life balance increases even more if they are married and have children. As is known, individuals fulfill the requirements of the roles they undertake in a certain period of time. According to rational perspective theory, spreading all the roles undertaken over a given period of time ultimately shortens the time allocated to each role. When the time allocated to roles shortens, individuals enter into a time-based conflict since these roles cannot be performed adequately (Efeoğlu, 2006). On the other hand, individuals may experience some stresses depending on the effects of the roles they undertake in their professional work and private life areas. Depending on these stresses experienced, they may not be able to fulfill all the roles they have undertaken due to tension-based conflict (Greenhaus and Beutell, 1985).

All these difficulties require supportive practices. At this point, the contribution of perceived organizational support is an undeniable fact. Perceived organizational support can be defined as the expression of an individual's belief, thoughts, and feelings about how much importance is attached by the company in which the individual is employed, at what level his/her socio-emotional needs are met, and how and to what extent he/she is valued (Eisenberger et al., 1986). Perceived organizational support is associated with increased employee well-being, including job satisfaction and work-life balance (Ulukapı, 2013; Kurtessis et al., 2017; Fitria & Linda, 2019). According to organizational support theory, perceived organizational support increases the employee's job satisfaction, well-being, and commitment to the organization (Burke, 2003; Foley, Yue & Lui, 2005; Laschinger et al., 2006; Eisenberger & Stinglhamber, 2011; Filipova, 2011; Poulose & Sudarsan, 2014; Hongvichit, 2015; Shao, Zhang, & Chen, 2016). Furthermore, it is also

argued that perceived organizational support reduces pressures on employees such as role conflict, emotional exhaustion, and burnout (Vallone & Ensher, 2001; Rhoades & Eisenberger, 2002; Turunç & Çelik, 2010; Kurtessis et al., 2017). From this point of view, according to organizational support theory, it can be said that when managers in the banking sector make their female employees working from home feel that they value and care about them (taking into account their requests and complaints, providing expert consultancy support, etc.), and they are aware of the contributions they make to their institutions, employees can establish a work-life balance without entering into tension and time-based conflict. Therefore, in the present study, hypothesis H1 was developed, arguing that the perceived organizational support of female employees employed in private banks and working from home will increase the work-life balance.

H1: There is a positive relationship between perceived organizational support and work-life balance.

Self-Efficacy Belief and Work-Life Balance

Work-life balance is the state of harmony between the private and professional lives of employees (Haar et al., 2019). The person himself/herself is the most important factor determining work-life balance (Takım & Timuroğlu, 2022). Self-efficacy belief has an important place in establishing a work-life balance for individuals (Siu, 2013; Nafei, 2015). Self-efficacy is the expression of an individual's judgments about how well he/she can take the necessary actions to cope with possible conditions (Bandura, 1977). According to social cognitive theory (Bandura, 1997), self-efficacy can be defined as an individual's confidence in his/her abilities to achieve a desired outcome (Tumasjan & Braun, 2012). It is stressed that individuals with higher self-efficacy beliefs will set more ambitious goals, rely on their abilities to achieve these goals, and work harder to turn these goals into reality (Komarraju & Nadler, 2013; Mutar, Mohammad & Hmmud, 2020).

Empirical studies have supported that individuals increase both the quality of work and the quality of life with their high self-efficacy belief (Nguyen & Nguyen, 2012; Nafei, 2015). Researchers emphasize that individuals with high self-efficacy beliefs are successful in establishing a work-life balance (Siu, 2013; Polatçı & Akdoğan, 2014; Nina & Fauziah, 2017; Kaplan, 2018; Badri & Panatik, 2020; Akkuş, Najimudinova & Gül, 2020; Parray, Shah & Islam, 2022). Moreover, empirical studies have also confirmed that self-efficacy reduces work and family conflict (Taşdelen-Karçkay, Bakalım & Yörük, 2016). However, studies examining the relationship between self-efficacy belief and work-life balance are limited (Badri, & Panatik, 2020). Based on social cognitive theory, it can be said that women employed in the banking sector and working from home will not enter into tension and time-based conflict in their search for work-life balance with their self-efficacy beliefs (Wyatt, 2018; Martínez-León, Olmedo-Cifuentes &Sanchez-Vidal, 2019). In the current study, based on all these discussions, hypothesis H2 was developed, assuming that the self-efficacy belief of women employed in private banks and working from home can be effective in establishing a work-life balance.

H2: There is a positive relationship between self-efficacy belief and work-life balance.

The Moderating Role of Self-Efficacy Belief

When individuals perceive that their contributions are valued and their well-being is cared for by the institution they work for in return for their efforts, they can establish a work-life balance in return for this (Eisenberger et al., 1986). Since employees employed in organizations have different personality traits, they perceive and interpret events differently (Banerjee & Somanathan, 2001; Chiu et al., 2005) and act accordingly. In this regard, Pinder and Harlos (2001) underlined that researchers should consider individuals' personality traits and differences when evaluating organizational issues. Self-efficacy beliefs shape the choices, emotional reactions, and behaviors of individuals in relation to their personality traits (Bandura, 1986; Gist & Mitchell, 1992). Therefore,

since individuals' self-efficacy belief levels are effective in their interpretation of events, it can affect the level of perceived organizational support (Rhoades & Eisenberger, 2002; Caesens & Stinglhamber, 2014). High levels of both perceived organizational support and self-efficacy beliefs may support the individual in establishing a work-life balance because the individual's ability to establish a work-life balance is under his/her own control to a certain extent. No study was found in the literature examining the moderating role of self-efficacy belief in the effect of perceived organizational support on work-life balance. Considering the need to fill this gap, in the present study, hypothesis H3 was developed to investigate the moderating role of self-efficacy belief in the effect of perceived organizational support on work-life balance among women employed in private banks and working from home.

H3: Self-efficacy has a moderating role in the positive relationship between perceived organizational support and work-life balance.

