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**MEASURING THE OCCUPATIONAL HEALTH AND SAFETY
CULTURE FROM THE PERSPECTIVE OF THE COMPETING
VALUES FRAMEWORK**

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Measuring the Occupational Health and Safety Culture from the Perspective of
The Competing Values Framework

İş Sağlığı ve Güvenliği Kültürünün Rekabetçi Değerler Modeli Çerçevesinde
Ölçülmesi

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TABLE OF CONTENTS

ACKNOWLEDGEMENT	iii
LIST OF ABBREVIATIONS	vi
LIST OF TABLES	vii
ABSTRACT	viii
ÖZET.....	ix
CHAPTER 1	1
INTRODUCTION	1
1.1. Organizational Culture	1
1.2. Competing Values Framework.....	2
1.3. Safety Culture	5
1.4. Occupational Health and Safety Management System	9
1.5. Research Aim and Model	10
CHAPTER 2	12
METHOD.....	12
2.1. Participants	12
2.2. Measures.....	14
2.2.1 The Employee Health and Safety (EHS) Culture Scale.....	14
2.2.2 The Safety Culture Scale.....	16
2.3. Procedures	16
2.4. Data Analysis	17
CHAPTER 3	18
RESULTS	18
3.1. Factor Analyses of The Safety Culture Scale.....	18

3.2.	Multi-Dimensional Scaling of EHS Culture Scale.....	22
3.3.	Relationships Among Organizational Cultures and Safety Factors	30
3.4.	Comparison of EHS Culture Perceptions According to Managerial Roles	
	33	
CHAPTER 4		35
DISCUSSION		35
4.1.	Implication of Current Research	39
4.2.	Limitation of Current Research	40
4.3.	Future Studies	40
REFERENCES.....		43
APPENDICES		46
Appendix.1.	Employee Health And Safety Culture Assessment Survey	46
Appendix.2.	Safety Culture Survey Form	54
Appendix.3.	Informed Consent Form (English & Turkish)	60
Appendix.4.	Ethics Committee Approval.....	62
Appendix.5.	Demographics	63
Appendix.6.	Final coordinates of the EHS culture MDS analysis resulted in for two dimensions	64
Appendix.7.	Independent Samples Test of Number of Employees Reporting	
	65	
Appendix.8.	Independent Samples Test of The Groups According to The Number of Functions Managed	69
Appendix.9.	The Rotation of the Factors of The Safety Culture Scale	73

LIST OF ABBREVIATIONS

EHS	: Employee Health and Safety
MDS	: Multi-Dimensional Scaling
CVF	: Competing Values Framework
ISO	: International Organization for Standardization.
SDT	: Self Determination Theory

LIST OF TABLES

Table 1.1. Culture Types, According to The Competing Values Framework	4
Table 2.1 Participant's Education Level.....	13
Table 2.2 Participant's Main Responsibilities	13
Table 3.1 The Pattern Matrix of The Safety Culture Scale.....	19
Table 3.2 The Total Variance Explained by Factors of The Safety Culture Scale	21
Table 3.3 The Coordinates for The Dimensions of EHS Culture Items	24
Table 3.4 Descriptive Statistics of EHS Culture Types.....	28
Table 3.5 Comparison of The Current and Preferred Situation in Cooperation With EHS	29
Table 3.6 The Correlation Between The Arpat Safety Culture Factors and The EHS Current Culture Alternatives	31
Table 3.7 Independent Samples Test of The Groups According to The Number of Functions Managed	33
Table 3.8 Independent Samples Test of The Groups According to The Number of Functions Managed	34

ABSTRACT

This research aims to create a measurement tool for the effective analysis of the current employee health and safety culture in a ground handling company operating in the aviation industry. This scale is designed based on the dimensions of the competing values model of employee health and safety practices. The study was carried out with the executives working in the operational unit with the highest risk level within the scope of occupational health and safety. The Employee Health and Safety Corporate Culture Questionnaire applied to the executives to identify the current and desired employee health and safety corporate culture. Bülent Arpat's (2016) Safety Culture Assessment tool was used to evaluate the safety culture. As a result of the measurement made with the Scale of Employee Health and Safety, which consists of seven dimensions (Main Features, Corporate Leadership, Employee Management, Corporate Value, Strategic Emphasis, Success Criteria, Control Approach to SHE Processes), two dimensions representing the concepts of "openness to change" and "internalization" and five different culture segments have emerged regarding the concepts of intrinsic and extrinsic motivation (Collobrative, Innovative, Positioning Relative to Competitors, Goal Orientedness, Compliance).

Keywords: Health and safety, positive culture, competitive values model

ÖZET

Bu araştırmanın amacı, havacılık sektöründe faaliyet gösteren bir yer hizmetleri firmasındaki mevcut çalışan sağlığı ve güvenliği kültürünün etkin analizi için bir ölçüm aracı oluşturmaktır. Bu ölçek çalışan sağlığı ve güvenliği uygulamalarının rekabetçi değerler modelinin yedi boyutu baz alınarak tasarlanmıştır. Ölçümleme için şirkette iş sağlığı ve güvenliği kapsamında risk seviyesi en yüksek operasyonel birimde çalışan yöneticilerle bir çalışma yürütülmüştür. Yöneticilere uygulanan Çalışan Sağlığı ve Güvenliği Kurum Kültürü Anketi ile mevcut ve istenilen çalışan sağlığı ve güvenliği kurum kültürüne ilişkin tespitler yapılmıştır. Güvenlik kültürü değerlendirmesi yapılırken Bülent Arpat'ın (2016) Güvenlik Kültürü Değerlendirme aracı kullanılmıştır. Yedi boyutlu (Ana Özellikler, Kurumsal Liderlik, Çalışan Yönetimi, Kurumsal Değer, Stratejik Vurgu, Başarı Kriterleri, ÇSG Süreçlerine Kontrol Yaklaşımı) Çalışan Sağlığı ve Güvenliği ölçeği ile yapılan ölçümleme sonucunda SDT'de açıklanan içsel ve dışsal motivasyon kavramları ile ilgili olarak “değişime açıklık” ve “içselleştirme” kavramlarını temsil eden belirleyici iki boyut ve beş farklı kültür segmenti ortaya çıkmıştır.

Anahtar kelimeler: Sağlık ve güvenlik, pozitif kültür, rekabetçi değerler modeli

CHAPTER 1

INTRODUCTION

Today companies are looking for different methods than the traditional ones in order to increase their performance and efficiency, reduce their losses, and increase their market share and profitability. In order to achieve this, they start from understanding the business conduct, basic values and behavioural patterns of the organization and changing them if necessary.

1.1. Organizational Culture

Organizational culture, which forms the basis of corporate identity, has a significant impact on the formation of operational power at this stage, such as leadership commitment, decision-making processes.. In this context, it is crucial and challenging to define the organizational culture, which is of strategic importance for the organization to achieve its identified goals. The challenge is that the concept of organizational culture has a complex structure that is very much related to many other concepts (Alvesson & Sveningsson, 2008; Schein, 2004). “It is very common among managers and others to characterize the organization as unique and special but then to characterize it in simple and standardized terms such as ‘We are customer- [or market-] oriented’; ‘We are quality leaders’; ‘We treat employees with respect and see them as our most valuable asset’; ‘We provide excellent service’; ‘We are in favour of change’; and ‘We support sustainable development.’” (Alvesson & Sveningsson, 2008, p.35).

Hofstede (1990), taking into account the common characteristics of different definitions of organizational culture, defined organizational culture holistic feature, accumulated from the past, related to other concepts of human and society, challenging to change and understand (Hofstede et al., 1990). The mind has the collective programming feature to distinguish members of a group or category of people from others. Accordingly, culture is a mental event that allows individuals

within a particular group to think and evaluate facts similar to each other but separately from other groups rather than social structures and behaviors (Alvesson & Sveningsson, 2007).

Application of concepts and techniques and their success for management and organization may be affected by the sum of values like business culture, organizational culture, firm culture, or community culture. Therefore, the implementation of all management concepts and techniques, including safety, should be considered together with organizational culture (Sungur, 2012).

1.2. Competing Values Framework

One of the most widely accepted classifications of organizational culture is based on The Competing Values Framework, which refers to four types of culture that fall under two dimensions, as developed by Cameron and Quinn (1999). Culture types can be classified as a clan culture, adhocracy culture, hierarchy culture, and market culture. These types of cultures can be found in various proportions in each organization. Competing Values Framework asserts that a culturally healthy organization requires that some characteristics of each typology should be housed within an organization. The overriding characteristics of a single typology lead organizations to fail and lead to vicious cycles. In organizations that contain a part of all typologies, different typological characteristics do not necessarily have to be at the same rate. It follows that culturally healthy organizations embody the characteristics, values, and beliefs of different typologies. The distinction is the dominant culture.

- a) **Clan Culture.** Shared values, cohesion, participation, individuality, and “we” identity are essential for clan culture-type businesses. Such businesses function more like a large family than an economic unit. Rules and procedures from the hierarchy have been replaced by teamwork, employee engagement programs, and corporate commitment.
- b) **Adhocracy Culture.** The main purpose of adhocracy culture is to promote adaptability, flexibility and creativity in an uncertain, complex and overloaded

environment. For organizations of this type, the main issue is to offer innovative products and services and adapt them quickly to new opportunities. There is a distributed power flow between individuals and teams rather than a central power or authority relationship.

c) Hierarchy (Control) Culture. The control of the external environment is essential. Rules and procedures guide people's behavior. Especially large organizations and bureaucratic structures host standardized procedures and rules, control, and accountability mechanisms. The clarity of these and the decision-making authorities are deemed necessary for successd)

d) Market Culture. Finally, the control of the type of culture in the market (to compete) directs market mechanisms, competition dynamics, and money exchange. In this culture, businesses aim to be profitable, to be strong in market segments, and to build a reliable customer base (Cameron & Quinn, 2006).

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Table 1.1. Culture Types, According to the Competing Values Framework (Cameron & Quin, 2008).

Culture Type	Assumptions	Beliefs	Values	Artifacts (behaviors)	Effectiveness Criteria
Clan	Human affiliation	People behave appropriately when they have trust in, loyalty to, and membership in the organization	Attachment, affiliation, collaboration, trust and support	Teamwork, participation, employee involvement, and open communication	Employee satisfaction and commitment
Adhocracy	Change	People behave appropriately when they understand the importance and impact of the task	Growth, stimulation, variety, autonomy, and attention to detail	Risk-taking, creativity, and adaptability	Innovation
Market	Achievement	People behave appropriately when they have clear objectives and are rewarded based on their achievements	Communication, competition, competence, and achievement	Gathering customer and competitor information, goal setting, planning task focus, competitiveness, and aggressiveness	Increased market share profit, product quality, and productivity
Hierarchy	Stability	People behave appropriately when they have clear roles and procedures are formally defined by rules and regulations	Communication, routinization, formalization	Conformity and predictability	Efficiency, timeliness and smooth functioning

1.3. Safety Culture

Organizational culture has a subculture so-called "safety culture". Safety culture is, therefore, constrained and influenced by the organization culture. A definition of the safety culture may be the beliefs, truths, and ideas that the organization's members agree on for any risk, injury, accident, and occupational health.

The first use of the safety culture concept was made in a report drafted following the Chernobyl nuclear accident in 1986 (Cox & Flin, 1998). The UK Industrial Confederation defines the concept as the ideas and beliefs it shares about risk, accident, and illness (Cooper, 2000). Cooper (2000) defines it as a product of direct multi-purpose interactions between human (psychological), work (behavioural), and organization (situational). The culture of safety was identified as the level of visible efforts related to the interest and actions to improve work safety, guiding all members of the organization. Accordingly, as a sub-dimension of organizational culture, safety culture reflects the behaviours and attitudes of the members of the organization regarding the maintenance of an organization's health and safety performance.

Safety culture is a concept that is related to all safety issues in the organization as a whole, is based on values shared by everyone, affects the behaviour of employees at work, is influenced by reward systems, and change is quite laborious. The safety culture is a reflection of the organisational culture and is a social construct. Different hierarchical levels can give more or less importance to safety, and the ways of considering it to be more or less convergent.

Reason (1997) classified a safety culture under several desirable attributes:

- a) An informed culture: Relevant information is collected and analysed by the organisation;
- b) A reporting culture: Actors feel no fear of blame in reporting safety concerns;
- c) A learning culture: The organisation derives lessons from incidents, and unsafe conditions are rectified with due steps;

- d) A flexible culture: Once the circumstances require, command chain can be restructured;
- e) A just culture: Everybody understands well the boundary between acceptable and unacceptable behavior. Fair and consistent means are defined and implemented for any unacceptable behavior. Any positive contribution is recognized.

Safety culture is an essential key for eliminating occupational accidents caused by unsafe behaviours of employees, especially with its ability to influence employees' behaviors at work (Özkan & Arpat, 2016).

