

Perceived-teacher presenteeism scale: A scale development study

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Abstract: This study aims to develop and test the reliability and validity of a multi-item teachers' perceived presenteeism behavior scale. For this, first of all, a semi-structured interview form was applied to 57 teachers, an item pool was formed for the presenteeism scale with the data obtained, and the draft form of the scale was prepared in line with the expert opinions. Then, the draft scale form was applied to 382 teachers, and exploratory factor analysis was performed with the data obtained. As a result of the analysis, a three-dimensional scale structure consisting of 14 items was obtained. Data were collected from 303 teachers to confirm this structure, and the three-factors scale structure was confirmed based on acceptable fit values with confirmatory factor analysis. It was determined that the validated second-order three-factor model provided convergent and discriminant validity criteria. The measurement invariance of the scale according to gender, marital status, and age groups was tested, and it was observed that the same structure was measured in different groups. Cronbach Alpha internal consistency coefficient and composite reliability values showed that sufficient reliability values were achieved for the scale. Finally, the test-retest performed to test its stability showed that the scale was stable. Thus, it was concluded that the scale is valid and reliable with sufficient conditions to measure the teachers' perceptions of presenteeism.

1. INTRODUCTION

Continuing to work in inappropriate biopsychosocial conditions, referred to in the literature as presenteeism (Vera-Calzaretta & Juarez-Garcia, 2014). Research on presenteeism have shown that this experience has negative psychological effects on employees (Baker-McClearn et al., 2010; Cooper & Lu, 2016); organizational functioning (D'Abate & Eddy, 2007; Ferreira & Martinez, 2012), and affects production relations negatively (Gilbreath & Karimi, 2012). In addition, it was revealed that the negative effects on productivity resulted in a costly loss of approximately 150 billion USD in the USA (Hemp, 2004) and 225 billion Euros in Germany (Abasilim et al., 2015) over one year.

Despite these negative consequences, presenteeism is a new phenomenon for organizational researchers, and a consensus on its definition has yet to be reached (Cooper & Lu, 2016). Certain researchers (e.g., Aronsson et al., 2000; Dew et al., 2005; Kivimäki et al., 2005; Turpin et al., 2004) define presenteeism as the employees being at work while sick, merely by

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associating it with the sickness. However, some other researchers (e.g., D'Abate & Eddy, 2007; Evans, 2004; Johansson & Lundberg, 2004) define presenteeism as the employee's continuing to work despite the circumstances that prevent them from revealing the authentic performance in the workplace. Therefore, according to these researchers, presenteeism is defined as an experience that occurs as a result of many factors (chronic illness, workplace stress, non-work related occupations, special situations related to the employee and negative environmental factors, etc.). However, the tools used to measure the phenomenon in the literature have been developed based on the meaning of the employee continuing to work while sick (e.g., Aronsson et al., 2000; Koopman et al., 2002; Lohaus & Habermann, 2019; Lu et al. 2013; McGregor et al., 2016; Miraglia & Johns, 2016). These tools, which usually consist of one or two-item questions, are designed to measure the frequency of presenteeism (going to work while sick) or the loss of productivity caused by the presenteeism. For this reason, these measurement tools ignore the various dynamics (other than the disease) that the phenomenon may be associated with and its negative consequences other than loss of productivity.

Due to the lack of literature in this area, it is aimed to develop a presenteeism scale in this study according to the perceptions of teachers, who are considered as one of the occupational groups that have experienced presenteeism the most (Bergström et al., 2009; Lohaus & Habermann, 2019), taking into consideration the broadening meaning of presenteeism and its consequences other than loss of productivity.

1.1. What is Presenteeism?

There is inconsistent (Johns, 2011) and complex (Wang et al., 2010) literature on what presenteeism is. Three different research lines related to the concept can be mentioned. The first line of research -especially from European Researchers- defines presenteeism as “continuing to work while sick” (Johns, 2010) examines the phenomenon in a reductionist perspective by distinguishing its premises and consequences. This perspective focuses on factors related to employees, working conditions, and environmental factors associated with presenteeism (Karanika-Murray & Cooper, 2019).

The second line of research, represented by North American researchers (Johns, 2010) defines presenteeism as a loss of productivity due to continuing to work despite health problems (Goetzel et al., 2004; Turpin et al., 2004). This perspective focuses on measuring the loss of productivity caused by presenteeism (Goetzel et al., 2004; Koopman et al., 2002) and necessary medical interventions for emerging physical health problems (Ammendolia et al., 2016).

The first two perspectives formulate presenteeism within the framework of physical health problems, and this situation is called *Sickness Presenteeism* in the literature. Research that covers the concept more broadly and can be considered as a third line, in addition to physical health problems that will prevent the employee from performing optimally and collecting cognitive energy at work, stress (Gilbreath & Karimi, 2012), depression (Wang et al., 2010), non-work related deals (D'Abate & Eddy, 2007), environmental elements (Hansen & Andersen, 2008), etc. by associating variables with the phenomenon, it defines presenteeism as physically present, but functionally disappeared (Cooper & Lu, 2016). This perspective associates the state of being unwell that will prevent the employee from performing at a high level while at work, with the employee's health problems and organizational, individual and environmental variables. In this study, presenteeism is evaluated within the framework of the third line.

1.2. Presenteeism as a State of Unwell

Presenteeism studies generally focus on the health problems underlying dysfunction in the workplace (Evans, 2004; Johansson & Lundberg, 2004; Turpin et al., 2004). These studies concentrate on physical health problems such as allergies, diabetes, arthritis, asthma, heart

disease, hypertension, migraine/headache, fatigue, respiratory tract infections, neck and back pain (Aronsson et al., 2000; Baker-McClearn et al., 2010; Caverley et al., 2007; Kivimaki et al., 2005). However, the World Health Organization (WHO) defines health as a state of complete physical, mental and social well-being (Witmer & Sweeney, 1992).

