**EGE AKADEMİK BAKIŞ** / *EGE ACADEMIC REVIEW*

Cilt 23 • Sayı 1 • Ocak 2023
SS. 59/74
Doi: 10.21121/eab.1086516
Başvuru Tarihi: 11 Mart 2022 • Kabul Tarihi: 23 Ağustos 2022

# Green Organizational Climate: Measurement Scale Development and Validation to Measure Green Climate Structure in Organizations

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## ABSTRACT

This paper aimed to develop a valid and reliable measurement scale for green organizational climate. Both qualitative and quantitative research methodologies were applied. In the research, the three-stage scale development process proposed by Schwab (1980) was be used. The conceptual framework were first clarified and a proposal pool were created by compiling the expressions in scale through a qualitative exploration study, which includes literature review, in-depth interviews and focus group studies using deductive and inductive methods. Expert opinions were sought for the examination of face validity and content validity. After the pilot application, draft scale was applied to 750 managers of businesses operating in different sectors in various provinces of Türkiye. According to the results of the exploratory factor analysis, 21 items and 4 dimensions were extracted, namely green economic climate, green social climate, green digital climate, and green bureaucratic climate. The results of confirmatory factor analysis indicated that the measurement items developed were had an acceptable level of compatibility. The cronbach alpha coefficients had sufficient reliability in all dimensions. As a result, it was seen that the green organizational climate scale is a valid and reliable measurement tool.

**Keywords:** Green Organizational Climate, Green Business, Measurement Scale, Organizational Behavior, Green Climate Structure.

**JEL Classification Codes:** D23, L20, M10, Q56.

## INTRODUCTION

The concept of green has started to take the attention of all scientific fields in recent years. This attention can be based on many reasons such as the change in the environment, the negative effects of climate change on life, and the increase in unnatural production methods. In this context, branches of science are in search of methods that contribute to the environment related to their fields of interest. For example, applications such as researches focusing on the effective use of energy in the field of engineering, service delivery tools of accommodation enterprises that do not harm the environment in the field of tourism, how to create green hospitals in the field of health, and the contents of environmental production materials in the field of chemistry have become very popular. These practices also have various reflections in the field of business administration. Examples of these are green management, green human resources management, green procurement and logistics, green marketing, green accounting, green finance. One of the most comprehensive application areas of the green concept in the field of business is the field of management. It is seen that a wide variety of green-oriented concepts such as green management, green organisational behavior, green organisational climate, green psychological climate have begun to be discussed in the field of business administration.

In order for organisations to be environment-friendly or for employees to exhibit environment-friendly behaviours, the organisational structure must have a suitable climate. The issue of creating an organisational climate that increases the green-oriented behavior of employees or drives them in this direction is conceptualised under the name of green organisational climate in the organisational behavior literature. There are very few studies on green organisational climate in the literature. Since the concept of green organisational climate is a relatively new in the literature, there are very few scale development searches for the measurement of the concept. Among these few studies, the organizational behavior literature lacks a comprehensive scale for the determination of the green organizational climate structure. Developing a green organizational climate scale will be the right step to determine how a green climate can be created in an organization. The main problem here is about which organisational practices will

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be considered as green organisational climate practices. In other words, the first step in creating organisations with a green climate is the development of measurement tools that can guide what organizations should do in this context. Therefore, the issue of which practices will establish a green organisational climate within the organisation is a subject that needs to be discussed comprehensively. Despite this necessity, when the literature is examined, it is understood that researchers have produced few answers to the question of "how to create a green climate in organizations", and these answers are not at a satisfactory level.

When the search for a small number of scales developed for the measurement of green organizational climate, which is explained in detail in the literature review, is examined, it is thought that some of them suggest a single-factor model, and some of them do not include some features that should be found in a green organizational climate review or only contain features for a certain universe. So much so that the green organizational climate has been tried to be explained with a single factor model in some studies (for example, Norton et al., 2017). In some studies (for example, Chou, 2014; Tsai et al., 2017), the characteristics of the sample or the sector in which the scale is applied come to the fore. For example, Tsai et al. (2017), a four-factor structure was proposed, namely green port policy, green education, green communication and green motivation, and a scale proposal was made to apply to port workers. In this respect, there is a need to develop a green organizational climate scale that can be measured in organizations in all sectors and that can examine measurement in terms of different dimensions. In addition, the measurement of a green organizational climate should have a structure that includes social, economic and digital etc. elements. These dimensions included in the measurement tool developed with this research stand out as a distinctive feature of the developed scale against other scales.

The search for the practices within the organization can serve to create a green organizational climate, in other words, the elements of a green organizational climate constitutes the scope of this research. In the research, answer is sought for the question "*How can a statistically valid and reliable green organisational climate scale be developed?"*. For this reason, in the research it is aimed to develop a valid and reliable measurement tool to measure the green organisational climate.

## LITERATURE REVIEW

Organizations are encouraged to adopt and improve green policies and practices in order to increase their environmental performance (Xiao et al., 2020: 13). This has led to the emergence of various concepts in the field of management that focus on the organizational policies that contribute to the environment and direct employee behaviors. From this point of view, the concept of green organizational climate has emerged with the assumption that organizational climate predicts the behavior of employees towards the environment.

At the focus of the literature on the measurement of green organizational climate is a theoretical compilation study on green organizational climate by Norton et al. (2012). In this study, a conceptual framework has been presented for the concepts of organizational climate and green organizational climate, and various suggestions have been developed for future research. In this context, the authors presented some item suggestions to measure the green organizational climate in the study.