Being open to change, development, willingness to learn from incidents, errors, and accidents; are the characteristics of the positive safety culture. According to Uçkun and Aktay (2013), in negative safety culture, employees fail to consider existing risks as “risk”, ignore them, or show overtrust in themselves in facing the risks/dangers and presents a structure that is as resistant as possible.

Although the existence of regulatory laws and norms is important based on the safety culture that will operate on a healthy basis, the primary determinant in this issue is the dominant culture in social culture and institutions/enterprises. In order to have an influential safety culture, besides the regulatory laws and norms, it is necessary to emphasize the necessity of a safety culture that will settle in social culture and reflect on attitudes (Koydemir, Akyürek, & Topçuoğlu, 2014)

As Griffin and Neal (2000) mention, two components of safety behaviors are namely, safety compliance and safety participation. Safety compliance refers to the employees' behaviors to provide a safe work environment during the performance of their jobs (e.g., pursuing safety rules and use of personal protective equipment). In contrast, the safety participation refers to the voluntary behaviors of the employees not required/imposed by the organization, but help increase the organization's safety environment (e.g., attendance to non-mandatory safety meetings and motivation of colleagues for complying safety practices).

Workers generally become more productive when working conditions satisfy them and pose no injury risk (Luria & Yagil, 2010). However, daily work practices do not always reflect the theoretical knowledge about human factors and

boundaries of human performance to the extent preferred by the management for compliance with safety standards and rules; learning from past errors is not always visible (Griffin & Neal, 2000). Training might be proposed, but the practice generally provides safety skills. Safety-related positive attitudes are developed mainly by the experience gained from their tasks and transferred by experienced colleagues to less experienced ones (Nesheim & Gressgard, 2014).

The cultural approach to safety says that safety would fail if a safety management system alone is applied. Reason (2000) suggests that the cultural approach to safety is something to bring safety management to life, emphasizing the necessity of the right organizational culture to make safety system work. Organizational culture has to be considered together with organizational behavior and, hence with some relevant organizational factors.

The approach to the safety and health of employees has changed over time. Initially, the approach was a reactive one (safety action upon encountered injury/accidents) and changed to a proactive one (safety actions before any accident). The change cannot only be attributed to stricter laws and regulations. The managements see a chance for economic benefit in the provision of actions to ensure the safety and health of employees. Identification of losses has led to the search for new ways for improvement of safety culture. In the identification of problems and areas that require improvement, safety culture assessment has become one of the tools (Kaczmarek, Szwedzka, 2015).

According to Christer Viktorsson, The International Atomic Energy Agency (IAEA) executive who introduced the concept of safety culture, three levels of investigation are needed to understand the health and safety culture in an enterprise (Sungur, 2012):

- a) Safety policies at the policy level, management structure, resources, and specific regulations;
- b) Defining responsibilities at the level of management commitment, control of practices, qualifications and training, rewarding, auditing, reviewing and comparison;
- c) Employee attitudes, loyalty, communication, and prudent approach.

Occupational accidents cause critical social and economic losses all over the world. Despite all the precautions due to these severe losses, occupational accidents continue to exist as an area that hurts the productivity of organizations and requires intervention.

Considering that occupational accidents cause severe damages both for the organizations and the country's economy, the most important issue to prevent occupational accidents is the establishment of a safety culture in the organizations. To this end, the top management's view of the safety culture and the commitment of this culture should be decisive.

The root causes of major accidents are usually failures in the safety management system. Investigations sometimes show that the practice has little connection to safety management systems. Safety management systems are just paperwork, and in practice, they virtually exist. Regulators, safety professionals, and others have been arguing for some time that safety is not merely a matter of compliance with externally imposed regulations (Kong & Rowlinson, 2009)

Instead, Hopkins (2006) argues that organizations should show a proactive approach in managing safety, as in the case of production activities. Hence, attention is now given the cultural approach to enhance safety in organizations. The cultural approach to safety says that safety would fail if a safety management system alone is applied. Reason (2000) suggests that the cultural approach to safety is something to bring safety management to life, emphasizing the necessity of the right organizational culture to make safety system work.

The management is responsible for the life of the organization as a factor dominating the cultural environment. Management approaches and practices affect the formation of health and safety behaviors. Health and safety culture is related to individuals as well as organizations.

The management's commitment to a culture of health and safety is a prerequisite, and safety communication must be freely available at all levels of the organization. It should be clear and concise. Employees should understand their responsibilities. Employees should be made aware of any safety concerns they may have to express or communicate improvement suggestions. It is necessary to

establish a trust-based, two-way relationship with health and safety personnel. The way to develop such a relationship is to communicate interactively and regularly (Raines, 2011)

Safety performance is no exception. Employee involvement and engagement and safety performance have a definite link. The continuity of improvement of safety performance in time is challenging if the input and involvement of the employees are not sought for the safety-related changes (Raines, 2011).

A common goal for employees and managers is to ensure that none gets hurt on the job. Also, brands and reputations are increasingly giving importance to responsible practices. Top management is required to develop, lead, and promote a culture in the organization that supports the health and safety management system. The commitment and leadership are vital in the establishment and implementation of an effective health and safety management system and an occupational health and safety culture.

1.4. Occupational Health and Safety Management System

Aiming to provide the framework to manage risks and opportunities in the field of employee health and safety, ISO 45001 takes an approach that considers the unique context of organizations and emphasizes the strong impact of leadership in this process.

ISO 45001 offers a single, clear framework to improve the organizations' health and safety performance and management system standards. Directed at the top management, the standard aims to provide the employees with a safe and healthy workplace. All adverse factors on the physical, mental, and cognitive conditions of an employee should be mitigated to achieve this goal. Hence the control over the factors that might result in illness, injury, and in extreme cases, death is ensured.

ISO 45001 focuses on the interaction between the organization and its business environment. The standard is applicable to the health and safety risks

under the organization's control. It takes into account factors such as the needs and expectations of workers and other parties and the context in which the organization operates.

ISO 45001 states that within the unique context of the organization, the desired employee health and safety results can be achieved through leadership and employee involvement. Leadership drives performance by allowing everyone to understand their role and impact on the company. Connecting employee actions and contributions to the broader vision is the key to a performance culture, and this is emphasized in the ISO 45001 requirements relating to worker participation.

Emphasizing leadership in the context of business benefits creates a clear direction and the tools for governance across the entire business. Proper alignment of the management system with the organization's objectives allows leadership to make the right decisions on complex topics. Engaging top management is fundamental to implementing an effective occupational health and safety management system. In order to attain this goal, contemporary efforts started to meet the expectations of ISO 45001 via shaping an influential safety culture, blended with employee participation and strong leadership.

1.5. Research Aim and Model

The study aims to create a measurement tool for the effective analysis of the current employee health and safety culture in a ground handling company operating in the aviation industry. A scale is designed based on the dimensions of the competitive values model of employee health and safety practices. It is structured on a biaxial cultural orientation model based on the following interrogation:

- a) Is the tendency to comply with rules due to the inner motivation of the organization and the individual or due to the control fed from outside?
- b) To which extent is the organization open to change, innovation, and the power of the corporate entrepreneurship?

This biaxial structure brings four different types of culture inspired by the Competing Values Framework (CVF) but with the scope of employee health and safety (EHS)

- a) Collaborative EHS: It manifests the Clan Culture of CVF. Strong group ties and cooperation between employees specific to matters of EHS.
- b) Innovative EHS: It manifests the Adhocracy Culture of CVF. Dissociation from bureaucracy and innovative solutions specific to matters of EHS.
- c) Competitive EHS: It manifests the Market Culture of CVF. Monitoring EHS practices in other institutions, adaptation to market conditions and competition.
- d) Compliance EHS: It manifests the Hierarchy Culture of CVF. Motivation for compliance with minimum conditions in EHS, hierarchy, and control.

This research has a quantitative approach and aims to demonstrate how the variables are associated with each other while pursuing their correlational and causal relationships.

CHAPTER 2

METHOD

This chapter consists of methodological procedures of this master thesis involving sampling, measurement, instruments, and data collection.

2.1. Participants

The sample was from a multinational company, which performs in the aviation industry in Turkey. The survey was in Turkish and data collected from Turkish speaking participants. The company carries out ground handling services at 28 airports in Turkey and two airports abroad, including Riga Airport in Latvia, Madinah Airport in Saudi Arabia. It also provides warehouse services and passenger transport services between airports and city centers. The company has been organized to meet all ground handling requirements of an airline company at an airport by providing passenger services, ramp services, cargo and mail services, flight operations/load control and communication services, representation, and supervision services. Today it holds a portfolio of more than 200 distinguished airline companies.

A total of 141 respondents participated in the study; however, only responses of 114 participants were usable. The participants, apart from the questions, were asked to answer the questions about their demographic variables. The demographic variables were controlled in order to be able to measure the aimed variables.

All participants are full-time employees working eight hours a day. The large segment of participants are males 73% (n=81), 27% (n=30) of participants were stated as females. Three of the participants did not select any of them to declare their gender.

Among the participants, 65.5% (n=72) are undergraduate, 20% (n=22) are post-secondary degree and 14.5% (n=16) are high school graduates. Four of the participants did not respond to this question in the survey.

Table 2.1 Participant's Education Level

	Number of Participants	Percent	Valid Percent
Highschool	16	14,0	14.5
Post-secondary degree	22	19.3	20
Undergraduate	72	63.2	65.5
Total	110	96.5	100
Missing System	4	3.5	
Total	114	100	

All participants are white-collar employees with administrative responsibility and working in shifts. The participants were asked which processes they were responsible for operationally. What is meant here are the ramp, operation, passenger services that compose ground services, and administrative processes that cover them all. 89.9% (n=98) of the participants stated that they have administrative responsibility and the main areas of responsibility of the participants were 19% (n=20) ramp, operations 12.4% (n=13), passenger services 16.2% (n=17) and station management 54.2% (n=55).

Table 2.2 Participant's Main Responsibilities

	Number of Participants	Percent	Valid Percent
Ramp	20	17.5	19.0
Operation	13	11.4	12.4
PAX Services	17	14.9	16.2
All	55	48.2	52.4
Total	105	92.1	100
Missing System	9	7.9	
Total	114	100	

2.2. Measures

There were two scales in total, which were used to measure the safety and health culture of the company. The scales were Turkish.

2.2.1 The Employee Health and Safety (EHS) Culture Scale

A scale was adapted from Cameron and Quinn's Competitive Values (1999) approach to analyze corporate employee health and safety culture. The questionnaire developed by Assoc. Prof. İdil Işık and Başak Helen Taşkan consists of the following seven dimensions, and each dimension has four alternatives: Main Features, Corporate Leadership, Employee Management, Corporate Values, Strategic Emphasis, Success Criteria and Control Approach to EHS Processes.

“The Main Features” dimension is focusing on the general characteristics of the organization in terms of EHS are expressed. While EHS applications are being implemented, the sense of trust in the organization, the existence of processes that support employees' entrepreneurship, the effectiveness of processes, and the existence of innovative policies in which corporate entrepreneurship is supported to implement best practices are evaluated under this dimension.

Under the “Corporate Leadership”, the leadership characteristics affecting managers' EHS processes are evaluated. From the perspective of the employees, the profile of the managers (mentor, parent figure, etc.), the leadership exhibited for their teams to develop entrepreneurial-innovative approaches, personality traits (ambitious, competitive, etc.), their level of expertise on the subjects they are responsible for.

In the “Employee Management”, the role of the employees in the execution and development of the organization's EHS processes is evaluated. Is the EHS management style driven by participation, teamwork and consensus; can employees produce EHS solutions with innovative approaches, getting out of customary solutions and specific approaches to specific problems? Are the employees focused on delivering sectoral good practices in EHS practices, making a difference

compared to other institutions and success? Is it possible to improve and maintain consistency as much as possible?

Under the “Corporate Values” dimension, the values that keep employees together in terms of EHS are questioned. Under four different cultural typologies of collaborative, innovative, competitive, and compliant, the central values themes are interrogated: mutual trust, commitment to innovation and development, being ahead of technological developments and the industry, achieving the goals and/or maintaining the EHS as a smoothly functioning structure.

The essential elements of the organization's EHS strategies are defined under the “Strategic Emphasis”. The following issues are considered among the basic principles that form the corporate EHS strategy; the importance given to the development of EHS by the top management; high trust, transparency, and continuity of participation; challenging the difficulties, trying the novel things and look for the new opportunities; measurable goals and objectives; permanent solutions, stability, careful use of resources, efficiency and smooth operation.

In the “Success Criteria” dimension the primary question is “How the EHS success is defined?” : human resource development and teamwork; having the most unique or newest ideas; EHS processes outperform other similar organizations with the results it produces; careful use of resources and efficiency; smooth scheduling and low costs. This section asks which of these might be the top headings of EHS success criteria.