Well-being, which is defined as a three-dimensional situation, is effective in increasing the capacity of the employee to use their abilities (Myers & Williard, 2003) and on their performance and productivity in the workplace. The negativity that may arise in any of these dimensions can hinder the energy to perform a task, attention, and motivation (Kiefer, 2008). Therefore, it would be incomplete to consider presenteeism as a process that starts with only physical health problems. Because presenteeism is an experience that begins with the employee's decision to continue working in inappropriate biological, psychological and social conditions (Vera-Calzaretta & Juarez-Garcia, 2014), and physical health problems can be associated with psychological and mental well-being variables that will put a person in a negative well-being state.

1.3. Presenteeism as a Fearful Process

Presenteeism associated with high cost losses was found to be more costly than absenteeism (Cooper & Dewe, 2008). Cross-sectional (Conner & Silvia, 2015; Miraglia & Johns, 2016) and longitudinal studies (Beswick et al., 2018; Chen et al., 2021; Demerouti et al., 2009; Lu et al., 2013) on the subject revealed that presenteeism predicts various negative outcomes. As a matter of fact, productivity in organizational life (Goetzel et al., 2004; Hemp, 2004; Turpin et al., 2004) is negatively associated with work speed, service quality, and organizational creativity (Gilbreath & Karimi, 2012); it is positively associated with work repetition, error rate, and work accidents (D'Abate & Eddy, 2007). It negatively affects employee's mental health, social relationships, physical health (Lu et al., 2013), performance (Berger et al., 2003), work energy (Roe, 2003), teamwork (Borrill et al., 2000), business relations and service quality (Borrill et al., 2000). As a result, presenteeism, which creates a perception of ineffectiveness in the workplace (Ferreira & Martinez, 2012), can be considered a fearful process that must be taken precautionary.

1.4. Teacher Presenteeism

Various variables are considered as basic dynamics that enable teachers to experience presenteeism by hindering them from taking absences based on excuses such as the importance of education-training for the future of students (Aronsson & Gustafsson, 2005) and the high sense of responsibility it creates (Widera et al., 2010), society's expectations from education and training (Grant, 2008), the perception that a teacher cannot be replaced in absenteeism (Caverley et al., 2007). Also, factors such as unsupportive organizational policies (Wrate, 1999), oppressive attitudes of the administration that do not have sufficient information about the effects of presenteeism, and an organizational climate that sees absenteeism as illegitimate (Dew et al., 2005) make teachers potential candidates for the experience of presenteeism. Therefore, teachers are among the employees who experience presenteeism the most (Aronsson et al., 2000; Bergström et al., 2009; Ferreira & Maritnez, 2012).

Intense and widespread experience of presenteeism among teachers may hinder creating and developing a positive and supportive school environment (Jennings & Greesnberg, 2009). It limits a healthy relationship with colleagues and students and a functional participation in the education-training process by predicting a negative mood. It may trigger failure in classroom management (Jennings & Greesnberg, 2009), the loss of the ability to be a correct model for students (Kidger et al., 2016) and weakening of belief in providing healthy guidance (Sisask et al., 2014). Considering these effects, presenteeism, which can cause psychological problems (Perez-Nebra et al., 2020) and learning difficulties (Jennings & Greesnberg, 2009) for students,

can be evaluated as a process that must be taken into consideration in terms of education. No scale has been found in the literature to measure teachers' perceptions of Presenteeism, an experience that cannot be ignored. Therefore, it is important to bring the perceived teacher presenteeism scale, which can be used in presenteeism studies, to the literature. In this context, it is aimed to develop the Perceived-Teacher Presenteeism Scale (P-TPS) in the study.

2. METHOD

2.1. Research Model

This study aimed to develop the perceived teacher presenteeism scale by using a sequential investigative design from mixed methods research. Exploratory sequential design is a sequential process in which the researcher begins qualitative research and continues using a quantitative sequence (Creswell & Plano Clark, 2011). In the study, first of all, a scale item pool regarding presenteeism was created with qualitative data, and the content validity of the item pool was tested by consulting with the field experts. Then, the validity and reliability analyzes of the scale were carried out with the quantitative data that had been collected.

2.2. Study Group

To collect the data to be used in the study, ethical approval was obtained (Ethic no: 20.01.2021-E-97132852-302.14.01-6275), and the research application permission was obtained from Elazığ Governorship Provincial Directorate of National Education (Ethic no: 19.04.2021- E-79137285-605.01). For this study, which was carried out in four stages, data collected from four different study groups were used. During the 2021-2022 academic year, all study data were collected from teachers working in Elazığ's city center. The researchers collected the data by personally interviewing the teachers. It was checked whether there was missing data in the data sets, and incompletely filled forms were removed from the data set. In the first stage, which was carried out in the form of qualitative analysis, the opinions of 57 teachers selected by purposive sampling were taken with a semi-structured interview form. In the second stage, the scale was applied to 382 high school teachers, and these data were used in Exploratory Factor Analysis (EFA). In the third stage, data collected from 303 secondary school teachers were used for Confirmatory Factor Analysis (CFA) and measurement invariance analyses. In the fourth stage, data were collected from 109 primary school teachers for test-retest reliability analysis. Information about the research participants is presented in [Table 1](#).