Two years after the publication of this research (Norton et al., 2012), Norton et al. (2014) examined the mediating role of organizational climate perceptions in the relationship between organizational sustainable policies and environmental behavior of employees. The authors state in their research that organizations are increasingly implementing sustainability policies to promote environment-friendly behaviors. Accordingly, it is emphasized that employees' perceptions of the green work environment (in other words, how their organizations and colleagues perceive their environmental sustainability orientation) create psychological mechanisms that associate such policies with behavior. In the research, the perceived existence of the corporational sustainability policies, green organisational climate perceptions and the relations between employees' green behaviours have been worked on. The basic assumption in this research is that employees' perceptions of green work climate mediate the positive relationship between their perceptions of the existence of a sustainability policy and their green organizational behavior. In the application part of the research, members of Amazon's Mechanical Turk online survey site were used and survey data were collected from 168 employees with 1-6 years of working experience in the industrial sector. As a result of the research, it was found that the organization's and colleagues' perceptions of the green working environment differentially mediate the effects of the perceived presence of a

sustainability policy on task-related and proactive green behaviors. From this point of view, it is emphasized that there is a significant relationship between perceived organizational sustainable policies and environmental behavior of employees, and the mediating role of employees' organizational climate perceptions in this relationship. In this direction, if there are those who exhibit environmentalist behaviors in the organization, other employees are also affected by this and tend to exhibit environmentalist behaviors. The findings shed new light on the psychological mechanisms associated with the green organizational behaviors of employees, guide research on the effectiveness of sustainability policies. A model consisting of 8 items and 2 dimensions was presented in the green organizational climate scale, which was developed within the scope of the research and recommended for the literature. In the creation of these items, it was explained that some item suggestions given in the theoretical compilation study conducted by Norton et al. (2012) on the green organizational climate were included. While 4 of the 8 items used in the research to measure the green organizational climate represent the green perceptions of the employees in the organizations, the other 4 items represent the perceptions of the employees towards the green behaviors of their colleagues. The Cronbach Alpha reliability coefficient of the 4-item dimension representing the green perceptions of the employees was determined as .93, and the Cronbach Alpha reliability coefficient of the 4-item dimension representing the green perceptions of the colleagues was determined as .92.

In another study, Norton et al. (2015) discussed the concepts of environmental sustainability, green organizational behavior, organizational culture, green organizational culture, organizational climate, strategic climate, and green organizational climate. Accordingly, environmental sustainability is the main objective in organizations and it is possible to achieve this with the green organizational behavior of employees. At this stage, the green organizational climate is considered as an important factor in the formation of green organizational behavior. The concept of strategic climate, on the other hand, is a concept that examines the issue from a safety perspective and is evaluated at individual and organizational levels such as accident and injury rates or safety motivation and participation. The authors, who create an integrative framework in the perspective of organizational culture and organizational climate, propose the structure in three dimensions: antecedents, social context and behavior, and outcomes. In this integrative framework, authors emphasize the dynamic processes that create and maintain a culture, and how culture leads to behavior. Accordingly, antecedents consist of two aspects: organizational (institutional pressure from regulatory, normative and socio-cultural perspectives, size, age) and individual (leader attitudes). Cultural elements such as assumptions, symbols, beliefs and values create social context and behavior through interpretation, symbolization, realization and manifestation. Perceptions of employees towards the organization create climate at individual and organizational level, and climate perceptions create individual and organizational behaviors through social norms. As a result, organizational (effectiveness and identity) and individual (working conditions and effectiveness) outcomes emerge. This model implies that an organization's social context is not an end-state, but a dynamic process through which an organization responds to external pressures.

Norton et al. (2017) examined the effect of employees' perceptions and interpretations of organizational policies, practices, and procedures on their behavioral intentions. In addition, the mediating role of the green psychological climate in this relationship was evaluated. To conduct these reviews, they collected survey data from 74 employees for 10 working days and found that corporate environmental strategy was positively associated with green psychological climate, which in turn improved the relationship between green behavior intentions and the employee's green behavior the next day. Accordingly, they found that the aforementioned relationship was positive only when employees perceived a positive green psychological climate. The scale used in the research includes 5 items of the scale used in the study by Norton et al. (2014), the details of which are given above. The researchers used 4 items that factored into the dimension of organizational perception out of 8 items here, and added 1 item to it. As can be seen, items that were considered as a dimension of green organizational climate in previous studies (Norton et al., 2014) were used as green psychological climate in this study (Norton et al., 2017).

Chou (2014) examined the effect of hotel employees' perceptions towards the green organizational climate on environmental behavior. According to the author, the recent trends in green consumption are driving the hotel industry to take on corporate social responsibility based on green innovation. Studies conducted in this direction reveal that adopting green practices is beneficial for the hotel industry. However, an organization's success in adopting green practices depends not only on corporate

attitudes towards environmental issues, but also on the personal beliefs and daily actions of its employees. The author focused on personal belief variables to explore the contextual and individual variation in the environmental behavior of hotel employees. In this direction, they tried to examine these behaviors through the concept of green organizational climate. In the research, questionnaires obtained from 254 employees of 32 hotels among 65 hotels in Taiwan that have the environmental program award and participate in environment-friendly programs were evaluated. According to the results of the research, it was determined that the factors at the individual and group level were significantly related to the environmental beliefs and behaviors of the employees. In other words, it has been determined that the green organizational climate perceptions of employees in Taiwan's environmentally oriented hotels have a significant effect on their environmental behavior. Accordingly, the author states that more emphasis should be placed on and applied to intensive institutional participation in environmental policies, human resource management and the provision of environmental education for employees. The scale used by the author in this research was created by making use of 7 criteria used for green hotel certification in Taiwan (corporate environmental management and policies, energy saving, water saving, green purchasing, reduction in the use of disposable products, waste reduction, pest control) and some of the articles of the corporate environmental policies recommended by Ramus (2000). In this context, there are 14 items in the scale used to measure the green organizational climate.

Brnova (2020) developed a scale called strategic organizational sustainability climate in their study. As a result of the research, they presented a scale consisting of 3 dimensions and 25 items. Labeling of the 3 dimensions in which the scale was modeled was made as environmental sustainability climate dimension (11 items), social sustainability climate dimension (7 items) and economic sustainability climate dimension (7 items). The environmental sustainability climate dimension is divided into sub-dimensions as "Finding alternatives (6 items)" and "Reducing negative effects (5 items)".