In the “Control Approach” to EHS processes, where the expected safe behaviors are evaluated in order to carry out the EHS processes effectively, which attitudes and behaviors provide safe behavior is evaluated: the attitude towards risky behaviors, the presence of a mutual sense of responsibility that guides employees towards safe behavior, effective communication that will ensure innovation and entrepreneurship, participation of employees in decisions, efforts to maintain positive performance, discipline and regular control efforts.

Each alternative is ranked for two different contexts. In the initial evaluation, a total of 100 points should be shared among the four alternatives of the relevant dimension, considering the current situation in the company. In the second

case, it should be scored considering the preferred situation in the future (next five years). There is a total of 28 questions to be answered in this way (Appendix 1).

2.2.2 The Safety Culture Scale

The Safety Culture Scale was developed by Bülent Arpat (2015) on six factors to measure the level of safety culture in the workplace and to examine the effects of safety culture on work accidents (Appendix 2). The factors are Safety Leadership, Safety Awareness and Behaviour, Safety Communication and Employee Participation, Safety Commitment of Management, Safety Training, Safety Rules. Since Cronbach's Alpha reliability analysis results of The Safety Culture Scale are in the range of 0.80-1.00, it can be said that the data has high reliability.

2.3. Procedures

Before proceeding to the data collection phase, an ethics committee approval was received from the Ethical Committee of İstanbul Bilgi University. (Appendix 4)

Data were collected via Survey Monkey. The questionnaire link was sent to the participants via a personal e-mail. The e-mail addresses of the participants were obtained in accordance with the information security and confidentiality procedures of the personal data from the company's HR department with the approval of the senior management. The link was sent exclusively to the participant; it was not possible to share it with another person. While the link was sent, in the content of the e-mail, it was stated that "this is a scientific study, and participation is voluntary. The research proceeds with operational managers who give consent to participate in the study."

The survey starts with the consent form, in which the participant's approval was obtained. The survey would not continue if the participant does not approve, and the participants who declined to go on were directed to the end. Names or any

other type of identification of the participants were not requested, and all responses were kept anonymous.

First, the participants responded to the employee health and safety culture scale by distributing 100 point for the current and ideal conditions and secondly, the safety culture scale developed by Arpat (2015) has been answered.

After completing the second part, participants were required to report their gender, age, education level, working time in the company, if they have any managerial role, number of employees reporting to them, and central area of responsibility. The filling the scales took about 20-30 minutes.

2.4. Data Analysis

The analysis of the data collected in the research was done through the SPSS 25 software. The Exploratory Factor Analysis was carried out to provide construct validity and to detect subdimensions of scales using Principle Axis Factoring extraction method and with oblimin rotation method.

Internal reliability analyses were run separately for each scale (Cronbach's Alpha) for each sub-factor that emerged as a result of factor analysis. Cronbach Alpha is the adaptive value based on the correlation between the items and shows the total reliability level of the items under the factor. Cronbach's Alpha value of scales was calculated so as to measure the internal consistency of scales.

Multi-Dimensional Scaling (MDS) was used to detect meaningful underlying dimensions and segments to explain distances between current EHS culture variables. PROXSCAL, MDS module in SPSS was utilized. The matrices of Pearson correlation coefficients between the 28 items were analyzed with interval MDS and initial Simplex configuration (defaults for ties and iteration criteria: keep ties; stress convergence = .0001, minimum stress = .0001, maximum iterations = 100).

CHAPTER 3

RESULTS

3.1. Factor Analyses of The Safety Culture Scale

Exploratory Factor Analysis (EFA) and internal reliability tests were conducted for the validity of The Safety Culture Scale. The principal axis factor analysis with direct oblimin rotation was used to extract the structures of the questionnaire. The details of the factor structure of the scale and the results from the reliability analyses are explained below.

In the study the Kaiser-Meyer-Olkin (KMO) test demonstrated the adequacy of inter-variables correlations in the sampling adequacy of the factors. The Barlett Sphericity test demonstrated that there is a sufficient relationship among items of the questionnaire.

The KMO sample adequacy ratio, which is 0.905 for The Safety Culture Scale is considered sufficient for EFA application to the data set. 3447.478 chi-square and $p = 0.000$ significance values obtained because of Barlett's test of fidelity indicate that there is a sufficient level of correlation among variables.

The original The Safety Culture Scale has 49 items, and it has six factors of safety culture, which are Safety Leadership, Safety Awareness and Behaviour, Safety Communication and Employee Participation, Safety Commitment of Management, Safety Training, and Safety Rules.

In the current study, statistical analysis and the rotation of the factors brought five factors after 10 stages of iteration of factor analysis. A total of 12 items were removed from the scale to reach the final structure, and Cronbach's Alpha reliability test was applied to all five factors. The factor loadings of items are shown in the pattern matrix of the scale Table 3.1. As a result of the rotation completed in ten stages, an analysis output consisting of 5 factors and 37 items was formed.

Table 3.1 The Pattern Matrix of The Safety Culture Scale

	Factor Loading
SAFETY LEADERSHIP	
24- My supervisor regularly monitors occupational safety.	0.954
25- My supervisor often warns employees not to engage in risky behaviour.	0.877
23- My supervisor provides guidance and pioneers to employees on occupational safety.	0.836
17- Management cares about and applies occupational safety recommendations from employees.	0.792
26- My supervisor often talks with employees about occupational safety issues and problems.	0.786
18- Occupational safety practices are regularly audited.	0.782
16- Managers regularly inform employees of occupational safety.	0.749
27- Employees are warned and encouraged to use protective equipment properly.	0.722
34- With regard to occupational safety, the top management's door is always open to employees.	0.714
13- Our managers come to see the working conditions and to meet with the employees.	0.679
22- Sufficient training is provided in our workplace to improve safe behaviour.	0.678
29- Suggestions or solutions from employees are accepted by our superiors.	0.644
21- Workplace health and safety training cover the issues that employees face in doing their job.	0.639
20- Safety trainings are repeated / updated at regular intervals.	0.625
33- There is good communication in my workplace on occupational safety issues that may affect me.	0.621
19- Employees receive extensive training in the areas of health and safety at work.	0.613
28- Persons who may be affected by changes to the production process are consulted directly.	0.613
30- Management asks employees to participate in meetings about the work to be done.	0.588
31- Problems related to working conditions are solved by a team of employees from different units.	0.541

6- Management really attaches great importance to employee safety.	0.526
5- Safety rules are regularly reviewed with employees.	0.517
15- Management is not only considering the business success but also the ensuring of job safety.	0.513
12- Managers actively and visibly pioneer work safety.	0.490
SAFETY PROCEDURES	
3- In some cases, it is necessary to leave the safety conditions in order to realize the production on time.	0.799
2- Some of the health and safety rules are not practically applicable.	0.697
4- The safety rules are very strict, I can work better without them.	0.682
SAFETY PROMOTION	
36- Employees are encouraged to support each other and pay attention to each other.	0.716
35- I receive "praise / appreciation" for my work when performed in compliance with occupational safety rules.	0.632
37- Employees advise each other on how to do the job safely.	0.601
SAFETY AWARENESS	
38- I always follow the safety rules.	0.831
39- I think safety is the most important thing when I perform the job.	0.823
47- I use all the necessary safety equipment when I do my job.	0.544
44- I inform the management about safety issues that I consider important.	0.533
48- I voluntarily carry out tasks and activities that contribute to improved workplace safety.	0.419
SAFETY PARTICIPATION	
43- Business management takes the opinions of employees before making final decisions on occupational safety.	-0.651
42- Employees participate in the development of safety practices.	-0.646
40- Employees are actively involved in risk assessment activities related to their work.	-0.550

Reliability analysis of The Safety Culture Scale and dimensions are tested by internal consistency analysis with calculation of Cronbach's Alpha values. Internal consistency coefficients observed as for leadership 0.964 (23 items), for procedures 0.753 (3 items), for promotion 0.873 (3 items), for awareness 0.846 (5 items) and for participation 0.890 (3 items).

As a result of the analysis, the rate of disclosure of total variance was obtained as 63.055% and the components representing the variance value explained in Table 3.2.

Table 3.2 The Total Variance Explained by Factors of The Safety Culture Scale

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	17.734	47.931	47.931	17.405	47.041	47.041	16.123
2	2.572	6.951	54.881	2.179	5.891	52.932	3.020
3	2.082	5.626	60.507	1.746	4.720	57.652	5.120
4	1.485	4.015	64.522	1.153	3.118	60.769	8.668
5	1.224	3.309	67.831	0.846	2.286	63.055	6.532

The statements that make up Safety Procedures (items 2,3,4) are consistent in themselves, but have negative relationships with other variables, and they contain negative attitude. In order to be consistent and same with others, three items under this factor were made in the same direction by reverse coding. It became more consistent and easier to interpret with recalculation. In order to be in the same

direction with other factors, taking into account the Arpat Factor 2 recoded, the correlation between the current score of the four culture types and the Arpat Factors was evaluated.

3.2. Multi-Dimensional Scaling of EHS Culture Scale

Multi-Dimensional Scaling (MDS) was used to detect meaningful underlying dimensions and segments to explain distances between current EHS culture variables. PROXSCAL, MDS module in SPSS was utilized. The matrices of Pearson correlation coefficients between the 28 items were analyzed with interval MDS and initial Simplex configuration (defaults for ties and iteration criteria: keep ties; stress convergence = .0001, minimum stress = .0001, maximum iterations = 100).

As a result, MDS brought out two higher-order dimensions, and five segments which were named as shown in Figure 3.1 with the Stress-I level of .20454 and the Appendix 6 provides the final coordinates that the analysis emerged.

According to Kruskal (1964)'s benchmarks, this fit measure is poor; but based on Borg and Groenen (2005)'s recommendation, MDS created a feel of 28 items in phrases of their association to every other (Figure 3.1).

With Multi-Dimensional Scaling, where we look at the relationships among the items in a scale, analysis is made on the correlation table between all items. First, a table of the correlation coefficient between all variables is created, and this table is used as a new database. Then the most interconnected ones are placed on a 360-degree spatial area by placing them. This distribution has 2 axes that are less than zero and greater than zero. Axes are defined as openness to change and internalization. Answers that have the highest bond with each other on the two coordinate axes define the correlations in the same box.

Internalization axis; indicates the acceptance of the employee by internalizing the norms and values related to the EHS by individual analysis and / or feeling compelled to comply with the defined requirements. On the openness to

change axis, the state of being open to change, innovation, and the power of the corporate entrepreneurship factor are expressed.

MDS is used to analyses whether the expressions in the measurement tool we use academically show a particular theoretical grouping. It is an alternative method instead of factor analysis to test that the items in the EHS Culture Scale that we developed for the first time are related to each other. It provides ease of analysis through the answers from many different question types that can serve many different scale types.

When we analyses using the correlation coefficients as a database, we group them in what dimension each expression is dominant, whether it has a higher positive or negative load. Load distributions are shown in Table 3.3.