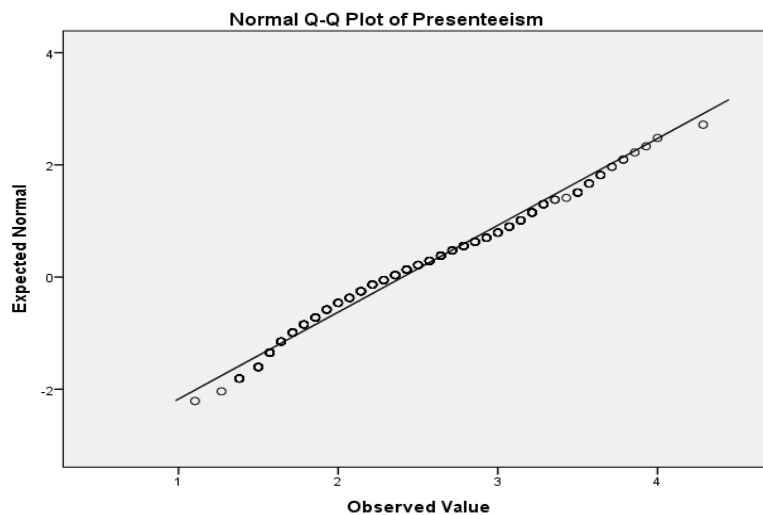
Table 1. Demographic information of participants.

		1. Step	2. Step	3. Step	4. Step
		N = 57	N = 382	N = 303	N = 109
Gender	Female	32	200	136	63
	Male	25	182	167	46
Marital Status	Married	36	287	193	87
	Single	21	95	110	22
Age	21-30	8	70	71	-
	31-40	18	131	86	23
	41-50	17	124	88	50
	51-60	11	55	58	35
	61+	3	2	-	1
Instructional Positions	Pre-school	14	-	-	-
	Primary school	17	-	-	109
	Secondary School	12	-	303	-
	High school	14	382	-	-

2.2. Data Analysis

In this study, it was suggested by DeVellis (2003) to be followed in scale development studies; drawing the conceptual and theoretical framework of the variable to be measured, creating the item pool, determining the measurement method, evaluating the item pool by experts, reliability analysis, validity analysis, and finalizing the scale were followed. First, qualitative data were subjected to descriptive and content analysis in the study, and then opinions on content validity were obtained from three education administration field experts and one measurement and evaluation expert. For the semantic validity of the scale, the opinions of two Turkish language experts were consulted. Then, in order to test the comprehensibility of the scale, a focus group interview was held with five teachers, and after it was determined that the scale was comprehensible, factor analysis was started. Kurtosis and skewness values were checked to see if the data sets met the univariate normality, and Mahalanobis distance values and Q-Q graph were checked for the multivariate normality. Since the kurtosis and skewness values are in the range of ± 1 the univariate normality assumption was met (Cokluk et al., 2010). The multivariate normality assumption was provided since Mahalanobis distance values approaching zero were obtained (Seçer, 2015) and as seen in Figure 1, the points were close to the 45-degree reference line on the Q-Q plot.

Figure 1. Q-Q plot graph.



For factorization, EFA was performed with the help of the SPSS 22 package program. Kaiser-Meyer-Olkin (KMO) sample adequacy coefficient and Bartlett's Sphericity Test results were examined for the suitability of the data for factor analysis. Since the Bartlett's Test of Sphericity is significant and the KMO value is more than .60, the data are appropriate for factor analysis (Tabachnick & Fidell, 2007). Maximum Likelihood (ML), which is based on the normality assumption and made with continuous indicators, and the direct oblimin rotation technique, which is one of the oblique rotation techniques based on the assumption that the factors are related (Cokluk et al., 2010), were used as factorization techniques. $\geq .50$ criterion was determined for item factor loads (Hair et al., 1998). Item evaluation was carried out according to the factor loadings of the items and the common factor variance (h^2) criterion they explained. In order to verify the scale structure revealed by EFA, CFA was performed with the help of Mplus 7.5 with the ML parameter estimation method, which is used in continuous variables and assumes multivariate normality. It is recommended to use CFI (Comparative Fit Index), TLI (Tucker-Lewis Index), RMSEA (Root Mean Square Error of Approximation), and SRMR (Standardized Root Mean Square Residual) fit criteria to evaluate model fit in CFA (Xu & Tracey, 2017). In addition to these values, Kline (2011) states that the relative chi-square (χ^2/df)

is an important criterion for model fit. In the evaluation of CFA fit indices, CFI and TLI values above .95, RMSEA and SRMR values less than .05, and χ^2/df values less than 2 are perfect fit; CFI and TLI values .90-.95, RMSEA value of .05-.08, SRMR value between .05-1 and χ^2/df value below 3 indicate acceptable fit (Hu & Bentler, 1999; Kline, 2011). While comparing alternative models that are not nested in CFA, Akaike's information criterion (AIC) was used with the χ^2 difference test. It was accepted that the model with a lower AIC value had a better fit (Barnes & Moon, 2006).

After the scale structure was verified, measurement invariance analysis was conducted to show whether the scale had the same parameter values in different groups. Measurement invariance is a necessary prerequisite for group comparison studies (Vandenberg & Lance, 2000). Therefore, measurement invariance is an important application in the scale development process (Şen, 2020). Failure to ensure measurement invariance may result in erroneous interpretations and results of any group comparisons (Byrne, 2008). In this study, measurement invariance of the scale was tested in terms of categorical variables of gender, marital status, and age.