Tsai et al. (2017) examined in their study the effect of green organizational climate on green organizational behavior. Survey data collected from 164 participants working at Kaohsiung Eco Port in Taiwan were analyzed in the study. As a result of the research, they proposed a 4-dimensional green organizational climate scale. These dimensions are green port policy, green education, green communication and green motivation. In addition, structural equation modeling was conducted to examine the effects of green organizational climate dimensions on employees' green behaviors. As a result of the research, it was determined that the green organizational climate dimensions were positively related to the green behaviors of the employees. As a result of the evaluation made between the dimensions, it has been determined that the green motivation dimension is the green organizational climate dimension that has the most important effect on the green behavior of the employees, followed by green port policy, green communication and green education, respectively.

Kuo and Lin (2020) examined the relationship between lean management, green operations and green behavior and the role of green organizational climate in this process. Using data from 268 samples in Kaohsiung, the findings of the study showed that lean management positively affects both green operations and green behavior; that green operational practices have a positive effect on both green behavior and green performance, and that the green organizational climate has a mediating role in this relationship. To measure the green organizational climate in this study, the authors used a one-dimensional, 7-item scale by making use of the literature review.

Although studies on green have gained popularity in Turkish literature, it is not possible to say the same for the green organizational climate literature. In addition to the limited number of studies in Turkish literature on the concept of green organizational climate, the literature on green organizational climate research in Türkiye has not sought to develop a scale. Among the Turkish-sourced studies on the concept of green organizational climate, Özalp ve Erbaşı (2021) examined the differences between the green organizational climate perception of hotel employees and the levels of green behavior in the organization according to some demographic variables. In the study, it is used to developed by Norton et al. (2014) and consisting of 8 questions. According to the findings obtained from 293 employees who works in the hotel enterprises having 5 and 4 stars environmental certificates in Konya, the participants had a high level of green organization climate perception and a high level of green organizational behavior. In the study, it was determined that the perception of green organizational climate significantly differ to the employees' duties in the hotel. And it was detected that the green organizational climate perception does not differ significantly in terms of variables such as gender, age, education level, income,

work experience, working time and department.

The most comprehensive and preliminary research on green organizational climate in Turkish literature was conducted by Erbaşı (2022), and the theoretical structure of the concepts of green organizational climate and green psychological climate was revealed in the research. According to the author, although these two terms are frequently used interchangeably in Turkish literature, they do not have the same meaning. Accordingly, when the measurement of the climate concept is done at the organizational level, it is called the organizational climate, and when it is done at the individual level, it is called the psychological climate. In other words, the focus of the research on the green organizational climate is the green working environment of the organization, and the focus of the research on the green psychological climate is the perception of the employees about the environmentalist working environment of the organization. In this context, if a research is concerned with the current environmentalist working environment in the organization, the concept of green organizational climate comes to the fore, if it is concerned with the individual perceptions of employees regarding environmental practices in the organization's working environment, the concept of green psychological climate comes to the fore. As a result, it is emphasized that researches on individual results on employees should use scales on psychological climate, while studies examining the results on the organization collectively should use scales on organizational climate. In his research, the author defines the green organizational climate as the environmentally friendly structure of an organization, while he defines the green psychological climate as the individual perceptions of the employees about how environmentally friendly the organizational environment is.

In this study, it was attempted to answer the question of how to develop a statistically valid and reliable green organizational climate scale. In this context, the aim of the research is to develop a valid and reliable measurement tool to measure the green organizational climate. For this purpose, a pool of propositions that can be used to determine the elements constituting the green organizational climate was created, the green organizational climate scale was structured, and the structured green organizational climate scale was tested.

Developing a scale for the measurement of green climate structure in organizations constitutes the original aspect of the research. It is expected that the developed green organizational climate scale will provide an understanding of the green climate in organizations and the dimensions that lead to the formation of this climate. It is expected that the scale developed within the scope of the research will give an idea to the managers about how they can create a green climate in their organizations and will guide future research on this subject. It is expected that the green organizational climate scale developed within the scope of the research will enable the green climate to be disseminated in organizations and the concept to be discussed more comprehensively in the organizational behavior literature. In addition, the new growth strategy of the European Green Deal focuses on realizing the green transformation across society. With this focus, it is planned to achieve the goals of green transformation of the Turkish economy and industry and establishing a sustainable growth. The spread of the achieved scale as an implementation policy will contribute to the goals of the "Green Agreement", the new growth strategy of the European Union. The scale developed in this context will contribute to the "Clean and Circular Economy" and "Climate Change, Environment and Biodiversity" research titles of "Green Deal".

## METHOD

This research has an exploratory character to develop an original scale. Since in studies of this nature, there is no need to develop problem statements or hypotheses, such an attempt was not undertaken here as well. Since it is tried to determine which green practices will create a green organizational climate, it has been tried to be designed a formative scale.

In order to develop the green organizational climate scale, the scale development process proposed by Schwab (1980) was taken as a basis. These three stages are creating a proposition pool, structuring the scale, and evaluating the scale.

## FINDINGS

The findings of the study were presented under the headings of creating a proposition pool, structuring the scale, and evaluating the scale, respectively, as suggested by Schwab (1980).

### Creating A Proposition Pool

In the process of creating the proposition pool, deductive and inductive methods were used together and literature review, in-depth interviews with 16 experts and 6 focus group studies were conducted. At this stage, a comprehensive literature review was conducted and the findings of the researches on the green organizational climate were examined. The studies

performed in particular on the measurement of the concept were examined in detail and the findings related to these were presented in the previous titles of the research. In addition, at this stage, in-depth interviews were conducted with 16 managers who participated in any study in the field of "green", in order to understand the green climate in organizations. Purposive sampling method was used in the selection of the interview participants and the principles of working as a manager in different sectors and volunteering were taken as basis. Participants were determined from among people who worked as managers in companies in different sectors operating in Türkiye and had practical applications in green before. In this method, which was used to analyze the expert opinions on the subject in depth, semi-structured interview method was used to focus on the subject and to determine the boundaries of the interview. The group of respondents to the in-depth interviews were asked to define the following questions about the green organizational climate:

- "What do you understand by the concept of green organizational climate?"
- "What is the difference between the concepts of organizational climate and green organizational climate?"
- "What kinds of organizational practices can be used to induce green behaviors among employees in the organization?"
- "What are the obstacles to creating a green climate in organizations?"
- "What does the business you work at do to create a green organizational climate and what do you recommend them to do?"