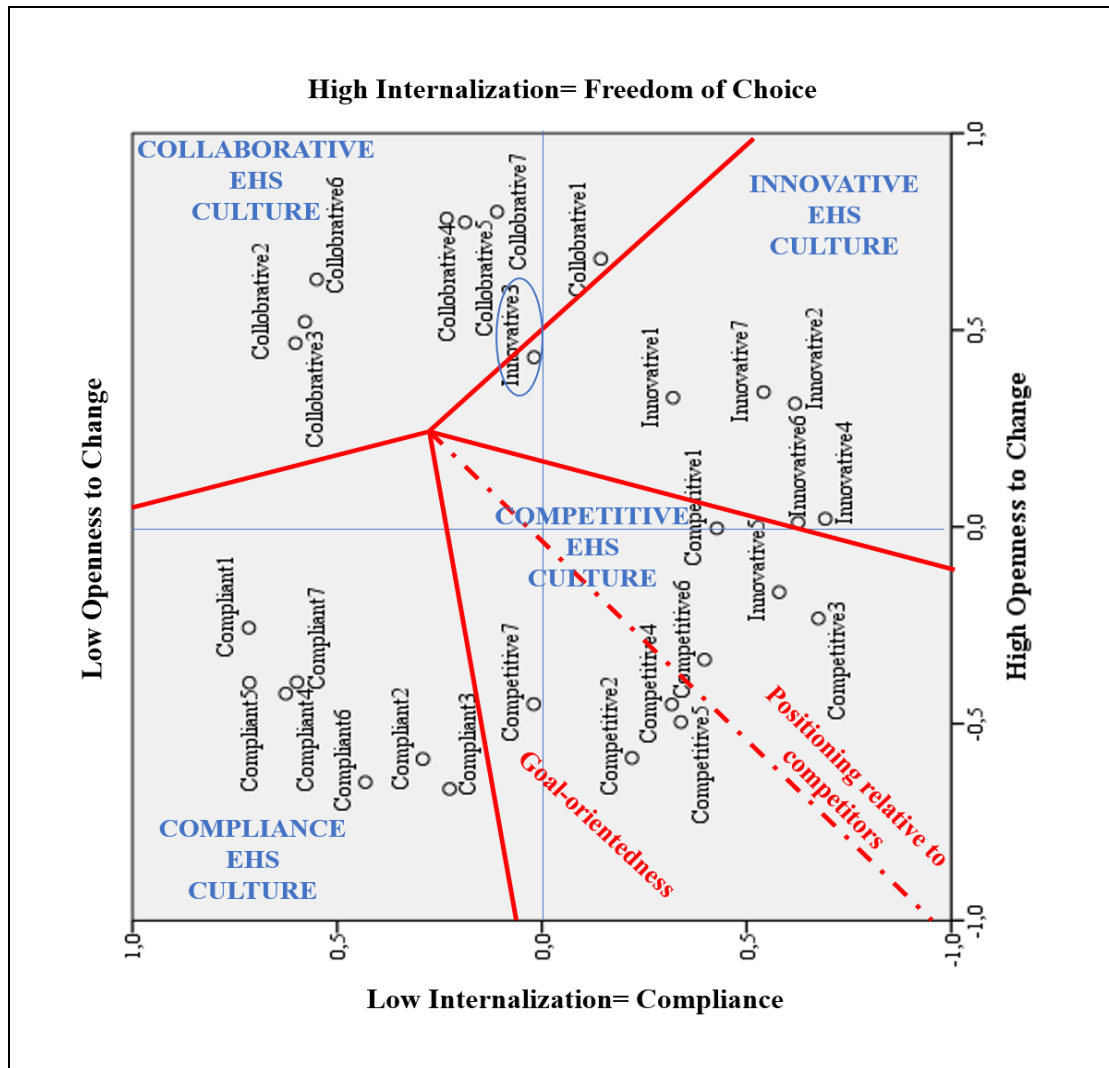
Table 3.3 The Coordinates for the Dimensions of EHS Culture Items

	Dimension	
	1	2
Current_Collaborative7	0.800	0.110
Current_Collaborative4	0.783	0.233
Current_Collaborative5	0.774	0.188
Current_Collaborative1	0.681	-0.144
Current_Collaborative6	0.629	0.550
Current_Collaborative3	0.466	0.602
Current_Collaborative2	0.521	0.579
Current_Compliance1	-0.257	0.716
Current_Compliance5	-0.396	0.714
Current_Compliance4	-0.424	0.626
Current_Compliance7	-0.395	0.598
Current_Compliance6	-0.649	0.431
Current_Compliance2	-0.590	0.291
Current_Compliance3	-0.666	0.225
Current_Innovative4	0.020	-0.692
Current_Innovative6	0.011	-0.626
Current_Innovative2	0.313	-0.619
Current_Innovative7	0.342	-0.542
Current_Innovative1	0.328	-0.320
Current_Competitive2	-0.587	-0.220
Current_Competitive5	-0.496	-0.340
Current_Competitive4	-0.451	-0.317
Current_Competitive7	-0.450	0.020
Current_Innovative5	-0.166	-0.580
Current_Competitive1	-0.004	-0.428
Current_Competitive3	-0.233	-0.675
Current_Competitive6	-0.337	-0.397

In this analysis, the relationship of the questions with each other and the points converging within the framework of the expected model; it is divided into 4 sections with 2 axes -openness to change and internalization-. When looking at the distribution of the items in this division all collaborative and compliant items were gathered together meaningfully, new axes were created from the points suitable for the model. However, the competitive EHS culture segment is divided into 2 sub-dimensions due to the strong relationship that Competitive7 and Innovative5 have established outside their own groups. Considering the expressions of the items collected in these sub-dimensions, this segment has been named as "Goal Orientedness" since the target orientation is emphasized in Competitive2, Competitive4, Competitive5 and Competitive7. Competitive1, Competitive3, Competitive6 and Innovative5 are named as "Positioning Relative to Competitors" since it is emphasized to avoid competitors with an innovative approach. The stress indices give information that they are similar, and the coordinates are shown in Figure 3.1.

These coordinates are positioned as negative/positive according to dimensions 1 and 2 and according to their load. In this case, Innovative 3 is incompatible in terms of its location and content. It does not show consistency in content with the collaborative group it belongs to. We cannot include it in the innovative segment because it does not show a negative load. Since it is located at an inconsistent point in terms of coefficients, it cannot accurately measure what it wants to measure and does not show correct correlations. For these reasons, it was decided to exclude the evaluation.

Figure 3.1 Multi-Dimensional Scaling of EHS Culture Scale (Segments and Dimension)



As the Figure 3.1. shows the groups containing four culture types can be named: Collaborative, Innovative, Competitive, and Compliance.

Comparison of the current situation evaluations of the groups consisting of seven questions representing each of the four different culture types with the meanings of the preferred situation evaluations can be seen in Table 3.4. Here, the differences between the two situations seem to be quite low. Averages were also calculated for the newly created Goal Orientedness and Positioning Relative to Competitors segments. Segments consisted of the following items.

Current Innovative:

Innovative1, Innovative2, Innovative4, Innovative6, Innovative7

Current Competitive:

Competitive1, Competitive2, Competitive3, Competitive4, Competitive5, Competitive6, Competitive7, Innovative5

Current Goal-Orientedness:

Competitive2, Competitive5, Competitive4, Competitive7

Current Positioning Relative to Competitors:

Competitive1, Competitive3, Competitive6, Innovative5

Preferred Innovative:

Innovative1, Innovative2, Innovative4, Innovative6, Innovative7

Preferred Competitive:

Competitive1, Competitive2, Competitive3, Competitive4, Competitive5, Competitive6, Competitive7, Innovative5

Preferred Goal-Orientedness:

Competitive2, Competitive5, Competitive4, Competitive7

Preferred Positioning Relative to Competitors:

Competitive1, Competitive3, Competitive6, Innovative5

Table 3.4 Descriptive statistics of EHS culture types

	N	Minimum	Maximum	Mean	Std. Deviation
Current_Colloborative	114	17.86	78.57	31.471	9.531
Current _Compliance	114	5.71	55.86	26.167	8.560
Current_Innovative	114	1.00	38.00	22.428	6.432
Current _Competitive	114	1.00	31.25	20.283	5.442
Positioning Relative to Competitors	114	1.00	30.00	20.614	6.077
Goal Orientedness	114	0.00	33.75	19.952	7.020
Preferred_Collaborative	114	7.86	69.57	31.774	10.281
Preferred_Innovative	114	1.00	53.00	26.421	7.237
Preferred _Compliance	114	1.43	44.29	22.043	6.765
Preferred_Competitive	114	1.00	31.25	20.578	5.503
Positioning Relative to Competitors	114	1.00	37.50	22.456	6.404
Goal Orietedness	114	0.00	32.50	18.699	6.833
Valid N (listwise)	114				

In the first place, the participants perceive the company as an organization with a culture of colloborative operation in terms of EHS (Mean=31.47, SD=9.531). . In the second rank, they defined it as a company with the motivation to adapt to the minimum requirements (Mean=26.16). Seeking innovative solutions in EHS in third place (Mean=22.42), and in the fourth place, they perceive it as an organization that competes with innovative approaches (Mean=20.61) and adopts a final goal-oriented competition approach (Mean=19.95).

When comparing the current situation and the preferred situation in Colloborative EHS culture, two values are almost equal, and the mean difference is small (mean difference =0.30). This difference indicates that no change is expected in this regard. With the difference of 3.90, it is seen that there is an expectation to focus on more innovative solutions on EHS. While there was no expectation of change in following EHS practices in other institutions (-0.08), it was observed that

there was an expectation of decreasing the motivation to comply with the minimum conditions (-4.12).

The removal of Innovative3 and Innovative5 from the innovative group did not have a major impact on the average score.

Table 3.5 Comparison of the current and preferred situation in cooperation with EHS

		CURRENT SITUATION C	PREFERRED SITUATION P	PREFERRED CHANGE (P-C)	
COLLABORATIVE	Type # 1: Cooperation among the Employees in the EHS	31.4712	31.7744	0.30	
COMPLIANCE	Type # 4: Minimum Requirements Compliance Motivation in EHS	26.1667	22.0426	-4.12	
COMPETITIVE	Type # 3: Following EHS Practices at Other Companies	20.2829	20.5779	0.29	
INNOVATIVE	Type # 2: Innovative Solutions in EHS	22.4281	26.4211	3.90	

We have seen how the scale we have created inspired by Cameron's The Competing Values Framework model and the culture types we have modeled accordingly, have a distribution of points in Havaş, we have taken a picture of the company.

3.3. Relationships Among Organizational Cultures and Safety Factors

The next question is if there a relationship between the scores the current EHS culture and the scores of Arpat. To understand this, the correlation between Arpat factors and the current situation can be seen in Table 3.6.

People who perceive Safety Leadership high in Arpat's scale high in Havaş also gave high scores to collaborative ($r=.308$, $p= 0.001$) and innovative ($r=.199$, $p=0.033$) cultures, and there is a positive relationship between them. A negative relationship with the culture of motivation to comply with the minimum requirements (compliance) ($r=-.367$, $p= 0.000$). When the participants perceive only the culture of occupational safety based on compliance, they perceive leadership as lower. Considering the correlation with the competitive culture it only has a negative significant relationship with Current Goal-Orientedness ($r=-.249$ $p=0.008$)

Table 3.6 The Correlation Between the Arpat Safety Culture Factors and the EHS Current Culture Alternatives

		SAFETY LEADERSHIP	SAFETY PROCEDURES	SAFETY PROMOTION	SAFETY AWARENESS	SAFETY PARTICIPATION
Current_Collaborative	Pearson Correlation	.308**	-0.068	.202*	.205*	0.080
	Sig. (2-tailed)	0.001	0.475	0.031	0.029	0.395
	N	114	114	114	114	114
Current_Compliance	Pearson Correlation	-.367**	-0.116	-.391**	-.239*	-.199*
	Sig. (2-tailed)	0.000	0.219	0.000	0.010	0.034
	N	114	114	114	114	114
Current_Competitive	Pearson Correlation	-0.145	0.074	0.003	-0.082	-0.001
	Sig. (2-tailed)	0.123	0.434	0.978	0.388	0.993
	N	114	114	114	114	114
Goal Orientedness	Pearson Correlation	-.249**	0.007	-0.105	-0.132	-0.091
	Sig. (2-tailed)	0.008	0.938	0.266	0.162	0.334
	N	114	114	114	114	114
Positioning Relative to Competitors	Pearson Correlation	0.027	0.124	0.126	0.006	0.104
	Sig. (2-tailed)	0.773	0.189	0.182	0.948	0.271
	N	114	114	114	114	114
Current_Innovative	Pearson Correlation	.199*	.197*	.278**	0.084	.193*
	Sig. (2-tailed)	0.033	0.035	0.003	0.374	0.040
	N	114	114	114	114	114

People who have a negative attitude towards Safety Procedures have a significant relationship only with the Innovative Culture ($r=.197, p=0.035$). Although there is not a strong relationship, it is significant. If there is an innovative creative occupational safety culture perception, negative attitude towards procedures decreases in company. Or people who have a higher score negative attitude towards procedures, do not perceive the company as a company with creative innovative values in the foreground.

If there is a collaborative culture there is also the perception of Safety Promotion ($r=.202, p=0.031$), there is also the perception of innovation ($r=.278, p=0.003$). However, if there is a culture perception where motivation to comply with the minimum requirements is at the forefront, it is in a negative relationship with this factor ($r=-.391, p=0.000$). The compliance culture that exists to fulfil the minimum conditions show a negative relationship with all components.

People with high Safety Awareness are also people with high collaborative culture perception ($r=.205, p=0.029$). On the other hand, these people evaluate the existing culture negatively in terms of hierarchical culture with high motivation to fulfil minimum conditions ($r=-.239, p=0.010$).

People who perceive Safety Participation positively and who have described themselves with a higher score show a negative relationship with Compliance Culture ($r=-.199, p=0.034$) and a positive ($r=.193, p=0.040$) with innovative approaches.

Considering the recoded Safety Procedures, the correlation between the average score of those preferred in four culture types and the Arpat factors was evaluated. It was not logical to compare the current situation with the preferred one, as there was little significance in this assessment and this was a weak outcome. Therefore, the assessment of the preferred situation has not been reported. Since participants responded to the current situation when responding to The Culture Scale, the current situation assessment was taken into account in The EHS Culture Scale.

3.4. Comparison of EHS Culture Perceptions According to Managerial Roles

In this study, we do not have a hypothesis that the perception of culture will differ according to the number of employees. However, it was evaluated whether there is a difference in order to be an exploratory study (Appendix 7).