Each of the measurement invariance, configural, metric, scalar, and strict invariance models are analyzed by comparing them with the previous model and evaluating the change in χ^2 . The χ^2 difference test ($\Delta\chi^2$) is used to compare nested models (Brown, 2006; Tabachnick & Fidell, 2007). The non-significant difference for each model is shown as evidence of measurement invariance. However, since the χ^2 test is sensitive to sample size, it is stated that alternative fit values such as ΔCFI and $\Delta RMSEA$ can be used for measurement invariance in nested model comparisons. Chen (2007) indicates that the values of $\Delta CFI \leq -0.010$ and $\Delta RMSEA \leq 0.015$ are good cut-off points for the invariance decision for samples greater than 300. In this study, ΔCFI and $\Delta RMSEA$ criteria were evaluated together with χ^2 difference tests.

The scale's convergent validity, discriminant validity and reliability were tested using CFA data. Because it calculates the Cronbach Alpha coefficient by equally evaluating the factor load values and error variances of the items, the composite reliability (CR) coefficient gives stronger results than the Cronbach Alpha coefficient (α) in reliability calculations in multidimensional scales (Raykov, 1998). For this reason, the Cronbach Alpha coefficient was tested with the composite reliability coefficient. For convergent validity, it is expected that all CR values for the scale ($CR > .70$) are greater than AVE (Average Variance Extracted) values, and the AVE value is expected to be greater than .50. For discriminant validity, CR should be $> .70$, and AVE should be $> .50$ ($CR > AVE$), and the square root of the AVE of each construct should be larger than the correlation of the specific construct with any of the other constructs (Fornell & Larcker, 1981). Hair et al. (2014) say that for a scale to be reliable, its Cronbach's alpha internal consistency coefficient and CR value must be above .70. At the last stage, test-retest reliability analysis was performed to test the scale's stability. In the test-retest reliability analysis, the scale's stability depends on the correlation value between the structures measured at different times approaches 1, and the correlation value is significant (Gravesande et al., 2019).

3. RESULT

In this part, findings related to the validity and reliability of the scale have been presented respectively.

3.1. First Stage

In this study, presenteeism, which is examined following the third tradition, is defined as a process that starts with the employee's working and foresees various negative results despite their unwellness. Based on this definition and the literature, a semi-structured interview form consisting of three questions was prepared. The prepared form was submitted to review two experts from the field of educational administration, and necessary corrections were made

according to the feedback. In addition, it was examined by a measurement and evaluation expert to check the form in terms of scientific research logic and a Turkish language expert examined it to determine the points that were not understood. Due to the ambiguous meaning of a question, it was changed and the form was given its final form. It was the way the questions were;

1. Have you continued to work at school in the last month even though you did not feel well (psychologically, physically, or mentally)? (Yes/No).
2. If your answer is yes, what were the factors/reasons that prevented you from feeling well?
3. What were the consequences of continuing to work despite not feeling well?

3.1.1. Creation of the item pool

The data collected from the teachers with a semi-structured interview form were analyzed separately by three researchers. It was created by content analysis which can predict the results of the work, despite the factors that make it unwell and unwell at work. The premises and outcomes reached by each researcher have been listed, and the results were compared. Specific premises and outcomes were cocompiled under more general premises and outcomes, and the decisions were tabulated on them (Table 2).

Table 2. Premises and outcomes of unwellness.

Premises	f	Presenteeism		f	%
		%	Outcomes		
Economic uncertainty in the	43	12.1	Distraction/inability to focus	32	16.2
Epidemic diseases	39	11.0	Unproductiveness	28	14.1
Economic problems	35	9.9	Lack of motivation	25	12.6
Authoritarian principal behaviors	27	7.6	Disruption of business	19	9.6
Family problems	27	7.6	Inability to use its capacity	19	9.6
Health problems	24	6.8	Inability to complete tasks	19	9.6
Students' discipline problems	23	6.5	Inability to be energetic	17	8.6
Unfair management style	20	5.6	Unrest	12	6.1
Natural disasters	19	5.4	Business Failure/Fault	8	4
Psychological problems	17	4.8	Inability to give oneself to the lesson	8	4
Stressful environment at school	16	4.5	Forgetfulness	6	3
Time pressure	16	4.5	Inability to pick up what to teach	5	2.5
Incompetent managers	14	3.9			
Excessive workload	13	3.7			
Exclusion	6	1.7			
Hygiene problems	3	0.8			
Political conflicts	2	0.6			
Visual and noise pollution	2	0.6			
Adverse climatic conditions	1	0.3			
Negative changes in legislation	1	0.3			
The absence of teacher career ladders	1	0.3			
Private affairs	1	0.3			
Crowded classes	1	0.3			
Works performed outside of education and training	1	0.3			
Polarizations in school	1	0.3			
Disregard	1	0.3			
Being ignored	1	0.3			

For example, blood pressure, heart disease, rheumatoid arthritis, diabetes, seborrheic dermatitis, etc., health problems; burn-out, depression, obsession, psychological problems; reluctance, demoralization, etc., were grouped under the heading of low motivation. After these results were confirmed by 10 teachers from the same participant group, the item was written. The algorithm prepared in the computer program and the causes and results of being unwell were matched to create the item pool. The algorithm is based on the principle of combining the most emphasized result of the participants stating a certain reason. For example, "focus", which is the most emphasized result of the participants who stated "family problems", was brought together and the scale item "I have no problem focusing on my work at school despite my family problems (reverse item)" was created. In this way, a meaningful 27-item pool was created about presenteeism.