Within the scope of the qualitative discovery study, 6 focus group studies were carried out in addition to the interviews. 6 people participated in each of the focus group discussions. For focus group discussions, which is a technique in which the researcher and participants meet face-to-face on a determined topic, the participation of the MBA students who have worked in organizations that carry out green studies and have knowledge on this subject, academics who have done at least one study on green, and members of the board of directors of the non-governmental organizations working in green field in Türkiye was ensured. Issues related to the functioning and process of the focus group interviews proceeded in the same way as in the semi-structured interviews. In both semi-structured interviews and focus group interviews, the participants were not intervened, provided that they did not deviate from the main topic. Based on the data obtained at this stage, a draft scale consisting of 52 items was created.

**Structuring the Scale**

In order to examine the content validity of the scale, first of all, the 52-item draft scale was presented to the opinions of 6 academicians who took part in the final focus group meeting. Here, experts were provided to evaluate the scale items in terms of content, meaning and language integrity. As a result of content validity, a draft scale consisting of 41 items was obtained.

This 41-item draft scale was applied as a pilot to 100 managers who participated in the practices in the green field, and as a result of the subsequent analyzes, various corrections were made in some items in the scale. Accordingly, a draft scale, which was reduced to 37 items, was obtained.

The report of Selçuk University Faculty of Economics and Administrative Sciences Social and Humanities Scientific Research and Publication Ethics Committee Report dated 05.10.2021 and numbered 09/26 that the resulting scale is suitable for scientific research and publication ethics has been received.

A 5-point Likert-type rating was used to express the level of agreement about the items in the scale. This rating is "Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1)". (1) represents that the green organizational climate practices were not carried out, ....., (5) represents that the green organizational climate practices were carried out. Therefore, while making the evaluations, it has been commented that the green organizational climate increases as it approaches 5, and moves away from the green organizational climate as it approaches 1.

The 37-item draft scale, which was ready to be applied to the main sample, was transformed into a questionnaire consisting of two parts. In the first part of the questionnaire, there was a 37-item draft scale, and in the second part, there were 8 items to examine the demographic characteristics of the participants. The questionnaire form was applied to 750 organization managers online via Googleform, one of the online application tools, by choosing the purposive sampling method. Data analyzes were performed using SPSS 21 and AMOS 21 programs. The answers of 750 participants who filled out the questionnaire were examined, 115 questionnaires that were found to be incompletely filled

were excluded from the evaluation, and the analyzes continued with 635 questionnaires. It has been found out that 43.5% of the 635 participants were female and 56.5% were male; 48.3% of them were undergraduate, 21.9% of them had associate degree and 13.5% of them were graduates; 41.6% of them have a monthly income of 2826 TL and below, 44.4% of them have a monthly income between 2827-7972 TL and 14% of them have a monthly income of 7973 TL and above; 61.4% of them work in the private sector and 38.6% in the public sector; and there are employees from 26 different sectors. In addition, the average age of the participants was 27 years, the average working time in the sector was 6.6 years, and the average working time in the current organization was 5.2.

Explanatory factor analysis and confirmatory factor analysis were performed on 37 items included in the scale configuration. At this stage, propositions with a correlation value of less than 0.40 among themselves, propositions with a common factor variance value of less than 0.30, propositions with a load value of less than 0.30, the ones not included in a single factor, and propositions with a difference of less than 0.10 between the factors in two factors were excluded from the analysis. After each inference, the change in values within the scope of explanatory factor analysis and confirmatory factor analysis was examined. In the following parts of the research, the values of the propositions remaining in the scale as a result of all reanalysis are included.

At the stage of scale configuration, primarily the descriptive findings of the data obtained for the green organizational climate scale were evaluated. In Table 1, the minimum, maximum, average and standard deviation values of the items in the draft scale are given. As stated above, only the values of the propositions remaining in the scale as a result of the analyzes are included. According to the findings, it is seen that the average values of the items are between 4.4378 and 3.5024.

A series of analyzes were conducted to obtain the findings regarding the validity of the scale. In this context, Kaiser Meyer Olkin (KMO) test and Barlett test were performed to examine whether the data are suitable for factor analysis. Table 2 shows the results of the KMO and Barlett test.

As can be seen in Table 2, the result of the KMO test was found to be 0.947. This value is well above the acceptable

**Table 1.** Minimum, Maximum, Average and Standard Deviation Values of Items

| Item No | Minimum Value | Maximum Value | Average Value | Standard Deviation |
|---|---|---|---|---|
| **GOC1** | 1 | 5 | 4.1528 | 1.06876 |
| **GOC2** | 1 | 5 | 3.8205 | 1.11311 |
| **GOC3** | 1 | 5 | 4.0110 | 1.04242 |
| **GOC4** | 1 | 5 | 4.0094 | 1.09483 |
| **GOC5** | 1 | 5 | 4.3638 | .86006 |
| **GOC6** | 1 | 5 | 4.4378 | .87400 |
| **GOC8** | 1 | 5 | 3.9433 | 1.09051 |
| **GOC9** | 1 | 5 | 4.3323 | .87273 |
| **GOC10** | 1 | 5 | 4.1559 | 1.09167 |
| **GOC11** | 1 | 5 | 4.2079 | .99728 |
| **GOC12** | 1 | 5 | 4.1654 | 1.01692 |
| **GOC13** | 1 | 5 | 4.1055 | 1.06710 |
| **GOC15** | 1 | 5 | 4.2756 | .88874 |
| **GOC18** | 1 | 5 | 3.8992 | 1.20039 |
| **GOC19** | 1 | 5 | 3.5024 | 1.41797 |
| **GOC20** | 1 | 5 | 4.1291 | 1.03367 |
| **GOC21** | 1 | 5 | 4.1921 | .96350 |
| **GOC23** | 1 | 5 | 3.7969 | 1.20906 |
| **GOC26** | 1 | 5 | 4.2299 | .98924 |
| **GOC28** | 1 | 5 | 4.0488 | 1.08291 |
| **GOC30** | 1 | 5 | 4.0709 | 1.06108 |

**Table 2.** KMO and Barlett's Test Results

| | | Green Organizational Climate Scale |
|---|---|---|
| Kaiser Meyer Olkin Measure of Sampling Adequacy | | 0,947 |
| Bartlett's Test of Sphericity | Approximate chi-square ($\chi^2$) | 5409,90 |
| | Degrees of freedom (df) | 210 |
| | Sig. (p) | 0,000 |

values. In addition, the Bartlett test rejected the null hypothesis with a statistically significant $\chi^2$ result ($\chi^2$= 5409.90, df= 210, p=0.000).