Whether the mean difference between the two independent groups for each dependent variable was statistically significant was analyzed by t-test.

According to descriptive, the grouping variables with the number of people reporting, as more than 50 and less than 50 below. When the answers of these two groups were compared between the current and preferred ones in terms of the variables we were interested in, it was determined that there was no significant difference.

Those who manage single functions and those who manage multiple functions were divided into two groups and their responses were analyzed too. Besides the standard deviations (variance) of these two groups, it is an important indicator how homogeneous the answers are.

Table 3.7 Independent Samples Test of The Groups According to The Number of Functions Managed

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		<i>F</i>	Sig.	<i>t</i>	<i>df</i>	<i>p</i>	Mean Difference	Std. Error Differe nce	95% Confidence Interval of the Difference	
									Lower	Upper
Current_C ompliance	Equal variances not assumed	7.934	.006	-3.212	95.380	.002	-5.06	1.576	-8.194	-1.9351
Current_In novative	Equal variances assumed	3.496	.064	3.451	103	.001	4.186	1.212	1.780	6.5899

The mean difference of those who manage single function and those who manage all is statistically significant for compliance [$t(95.38) = -3.212, p = .002$]; compliance perception is higher in those who manage all functions than those who manage single function.

The innovative approach perception is higher [$t(103) = 3.451, p = .001$]; in the group that manages single function than those who manage all of them. From here, we can say that the group that manages all functions is in trouble about regulations, hierarchical structures.

Table 3.8 Independent Samples Test of the Groups According to the Number of Functions Managed

		N	Mean	Std. Deviation	Std. Error Mean
Current_Compliance	Single Function	50	23.46	6.45	0.912
	All	55	28.52	9.54	1.286
Current_Innovative	Single Function	50	24.67	5.57	0.788
	All	55	20.49	6.73	0.907

CHAPTER 4

DISCUSSION

This study aimed to develop a new scale that can measure employee health and safety culture perception. In this framework, a 7-dimensional scale (with four alternatives in each one) has been developed, inspired by the Cameron's Competitive Values Model. These seven dimensions are Main Features, Corporate Leadership, Employee Management, Corporate Value, Strategic Emphasis, Success Criteria, and Control Approach to EHS Processes.

The developed scale has been administered to the employees working in the operational departments of a ground handling company in the aviation industry. Application of concepts and techniques and their success for management and organization may be affected by the sum of values like business culture, organizational culture, firm culture, or community culture. Therefore, the implementation of all management concepts and techniques, including safety, should be considered together with organizational culture (Sungur, 2012). We have seen how the scale we have created inspired by Cameron's The Competing Values Framework model and the culture types we have modeled accordingly, have a distribution of points in Havaş, we have taken a picture of the company.

With Multi-Dimensional Scaling the relationships among the items on a scale were analyzed, and the most interconnected ones were placed on 360-degree spatial area on two axes. The two axes representing these positioning were named as “openness to change” and “internalization” in relation to the concepts of intrinsic and extrinsic motivation explained by Self Determination Theory (SDT).

Internalization axis; indicates the acceptance of the employee by internalizing the norms and values related to the EHS by individual analysis and/or feeling compelled to comply with the defined requirements. On the openness to

change axis, the state of being open to change, innovation, and the power of the corporate entrepreneurship factor is expressed.

SDT is an empirically based theory of human motivation, development, and wellness. The theory focuses on types of motivation, rather than level, paying particular attention to autonomous motivation, controlled motivation, and motivation as predictors of performance, relational, and well-being outcomes. SDT also examines people's life goals or aspirations, showing differential relations of intrinsic versus extrinsic life goals to performance and psychological health (Deci & Ryan, 2008). Self-determination theory posits that human beings are active and initiate their behaviour (Deci & Ryan, 1985).

SDT states that there are two types of motivation that influence behaviours: intrinsic (or autonomous) and extrinsic (or controlled). Autonomous motivation comprises both intrinsic motivation and the types of extrinsic motivation in which people have identified with an activity's value and ideally will have integrated it into their sense of self. When people are autonomously motivated, they experience volition, or a self-endorsement of their actions. Controlled motivation, consists of both external regulation, in which one's behaviour is a function of external contingencies of reward or punishment, and introjected regulation, in which the regulation of action has been partially internalized and is energized by factors such as an approval motive, avoidance of shame, contingent self-esteem, and ego-involvements. When people are controlled, they experience pressure to think, feel, or behave in particular ways (Deci & Ryan, 2008).

Accordingly, as a result of MDS, two main dimensions of SDT, namely internalization and openness to change, and four main EHS culture segments were formed as collaborative, innovative, competitive and compliance. Considering the item expressions of these segments, where different culture types are represented, it is seen that significant groupings have occurred in those other than Competitive EHS culture, while two different meaning groups have been formed in this competitive segment. Considering the expressions of the items collected in these sub-dimensions, this segment has been named as "Goal Orientedness" since the

target orientation is emphasized in Competitive2, Competitive4, Competitive5 and Competitive7. Competitive1, Competitive3, Competitive6 and Innovative5 are named as “Positioning Relative to Competitors” since it is emphasized to avoid competitors with an innovative approach. This sub-break provides an insight into the organization's own safety performance or its competitors' performance based on the Competitive EHS culture. This distinction can be an important basis for the development of the Competitive EHS culture in organizations.

The openness to change axis, which constitutes one of the two main dimensions, expresses the state of being open to change, innovation, and the power of the corporate entrepreneurship factors of five different culture types. While Collaborative and Innovative EHS cultures are clearly seen with all items with high openness to change, this dimension effect is reduced in Compliance and Competitive EHS cultures.

In factor analysis for safety culture scale developed by Arpat, factors were grouped under five headings; safety leadership, safety procedures, safety promotion, safety awareness, and safety participation.

People who perceive safety leadership high in Havaş also gave high scores to collaborative and innovative cultures, and there is a positive relationship between them. Here, the link between teamwork and employee involvement and leadership, especially observed in a collaborative culture, has emerged. It has been revealed that understanding the purpose of the tasks assigned, the place and influence of the tasks within the whole by the employees in the innovative culture can only be ensured in parallel with the strong leadership perception. When the participants perceive only the culture of occupational safety based on compliance, they perceive leadership as lower. Especially in situations where compliance is very critical in the aviation sector where the study is carried out, the decrease in leadership expectation appears as a realistic output.

If the company is working solely in a compliance focused, it should not introduce himself as everyone leads each other in terms of occupational safety,

everyone is his leader, there is an influential culture. Employees do not perceive this in this way. If you are providing compatibility, you have to show, on the other hand, that you are leading this business with other tools. Approaches to provide only the minimum conditions are not enough to create a sense of leadership in people.

The negative attitude mentioned towards safety procedures have a significant relationship only with the culture of Innovative. If there is an innovative creative occupational safety culture perception, negative attitude towards procedures decreases in the company. Or people who have a higher score negative attitude towards procedures, do not perceive the company as a company with creative innovative values in the foreground.

In discussing the correlations, these coordinates are positioned as negative / positive according to dimensions 1 and 2 and according to their load. In this case, Innovative3 is incompatible in terms of its location and content. It does not show consistency in content with the collaborative group it belongs to. Innovative3 has been linked, by its content, to teamwork, participation, employee involvement, and open communication within collaborative culture artifacts. This item expresses a completely innovative solution-oriented management strategy. We cannot include it in the Innovative group because it does not show negative load. Since it is located at an inconsistent point in terms of coefficients, it cannot accurately measure what it wants to measure and does not show correct correlations. For these reasons, it was decided to exclude in the evaluation.

It is found out that Innovative3 item did not work in the item analysis made with MDS for the EHS Culture Scale (The EHS management style in my organization can be described as innovation, going beyond customary solutions and providing solutions to specific situations / problems with unique approaches). Innovative5, however, has gone under a different dimension (My organization emphasizes the acquisition of new resources and the challenge to new challenges for EHS. Trying the new and looking for new opportunities are worthwhile). Innovative5 is included in the "Positioning Relative to Competitors" segment with the competitive EHS

culture group components Competitive1, Competitive3, Competitive6. Innovative5 can be attributed qualitatively to goal setting, competitiveness, and aggressiveness, which are artifacts of the market culture.

4.1. Implication of Current Research

The goals of increasing organizational effectiveness and efficiency, increasing performance, and reducing production costs can be achieved in a safe work environment and in organizations where healthy employees are employed. The effectiveness of measures to be taken to identify health and safety risks in an organization and to reduce and / or eliminate them is directly related to employees' perceptions. The health and safety culture of the organization is formed by the perceptions of the employees. Therefore, when performance related to occupational health and safety is considered as a general operating performance criterion, the practices regarding health and safety and, as a result of these, the relationship between the employees' perception of safety in their workplaces, the safety behavior they exhibit and the measurement of their individual performance, is important for management. Consequently, the first major practical contribution of the present research is that it provides a tool for organizations to identify the health and safety culture from the perspective of employees.

With the outputs of this tool, which is The EHS Culture Scale, organizations will be able to understand the characteristics of health and safety cultures and employees' perceptions and develop appropriate methods. This research also undertakes the task of drawing attention to the importance of management commitment in health and safety culture and has a role in raising awareness in relation to this issue. It is obvious that raising awareness in the top management may be considered as an essential contribution.

The results of questionnaires could help the training professionals in the companies to identify the training needs of health and safety. Specific training contents can be developed in accordance with the organization's designated health and safety culture.

In addition to practical implications and benefits that are provided to organizations, managers and employees, the current study also contributed to existing literature on organizational psychology.

4.2. Limitation of Current Research

The number of control variables was very limited due to the limited data collection time. This narrowed the collected information about the participants. The questionnaires used in this research to gather information contained approximately 77 questions; therefore, only 114 participants completed the survey, and more than half of the participants quitted because of the time it took to complete. This sample size can be considered as a constraint on the generalization of research results.

The study was carried out in only one ground handling company. There are three companies in the Turkish aviation industry. If it can be done in other companies, more diverse scenarios and sectoral comparisons could have been produced.

The questions about the accident history of the participants and the number of near-miss they have reported so far, and health and safety trainings they attended could give a hint to understand the participants' safety perception better. Also, there could be some questions to understand them to understand the effectiveness of operational inter-departmental communication and how far the top management commitment reaches blue-collar employees.

4.3. Future Studies

Larger sample sizes that are representative of the aviation industry, especially from groups having different demographical characteristics are recommended if the researchers have the aim to generalize the results.

It is suggested that the research should be done on different organizations to reach more meaningful and comparable results. The data for the EHS Culture Scale

had been collected from various companies in aviation industry, the results would provide great sectoral support to be able to minimize the health and safety risks collectively.

Running this work by separating those who involved and not involved in the accident would provide more descriptive and informative results.

Borg and Groenen (2005) emphasizes that MDS is a special analytic technique help researcher to explore and make sense of relations among apparently diverse issues. They also emphasize that replications are necessary to evaluate the MDS driven model's stability and reliability. Respectively, the future research should focus on replication of current research with diverse organizational structures both at national and global level. In the MDS analysis, the calculations can be made that can compare the right-left and the top and the bottom of the axis. According to the responses we received from our participants, it may give the opportunity to look at the relationship between those who perceive the company with high internalization and those who perceive low internalization with their scores in the safety culture scale.

A focus group can be created in the company for practical significance study, after the information is collected through a questionnaire, it is submitted to management, and its feedback is collected. Then we verify the findings we obtained with a qualitative method. In the current conditions, due to the pandemic conditions, practical significance cannot be established because there is no situation to look at. However, such a subcommittee should be established in future studies.

We may also be able to look at this analysis in terms of grouping individuals. We can investigate Cluster Analysis, how individuals are clustered in terms of their answers, when viewed with profiles. In this case, it will be clustered in terms of four variables.

It is not a different coding or a different analysis method, but different individual profiles can be created within the sample itself. Analyses can be diversified in this way. People can be grouped and looked after; In the next phase,

it may be possible to examine by adding additional grouping like those who expect change.

One of these efforts has positive organizational culture in the background. The main features of the positive organizational culture, shaped by studies focusing on the positive aspects of human behaviors, emotions and thoughts can be listed as follows:

- a) It is an approach in which employees feel valued and emphasize decent work contents, processes, relationship networks and opportunities.
- b) On the positive side, there is a performance acceptance that goes beyond standard assumptions.
- c) The focus is on the strengths and capacity of everything.
- d) It is based on the belief that man has a natural orientation to the good and the right.

This study will form a model for the transformation of employee health and safety practices into a systematic functioning with positive organizational culture values in corporate processes. Positive leadership, positive communication and positive behavior will form the framework in which the model of employee health and safety is accepted as one of the main components of the corporate culture.