The focus group interview technique was used to analyze the item pool. Focus group interviews are the exchange of views between 4-12 people on the subject of interest under the guidance of a researcher (Marshall, 1999). This technique, built on a discussion strategy on a certain subject, aims to clarify a subject, to clarify, to reveal incomprehensible points, and reach a maximum level of consensus. In this context, focus group interviews were conducted with 5 teachers, each from a different branch, to evaluate the items and to determine whether there were items that were not understood. The items were distributed to these five teachers before the interview, and they were asked to review them. In the interview, which lasted an average of 30 minutes, it was decided to remove seven items that were considered to have the same meaning or had ambiguous expressions from the pool and to make changes in the expressions of four items. The corrected item pool was examined by three educational administrators and an assessment and evaluation expert in terms of content and construct validity and by two Turkish language field experts in terms of semantic validity to get their opinions on content validity and expressions. In the light of expert opinions, 3 more items were removed from the pool, and the expressions (in terms of results) of two items were changed. As a result, a 17-item scale form was created, four of which were reverse items. The scale was graded in a five-point Likert type as "Always (5)", "Mostly (4)", "Sometimes (3)", "Rarely (2)" and "Never (1)" considering the item statements.

3.2. Second Stage

At this stage, it was aimed to determine the factor structure of the 17-item scale and to make item analyzes.

3.2.1. Exploratory factor analysis

In the analysis performed to determine whether the sample is suitable for EFA, the KMO value .87 was found, and the sample adequacy condition was laid down. Bartlett's test of sphericity ($\chi^2 = 3474.11$; $df = 136$; $p = 0.00$) was found to be statistically significant, so it was determined that the data set was suitable for factor analysis. EFA results have been presented in [Table 3](#).

When [Table 3](#) is examined, it was seen that the scale, which was subjected to factor analysis, consisted of three factors with an eigenvalue higher than 1. It is stated that the item can be removed from the scale in cases where the difference between the loads under the two factors is less than .10 (Hair et al., 1998); therefore, two items were removed. The low common factor variance also indicates that the item should be removed from the scale (Kalaycı, 2010), so one item was removed for this reason. The eigenvalues and variances of the factors obtained were 4.56 (32.56), 2.18 (15.59), and 1.56 (11.16), respectively. All three factors together explain 59.31% of the total variance. It is seen that factor loads vary between .64 and .88.

Table 3. Exploratory factor analysis results for the scale.

	Factor Loads			h ²
	Factor 1	Factor 2	Factor 3	
I8- The school principal's authoritarian attitudes cause me to make mistakes in school.	.85			.66
I10- I can complete my tasks despite the excessive workload. *	.75			.61
I6- The stressful environment at school affects my professional performance negatively.	.71			.50
I7- The incompetence of school administrators affects my motivation negatively.	.71			.55
I12- The pressure of time I am exposed to by the managers consumes my energy.	.69			.51
I13- Despite the discipline problems of our school students, I can use my full capacity in my lessons. *	.68			.51
I9- Unfair attitudes and behaviors exhibited by school administrators make me feel restless at school.	.64			.51
I1- Despite my economic problems, I concentrate on my work at school. *		.88		.89
I2- Despite my family problems, I have no problem focusing on my work at school. *		.87		.72
I4- My emotional problems hinder my works at school.		.84		.70
I3- Because of my health problems, I cannot show the performance I want while teaching.		.74		.60
I15- I cannot concentrate on my works at school due to the economic uncertainties in the country.			.72	.53
I17- Due to epidemics (COVID-19, Flu, etc.), I cannot be as productive as I would like at school.			.72	.52
I16- Natural disasters and climate change affect my motivation at school negatively.			.70	.50
Eigenvalue	4.56	2.18	1.56	
Total Variance Explained %	32.56	15.59	11.16	

* Reversely coded items

The first factor consists of seven items with loads ranging from .64 to .85; the second factor consists of four items with load values between .74 and .88; the third factor consists of three items that take load values between .70 and .72. The common variance values (h²) being .50 and above have been seen as important evidence of the homogeneity of the scale (Çokluk et al., 2021; Thompson, 2004).

Organization-Related Presenteeism (OP), Individual-Related Presenteeism (IP), and Environment-Related Presenteeism (EP) were determined based on the contents of the items collected under the factors and the available literature.

3.3. Third Stage

At this stage, it was aimed to verify the scale structure obtained as a result of EFA and to test the measurement invariance. For this, the data of 303 secondary school teachers were used. Although there are different opinions, Comrey and Lee (1992) expressed that a participant group consisting of 300 people was good in their CFA analysis. Therefore, it can be said that the determined participant group (Table 1) is good according to the specified criteria.

3.3.1. Confirmatory factor analysis

CFA was conducted to validate the scale structure that emerged in EFA and to test alternative models. Three-factor, second-order, and one-factor CFA model fit values for the scale are shown in Table 4.

Table 4. Fit values of models related to factor structure of the PTP scale.