After obtaining the KMO and Bartlett values indicating that the data set of the scale was suitable for factor analysis, explanatory factor analysis was applied to control the dimensions of the scale and to ensure unidimensionality in the relationship between the variables. First of all, correlation findings between propositions were examined and it was determined that all correlations were higher than 0.40 as expected.

Principal component analysis was used as factorization method. Eigenvalues and percentages of variance were used to determine the number of factors. Table 3 shows the total variance explained in the final version of the 21-item scale.

**Table 3.** Total Variance Explained

| Factor | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | Percentage of Variance Explained | Cumulative Percentage of Variance Explained | Total | Percentage of Variance Explained | Cumulative Percentage of Variance Explained |
| 1 | 8.284 | 39.449 | 39.449 | 3.860 | 18.360 | 18.380 |
| 2 | 1.518 | 7.228 | 46.678 | 3.182 | 15.151 | 33.532 |
| 3 | 1.095 | 5.214 | 51.891 | 2.498 | 11.896 | 45.428 |
| 4 | 1.000 | 4.575 | 56.467 | 2.318 | 11.039 | 56.467 |

While performing the exploratory factor analysis, the rotated components matrix method was chosen to determine in which factor the items had a strong correlation. The load value of the items is at least .30, the items are included in a single factor, and there is at least .10 difference between the factors in the two factors (Büyüköztürk, 2007). The 25 degree varimax axis rotation method was used. Among the 37 items for which the scale was started to be constructed (Annex-3), 2 items with a load value of less than .30, 7 overlapping items that were not included in a single factor and had a difference of less than .10 between the two factor loading values, and 7 items that were not loaded under the correct factor were excluded from the analysis. At this stage, the items were removed one by one, and factor analysis was repeated each time. The factor pattern findings obtained for the green organizational climate scale are given in Table 4.

The analyzes started with 37 items, but as a result of the explanatory factor analysis, the items in the scale were grouped under 4 factors with an eigenvalue above 1, a total of 21 items were loaded on these factors, the variance explanation rate of the scale was 56,467%, and all items had acceptable loading values (>.40) (the lowest item load value is .443 and the highest item load value is .707). Table 5 shows the dimensions of the green organizational climate scale and the labeling for these dimensions, the number of items in the factors and the numbers of the items in the draft scale.

As can be seen in Table 5, economic, social, digital and bureaucratic aspects were determined in factor labeling in the scale. *The green economic climate* dimension is used for green practices in the organizational climate and carried out with economic motives. *Green social climate* has been used to describe green practices carried out with social motives in the organization. *The green digital climate* is used to explain the digital practices that

**Table 4.** Factor Pattern of the Green Organizational Climate

| Item No | Green Economic Climate | Green Social Climate | Green Digital Climate | Green Bureaucratic Climate |
|---|---|---|---|---|
| **GOC4** | .407 | | | |
| **GOC5** | .579 | | | |
| **GOC12** | .687 | | | |
| **GOC13** | .617 | | | |
| **GOC18** | .700 | | | |
| **GOC20** | .567 | | | |
| **GOC1** | | .728 | | |
| **GOC2** | | .762 | | |
| **GOC6** | | .454 | | |
| **GOC10** | | .640 | | |
| **GOC26** | | .542 | | |
| **GOC9** | | | .835 | |
| **GOC11** | | | .685 | |
| **GOC15** | | | .714 | |
| **GOC30** | | | .453 | |
| **GOC3** | | | | .610 |
| **GOC8** | | | | .400 |
| **GOC19** | | | | .721 |
| **GOC21** | | | | .443 |
| **GOC23** | | | | .567 |
| **GOC28** | | | | .484 |

**Table 5.** Dimensions and Items of the Green Organizational Climate Scale

| Dimension | Number of Item | Item No. |
|---|---|---|
| Factor 1: Green Economic Climate | 6 | 4, 5, 12, 13, 18, 20 |
| Factor 2: Green Social Climate | 5 | 1, 2, 6, 10, 26 |
| Factor 3: Green Digital Climate | 4 | 9, 11, 15, 30 |
| Factor 4: Green Bureaucratic Climate | 6 | 3, 8, 19, 21, 23, 28 |

contribute to the environment in the organization, and *the green bureaucratic climate* is used to describe the bureaucratic processes of the management levels of the organization that contribute to the environment.

The common variance values of the propositions that make up the green organizational climate scale were examined. The communality values were found to be the lowest .443 and the highest .707. Since there was no value less than .30 among the variance values of the extraction, all items remained on the scale. Table 6 shows the common variance values of the propositions that make up the green organizational climate scale.

At this stage, partial correlation coefficients of 21 items were examined and values close to 0 were obtained for all items. The findings regarding the anti-image correlation coefficients, which are the negative of the partial correlation coefficients, are shown in Table 7. The anti-image correlation coefficients give information about the sample adequacy of each variable. For a good scale model, it is recommended that the coefficients of the diagonal elements be greater than .50. When these values of the scale were examined, it was determined that the anti-image correlation coefficients of each item were close to 1. Accordingly, the lowest anti-image correlation coefficients of the propositions forming the green

**Table 6.** Communality Values of the Green Organizational Climate Scale

| Item No. | Initial | Extraction | Item No. | Initial | Extraction |
|---|---|---|---|---|---|
| **GOC4** | 1.000 | .473 | **GOC9** | 1.000 | .707 |
| **GOC5** | 1.000 | .595 | **GOC11** | 1.000 | .569 |
| **GOC12** | 1.000 | .540 | **GOC15** | 1.000 | .578 |
| **GOC13** | 1.000 | .638 | **GOC30** | 1.000 | .533 |
| **GOC18** | 1.000 | .593 | **GOC3** | 1.000 | .599 |
| **GOC20** | 1.000 | .584 | **GOC8** | 1.000 | .443 |
| **GOC1** | 1.000 | .592 | **GOC19** | 1.000 | .524 |
| **GOC2** | 1.000 | .659 | **GOC21** | 1.000 | .519 |
| **GOC6** | 1.000 | .564 | **GOC23** | 1.000 | .588 |
| **GOC10** | 1.000 | .546 | **GOC28** | 1.000 | .544 |
| **GOC26** | 1.000 | .471 | | | |