Figure 1 shows the hypotheses and conceptual model of this study.
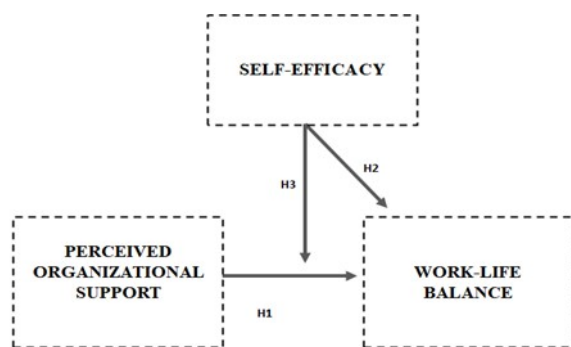
Figure 1. Research Model and Hypotheses

Methodology of the Study

Sample of the Study

Data were collected using the survey method to test the research model and hypotheses of this study. The participants of the present study are female employees employed in private banks and working from home in Turkey. The sampling technique is simple random sampling. Data were

collected from 428 bankers through questionnaires sent to bank employees who agreed to participate in the study, but 403 usable data were obtained. Some questionnaires were collected face-to-face, and some were collected via e-mail and other digital platforms. The participants were assured that the data collected would be confidential and only be used for research purposes. To test the non-response bias, the data collection process took three months, from July to October 2022. The current study was carried out following the Scientific Research and Publication Ethics rules with the Approval Certificate of the Academic Research and Publication Ethics Committee of Istanbul Topkapı University, dated 23.05.2022 and numbered E-31675095-100-2200005048. Table 1 contains the demographic characteristics of female employees employed in private banks and working from home in Turkey.

Table 1. Demographic Characteristics of the Participants

Demographics	Frequency	Percentage (%)
Female	403	100
Marital status		
Married	290	71.96
Single	113	28.04
Child status		
Childless	151	37.47
1- child	103	25.56
2- and above	149	36.97
Age		
18–25	92	22.83
26–33	105	26.05
34–41	126	31.27
42–49	28	6.95
50 and above	52	12.90
Tenure		
Less than 5 years	108	26.80
5–10 years	142	35.24
Between 11–15 years	98	24.31
16 years and above	55	13.65

Development of the Data Collection Tool

In the questionnaire created for this study, a five-point Likert scale consisting of 4 questions, developed by Brough et al. (2014), was used to measure the work-life balance of women employed in the bank and working from home. Second, the self-efficacy levels of women employed in banks and working from home were

measured using a 6-item self-efficacy scale (five-point Likert scale) developed by Luthans et al. (2007) and translated into Turkish by Çetin and Basım (2012). Third, the perceived organizational support levels of women employed in banks and working from home were measured using the 8-question short version of the perceived organizational support scale consisting of 36 questions developed by Eisenberger et al. (1986) and simplified by Eisenberger et al. (1997). Finally, questions about the demographic characteristics of women employed in banks and working from home were included.

Analysis And Results

Assessment of the Measurement Model

In the current study, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the hypotheses in the research

loadings, composite reliability (CR), Cronbach's alpha and rho_A coefficients were examined in the first stage (Ringle, Sarstedt & Straub, 2012). Since the factor loading of item SE6 was lower than 0.70, it was excluded from the analysis, and the analysis was repeated. Finally, all factor loadings, CR values, Cronbach's alpha and rho_A coefficients are greater than 0.70 (Hair et al., 2016). Thus, it can be said that the reliability of the measurement model was ensured. In the next stage, convergent validity was examined by considering the average variance extracted (AVE) (Henseler, Hubona & Ray, 2016). AVE values for all constructs exceeded the recommended 0.50 value for convergent validity (see Table 2). In other words, convergent validity was provided.

Then, discriminant validity was assessed using the Fornell and Larcker (1981) criterion. According to the Fornell-Larcker criterion, the square root of AVE should be higher than the correlations of all the constructs in the model with each other. Table

Table 2. Results of the Measurement Model

Constructs	Items	Factor Loadings	P Values	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Perceived Organizational Support (POS)	POS1	0,763	0,000	0,899	0,901	0,919	0,586
	POS2	0,800	0,000				
	POS3	0,830	0,000				
	POS4	0,790	0,000				
	POS5	0,731	0,000				
	POS6	0,713	0,000				
	POS7	0,752	0,000				
	POS8	0,739	0,000				
Work-Life Balance (WLB)	WLB1	0,721	0,000				
	WLB2	0,774	0,000	0,761	0,765	0,848	0,582
	WLB3	0,769	0,000				
	WLB4	0,787	0,000				
Self-Efficacy (SE)	SE1	0,759	0,000	0,808	0,808	0,866	0,565
	SE2	0,720	0,000				
	SE3	0,757	0,000				
	SE4	0,780	0,000				
	SE5	0,741	0,000				

model. In this context, the data were analyzed using the SmartPLS 3 software based on the research logic PLS-SEM. In the said software, analyses are carried out in two stages (measurement/internal and structural/external model). Hence, the measurement model was analyzed first. The measurement model was assessed by examining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity (Henseler, Hubona & Ray, 2016). In this respect, factor

3 shows that the square roots of AVEs (diagonal values) are greater than the corresponding correlations between constructs in a row and column (non-diagonal values), and the Fornell-Larcker criterion was met.

Table 3. Fornell-Larcker Criterion

Constructs	1	2	3
POS	**0,766**		
SE	0,714	**0,752**	
WLB	0,702	0,707	**0,763**
Note: Bold diagonal values represent the square of AVE			

Cross-loading values were examined to assess discriminant validity. The cross-loading values (bold values) in Table 4 are higher than the loadings of the corresponding constructs for discriminant validity (Fornell & Larcker, 1981). Therefore, it can be said that the desired criterion was met.

Table 4. Cross-Loadings

	POS	SE	WLB
POS1	*0,763*	0,553	0,571
POS2	*0,800*	0,534	0,547
POS3	*0,830*	0,547	0,567
POS4	*0,790*	0,542	0,587
POS5	*0,731*	0,549	0,540
POS6	*0,713*	0,571	0,523
POS7	*0,752*	0,549	0,446
POS8	*0,739*	0,535	0,493
SE1	0,500	*0,759*	0,563
SE2	0,590	*0,720*	0,571
SE3	0,542	*0,757*	0,524
SE4	0,555	*0,780*	0,512
SE5	0,488	*0,741*	0,476
WLB1	0,466	0,484	*0,721*
WLB2	0,575	0,603	*0,774*
WLB3	0,519	0,527	*0,769*
WLB4	0,572	0,535	*0,787*

Finally, the heterotrait-monotrait (HTMT) method was employed to assess the discriminant validity of the constructs. The HTMT value should be lower than 0.90 (Henseler, Ringle & Sarstedt, 2015). As is seen in Table 5, all HTMT values are lower than 0.90. Thus, it can be said that discriminant validity was ensured.