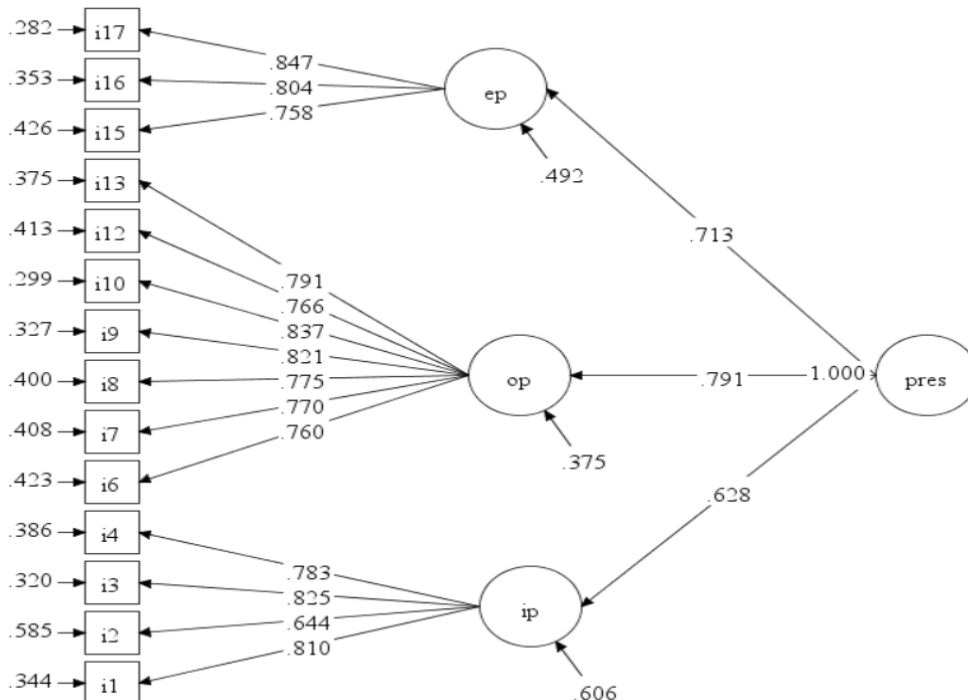
Modeller	χ^2	df	χ^2/df	$\Delta\chi^2$	RMSEA	CFI	TLI	SRMR	AIC
The-three factor model	150.69	74	2.03		.058	.968	.961	.032	9318.942
Second order- three factor model	150.69	74	2.03		.058	.968	.961	.032	9318.942
The one-factor model	775.16	77	10.06	624.47*	.173	.713	.660	.114	9937.409
Used model fit indices			≤ 3		<.05	>.95	>.95	<.05	

CFI: comparative fit index, TLI: Tucker–Lewis index, RMSEA: root mean square error of approximation, SRMR: standardized root mean square Residual

* $p < .001$

Comparing the three-factor model, second order-three-factor model, and the one-factor model in Table 4, it has been seen that the three-factor model and second-order three-factor models have good fit values. The fit values of the models were detected $\chi^2 = 150,693$ ($df = 74$; $p = .000$), $RMSEA = .058$ (90% CI = .045-.072), $CFI = .968$, $TLI = .961$, and $SRMR = .032$. χ^2/df was also below 3. We also tested the single-factor model, as the indicators showed high correlation values with each other. However, the fit values of the single factor model deteriorated compared to the other models ($\Delta\chi^2 = 624.47$, $p < .001$, $\Delta AIC = 555.467$), and the model fit values were outside the acceptable limits [$\chi^2 = 775.16$, $df = 77$; $p = .000$], $\chi^2/df = 10.06$, $RMSEA = .173$ (90% CI = .162-.184), $CFI = .713$, $TLI = .660$, and $SRMR = .114$]. Therefore, it can be said that the three-factor and second-order three-factor models have good fit values. Therefore, it can be said that the construct validity of the model created in EFA and conceptualized theoretically is ensured. The second-order three-factor model obtained from the CFA result of the scale is shown in Figure 2.

Figure 2. The second order-three factor confirmatory factor analysis model of the scale.



The second order-three-factor scale structure in Figure 2 was seen to vary the item loads of the “Organization-Related Presenteeism” factor between .760 and .837, the item loads of the “Individual-Related Presenteeism” factor between .644 and .825, and the item loads of the “Environment-Related Presenteeism” factor between .758 and .847.

The CR, AVE, the square root of AVE, and correlations between factors were calculated for the scale's convergent and discriminant validity, whose construct validity was proven by CFA. The results are presented in Table 5.

Table 5. Fit values of models related to factor structure of the PTP scale.

Factor	α	AVE	CR	1	2	3
1. IP	.84	.59	.85	.76*		
2. OP	.91	.62	.92	.50	.78*	
3. EP	.84	.64	.84	.51	.62	.80*

α = Cronbach Alpha; AVE = Average Variance Extracted; CR = Composite Reliability

* The square root of AVE

Table 5 shows that CR values for all factors are higher than .70, AVE values are higher than .50, and AVE values are lower than CR values. Thus, it can be said that the scale has convergent validity. CR values from AVE values and .70; likewise, the square roots of the AVE values were higher than the correlation values between the factors. These estimations show that the scale has discriminant validity. Therefore, although the scale measures conceptually similar concepts, it has been seen that the measurements are sufficiently different from each other. Both Cronbach Alpha and CR values show that all factors have high reliability.

3.3.2. Measurement invariance

The data obtained as a result of the measurement invariance analysis between the categorical variables of the scale's gender (female-male), marital status (married-single), and age (early adulthood-middle adulthood) are presented in Table 6.

Table 6. Measurement invariance fit indexes ($N = 303$).