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APPENDICES

Appendix.1. Employee Health And Safety Culture Assessment Survey

The purpose of the following questions is to evaluate how you perceive your corporate culture in terms of EMPLOYEE HEALTH AND SAFETY.

When responding to these clauses, please focus on your ORGANIZATION and HOW EMPLOYEE HEALTH AND SAFETY IN THE BUSINESS IS EXPERIENCED.

EMPLOYEE HEALTH AND SAFETY concept will be written with the abbreviation EHS in the text.

Responses

Below are the six dimensions of EHS culture. Each dimension has four alternatives. When responding to each dimension, you should split 100 points between the four alternatives. Give the highest score to the alternative most similar to your ORGANIZATION. Give the lowest score to the alternative that least resembles your ORGANIZATION.

Process

We ask you to answer the questions in this section twice. In the first one, answer the questions considering the CURRENT STATE of our organization. Describe how everything is now.

In the second one, we ask you to re-score our organization as you PREFERRED; focus on where you want to see your organization in five years. Your answers should show you how your organization should be in order to reach its targets and show an improved performance in EHS field, meaning how you CHOOSE it to be.

			STATUS (to be completed to 100)	PREFERRED (to be completed to 100)
	MAIN FEATURES	HAKİM ÖZELLİKLER		
KA1	A. My organization is a place that is decent and gives one the feeling it is a very special place in terms of EHS. The atmosphere is dominated by “trust in the family ”.	A. Kurumum, ÇSG açısından insana yaraşır ve çok özel bir yer hissi veren bir yerdir. Atmosfere “aile içindeki güven” duygusu hakimdir.		
AB1	B. My organization is a very dynamic and entrepreneurial place to implement EHS practices. It is ambitious to try and implement new solutions, technologies and applications right.	B. Kurumum ÇSG uygulamalarını hayata geçirmek açısından çok dinamik ve girişimci bir yerdir. Yeni çözüm yolları, teknolojiler ve uygulamaları hemen denemek ve hayata geçirmek ister.		
PC1	C. My organization is competitive and very result oriented in terms of EHS. It realizes EHS practices in a sincere, yet ambitious way to have best practices in the industry.	C. Kurumum ÇSG açısından rekabetçi ve çok sonuç odaklıdır. Sektördeki en iyi uygulamalara sahip olmak için samimi, ama aynı zamanda hırslı bir şekilde ÇSG uygulamalarını hayata geçirir.		
HD1	D. My organization is a very organizational and well-structured place for EHS. Generally, bureaucratic rules govern what is done in terms of EHS.	D. Kurumum ÇSG açısından çok kurumsal ve iyi yapılandırılmış bir yerdir. ÇSG açısından neler yaptığını genel anlamda bürokratik kurallar yönlendirir.		

			STATUS (to be completed to 100)	PREFERRED (to be completed to 100)
	CORPORATE LEADERSHIP	KURUMSAL LİDERLİK		
KA2	A. In terms of EHS, managers are often seen as a mentor, a person who put things right, or a parent figure. Employee can reach the manager when he/she is in trouble.	A. ÇSG açısından yöneticiler genellikle bir akıl hocası, işleri yoluna sokan kişi ya da bir ebeveyn figürü olarak görülür. Çalışan başı sıkıştığında yöneticisine ulaşabilir.		
AB2	B. Managers generally exhibit entrepreneurial and innovative approaches to EHS.	B. Yöneticiler ÇSG açısından genellikle girişimci ve yenilikçi yaklaşımlar sergiler.		
PC2	C. Managers are often seen as ambitious, obsessed and competitive in terms of EHS.	C. Yöneticiler ÇSG açısından genellikle hırslı, takıntılı ve rekabetçi bir kişi olarak görülür.		
HD2	D. Managers are often seen as a coordinator, an organizer, or an expert using resources efficiently for EHS.	D. Yöneticiler ÇSG açısından genellikle bir koordinatör, bir organizatör veya kaynakları verimli şekilde kullanan bir uzman olarak görülür.		
	EMPLOYEE MANAGEMENT	ÇALIŞANLARIN YÖNETİMİ		
KA3	A. The EHS management style in my organization can be described by teamwork, consensus and participation.	A. Kurumumdaki ÇSG yönetim tarzı, ekip çalışması, fikir birliği ve katılım ile tarif edilebilir.		
AB3	B. The EHS management style in my organization can be described as innovation, going beyond customary solutions and	B. Kurumumdaki ÇSG yönetim tarzı, yenilikçilik, alışılmış çözümlerin dışına çıkmak ve özel durumlara/problemlere özgün		

			STATUS (to be completed to 100)	PREFERRED (to be completed to 100)
	providing solutions to specific situations / problems with unique approaches.	yaklaşımlarla çözüm üretmek olarak tarif edilebilir.		
PC3	C. The EHS management style in my organization can be described with the principles of providing sectoral good practices in EHS, making a difference compared to other organizations and being focused on success.	C. Kurumumdaki ÇSG yönetim tarzı, ÇSG’de sektörel iyi uygulamalar sunmak, diğer kurumlara göre fark yaratmak ve başarıya odaklı olmak ilkeleri ile tarif edilebilir.		
HD3	D. The EHS management style in my organization can be described by consistency and making improvements while preserving the current situation as much as possible.	D. Kurumumdaki ÇSG yönetim tarzı, mevcut durumu olabildiğince koruyarak iyileştirme yapılması ve tutarlılık ile tarif edilebilir.		
	CORPORATE VALUE	KURUMSAL DEĞER		
KA4	A. In terms of EHS, it is mutual trust that keeps people together. Commitment to the EHS principles, the organization cherishes, are high.	A. ÇSG açısından kişileri bir arada tutan, karşılıklı güvendir. Kurumun değer verdiği ÇSG ilkelerine bağlılık yüksektir.		
AB4	B. It is the commitment to innovation and development that holds people together in terms of EHS. There is emphasis on being ahead of technological developments and sector.	B. ÇSG açısından kişileri bir arada tutan, yeniliğe ve gelişmeye bağlılıktır. Teknolojik gelişmelerin ve sektörün önünde olmaya vurgu vardır.		

			STATUS (to be completed to 100)	PREFERRED (to be completed to 100)
PC4	C. In terms of EHS, it is the emphasis on achieving the EHS objectives that keep people together. Hard work and success are common themes	C. ÇSG açısından kişileri bir arada tutan, ÇSG hedeflerini başarmaya yapılan vurgudur. Sıkı çalışma ve başarı ortak temalardır.		
HD4	D. In terms of EHS, it is the official rules and policies that keep people together. It is important to maintain the EHS as a smoothly functioning structure.	D. ÇSG açısından kişileri bir arada tutan, resmi kurallar ve politikalarıdır. ÇSG'yi sorunsuz işleyen bir yapı olarak idame ettirmek önemlidir.		
	STRATEGIC EMPHASIS	STRATEJİK VURGU		
KA5	A. My organization attaches importance to the development of its employees in terms of EHS. High confidence, openness and participation show continuity.	A. Kurumum çalışanlarının ÇSG açısından gelişmesine önem verir. Yüksek güven, açıklık ve katılım süreklilik gösterir.		
AB5	B. My organization emphasizes the acquisition of new resources and the challenge to new challenges for EHS. Trying the new and looking for new opportunities are worthwhile	B. Kurumum, ÇSG açısından yeni kaynaklar edinmeyi ve yeni zorluklara meydan okumayı vurgular. Yeni olanı denemek ve yeni fırsatları kollamak değer verilen şeylerdir.		
PC5	C. My organization attaches importance to competitive movements and success in the field of EHS. Measurable goals and objectives are very important.	C. Kurumum için ÇSG alanında rekabetçi hareketlere ve başarıya önem verir. Ölçülebilen hedefler ve amaçlar çok önemlidir.		

			STATUS (to be completed to 100)	PREFERRED (to be completed to 100)
HD5	D. My organization attaches importance to permanent solutions and stability for EHS. Using resources carefully, efficiency and trouble-free operation in EHS are important	D. Kurumum ÇSG açısından kalıcı çözümlere ve istikrara önem verir. Kaynakları dikkatli kullanmak, ÇSG’de verimlilik ve sorunsuz işleyiş önemlidir.		
	SUCCESS CRITERIA	BAŞARI KRİTERLERİ		
KA6	A. My organization defines success in EHS through development of human resources, teamwork and caring for people.	A. Kurumum ÇSG’de başarıyı, insan kaynaklarının gelişmesi, ekip çalışması ve insanların önemsenmesi üzerinden tanımlar.		
AB6	B. My organization defines success in EHS by having the most unique or newest ideas. Entrepreneurial and innovative approaches in the EHS field are considered as indicators of success.	B. Kurumum ÇSG’de başarıyı, en eşsiz veya en yeni fikirlere sahip olmak üzerinden tanımlar. ÇSG alanında girişimci ve yenilikçi yaklaşımlar başarının göstergesi kabul edilir.		
PC6	C. My organization defines success in EHS through the practices it has implemented and the results it produces, outpacing other similar organizations. Being a pioneer is important.	C. Kurumum ÇSG’de başarıyı, hayata geçirdiği uygulamaların, ürettiği sonuçların diğer benzer kuruluşları geride bırakması üzerinden tanımlar. Öncü olmak önemlidir.		
HD6	D. My organization defines success in EHS through careful use of resources and efficiency. Smooth timing and low costs are crucial.	D. Kurumum ÇSG’de başarıyı, kaynakları dikkatli kullanmak ve verimlilik üzerinden		

			STATUS (to be completed to 100)	PREFERRED (to be completed to 100)
		tanımlar. Sorunsuz zamanlama ve düşük maliyetler çok önemlidir.		
	CONTROL APPROACH TO EHS PROCESSES	ÇSG SÜREÇLERİNE KONTROL YAKLAŞIMI		
KA7	A. My organization is a place where employees warn each other in case of risky behaviours and attach importance to the safety of others. The responsibility that colleagues feel about each other's safety directs the individual to show safe behaviours.	A. Kurumum, çalışanların birbirini riskli davranılması durumunda uyardığı, diğerlerinin güvenliğine önem verdiği bir yerdir. Çalışma arkadaşlarının birbirinin güvenliğine dair hissettiği sorumluluk, bireyi güvenli davranışlar göstermeye yönlendirmektedir.		
AB7	B. There is a communication environment that will enable employees to get innovative and entrepreneurial ideas to ensure EHS. Employees behave safely because there is employee participation in EHS decisions and the opportunity to take initiatives.	B. ÇSG'nin sağlanması için çalışanların yenilikçi ve girişimci fikirlerini almayı sağlayacak iletişim ortamı vardır. ÇSG kararlarına çalışan katılımı olduğu için ve inisiyatif alma şansı tanındığı için çalışanlar güvenli davranırlar.		

			STATUS (to be completed to 100)	PREFERRED (to be completed to 100)
PC7	C. Every year, the effort to achieve more positive results than the previous year in terms of EHS drives employees to act safely. An effort to maintain records of criteria such as accident-free days, work-day loss-free rates leads employees to act safely.	C. ÇSG açısından her sene bir önceki seneden daha olumlu sonuçlar elde etme çabası çalışanları güvenli davranmaya iter. Kazasız gün, iş günü kayıpsızlık oranları gibi kriterlere dair rekorları koruma çabası çalışanları güvenli davranış göstermeye yöneltmektedir.		
HD7	D. The functionality of rewards, incentives, penalties and sanctions is believed to ensure EHS. Discipline and continuous efforts to control the processes provided by the management, authorities or other key people lead employees to act safely.	D. ÇSG'nin garantiye alınması için ödüller, teşvikler, cezalar ve yaptırımların işlevselliğine inanılır. Yönetimin, yetkililerin ya da diğer söz sahibi kişilerin sağladığı disiplin ve süreçleri sürekli kontrol etme çabaları çalışanları güvenli davranmaya yöneltmektedir.		

Appendix.2. Safety Culture Survey Form

This survey is used to investigate the level of safety culture in your workplace and to examine the impact of safety culture on work accidents. The results of the survey will be used for purely scientific research and will be kept strictly confidential. PLEASE DO NOT LEAVE ANY QUESTIONS EMPTY.

Please do not enter your name and surname on this form.

Thank you for your attention and contribution in answering the questions.

PLEASE MARK THE APPROPRIATE OPTION WITH “X” TO SHOW YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENT.

“1” on the scale ranging from 1 to 6 means totally disagree, “6” means totally agree. Give your answer by choosing a suitable number between 1 and 6, whichever side your view is close to.