**Table 7.** Anti-Image Correlation Coefficients of Propositions Constituting the Green Organizational Climate Scale

| Item No. | Coefficient | Item No. | Coefficient |
|---|---|---|---|
| **GOC4** | .953 | **GOC9** | .856 |
| **GOC5** | .928 | **GOC11** | .926 |
| **GOC12** | .939 | **GOC15** | .927 |
| **GOC13** | .948 | **GOC30** | .954 |
| **GOC18** | .949 | **GOC3** | .953 |
| **GOC20** | .950 | **GOC8** | .967 |
| **GOC1** | .944 | **GOC19** | .921 |
| **GOC2** | .925 | **GOC21** | .968 |
| **GOC6** | .954 | **GOC23** | .950 |
| **GOC10** | .971 | **GOC28** | .959 |
| **GOC26** | .964 | | |

organizational climate scale were determined as .833 and the highest as .942. It has been observed that the out-of-diagonal elements in the anti-image matrix are close to zero as expected.

When the distinctiveness of the items was examined to support the construct validity findings, it was seen that none of the items had a negative, zero or close to zero item-total correlation. In addition, when the t-test findings on item distinctiveness were examined, it was determined that the mean score of all items differed statistically in the lower and upper 27% groups.

**Evaluation of the Scale**

In order to evaluate the scale, the model obtained as a result of the explanatory factor analysis was validated. In this context, firstly, the Path diagram was used to establish the measurement model, secondly, the goodness-of-fit indices were examined to test the measurement model, and thirdly, the reliability findings were examined. The Path diagram created using the AMOS 21 program in order to set up the measurement model is presented in Figure 1.

The goodness-of-fit index values of the established measurement model were determined using the AMOS 21 program and are shown in Table 8.

According to the data obtained, the chi-square value = 491.462 and the degree of freedom = 176. Accordingly, $\chi^2$/df=2.792; GFI=0.929; AGFI=0.907; RMR=0.045; NFI=0.910; IFI=0.940; CFI=0.940; RMSEA=.053; and SRMR=.041 values were obtained. Among these values, it is seen that $\chi^2$/df, GFI, AGFI, NFI, IFI, CFI and RMSEA values are acceptable, and RMR and SRMR values are in the excellent goodness of fit index ranges.

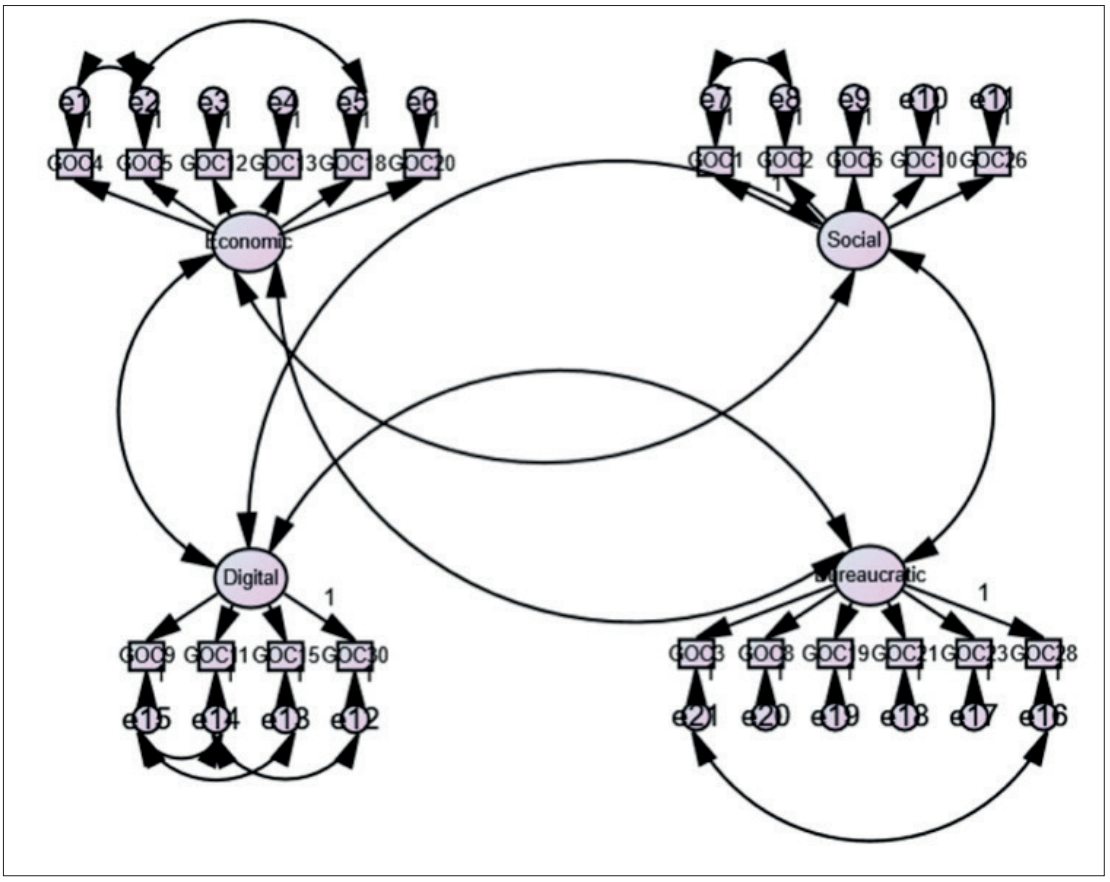


**Figure 1.** Path Diagram of the Green Organizational Climate Scale Model

**Table 8.** Goodness of Fit Index for the Green Organizational Climate Scale

| Index | Result | Comment |
|---|---|---|
| $\chi^2$/df | 491,462 / 176 = 2,792 | Acceptable Fit |
| GFI | .929 | Acceptable Fit |
| AGFI | .907 | Acceptable Fit |
| RMR | .045 | Excellent Fit |
| NFI | .910 | Acceptable Fit |
| IFI | .940 | Acceptable Fit |
| CFI | .940 | Acceptable Fit |
| RMSEA | .053 | Acceptable Fit |
| SRMR | .041 | Excellent Fit |