Table 5. Heterotrait-Monotrait Ratio (HTMT)

Constructs	1	2	3
POS			
SE	0,837		
WLB	0,840	0,893	

Assessment of the Structural Model

The structural model was assessed after ensuring the validity and reliability of the measurement model. In this context, the 5000 resampling procedure was used on the full model to generate the t values corresponding to the path coefficient values (Hair et al., 2016). Model fit was evaluated according to the Standardized Root Mean Square (SRMR) and Normed Fix Index (NFI) values, indicating good model fit (Hair et al., 2016). As is

seen in Table 6, the SRMR value is 0.071<0.080, and the NFI value is 0.806>0.80, and these values indicate a good model fit. Afterward, Variance Inflation Factor (VIF) values were examined to assess whether there was a linearity problem in the model, and no linearity problem was observed since the results did not exceed the threshold value of 3 (see Table 6).

The path analysis results in Table 6 and Figure 2 show that perceived organizational support (POS→WLC; β = 0.368, t = 4.868, p = 0.000) and professional self-efficacy (SE→WLB; β = 0.396, t = 5.104, p = 0.000) significantly and positively affect work-life balance. Thus, hypotheses H1 and H2 were supported. Furthermore, the moderating role of professional self-efficacy (POS*SE→WLB; β = 0.101, t = 2.669, p = 0.008) in the relationship between perceived organizational support and work-life balance was supported. Thus, hypothesis H3 was also accepted. R^2 values, which indicate what percentage of the variance is explained, show that 59.1% of the work-life balance is explained. The effect size (f^2) value was assessed to test the individual contributions of each exogenous variable (Henseler et al., 2015). According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 are considered low, moderate, and high, respectively. In the present study, f^2 values were moderate (see Table 6). The predictive power of the model was examined on the basis of Stone-Geisser's Q^2. The Q^2 values greater than zero indicate that the model has predictive significance. As shown in Table 6, the Q^2 values are greater than zero. Hence, it can be said that the structural model has predictive significance (Fornell & Cha, 1994).

Table 6. *Relationships Between the Variables*

Path Coefficients	Coef (β)	S.D.	T Values	P Values	Adj. R²	f²	Q²	VIF	Confidence Interval (BC) LL	UL	Conclusion
Moderating Effect (POS*SE)→WLB	0,101	0,038	2,669	0,008		0,029		1,244	0,028	0,179	H3 Supported
							0,329				
POS →WLB	0,368	0,076	4,868	0,000		0,155		2,137	0,213	0,512	H1 Supported
					0,591						
SE →WLB	0,396	0,078	5,104	0,000		0,183		2,093	0,244	0,550	H2 Supported

SRMR= 0,071; NFI= 0,806
Results of the bootstrapping with 5,000 sub-samplings
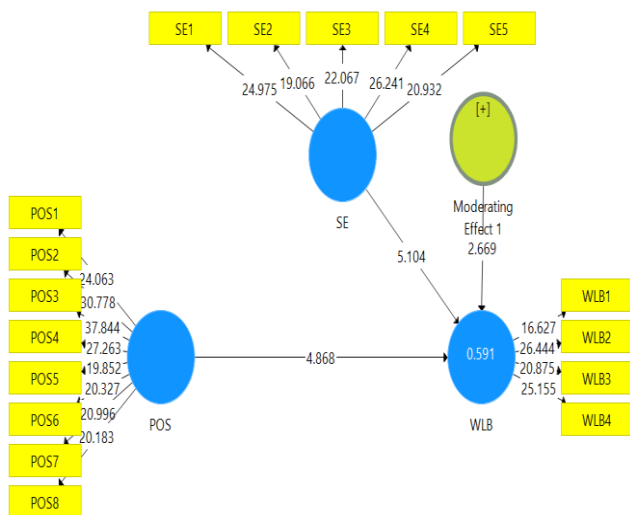
Figure 2. *The Structural Measurement Model*

Discussion and Conclusion

The use of information technologies in professional working life has brought about home working models. The home working model is the execution of all or part of the work from home through information technologies (Kavi & Koçak, 2010). Although working from home offers advantages to women, it brings about disadvantages such as the prolongation of working hours, the increase in the number of daily meetings and the increased workload, the inability to work from home in a disciplined and regular manner, the need to take care of children, the unavailability of the home to do work, and the inability to do technical work, which can be done in the office, at

home. On the other hand, problems experienced due to the disruption of professional working life, physical problems due to inactivity, disruption of sleep patterns, and psychological problems due to isolation of the employee by staying away from his/her colleagues and workplace may occur (Serinikli, 2021; Tuna & Türkmendağ, 2020). Working from home blurs the border between the work and private life of individuals with each passing day and disrupts the work-life balance (Baycık & Erdoğan, 2021). Empirical studies in the literature have also confirmed that working from home actually disrupts the work-life balance (Akça & Küçükoğlu, 2020; Serinikli, 2021; Tuna & Türkmendağ, 2020; Güler & Nalbant, 2022; Özkanan, 2022).

Although the home working model, which started in the general directorates at first and then emerged in the branches in the banking sector, has some advantages, it disrupts the work-life balance of individuals in the long run. Thus, in the present study, a conceptual model was developed and analyzed to examine the question of how women employed in private banks and working from home will maintain a work-life balance. The main motivation of the current study is (i) to examine the relationship between the perceived organizational support and work-life balance of women employed in the banking sector and working from home, (ii) to determine whether there is a significant relationship between the professional self-efficacy and work-life balance of women employed in the banking sector and working from

home, and (iii) to examine whether professional self-efficacy of women employed in the banking sector and working from home has a moderating role in the relationship between perceived organizational support and work-life balance.

The study results indicate a positive relationship between the perceived organizational support and work-life balance of women employed in the bank and working from home. Studies in the literature also confirm that perceived organizational support increases employee well-being, including job satisfaction and work-life balance (Ulukapı, 2013; Kurtessis et al., 2017; Fitria & Linda, 2019).

Another result of the study demonstrates that women employed in the bank and working from home with high professional self-efficacy beliefs can achieve a work-life balance. Few studies in the literature (Badri, & Panatik, 2020) support this result (Siu, 2013; Polatçı & Akdoğan, 2014; Nina & Fauziah, 2017; Kaplan, 2018; Badri & Panatik, 2020; Akkuş, Najimudinova & Gül, 2020; Parray, Shah & Islam, 2022).

On the other hand, another result of the study shows that professional self-efficacy plays a moderating role in the significant and positive relationship between perceived organizational support and work-life balance. However, no study was found in the literature evaluating this relationship. In this sense, the current study has theoretical and managerial implications.

Theoretical Contributions

The present research investigates the relationship between perceived organizational support, professional self-efficacy, and work-life balance in women employed in the banking sector and working from home and enriches the content related to organizational support theory and social cognitive theory. First, the current study develops the literature by explaining that women employed in the banking sector and working from home can establish a work-life balance with their perceived organizational support, without entering into tension and time-based conflict, from the perspective of organizational support theory.