MEASUREMENT STATEMENT			1	2	3	4	5	6
1	Some safety rules and procedures do not need to be followed to do the job safely.	İş güvenli yapmak için bazı güvenlik kuralları ve prosedürlerin izlenmesine gerek yoktur.	1	2	3	4	5	6
2	Some of the health and safety rules are not practically applicable.	Sağlık ve güvenlik kurallarının bir kısmı pratikte uygulanabilir değildir.	1	2	3	4	5	6
3	In some cases, it is necessary to leave the safety conditions in order to realize the production on time.	Bazı durumlarda, üretimi zamanında gerçekleştirebilmek için güvenlik şartlarından ayrılmak gereklidir.	1	2	3	4	5	6
4	The safety rules are very strict, I can work better without them.	Güvenlik kuralları çok katı, onlar olmadan daha iyi çalışabilirim.	1	2	3	4	5	6
5	Safety rules are regularly reviewed with employees.	Güvenlik ile ilgili kurallar, çalışanlar ile birlikte düzenli olarak gözden geçirilir.	1	2	3	4	5	6
6	Management really attaches great importance to employee safety.	Yönetim, çalışanların güvenliğine gerçekten büyük önem vermektedir.	1	2	3	4	5	6
7	I do not believe that safety issues are given due attention in the workplace.	İşyerinde, güvenlik konularına gereken önemin verildiğine inanmıyorum.	1	2	3	4	5	6
8	Management places more emphasis on production than the safety of employees.	Yönetim, üretime çalışanların güvenliğinden daha fazla önem gösterir.	1	2	3	4	5	6
9	Management has little sensitivity to occupational health and safety.	Yönetimin, iş sağlığı ve güvenliği konularındaki hassasiyeti azdır.	1	2	3	4	5	6
10	Due to the legal obligation, only accidents are recorded in the workplace.	Kanuni zorunluluğu nedeniyle, işyerinde sadece kazalar kayıt altına alınır.	1	2	3	4	5	6
11	Management really considers the health and safety of employees.	Yönetim, çalışanların sağlığını ve güvenliğini gerçekten düşünür.	1	2	3	4	5	6

MEASUREMENT STATEMENT			1	2	3	4	5	6
12	Managers actively and visibly pioneer work safety.	Yöneticiler, iş güvenliği konusunda aktif ve görünür şekilde öncülük ederler.	1	2	3	4	5	6
13	Our managers come to see the working conditions and to meet with the employees.	Çalışma koşullarını görmek ve çalışanlarla görüşmek için yöneticilerimiz yanımıza gelirler.	1	2	3	4	5	6
14	Employees participate in the organization of safety objectives and targets.	Çalışanlar, güvenlik amaç ve hedeflerinin düzenlenmesi çalışmalarına katılırlar.	1	2	3	4	5	6
15	Management is not only considering the business success but also the ensuring of job safety.	Yönetim, işletmenin başarısı kadar iş güvenliğinin sağlanması ile de ilgilidir.	1	2	3	4	5	6
16	Managers regularly inform employees of occupational safety.	Yöneticiler, çalışanları düzenli olarak iş güvenliği hakkında bilgilendirir.	1	2	3	4	5	6
17	Management cares about and applies occupational safety recommendations from employees.	Yönetim, çalışanlardan gelen iş güvenliği önerilerini önemser ve uygular.	1	2	3	4	5	6
18	Occupational safety practices are regularly audited.	İş güvenliği ile ilgili uygulamalar düzenli olarak denetlenir.	1	2	3	4	5	6
19	Employees receive extensive training in the areas of health and safety at work.	Çalışanlar, işyerinde sağlık ve güvenlik konularında kapsamlı eğitim alır.	1	2	3	4	5	6
20	Safety trainings are repeated / updated at regular intervals.	Güvenlik eğitimleri düzenli aralıklarla tekrar edilir/güncellenir.	1	2	3	4	5	6
21	Workplace health and safety training covers the issues that employees face in doing their job.	İşyeri sağlık ve güvenlik eğitimi, çalışanların işini yaparken karşılaştığı konuları kapsar.	1	2	3	4	5	6
22	Sufficient training is provided in our workplace to improve safe behaviour.	Güvenli davranışı geliştirmek için işyerimizde yeterli derecede eğitim yapılmaktadır.	1	2	3	4	5	6

MEASUREMENT STATEMENT			1	2	3	4	5	6
23	My supervisor provides guidance and pioneers to employees on occupational safety.	Amirim, çalışanlara iş güvenliği hakkında rehberlik yapar ve öncülük eder.	1	2	3	4	5	6
24	My supervisor regularly monitors the occupational safety.	Amirim, çalışanları iş güvenliğini konusunda düzenli olarak gözlemler.	1	2	3	4	5	6
25	My supervisor often warns employees not to engage in risky behaviour.	Amirim, çalışanları risk oluşturan davranışlarda bulunmamaları konusunda sık sık uyarır.	1	2	3	4	5	6
26	My supervisor often talks with employees about occupational safety issues and problems.	Amirim, çalışanlarla iş güvenliği konuları ve sorunları hakkında sık sık konuşur.	1	2	3	4	5	6
27	Employees are warned and encouraged to use protective equipment properly.	Çalışanlar, koruyucu ekipmanları düzgün kullanma konusunda uyarılır ve teşvik edilir.	1	2	3	4	5	6
28	Persons who may be affected by changes to the production process are consulted directly.	Üretim sürecinde yapılacak değişikliklerden etkilenebilecek kişilere doğrudan danışılır.	1	2	3	4	5	6
29	Suggestions or solutions from employees are accepted by our superiors.	Çalışanlardan gelen öneriler veya çözümler amirlerimiz tarafından kabul görür.	1	2	3	4	5	6
30	Management asks employees to participate in meetings about the work to be done.	Yönetim, işin yapılması ile ilgili toplantılara çalışanların da katılmasını ister.	1	2	3	4	5	6
31	Problems related to working conditions are solved by a team of employees from different units.	Çalışma koşulları ile ilgili problemler, farklı birimlerdeki çalışanlardan oluşan takımla çözülür.	1	2	3	4	5	6
32	My colleagues immediately warn when they see behaviours that do not comply with occupational safety.	İş arkadaşlarım, iş güvenliğine uymayan davranışları gördüklerinde hemen ikaz ederler.	1	2	3	4	5	6

MEASUREMENT STATEMENT			1	2	3	4	5	6
33	There is good communication in my workplace on occupational safety issues that may affect me.	İşyerimde, beni etkileyebilecek iş güvenliği konularında iyi bir iletişim vardır.	1	2	3	4	5	6
34	With regard to occupational safety, the top management's door is always open to employees.	İş güvenliği konusunda, üst yönetimin kapısı çalışanlara her zaman açıktır.	1	2	3	4	5	6
35	I receive "praise / appreciation" for my work when performed in compliance with occupational safety rules.	İş güvenliği kurallarına uyarak çalışmam nedeniyle "övgü/takdir" alıyorum.	1	2	3	4	5	6
36	Employees are encouraged to support each other and pay attention to each other.	Çalışanların birbirini desteklemeleri ve birbirlerine dikkat etmeleri teşvik edilir.	1	2	3	4	5	6
37	Employees advise each other on how to do the job safely.	Çalışanlar, için emniyetli biçimde nasıl yapılacağı konusunda birbirlerine tavsiyelerde bulunurlar.	1	2	3	4	5	6
38	I always follow the safety rules.	Güvenlik kurallarına her zaman uyarım.	1	2	3	4	5	6
39	I think safety is the most important thing when I perform the job.	İşi yaparken benim için en önemli şeyin güvenlik olduğunu düşünürüm.	1	2	3	4	5	6
40	Employees are actively involved in risk assessment activities related to their work.	Çalışanlar, yaptıkları işlerle ilgili risk değerlendirme faaliyetlerinde aktif olarak yer alırlar.	1	2	3	4	5	6
41	Employees comply with safety regulations.	Çalışanlar, güvenlik konusunda yapılan düzenlemelere uyarlar.	1	2	3	4	5	6
42	Employees participate in the development of safety practices.	Çalışanlar, güvenlik uygulamalarının geliştirilmesi çalışmalarına katılırlar.	1	2	3	4	5	6

MEASUREMENT STATEMENT			1	2	3	4	5	6
43	Business management takes the opinions of employees before making final decisions on occupational safety.	İşletme yönetimi, iş güvenliği ile ilgili nihai kararları almadan önce çalışanların görüşlerini alır.	1	2	3	4	5	6
44	I inform the management about safety issues that I consider important.	Önemli gördüğüm güvenlik meselelerinde yönetime bilgi veririm.	1	2	3	4	5	6
45	I avoid some safety rules in order to do my job better.	İşimi daha iyi yapabilmek için bazı güvenlik kurallarını dikkate almam.	1	2	3	4	5	6
46	I use risk-free or low-risk shortcuts when doing my job.	İşimi yaparken risksiz veya düşük risk içeren kestirme yollar kullanırım.	1	2	3	4	5	6
47	I use all the necessary safety equipment when I do my job.	İşimi yaptığım esnada bütün gerekli güvenlik ekipmanlarını kullanırım.	1	2	3	4	5	6
48	I voluntarily carry out tasks and activities that contribute to improved workplace safety.	İşyeri güvenliğinin iyileştirilmesine katkı sağlayacak görev ve aktiviteleri gönüllü olarak yaparım.	1	2	3	4	5	6
49	I got enough information about risk analysis and production safety.	Risk analizi ve üretim güvenliği konusunda yeterli düzeyde bilgi aldım.	1	2	3	4	5	6
50	In your opinion, what are the most important factors that negatively affect occupational safety in your workplace?	Size göre işyerinizde iş güvenliğini olumsuz şekilde etkileyen en önemli faktörler nelerdir?						
51	What changes should be made in your workplace to improve work safety?	İşyerinizde iş güvenliğini iyileştirmek için ne tür değişiklikler yapılmasını isterdiniz?						

Appendix.3. Informed Consent Form (English & Turkish)

Dear Participant,

The objective of this study is to understand the current and expected occupational health and safety culture in the company. Expected participants of this study are the ones having a manager and managing an operational process.

The study is carried out by Başak Helen TAŞKAN, an organizational psychology student at Istanbul Bilgi University, within the scope of Master Thesis under the supervision of Dr. İdil Işık.

Name-surname and contact information are not being asked from the participants. All information that you give within the scope of the study will be kept confidential and data collected will only be used for the scientific purposes. The data collected from participants will not be used individually, they will be combined in a data pool and analysis will be conducted on this anonymous database. Analysis results regarding occupational health and safety culture in the company shall be shared with the company's top management.

Survey questions have no right or wrong answers. You are expected to answer the survey questions without too much thought on, by selecting the closest option to you. There will be no harm expected from this study for the participants. It is voluntary to participate in this study. Your participation is completely voluntary and participating or not participating in this research has no organizational consequences for you. You can quit answering the questionnaire any time without mentioning an excuse. Answering the questionnaire will take about 20 minutes. You can contact Başak Helen TAŞKAN (basakhelen@gmail.com) if you have any further questions on the study. Thanks for your participation.

I have read and understand the explanation provided to me, and I voluntarily agree to participate in this study.

☐ I accept

☐ I don't accept

Değerli Katılımcı,

Bu çalışmanın amacı, şirketteki mevcut ve beklenen iş sağlığı ve güvenliği kültürünün anlaşılmasıdır. Katılımcıların bir yöneticisinin olması ve operasyonel bir süreç yönetiyor olması beklenmektedir.

Çalışma, İstanbul Bilgi Üniversitesi Örgütsel Psikoloji öğrencisi Başak Helen Taşkan tarafından Yüksek Lisans Tezi kapsamında Doç. Dr. İdil Işık danışmanlığında yürütülmektedir.

Katılımcılardan, adı-soyadı ve iletişim bilgileri talep edilmemektedir. Çalışma kapsamında vereceğiniz tüm bilgiler gizli tutulacak ve sadece bilimsel amaçla kullanılacaktır. Anketten elde edilen veri tekil olarak kullanılmayacak, tüm katılımcılardan alınan cevaplar bir veri havuzunda bir araya getirilecek ve analizler bu toplam veri üzerinde yapılacaktır. Şirketteki iş sağlığı ve güvenliği kültürüne ilişkin analiz çıktıları şirket üst yönetimi ile paylaşılacaktır.

Anket sorularının doğru veya yanlış cevabı yoktur. Ekranı gelecek olan anket sorularını, üzerinde çok fazla düşünmeden, size en yakın seçeneği işaretleyerek yanıtlamanız beklenmektedir. Araştırmada yer alan soruların katılımcılar açısından olumsuz etkileri olması beklenmemektedir.

Çalışmaya katılım tamamen gönüllülük esasına dayanmaktadır. Uygulama sırasında istediğiniz anda ve gerekçe belirtmeden bırakabilirsiniz. Bu araştırmaya katılmanız ve/veya katılmamanız sizin için herhangi bir sonucu olmayacaktır. Tüm soruları cevaplamanız yaklaşık 20 dakika sürecektir.