**Table 9.** Cronbach Alpha Values of the Green Organizational Climate Scale

| Dimensions | Item No | Cronbach Alfa Value |
|---|---|---|
| Factor 1: Green Economic Climate | 6 | .817 |
| Factor 2: Green Social Climate | 5 | .758 |
| Factor 3: Green Digital Climate | 4 | .726 |
| Factor 4: Green Bureaucratic Climate | 6 | .768 |
| **Green Organizational Climate Scale** | **21** | **.918** |

Finally, for the evaluation of the measurement model, the Cronbach alpha internal consistency coefficients were calculated and the reliability values were examined. The findings are presented in Table 9. Accordingly, the cronbach alpha value of 6 items in the "Green Economic Climate" dimension is .817, the cronbach alpha value of 5 items in the "Green Social Climate" dimension is .758, the cronbach alpha value of 4 items in the "Green Digital Climate" dimension is .726 and the cronbach alpha value of 6 items in the "Green Bureaucratic Climate" dimension was found to be .768. In addition, the cronbach alpha value of all 21 items of the Green Organization Climate Scale was determined as .918. When these values are examined, it is seen that the whole scale and its sub-dimensions are reliable.

## CONCLUSION

The aim of this research is to develop a valid and reliable measurement tool for the measurement of green climate structure in organizations. The three-stage scale development process suggested by Schwab (1980) was used in the study. First of all, a proposition pool consisting of 52 items was created by using deductive and inductive methods together, through a literature review, in-depth interviews with 16 experts and a qualitative exploration study including 6 focus group studies. In the second stage, which is the structuring of the scale, expert opinions were taken to examine the face validity and content validity. The 41-item draft scale, which was obtained as a result of the removed and corrected items, was applied to 100 managers as a pilot, and some items in the scale were removed and some items were corrected in terms of meaning. 37-item draft scale obtained after the pilot application was converted into a questionnaire and the questionnaires were applied to 750 managers of businesses operating in different sectors in various provinces of Türkiye, using the purposive sampling method. Data analysis was performed using SPSS 21 and AMOS 21 programs. The exploratory factor analysis findings revealed a model with 21 items and 4 factors with construct validity. Factors were labeled as green economic climate, green social climate, green digital climate, and green bureaucratic climate. In the third stage, which is the evaluation of the scale, the structure consisting of 4 factors was tested with confirmatory factor analysis and acceptable goodness of fit index values were obtained. Cronbach alpha internal consistency coefficients were examined for the reliability of the scale, and reliable values were obtained in all dimensions and in the whole scale. As a result, it has been seen that the developed green organizational climate scale is a valid and reliable measurement tool.

The findings of this study have to be seen in light of some limitations. First, considering the time constraints and financial opportunities in the research, only the data obtained from the managers of the companies operating in Türkiye were included in the analysis. Future research on managers in different countries will make the results of the research more meaningful. Secondly, due to the search for a measurement that can measure the green climate in all organizations, no sectoral discrimination was observed in the determination of the universe and sample. Comparing the results of the green organizational climate scale in different sectors can be recommended for further research. The third limitation of the study is that the questionnaire form created in the study was only applied online to the participants due to the constraints about sample size, lack of time and cost. For this reason, it was not possible to obtain information about the environment and how long it took the participants to fill out the questionnaires. The fact that the markings made at extreme values and 7 items were not gathered under the correct factor in factorial structures make it possible that there may be sloppy behaviors in filling out the questionnaires. The fourth limitation of the study is that although a quota application was planned on the basis of the cities where the surveyed companies are located in Türkiye, quota sampling could not be made because sufficient volunteer participants could not be reached from some cities and a uniformity could not be achieved in this context. In relation to this, about 50% of those who requested participation were able to return, but the planned number of 750 managers were still reached. The fifth and last limitation of the study is that, as stated before, very little research has been done on green organizational climate in the literature, and different concepts (for example, green psychological climate, green organizational culture) are often used interchangeably. Although this situation has brought some difficulties in the development of the research typology, it reveals the need for more research on the green organizational climate. Future research to determine the relationships between different variables in the field of organizational behavior and the green organizational climate will make significant contributions to the understanding of the concept.

The Turkish scale (Annex-2) obtained as a result of the research was translated into English by the researcher and was reviewed and edited by 3 experts in the field with good command of both languages. The Turkish and English scales obtained were applied to 30 managers who were fluent in both languages, twice within 10 days and and the Pearson product-moment correlation coefficients were found to be significant in all items, and the related group t-test results were found to be insignificant. As a result, it was seen that linguistic equivalence was achieved.

It is considered that the green organizational climate scale (Annex-1) obtained within the scope of the research provides an understanding of the green climate in organizations and the dimensions that make up this climate. The developed green organizational climate scale is the original value of the research. It is expected that the scale developed within the scope of the research will give an idea to the managers about how they can create a green climate in their organizations and will guide future research on this subject. It is expected that the green organizational climate scale developed within the scope of the research will enable the green climate to be disseminated in organizations and the concept to be discussed more comprehensively in the organizational behavior literature.

This research was produced by using the data obtained within the scope of the project named "Green Organization Climate: A Project for Developing a Scale to Measure Green Climate Structure in Organizations" numbered 21401093 and supported by the Selcuk University Scientific Research Projects (BAP) Coordinatorship. The author would like to thank Selcuk University BAP Coordinatorship for their support.