Second, this study expands the research scope of professional self-efficacy belief in a more systematic and comprehensive way by showing the positive relationship between the professional self-efficacy and work-life balance of women employed in the banking sector and working from home, based on social cognitive theory. Previous studies, although in limited numbers, have successfully highlighted the effect of self-efficacy on work-life balance, but the impact of professional self-efficacy belief of women employed in the banking sector and working from home on work-life balance is new.

Finally, the current study demonstrates a new way to achieve work-life balance for bankers and managers by clarifying that the professional self-efficacy of women employed in the banking sector and working from home has a moderating role in the positive relationship between their perceived organizational support and work-life balance. Previous studies have successfully stressed the positive effect of perceived organizational support on work-life balance and the positive effect of self-efficacy on work-life balance, but the moderating role of professional self-efficacy in the positive relationship between perceived organizational support and work-life balance is new. Therefore, this study, which addresses the deficiencies of the current literature, improves organizational support theory and social cognitive theory.

Managerial Contributions

According to the first finding of the present study, perceived organizational support is positively correlated with work-life balance. This finding demonstrates that due to the negative effects of working from home on the life and health of the employee, the work-life balance of the employee should be taken into account in the content of the manager's duty to supervise the employee. Therefore, managers should develop policies and projects to ensure the work-life balance of employees and provide the necessary support (Baycık & Erdoğan, 2021). However, managers may consider positive discrimination in their business models as a solution to women working from home regarding their difficulties in maintaining their work and family roles together. Moreover, to prevent the social isolation of employees working from home, hybrid working

systems can be chosen, expert consultancy support can be provided, meetings can be organized, motivation messages can be sent via e-mail, and personal development seminars can be organized (Gümrükçüoğlu, 2020). Thus, women can stay motivated by not disconnecting from their teams. Additionally, managers may include the right of inaccessibility of the employee in order to establish the borders between the work and private life of individuals in the policy of ensuring work-life balance (Savage & Staunton, 2018). Furthermore, regular breathing exercises, meditation and physical exercise, and paying attention to a healthy diet can help women working from home achieve work-life balance.

The second finding of the study demonstrates that professional self-efficacy is effective in achieving work-life balance. The said finding shows that students studying in the banking department should be trained to raise future bankers with strong self-efficacy. Furthermore, it can be said that more activities should be carried out by the institutions that make banking regulations so that bankers can continuously improve their self-efficacy levels by organizing training programs, workshops, and awareness seminars supported by strong leadership.

The last finding of the study indicates the moderating role of professional self-efficacy in the positive relationship between perceived organizational support and work-life balance. It can be said that managers should accept the importance of women's professional self-efficacy beliefs and perceived organizational support in order to ensure work-life balance for women working from home and they should adopt practices in this direction.

Limitations and Future Research Recommendations

Specifically, this study was conducted on female bank employees. Therefore, readers should be careful when evaluating and generalizing the results of various occupations. Second, cross-sectional data were used in this study. Therefore, questions may be asked about the causal aspect of the relationship between the structures studied. In the future, researchers can explore the moderator roles of different variables while examining the relationship between perceived organizational support and work-life balance. In addition, researchers can gain comprehensive insights into this relationship through case studies.

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RESEARCH ARTICLE

Efficacy of Technology Addiction Awareness Training Given to High School Students: Randomized Controlled Experimental Study

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Abstract

It was aimed to evaluate the efficacy of Technology Addiction Awareness Training given to high school students in this study. This study was conducted in two different high schools of National Education Directorate of a province in the Southeastern Region of Turkiye as a randomized controlled experimental study. The research was finalized with 54 students (28 control, 26 Experimental). As data collection tools, Socio-demographic Information Form and Young Internet Addiction Test Short Form were used in the research. The students in the experimental group were given Technology Addiction Awareness Training for 5 weeks, but no intervention was made to the students in control group. The trainings were carried out as group education. Descriptive statistics such as number, percentage, mean, standard deviation were used in the analyses of data, and t test was used in dependent and independent groups After the Technology Addiction Awareness Training of the high school students in the experimental group, it was determined that the Young Internet Addiction Test Short Form post-test score average decreased compared to the pre-test. As a result, it is possible to say that Technology Addiction Awareness Training can be an effective and useable intervention in reducing technology addiction in high school students.

Keywords: *Adolescence, Technology Addiction, Pyscho-education.*

Öz

Bu araştırmada; lise öğrencilerine verilen Teknoloji Bağımlılığı Farkındalık Eğitiminin etkinliğinin değerlendirilmesi amaçlandı. Bu araştırma, randomize kontrollü deneysel bir araştırma olarak Türkiye'nin Güneydoğusunda bulunan bir ilde Milli Eğitim Müdürlüğüne bağlı iki farklı lisede gerçekleştirildi. Araştırma toplam 54 (28 kontrol, 26 deney) öğrenci ile tamamlandı. Araştırmada veri toplama formu olarak; Sosyodemografik Bilgi Formu ve Young İnternet Bağımlılığı Testi Kısa Formu kullanıldı. Deney grubunda bulunan öğrencilere 5 hafta boyunca Teknoloji Bağımlılığı Farkındalık Eğitimi verildi, kontrol grubunda bulunan öğrencilere ise herhangi bir müdahale yapılmadı. Eğitimler grup eğitimi olarak gerçekleştirildi. Araştırma verilerinin analizinde; sayı, yüzde, ortalama, standart sapma gibi tanımlayıcı istatistikler ile bağımlı ve bağımsız gruplarda t testi analizleri kullanıldı. Deney grubunda bulunan lise öğrencilerinin, Teknoloji Bağımlılığı Farkındalık Eğitiminden sonra Young İnternet Bağımlılığı Testi Kısa Formu son test puan ortalamasının ön teste oranla azaldığı belirlendi. Sonuç olarak Teknoloji Bağımlılığı Farkındalık Eğitiminin lise öğrencilerinde teknoloji bağımlılığını azaltmada etkili ve kullanılabilir bir müdahale olduğu söylenebilir.

Anahtar Kelimeler: *Ergenlik, Teknoloji Bağımlılığı, Psikoeğitim.*

Introduction

Adolescence, defined as the transition process from childhood to adulthood, is one of the most important stages of human life, which according to World Health Organization, covers the ages from 10 to 19, and during which fast physical, social and spiritual changes take place and character of the individual is formed. During this stage, together with the use of metacognitive functions, the adolescent starts to question himself, his/her family and environment etc. (Bayhan & Artan, 2005; Bee & Boyd, 2009; Ektiricioğlu et al., 2020). The support taken from friend, father, mother, teacher and close circles is extremely important for adolescents. Otherwise, the adolescent, who feels that he/she is not understood, may be interested in different fields.