Models	χ^2	df	SRMR	TLI	CFI	RMSEA	$\Delta\chi^2$	Δdf	p	ΔCFI	$\Delta RMSEA$
Female (N = 136)											
Male (N = 167)											
Configural model	238.395	148	.042	.955	.963	.063					
Metric model	248.455	159	.048	.958	.964	.061	10.060	11	.525	.001	-.002
Scalar model	266.275	170	.051	.958	.961	.061	17.820	11	.085	-.003	.000
Strict model	278.210	184	.053	.962	.962	.058	11.935	14	.611	-.001	-.003
Married (N = 193)											
Single (N = 110)											
Configural model	234.046	148	.040	.957	.965	.062					
Metric model	251.158	159	.050	.957	.962	.062	17.112	11	.104	-.003	.000
Scalar model	259.174	170	.053	.961	.964	.059	8.017	11	.711	.002	-.003
Strict model	268.597	184	.053	.966	.965	.055	9.423	14	.803	.001	-.004
Early adult (N = 157)											
Mid adult (N = 146)*											
Configural model	238.484	148	.041	.955	.963	.064					
Metric model	254.893	159	.052	.955	.961	.063	16.409	11	.126	-.002	-.001
Scalar model	271.579	170	.055	.956	.958	.063	16.685	11	.117	-.003	.000
Strict model	285.707	184	.062	.959	.958	.060	14.128	14	.440	.000	-.003

* This study was based on Levinson's (1986) age curve. The author includes the age range of 20-40 years in early adulthood; middle adulthood 40-60 years old; defines the age of 60 and above as late adulthood. Participants who are 40 years old are in the early adulthood group; The ones who are over the age of 41 were evaluated in the middle adult group.

When Table 6 is examined; configural model fit indexes according to gender (female-male) variable $\chi^2(148) = 238.395$; RMSEA = .063; CFI = .963; TLI = .955; and SRMR = .042. Metric model fit values $\chi^2(159) = 248,455$; RMSEA = .061; CFI = .964; TLI = .958; and SRMR = .048, and ΔCFI and $\Delta RMSEA$ values show that the metric invariance conditions were satisfied.

Scalar model fit values $\chi^2(170) = 266.275$; RMSEA = .061; CFI = .961; TLI = .958; and SRMR = .051 and Δ CFI and Δ RMSEA values show that scalar invariance conditions were satisfied. Strict model fit values $\chi^2(184) = 278,210$; RMSEA = .058; CFI = .962; TLI = .962; and SRMR = .053, and Δ CFI and Δ RMSEA values show that strict invariance conditions were satisfied. Therefore, the insignificance of the χ^2 difference test and the changes in CFI and RMSEA show that configural, metric, scalar and strict invariances for gender are fully satisfied.

Configural invariance model fit indexes in terms of marital status (married-single) variable $\chi^2(148) = 234.046$; RMSEA = .062; CFI = .965; TLI = .957; and SRMR = .040. Metric model fit values $\chi^2(159) = 251.158$; RMSEA = .062; CFI = .962; TLI = .957; and SRMR = .050 and Δ CFI and Δ RMSEA values show that the metric invariance conditions were satisfied. Scalar model fit values $\chi^2(170) = 259,174$; RMSEA = .059; CFI = .964; TLI = .961; and SRMR = .053, and Δ CFI and Δ RMSEA values show that scalar invariance conditions were satisfied. Strict model fit values $\chi^2(184) = 268,597$; RMSEA = .055; CFI = .965; TLI = .966; and SRMR = .053, and Δ CFI and Δ RMSEA values show that strict invariance conditions were satisfied. Thus, the insignificance of the χ^2 difference test and the changes in CFI and RMSEA show that the configural, metric, scalar and strict invariances for marital status are fully satisfied.

Configural invariance model fit indexes for age (early adult-mid adulthood) variable $\chi^2(148) = 238,484$; RMSEA = .064; CFI = .963; TLI = .955; and SRMR = .041. Metric model fit values $\chi^2(159) = 254.893$; RMSEA = .063; CFI = .961; TLI = .955; and SRMR = .052, and Δ CFI and Δ RMSEA values show that the metric invariance conditions were satisfied. Scalar model fit values $\chi^2(170) = 271.579$; RMSEA = .063; CFI = .958; TLI = .956; and SRMR = .055, and Δ CFI and Δ RMSEA values show that scalar invariance conditions were satisfied. Strict model fit values $\chi^2(184) = 285.707$; RMSEA = .060; CFI = .958; TLI = .959; and SRMR = .062, and Δ CFI and Δ RMSEA values show that strict invariance conditions were satisfied. Therefore, the insignificance of the χ^2 difference test and the changes in CFI and RMSEA show that the age variable's configural, metric, scalar and strict invariances are fully satisfied.

3.4. Fourth Stage

3.4.1. Test-retest

Test-retest technique was used to determine the stability of the scale. The scale was applied to the determined participants (Table 7) with an interval of 3 weeks, and the stability of the scale was tried to be estimated by calculating the Pearson correlation (*r*) values over the data set reached. The results of the correlation analysis are shown in Table 7.

Table 7. Test-retest correlation values of the scale.

	<i>N</i>	1. P-TPS	IP (1)	OP (1)	EP (1)	2. P-TPS	IP (2)	OP (2)	EP (2)	α
1. P-TPS	109	1								
IP (1)	109	.86*	1							.83
OP (1)	109	.91*	.64*	1						.87
EP (1)	109	.78*	.66*	.55*	1					.82
2. P-TPS	109	.86*	.70*	.82*	.64*	1				
IP (2)	109	.48*	.52*	.39*	.36*	.67*	1			.81
OP (2)	109	.75*	.52*	.81*	.47*	.81*	.33*	1		.82
EP (2)	109	.60*	.53*	.43*	.72*	.66*	.26*	.40*	1	.80

**p* < .01; α : Cronbach Alpha

Table 7 shows the results of the correlation analysis. As can be seen in Table 7, the relationship between 1st P-TPS and 2nd P-TPS is .86; the relationship between IP (1) and IP (2) is .52; the correlation between OP (1) and OP (2) was calculated as .81 and between EP (1) and EP (2) as

.72. Test-retest results were found to be significant at the $p < .01$ level in terms of the overall scale and its factors, and it was determined that the stability of the scale was at a sufficient level.