Çalışma hakkında daha fazla bilgi almak isterseniz Başak Helen Taşkan (basakhelen@gmail.com) ile iletişime geçebilirsiniz. Desteğiniz için teşekkür ederiz.

Yukarıdaki çalışmanın amacını ve içeriğini belirten bildiriye okudum, anladım ve araştırmaya katılmayı,

☐ Kabul ediyorum

☐ Kabul etmiyorum

Appendix.4. Ethics Committee Approval

ETİK KURUL DEĞERLENDİRME SONUCU/RESULT OF EVALUATION BY THE ETHICS COMMITTEE

(Bu bölüm İstanbul Bilgi Üniversitesi İnsan Araştırmaları Etik Kurul tarafından
doldurulacaktır /This section to be completed by the Committee on Ethics in research
on Humans)

Başvuru Sahibi / Applicant: Başak Helen Taşkan

Proje Başlığı / Project Title: Developing an Occupational Health and Safety Model:
Measuring Safety Culture Based on the Competing Values Model

Proje No. / Project Number: 2020- 20024-36

1.	Herhangi bir değişikliğe gerek yoktur / There is no need for revision	XX
2.	Ret/ Application Rejected Reddin gerekçesi / Reason for Rejection	

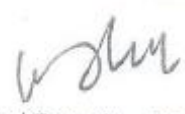
Değerlendirme Tarihi / Date of Evaluation: 20 Şubat 2020


Kurul Başkanı / Committee Chair

Doç. Dr. İtir Erhart


Üye / Committee Member

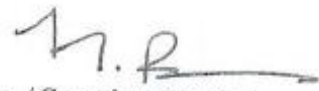
Prof. Dr. Turgut Tarhanlı


Üye / Committee Member

Prof. Dr. Koray Akay

Üye / Committee Member

Prof. Dr. Aşlı Tunç (izinli)


Üye / Committee Member

Prof. Dr. Hale Bolak Boratav

Appendix.5. Demographics

Turkish	English
Yaşınız	Age
Cinsiyetiniz: Kadın / Erkek	Sex: female / male
Eğitiminiz	Education
Şirketteki çalışma sürenizi lütfen yıl olarak belirtiniz.	Seniority in the company (in years)
Size bağlı çalışan sayısı.	Number of people in your team
Yönetmel bir rolünüz var mı? evet / hayır	Managerial status of the participant: yes / no
Ana sorumluluk alanınız nedir?	Participant's main field of the activity

Appendix.6. Final coordinates of the EHS culture MDS analysis resulted in for two dimensions

	Dimensions	
	1	2
Current_Collaborative1	.681	-.144
Current_Collaborative 2	.521	.579
Current_Collaborative 3	.466	.602
Current_Collaborative 4	.783	.233
Current_Collaborative 5	.774	.188
Current_Collaborative 6	.629	.550
Current_Collaborative 7	.800	.110
Current_Innovative1	.328	-.320
Current_Innovative 2	.313	-.619
Current_Innovative 3	.431	.019
Current_Innovative 4	.020	-.692
Current_Innovative 5	-.166	-.580
Current_Innovative 6	.011	-.626
Current_Innovative 7	.342	-.542
Current_Competitive1	-.004	-.428
Current_Competitive 2	-.587	-.220
Current_Competitive 3	-.233	-.675
Current_Competitive 4	-.451	-.317
Current_Competitive 5	-.496	-.340
Current_Competitive 6	-.337	-.397
Current_Competitive 7	-.450	.020
Current_Compliance1	-.257	.716
Current_Compliance 2	-.590	.291
Current_Compliance 3	-.666	.225
Current_Compliance 4	-.424	.626
Current_Compliance 5	-.396	.714
Current_Compliance 6	-.649	.431
Current_Compliance 7	-.395	.598

Appendix.7. Independent Samples Test of Number of Employees Reporting

		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df				Lower	Upper
Current_Collaborative	Equal variances assumed	0.007	0.934	-0.403	81	0.688	-0.76512	1.89774	-4.54103	3.01079
	Equal variances not assumed			-0.402	78.399	0.689	-0.76512	1.90535	-4.55808	3.02785
Current_Compliance	Equal variances assumed	0.216	0.643	0.011	81	0.991	0.01993	1.78909	-3.53980	3.57966
	Equal variances not assumed			0.011	80.338	0.991	0.01993	1.79024	-3.54254	3.58240
Current_Competitive	Equal variances assumed	8.023	0.006	-0.580	81	0.564	-0.67297	1.16059	-2.98218	1.63625

	Equal variances not assumed			-0.591	67.384	0.557	-0.67297	1.13900	-2.94618	1.60025
Current_Goal Orientedness	Equal variances assumed	7.301	0.008	-0.811	81	0.420	-1.25610	1.54939	-4.33890	1.82669
	Equal variances not assumed			-0.821	75.686	0.414	-1.25610	1.53055	-4.30466	1.79245
Current_Positioning Relative to Competitors	Equal variances assumed	0.652	0.422	-0.070	81	0.945	-0.08983	1.28832	-2.65318	2.47353
	Equal variances not assumed			-0.070	79.533	0.944	-0.08983	1.27857	-2.63449	2.45484
Current_Innovative	Equal variances assumed	0.001	0.978	1.584	81	0.117	2.10849	1.33148	-0.54073	4.75771
	Equal variances not assumed			1.593	80.397	0.115	2.10849	1.32375	-0.52566	4.74264
Preferred_Collaborative	Equal variances assumed	1.059	0.307	-0.333	81	0.740	-0.73455	2.20560	-5.12300	3.65390

	Equal variances not assumed			-0.331	77.075	0.741	-0.73455	2.21801	-5.15111	3.68201
Preferred_Compliance	Equal variances assumed	0.320	0.573	0.815	81	0.418	1.22566	1.50429	-1.76741	4.21873
	Equal variances not assumed			0.814	79.989	0.418	1.22566	1.50646	-1.77228	4.22361
Preferred_Competitive	Equal variances assumed	2.701	0.104	-0.835	81	0.406	-1.05211	1.26056	-3.56023	1.45601
	Equal variances not assumed			-0.845	75.979	0.401	-1.05211	1.24559	-3.53292	1.42870
Preferred_Goal Orientedness	Equal variances assumed	0.958	0.330	-0.574	81	0.568	-0.89651	1.56292	-4.00624	2.21322
	Equal variances not assumed			-0.577	80.424	0.566	-0.89651	1.55397	-3.98876	2.19573
Preferred_Positioning Relative to Competitors	Equal variances assumed	0.789	0.377	-0.826	81	0.411	-1.20770	1.46199	-4.11660	1.70119

	Equal variances not assumed			-0.832	79.501	0.408	-1.20770	1.45084	-4.09525	1.67985
Preferred_Innovative	Equal variances assumed	0.606	0.439	0.188	81	0.851	0.28012	1.49047	-2.68544	3.24568
	Equal variances not assumed			0.190	78.681	0.850	0.28012	1.47728	-2.66052	3.22075

Appendix.8. Independent Samples Test of The Groups According to The Number of Functions Managed

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Current_Collaborative	Equal variances assumed	1.888	0.172	0.386	103	0.700	0.71143	1.84139	-2.94054	4.36339
	Equal variances not assumed			0.391	100.177	0.696	0.71143	1.81842	-2.89618	4.31904
Current_Compliance	Equal variances assumed	7.934	0.006	-3.155	103	0.002	-5.06494	1.60513	-8.24834	-1.88153
	Equal variances not assumed			-3.212	95.380	0.002	-5.06494	1.57663	-8.19479	-1.93508

Current_Competitive	Equal variances assumed	0.000	0.992	0.800	103	0.425	0.85341	1.06656	-1.26187	2.96869
	Equal variances not assumed			0.804	103.000	0.423	0.85341	1.06162	-1.25207	2.95889
Current_Goal Orientedness	Equal variances assumed	1.446	0.232	0.034	103	0.973	0.04727	1.37406	-2.67784	2.77239
	Equal variances not assumed			0.034	99.923	0.973	0.04727	1.37933	-2.68930	2.78384
Current_Positioning Relative to Competitors	Equal variances assumed	1.245	0.267	1.382	103	0.170	1.65955	1.20040	-0.72117	4.04026
	Equal variances not assumed			1.396	101.820	0.166	1.65955	1.18879	-0.69846	4.01755
Current_Innovative	Equal variances assumed	3.496	0.064	3.451	103	0.001	4.18509	1.21259	1.78020	6.58999
	Equal variances not assumed			3.482	102.156	0.001	4.18509	1.20181	1.80134	6.56884

Preferred_Collaborative	Equal variances assumed	0.179	0.674	0.492	103	0.624	0.98727	2.00866	-2.99643	4.97098
	Equal variances not assumed			0.496	101.896	0.621	0.98727	1.98956	-2.95906	4.93361
Preferred_Compliance	Equal variances assumed	0.225	0.637	1.362	103	0.176	1.70805	1.25441	-0.77978	4.19588
	Equal variances not assumed			1.363	102.399	0.176	1.70805	1.25323	-0.77760	4.19370
Preferred_Competitive	Equal variances assumed	0.648	0.423	-1.064	103	0.290	-1.11409	1.04742	-3.19141	0.96322
	Equal variances not assumed			-1.063	101.992	0.290	-1.11409	1.04758	-3.19196	0.96378
Preferred_Goal Orientedness	Equal variances assumed	0.489	0.486	0.037	103	0.971	0.04864	1.32147	-2.57219	2.66947
	Equal variances not assumed			0.037	101.915	0.971	0.04864	1.32191	-2.57340	2.67067

Preferred_Positioning Relative to Competitors	Equal variances assumed	1.116	0.293	-1.840	103	0.069	-2.27682	1.23770	-4.73151	0.17787
	Equal variances not assumed			-1.838	101.584	0.069	-2.27682	1.23900	-4.73449	0.18086
Preferred_Innovative	Equal variances assumed	0.310	0.579	-1.033	103	0.304	-1.41636	1.37059	-4.13461	1.30188
	Equal variances not assumed			-1.043	101.829	0.299	-1.41636	1.35736	-4.10874	1.27601

Appendix.9. The Rotation of the Factors of The Safety Culture Scale

In the first phase of EFA all 49 items are studied with eigenvalue 1,1 and above. A 9-factor structure with a total variance of 64.03% was obtained. However, at this phase, because there are two and single item factors and a large number of items with no factor loading value, the analysis was repeated since the analysis was not functional.

In the second stage, by keeping the number of factors open, the analysis of the eigenvalue 1.1, which we determined by starting from Arpat, was repeated as 1.5. At this stage, factor loading did not occur in 4 items (15, 9, 8, 41). In addition, item 42 loaded on two factors, and a factor with 2 items was formed. At this stage, it became evident that the factor names should be determined again, and the naming specified in Table 3.2 was made.

From the theoretical point of view until the third phase, no significant results were obtained in the analyses that we made only by determining the eigenvalue value and keeping the factors to extract value open. The analysis made up to this stage was accepted as an indicator, accepting the factors to extract value as 5 and eigenvalue 1.5 was repeated. In addition to the constant KMO value, the communalities have changed, and the total variance has been calculated as 55.685%. Items that express negative attitudes are a significant grouping for this analysis by creating a factor. Double loading occurred in Item 11, but it was not removed by looking at the nature of the question and its consistency with other questions. There was no factor loading in items 1, 8, 7, 9, and 41. The item 1, which has the lowest communality (0.100) in these items, was removed, and the analysis was renewed.

In the fourth phase, the removal of item no. 1 strengthened the structure and brought the total variance to 56.648%. There is no factor loading in items 8, 7, 9, and 41 again, and double loading occurred at items 11 and 14. The lowest communality item 8 (0.160) has been removed.

In the fifth phase, the total variance increased to 57.545% with the removal of the item 8, but there was no factor loading for 7 and 9 again.

In the evaluation made by subtracting the lowest communality item 7 (0.176), the total variance reached 58.574%. While factor loading still does not occur in 9 and 41, the analysis has decreased to 4 factors since 2 items are grouped in the last factor.

In the seventh stage, the number of factors was reduced to 4, and the total variance value decreased to 56.014% in the analysis. No factor loading occurred in 9, 10, 46 and 47; double loading occurred at 14 and 44. Since item 9 appeared as an inadequate statement at all stages, it was removed from the list and the analysis with 5 factors was renewed.

In the eighth stage, which was studied as 5 factors, the total variance 59.313%, the communality distribution became more balanced. Only factor loading did not occur in item 41. In the 5-factor analysis by subtracting the item number 41, total variance got 59.458% but double loading occurred in 11, 14, 42 and 43. Therefore, the analysis was renewed by subtracting 14. At this stage, a consistent pattern matrix has been created in itself.

As a result of reliability analysis, the pattern matrix has been finalized by removing the items 45 and 46 due to the increase in Cronbach's Alpha values.