What causes an adolescent to spend longer time on television, tablet, computer, telephone, etc. than normal is characteristics of the century, and due to increase in digitalization, development of technology, widespread use of internet and easy-access to the internet. In addition, some reasons such as the adolescent's communication problems with primarily his/her family and peers, the problems experienced in school, emergence of aggressive feelings cause the adolescent to tend to use technological products (Dursun & Eraslan-Çapan, 2018; Ektiricioğlu et al., 2020). As a result, these factors lead to the emergence of technology addiction in adolescents.

The increase in the use of technological products in adolescents has led to both positive and negative results. Among the positive results of the use of technological products, it is possible to mention these results: Faciliating the accessibility of information, providing the opportunity to examine the subjects and events in the course curriculum in three dimensions thanks to digital tools and providing the opportunity to be more understandable, positively affecting academic success, concretizing information by visualizing, faciliating communication and providing fast shopping etc.. (Hamarta et al., 2021). In addition, it is known that digital tools turned out to be effective in an uninterrupted, continuous education during the Covid19 pandemic. and the

tools ensured that the education process continues without interruption (Henderson, 2017; Pekşen Akça, 2022; Şenyurt & Şahin, 2022; Uluçay & Kobak, 2020). The negative consequences of overuse of technological products can be counted as introversion, mood swings, tension and anger, conflict, etc.. In addition, a study examined the relationship between the time spent by young people in the digital environment and depression, as a result it is stated that spending more time with online activities such as using chat rooms in digital environments, shopping and playing games is effective in the emergence of depression symptoms (Dilmen-Bayar, 2019; Morgan & Cotten, 2003).

Addiction is a concept used to describe being overly fond of an object or behavior and is generally associated with the use of harmful substances such as cigarettes, alcohol and drugs (Ektiricioğlu et al., 2020). However, with the increase in technological products and digitalization in our age, there is a change in the fields with which this concept is associated. The excessive use of technological products such as tablets, phones, computers, and the internet has created the concept of technology addiction. Technology addiction, which is seen as one of the biggest problems of the age, emerges in basic areas such as internet, social media, digital games and mobile phone addiction (Aygün & Pekşen, 2022; Boyacı, 2019; Ertemel & Eroğlu-Pektaş, 2018; Kalaitzaki & Birtchnell, 2014; Lukavsk´a et al., 2022). In a study conducted on high school adolescents, it was stated that smartphone, internet, digital game and social media have great effects on technology addiction. According to the results of the study, it was concluded that these technological addictions significantly affect social addiction (Savcı & Aysan, 2017).

Technology addiction is an increasing problem in adolescents; and when the relevant literature is examined, it is seen that different therapy methods, especially cognitive behavioral therapies, and psychoeducational programs are used to reduce or prevent technology addiction (Aboujaoude, 2010; Bağatarhan & Siyez, 2017; Dicle, 2018; Karadağ & Noyan, 2023; King et al., 2017). Adolescence, which includes especially high school ages, is a period in which technological

tools are frequently used, and it is a risky stage in terms of the emergence of technology addiction. It is stated that school-based educations to be carried out within the scope of preventive intervention studies on technology addiction in adolescents are important in recognizing risky situations in terms of technology addiction in an earlier period (Yektaş & Yüncü, 2021). In line with this information, in this study, it is aimed to evaluate the effectiveness of the Technology Addiction Awareness Training given to high school students. For these purposes, the study tries to prove the following hypotheses:

Hypotheses:

H0: Technology Addiction Awareness Training is effective on decreasing technology addiction in high school students.

H1: Technology Addiction Awareness Training is not effective on decreasing technology addiction in high school students.

Methodology

Type of Research, Location and Sample Selection

In this study, a pretest posttest randomized controlled experimental research design was used. The research was carried out in two different high schools affiliated to the Directorate of National Education in a province in the southeast of Türkiye. Students in the research group were selected from two different high schools with similar structures (number of students, geographical location, program type, etc.). In order to determine from which high school the students to be selected for the experimental and control groups will be taken, the names of the high schools were written on a piece of paper and lots were drawn. It was decided to include the students of the first high school in the experimental group and the students of the second high school into the control group. In the study, the full randomization method was used to assign high school students to groups. Randomization was carried out in a computer environment.

The population of the research consisted of 419 students enrolled in the 11th grade of these two high schools. In the study, the sample size was determined using the G.Power 3.1.9.2 program. While calculating the sample size, the acceleration rate reported in the study by Erses and Müezzin (2018) was taken as reference. The required sample size was calculated as 40 students, 20 students for each group, with a 95% confidence interval, 0.05% margin of error and 0.8 effect size, according to the power analysis. However, considering the risk of participant loss and the use of parametric tests in the analysis of research data, 60 high school students were included in the study. High school students in the control and experimental groups included in the study were determined using a computer-assisted simple random sampling method. 4 students in the experimental group who did not attend the training program for more than one session and 2 students in the control group who did not fill in the posttest data were excluded from the study. The research was completed with 54 (28 control, 26 experimental) students. The flow chart of the research is given in Figure 1.

Study Inclusion Criteria: To be attending high school, to be 11th grade high school student, to submit his and his parent's written consent to participate in the study.

Study Exclusion Criteria: Not to be a high school student in 11th grade, not to have parental consent to participate in the study, and not to attend the session more than once.

Data Collection Forms

Socio-demographic Information Form and Young Internet Addiction Test Short Form were used as data collection forms in the study.