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**Annex 1.** Developed **"**Green Organizational Climate Scale"

| | |
|---|---|
| **GREEN ORGANIZATIONAL CLIMATE SCALE**<br>For the following statements, tick the box that reflects the current status of the organization you work for.<br>In the organization that I work, | |
| **Green Economic Climate** | |
| 1 | Photocell lamps and/or taps are used. |
| 2 | Energy saving light bulbs are used. |
| 3 | Manual adjustment of the ambient temperature is possible (eg. possibility to switch off when hot). |
| 4 | Environmentally friendly products are preferred in the supply of inputs (eg. cleaning products such as soap and detergent). |
| 5 | The use of environmentally friendly vehicles is preferred (eg. hybrid, electric). |
| 6 | Renewable energy is used or planned to be used (eg. solar energy). |
| **Green Social Climate** | |
| 7 | The use of public transport is encouraged (eg. giving free transportation cards for bus, tram, metrobus or offering staff shuttles). |
| 8 | Membership to environmental clubs/associations is encouraged and/or this kind of organizations are supported. |
| 9 | Paper, glass, metal, plastic, bottle, battery, etc. waste materials are separated in recycling bins. |
| 10 | Leftovers are not thrown away. |
| 11 | Where possible, afforestation and greening activities are carried out (eg. growing plants in pots, planting saplings). |
| **Green Digital Climate** | |
| 12 | Digital media is used in intra-organizational communication (eg. electronic correspondence or e-mails). |
| 13 | Personnel follow-ups are done electronically (eg. entry, exit, leave, vacation). |
| 14 | E-archive, e-invoice or e-signature systems are used. |
| 15 | Internet and electronic-based materials are used in promotions instead of paper-derived materials such as brochures. |
| **Green Bureaucratic Climate** | |
| 16 | Environmentally friendly programs are organized for employees (eg. environmental trainings). |
| 17 | When a written output is required, the use of scrap paper is encouraged. |
| 18 | The use of tobacco and tobacco products is prohibited. |
| 19 | There is at least one warning assembly (eg. informational sign or text) that reminds them of environmental sensitivity (eg. for the economical use of electricity or water). |
| 20 | Employees who exhibit environmentally friendly behaviors are preferred. |
| 21 | Archive documents are sent for recycling when the legal waiting period is over. |

**Suggested Level of Participation Rating:** (5) Strongly Agree, (4) Agree, (3) Undecided, (2) Disagree, (1) Strongly Disagree
**Note:** The use of the Green Organizational Climate Scale in academic research does not require permission from the author (with the appropriate reference to scientific qualifications).

**Annex 2.** Turkish Language Version of **"**Green Organizational Climate Scale"

| | |
|---|---|
| **YEŞİL ÖRGÜT İKLİMİ ÖLÇEĞİ**<br>Aşağıdaki ifadeler için çalıştığınız örgütün mevcut durumunu yansıtan kutucuğu işaretleyiniz.<br>Çalıştığım örgütte, | |
| **Yeşil Ekonomik İklim** | |
| 1 | Fotoselli lambalar ve/veya musluklar kullanılır. |
| 2 | Enerji tasarruflu ampuller kullanılır. |
| 3 | Ortam ısısının manuel ayarlanması (örneğin sıcak olduğunda kapatma imkânı) mümkündür. |
| 4 | Girdilerin (örneğin temizlik için kullanılan sabun, deterjan gibi ürünlerin) tedarik edilmesinde çevre dostu ürünlerin tercihine önem verilir. |
| 5 | Çevre dostu (hibrit, elektrikli gibi) araçların kullanımı tercih edilir. |
| 6 | Yenilenebilir enerji (örneğin güneş enerjisi gibi) kullanılır veya kullanımı düşünülmektedir. |
| **Yeşil Sosyal İklim** | |
| 7 | Toplu taşıma araçlarının kullanımı teşvik edilir (örneğin ücretsiz otobüs, tramvay, metrobüs kartı vermek ya da personel servis aracı imkânı sunmak gibi). |
| 8 | Çevre kulüplerine/derneklerine üyelik özendirilir ve/veya bu tür organizasyonlara destek verilir. |
| 9 | Kâğıt, cam, metal, plastik, şişe, pil vb. atık maddelerin geri dönüşüm kutularında ayrıştırılması sağlanır. |
| 10 | Artan yemekler/gıda ürünleri çöpe atılmaz. |
| 11 | Mümkün olan yerlerde ağaçlandırma ve (saksıda bitki yetiştirme, fidan dikimi gibi) yeşillendirme çalışmaları yapılır. |
| **Yeşil Dijital İklim** | |
| 12 | Örgüt içi iletişimde dijital ortamlar (elektronik yazışma veya e-mailler gibi) kullanılır. |
| 13 | Personel takipleri (giriş, çıkış, izin, tatil vb.) elektronik ortamda yapılır. |
| 14 | E-arşiv, e-fatura veya e-imza sistemi kullanılır. |
| 15 | Tanıtımlarda broşür gibi kâğıt türevi materyaller yerine, internet ve elektronik tabanlı materyaller kullanılır. |
| **Yeşil Bürokratik İklim** | |
| 16 | Çalışanlara yönelik çevre dostu programlar düzenlenir (örneğin çevre konusunda eğitimler gibi). |
| 17 | Yazılı bir çıktı gerektiğinde, müsvedde kâğıt kullanımı özendirilir. |
| 18 | Tütün ve tütün ürünlerinin kullanımı yasaktır. |
| 19 | Çevre konusundaki hassasiyeti hatırlatan (örneğin elektrik veya suyun tasarruflu kullanımına yönelik) en azından bir tane uyarıcı (bilgilendirici levha veya yazı vb.) vardır. |
| 20 | Çevre dostu davranışlar sergileyen personellerin çalıştırılması tercih edilir. |
| 21 | Arşiv belgeleri, yasal bekleme süresi tamamlanınca geri dönüşüme gönderilir. |

**Önerilen Katılım Düzeyi Derecelendirmesi:** (5) Kesinlikle Katılıyorum, (4) Katılıyorum, (3) Kararsızım, (2) Katılmıyorum, (1) Kesinlikle Katılmıyorum

**Not:** Yeşil Örgüt İklimi Ölçeğinin, akademik araştırmalarda kullanımı için (bilimsel niteliklere uygun atıfta bulunmak kaydıyla) yazarından izin alınmasına gerek bulunmamaktadır.