4. DISCUSSION and CONCLUSION

Presenteeism is associated with significant cost losses and has negative effects on both organizations and employees (Abasilim et al., 2015; Baker-McCleary et al., 2010; Bakker & Demerouti, 2007; Cooper & Lu, 2016; D'Abate & Eddy, 2007; Ferreira & Martinez, 2012; Gilbreath & Karimi, 2012; Li et al., 2019) is an important organizational reality. However, contrary to this importance, the absence of a measurement tool in the literature to measure this experience for teachers who experience presenteeism more intensely compared to other occupational groups has been seen as an important deficiency. Based on this deficiency, it is aimed to develop a useful scale with high validity and reliability to measure teachers' perceptions of presenteeism.

Although there are different understandings about presenteeism (Johns, 2010), in this study presenteeism means that the employee works despite being unwell (Gilbreath & Karimi, 2012; Wang et al., 2010), which will prevent him/her from being functional at work (D'Abate & Eddy, 2007) and thus results with negative consequences. In this context, other variables (stress, economic problem, non-work related, bad management, etc.) other than health problems that may be associated with the employee's well-being have been associated with presenteeism.

In the first stage of the development of the P-TPS, the factors associated with the employee's unwellness and the results they can predict were determined with open-ended questions, and scale items were created with the algorithm that had been developed over the obtained data. The scale items applied in the second stage were subjected to exploratory factor analysis. It was determined that the P-TPS had a three-factor structure (individual-related presenteeism, organization-related presenteeism, and environment-related presenteeism) according to the content of the items associated with unwellness. The dimension of "individual-related presenteeism" consists of four items; the "Organization-related presenteeism" factor consists of seven items; The factor of "environment-related presenteeism" consists of three items. The scale explains 59.31% of the total variance. There is no exact value for the minimum variance that a scale should explain, but it is stated that the variance explained by scales with two or more factors should not be less than 50%, especially in social sciences (Liau et al., 2011). There are four reverse items with positive statements, two in the IRP (individual-related presenteeism,) factor and two in the OP factor. These items should be reverse coded when coding the responses on the scale. The highest score that can be obtained on the scale is 70, and the lowest is 14. High scores on the scale and its factors indicate a high perception of presenteeism. In the third stage, as a result of the confirmatory factor analysis of the three-dimensional and 14-item P-TPS, good fit values were estimated, and thus construct validity was ensured. Although there is no consensus in the literature about the fit indices to be considered in determining the model fit in CFA, in addition to the χ^2/df value (Kline, 2011), RMSEA (Steiger, 1990), CFI (Bentler, 1990), TLI (Bentler & Bonett, 1980; Tucker & Lewis, 1973) and SRMR (Byrne, 2008; Hu & Bentler, 1999) fit indices are frequently recommended. For this reason, these fit indices were used in model evaluation in the research. As a result of the analysis of the square root of AVE, CR, and AVE and the correlation coefficients between the factors reached by CFA, it was seen that the scale met the conditions of convergent and discriminant validity. In the reliability analysis of the scale, Cronbach's alpha coefficient and CR values were examined, and if these values are above .80, it shows that sufficient conditions for reliability are met. In addition, measurement invariance analysis (Millsap, 2011), which is used to indicate whether the scale measures the same structure among the groups, was tested over the P-TPS. Considering the insignificance of the χ^2 difference tests and the changes in CFI and RMSEA, it shows that the P-TPS meets the configural, metric, scalar, and strict invariance conditions

regarding gender, age, and marital status variables. Therefore, it has been revealed that the PTP scale can measure the same structure among groups that differ in terms of these variables. In this sense, it can be said that the scale can be used to compare the perceptions of presenteeism among different groups.

Finally, the stability of the scale, which provided internal consistency with Cronbach's alpha and combined reliability conditions with CR values, was tested with the test-retest method, correlation values were examined in terms of the overall scale and the factors, and significant values were estimated. Therefore, it is possible to say that the scale has a stable structure, and consistent results can be achieved when applied at different times. When the validity and reliability proofs of the scale are evaluated together, it can be stated that the scale can be used safely to determine teachers' perceptions of presenteeism.

4.1. Limitations and Recommendations

This study analyzed the validity, reliability and measurement invariance of the three-dimensional and 14-item P-TPS. Therefore, it can be used as an effective measurement tool for in-depth analysis in future empirical, relational, and descriptive research on presenteeism. However, there are some limitations to this study. First, the scale was developed with presenteeism, approaching from a specific perspective (3rd tradition). In this sense, the scale may need to be adjusted according to other perspectives. Secondly, the sample was selected from among the teachers working in Turkey in 2021, and an item pool was created according to the answers given by these teachers to open-ended questions. Therefore, the content of the scale reflects the realities of the time the answers were collected (COVID-19, economic problems, etc.) and the professional and organizational characteristics of the teachers. Some revisions may be necessary for it to be used in another period and other professional fields. Thirdly, the semi-structured interviews for the creation of the item pool during the COVID-19 pandemic process and the focus interviews applied to evaluate the item pool have been minimized as much as possible. Therefore, overlooked, some important facts can be found. Finally, the second-order three-factor CFA results confirmed the structure of the scale. The scale scores show the teacher's presenteeism. For this reason, future researchers who will use the scale should be careful to use the second-order three-dimensional structure of this scale.

Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the authors. **Ethics Committee Number:** E-11611387-100-38896

Authorship Contribution Statement

Alper Uslukaya: Collected data, Investigation, Resources, Visualization, Software, Formal Analysis and Writing-original Draft. **Zulfu Demirtas:** Methodology, Supervision, and Validation. **Muslim Alanoglu:** Software, Formal Analysis, Writing-original Draft, Supervision, Validation.

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