Socio-demographic Information Form: In this form that the researchers developed by examining the literature, there are twelve questions to gather information. They are: Age, gender, parents' education status, family type, family income level, possessing his/her own mobile phone and computer, presence of internet connection at home,
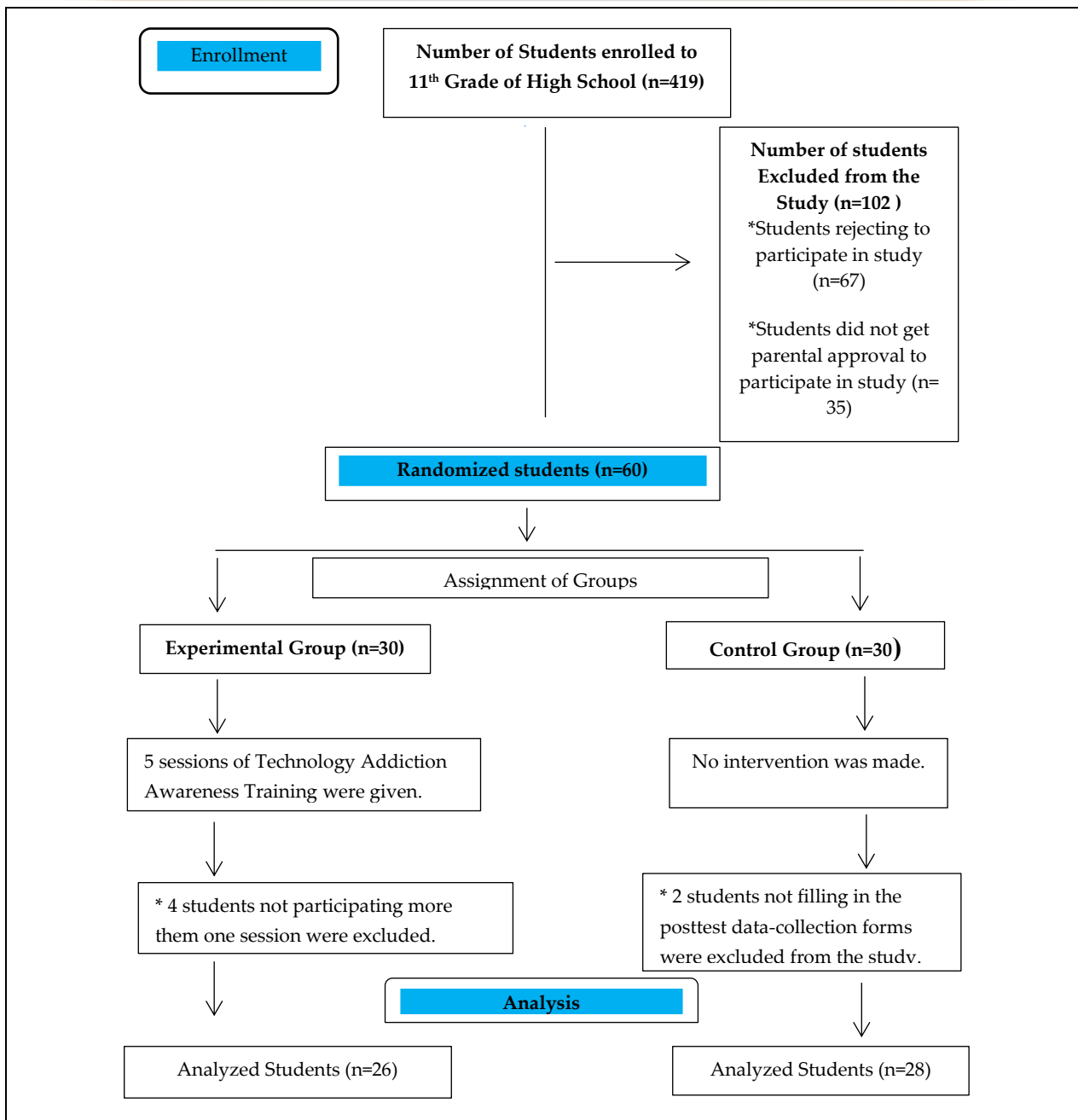
Figure 1. Study Flow Chart

the social medias mostly used, status of playing digital games and total time spent on the internet daily (Sezer-Efe et al., 2021).

Young Internet Addiction Test Short Form: Kutlu et al. (2016) conducted the Turkish validity and reliability study of the scale, which was developed by Young (1998), and it was later converted into a short form by Pawlikowski et al. (2013) in 2016. YIAT-SF consists of a five-point Likert type (1=Never, 5=Very often) and a total of 12 items.

The internal consistency reliability coefficient of YIAT-SF was calculated as 0.85. As a result of the validity and reliability study, it was determined that the scale is valid and reliable. There is no reverse scored item among the scale items. The minimum score taken from the scale is 12 and the maximum score is 60, and the higher the score, the higher the level of internet addiction (Kutlu et al., 2016). In this study, the Cronbachs alpha coefficient was calculated as 0.87.

Collecting Study Data and Training Intervention of Research

After determining the experimental and control groups of the research, the pre-test data of the students in the experimental group were collected in the first session the pre-test data of the students in the control group were also collected simultaneously on the same day. Technology Addiction Awareness Training was given to the students in the experimental group for 5 weeks, but no intervention was made to the students in the control group. The sessions of trainings were carried out as group education. After the training program of the students in the experimental group was completed, the posttest data of both the experimental and control groups were collected. The students filled data collection forms. It took an average of 10-15 minutes to fill out each form.

The content of the Technology Addiction Awareness Training was prepared by the researchers. After the Technology Addiction Awareness Training program was prepared, opinions were received from 5 experts in their fields. The training program was finalized in line with expert opinions. In the study, Technology Addiction Awareness Training was applied by the researchers. The content of Technology Addiction Awareness Training is given in Table 1.

Technical materials such as computers, projectors, smart boards and sound systems were used in the training sessions. Technology Addiction Awareness Training continued for 5 weeks, one class hour per week (40 minutes), and was completed in 5 sessions.

The content of the Technology Addiction Awareness Training sessions was determined as follows:

Session 1: In this session, it was aimed to introduce Technology Addiction Awareness Training and to get to know the students in the experimental group. In this session, the researcher explained the content of Technology Addiction Awareness Training, the frequency and schedule of training program, and the importance of regular participation in the training. The pretest data of the students in the experimental group were collected.

Session 2: In this session, high school students were informed about the concept of technology, technology addiction, the causes of technology addiction, individuals at risk for technology addiction and the symptoms of technology addiction.

Session 3: In this session, high school students were informed about the negative effects of technology addiction on physical, psychological and mental health and social and spiritual development.

Session 4: In this session, high school students were told about the ways to avoid technology addiction and how to use technology correctly and beneficially.

Session 5: In this session, high school students who participated in Technology Addiction Awareness Training were asked to evaluate the program. The researchers listened to the criticisms and suggestions of the high school students in the experimental group about the training program. Posttest data of high school students in the experimental group were collected.

Variables about Study

Dependent Variable: Technology Addiction

Independent Variable: Technology Addiction Awareness Training

Control Variables: Students' ages, genders, mothers' and fathers' education status, family types, income status of the families, possessing their own mobile phones and computers, presence of internet in their houses, mostly used social medias, playing digital games and total time they spend on the internet daily. Information on the control variables of high school students in the experimental and control groups is given in Table 1.

Table 1. Distribution of Technology Addiction Awareness Training Content by Sessions

Session	Subject Content	Training Material	Duration
Session 1	- Meeting high school students - Introducing the content of the training program - Determination of days and time of training - Filling in pretest data collection forms		40 min.
Session 2	-What is Technology? -What is technology addiction? -What are the reasons of technology addiction? -Who are under risk of technology addiction? -What are the symptoms of technology addiction?	- PowerPoint Presentation - Video demonstration	40 min.
Session 3	- What are the negative effects of technology addiction on physical, psychological and mental health? - What are the negative effects of technology addiction on social and spiritual development?	-PowerPoint Presentation - Video demonstration	40 min.
Session 4	- What are the protection ways from technology addiction? -To what degree is it true and beneficial the use of technology?	-PowerPoint Presentation -Video Demonstration	40 min.
Session 5	-Evaluation of training program -Feedback from high school students about training program -Filling in posttest data collection forms		40 min.

When the demographic characteristics of the high school students in the experimental and control groups participating in the study were examined, it was observed that 84.6% of the students in the experimental group were female, 30.8% of mothers were illiterate, 38.5% of the fathers were secondary school graduates, 92.3% of them were children of nuclear families and 50.0% families had a financial income equal to their expenses, 65.6% had their own mobile phones, 53.8% did not have their own computers, 57.7% had an internet connection at home. Besides, they used social networks, such as Instagram (88.5%), WhatsApp (84.6%), Youtube (76.9%); and 61.5%

did not play digital games, their average age was 17.03±0.91 years, and it was determined that they spent an average of 3.30±2.57 hours on the internet.

On the other hand, 82.1% of the students in the control group were female, 53.6% of mothers were graduate of primary schools and 39.3% of fathers were graduate of high schools, 92.8% had a nuclear family, and 64.3% had an income which was equal to their expenses, 85.7% had their own mobile phones, 67.9% did not have their own computers, and 89.3% had an internet connection at home and they used social medias, mostly Instagram (85.7%), WhatsApp (75.0%), Youtube (67.9%), and (82.1%) of them did not play digital games, their average age was 16.17±0.47 years. In addition, it was found that they spent 3.21±1.37 hours on average on the internet daily. High school students in the experimental and control groups were found to be largely similar in terms of demographic characteristics (Table 2).

Table 2. Comparison of control variables of students in experimental and control groups

Demographic Characters	Experimental group (n=26)		Control group (n=28)		Similarity
	S	%	S	%	
Gender					
Female	22	84.6	23	82.1	χ^2=0.059
Male	4	15.4	5	17.9	p=0.808
Mother's education level					
Illiterate	8	30.8	6	21.4	
Primary school	7	26.9	15	53.6	F=6.825
Secondary school	6	23.1	3	10.7	p=0.123
High school	5	19.2	4	14.3	
University	-	-	-	-	
Father's education level					
Illiterate	2	7.7	-	-	
Primary school	4	15.4	7	25.0	F=3.318
Secondary school	10	38.5	9	32.1	p=0.569
High school	8	30.7	11	39.3	
University	2	7.7	1	3.6	
Family Type					
Nuclear Family	24	92.3	26	92.8	F=1.355
Large Family	2	7.7	1	3.6	p=0.798
Single Parent family	-	-	1	3.6	

Income Status of Family					
Less income than expenses	12	46.2	3	10.7	F=10.516 p=0.005
Income equal to expenses	13	50.0	18	64.3	
Income more than expenses	1	3.8	7	25.0	
His/her Own Mobile Phone					
Available	17	65.6	24	85.7	χ^2=3.048
Unavailable	9	34.6	4	14.3	p=0.081
His/her own computer					
Available	12	46.2	9	32.1	χ^2=1.114
Unavailable	14	53.8	19	67.9	p=0.291
Internet connection at home					
Available	15	57.7	25	89.3	χ^2=5.458
Unavailable	11	42.3	3	10.7	p=0.019
Social medias used					
Twitter					
Yes	3	11.5	4	14.3	F=0.090
No	23	88.5	24	85.7	p=0.764
Instagram					
Yes	23	88.5	24	85.7	F=0.090
No	3	11.5	4	14.3	p=0.764
Tiktok					
Yes	4	15.4	6	21.4	F=0.049
No	22	84.6	22	78.6	p=0.825
WhatsApp					
Yes	22	84.6	21	75.0	χ^2=0.768
No	4	15.4	7	25.0	p=0.381
Youtube					
Yes	20	76.9	19	67.9	χ^2=0.552
No	6	23.1	9	32.1	p=0.457
Snapchat					
Yes	9	34.6	6	21.4	χ^2=1.169
No	17	65.4	22	78.6	p=0.280
Digital game playing					
Yes	10	38.5	5	17.9	χ^2=2.853
No	16	61.5	23	82.1	p=0.091
X±S.S					
Age	17.03±0.91		16.17±0.47		t=4.376 p=0.107
Time spent on internet daily (hour)	3.30±2.57		3.21±1.37		t=0.168 p=0.867

* χ^2= Pearson Chi-square, F=Fisher's Exact test, t= Independent Samples t test, p<0.05 significance value

Analysis of Study Data

Data of the study were analyzed using SPSS (Statistical Package for the Social Sciences) 26.0 package program. The skewness and kurtosis values of the pretest and posttest total scores of the experimental and control groups were checked for compliance with the normal distribution, and the distributions of the scores were accepted as normal if the coefficients of these values were between -1.5 and +1.5 (Tabachnick & Fidell, 2013).

Descriptive statistics such as number, percentage, mean, standard deviation and the chi-square test were used to evaluate the data, which were found to have normal distribution as a result of the analyses. In comparison of Young Internet Addiction Test Short Form mean scores of the students in the experimental and control groups, independent samples t test and dependent samples t test were used.

The Ethic Dimension of the Study

Approval was obtained from Batman University Scientific Ethics Committee (dated 04.01.2023 and numbered 2023-01-38) to conduct the study. After obtaining the approval of the ethics committee, institutional permission was obtained from the Provincial Directorate of National Education (dated 21.03.2023 and numbered 70715415). Written consents were obtained from high school students and their parents who agreed to participate in the study before the data were collected. After explaining the purpose of the research, the high school students participating in the research were informed that the information they provided would not be used anywhere other than this study, and that this information would be kept confidential and that the students had the right to withdraw from the research at any time.

Results

The Young Internet Addiction Test Short Form pretest posttest descriptive statistics of high school students in the experimental and control groups are given in Table 3. As seen in Table 3, while Young Internet Addiction Test Short Form score average of the high school students in the experimental group who participated in the research before the Technology Addiction Awareness Training program prepared for high school students was 27.76±8.50 (Min;12- Max;51), after training program, Young Internet Addiction

Test Short Form mean score turned out to be 19.96±12.65 (Min;12- Max;46).

Table 3. Descriptive Statistics of Young Internet Addiction Test Short Form Scores

Scale	Test	Experimental Group (n=26)			Control Group (n=28)		
		(X̄±S.S)	Min.-Max.	Skewness/ Kurtosis	(X̄±S.S)	Min.-Max.	Skewness/ Kurtosis
YIAT-SF	Pre-Test	27.76 ± 8.50	12 - 51	-0.106/ -1.267	28.60 ± 10.53	19-49	0.546/ -0.689
	Post-Test	19.96 ± 12.65	12 - 46	0.806/ -1.362	31.35 ± 10.70	13-56	0.478/ -0.781

Young Internet Addiction Test Short Form mean score of the high school students in the control group to whom Technology Addiction Awareness Training program was not applied was found to be 28.60±10.53 in the pretest (Min;19-Max;49) and 31.35±10.70 in the posttest (Min;13-Max;56). It was determined that the skewness and kurtosis values of Young Internet Addiction Test Short Form pretest and posttest scores of high school students in the experimental and control groups were between -1.5 and +1.5, and therefore the data showed a normal distribution (Table 3).

When Young Internet Addiction Test Short Form pretest and posttest mean scores between the experimental and control groups of high school students were analyzed, it was determined that the difference between the mean scores was statistically significant ($p<0.05$, Table 4). It was determined that Young Internet Addiction Test Short Form posttest mean score of the high school students in the experimental group decreased compared to the pretest, while Young Internet Addiction Test Short Form posttest mean score of the high school students in the control group increased compared to the pretest mean score ($p<0.05$, Table 4).

When the in-group Young Internet Addiction Test Short Form of high school students in the experimental and control groups was analyzed with the pretest-posttest mean score; it was determined that the difference between the mean scores was statistically significant ($p<0.05$, Table 5).

Table 4. Comparison of the Young Internet Addiction Test Short Form pretest-posttest mean scores of high school students in the experimental and control groups between groups (n=54)

Young Internet Addiction Test Short Form			
Groups	Pretest	Posttest	*Test and Significance
	(X̄±S.S)	(X̄±S.S)	
Experimental Group (n=26)	27.76±8.50	19.96±12.65	t=-2.860 p=0.006
Control Group (n=28)	28.60±10.53	31.35±10.70	t=-3.052 p=0.004

* Independent Samples t test, p<0.05 significance value

It was determined that the post-test mean score of the Young Internet Addiction Test Short Form (19.96±12.65) of the high school students in the experimental group decreased compared to the mean score of the pretest (27.76±8.50) ($p<0.05$, Table 5).

Table 5. Intra-group comparison of Young Internet Addiction Test Short Form pretest-posttest mean scores of high school students in the experimental and control groups (n=54)

Young Internet Addiction Test Short Form			
Groups	Pretest	Posttest	*Test and Significance
	(X̄±S.S)	(X̄±S.S)	
Experimental Group (n=26)	27.76±8.50	19.96±12.65	t=2.378 p=0.025
Control Group (n=28)	28.60±10.53	31.35±10.70	t=1.239 p=0.226

* Paired Samples t test, p<0.05 significance value

Discussion and Conclusion

Due to their age and developmental characteristics, adolescents are at serious risk of technology addiction. Because adolescence is a period when the adolescent wants to be understood, needs the most accurate and healthy interaction with parents, teachers and peers, and needs psychological, social and academic support, and especially tries to understand what his/her role is in society. During this period, the adolescent tries to form a healthy identity, but the negative conditions (parental attitudes, problems in family relations, loneliness, inadequacy in academic success, communication problems with peers, etc.) may cause role confusion in him/her (Trumello et

al., 2021). This situation causes the adolescent to be interested in other areas. In the light of this information, in this section, the findings of the research carried out to evaluate the effectiveness of the Technology Addiction Awareness Training given to high school students are discussed in line with the literature.

In the study, it was determined that after the Technology Addiction Awareness Training, the posttest average score of Young Internet Addiction Test Short Form of the high school students in the experimental group decreased compared to the pretest point average. In line with the data obtained from the research, it can be interpreted that Technology Addiction Awareness Training program creates an awareness in high school students about the risks of technology addiction, its negative effects on physical and mental health and social and spiritual development, and how technology can be used correctly and beneficially. In the last session, it was stated by the students that the information given in the training content about the risk factors and symptoms of technology addiction created an awareness in them about their own situation. In addition, it was observed that the post-test mean scores of the students in the control group, who did not receive any training on technology addiction, increased compared to the pre-test mean scores, and the increase in the post-test scores, despite the lack of any training and information on the subject, suggests that there is a risk for the development of technology addiction in adolescents in the future.

A systematic study was conducted by Hamarta et al., (2021) using terms such as internet addiction, psychoeducation etc.. As a result of this study, it was concluded that the experimental attempts made on internet addiction were effective on one of the sub-dimensions of technology addiction. Considering the results of a systematic analysis examining the programs prepared to prevent internet addiction in adolescents, it was stated that the results of the studies carried out to reduce internet addiction in this period were positive (Bağatarhan & Siyez, 2017). In the study conducted by Özcan and Çelik (2021), it was reported that the psychoeducation program based on Motivational Interview Technique developed for high school

students effectively reduced the addiction scores of students who did not reach the addiction criteria. Erses and Müezzin(2018), in their research with high school students, concluded that Human Values-Oriented Psycho-Education Program is effective in reducing the use of technology in high school students. According to the results of the study conducted by Dicle (2018), in which the effect of the psycho-education program on internet addiction was investigated, it was concluded that the psycho-education provided for thr individuals was effective in reducing internet addiction. In addition, there are other experimental studies supporting our study in the literature (Browne, 2021; Park & Kim, 2011).

In the study, it was concluded that the Technology Addiction Awareness Training given to high school students is effective in reducing technology addiction. In the light of the research results, it can be said that Technology Addiction Awareness Training is an effective and usable intervention in reducing technology addiction in high school students. In line with these results, it is recommended to carry out more studies on technology addiction, and conduct more informative trainings on the use of technological tools and the internet in adolescents.

Limitations: The limitations of this study are that the permanence of the training intervention was not measured and the study was conducted only with 11th grade students. In addition, data collection using a self-report questionnaire in the study may have biased the findings.

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