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Just Culture in Aviation: A Metaphorical Study on Aircraft Maintenance Students

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Air transportation, playing a crucial role in fostering global economic growth and development, facilitates both global economic integration and the establishment of vital connections at regional, national, and global levels among societies and cultures (Worldbank, 2023). In today's air transportation, there is a quantitative increase in passengers, airports, aircraft, and all elements of the aviation transportation system. This is primarily driven by the continuous growth in demand and the policies implemented in international aviation to meet this demand (Doc 9587, 2016). Air transportation, having adopted a liberal identity from the 1980s to the present due to the impact of globalization on the global economy, has enabled the movement of passengers from different income groups worldwide (Chi & Baek, 2013). In light of the developments in the sector, it is predicted that the trend towards aviation will continue in the future. Indeed, the United Nations, forecasting that two-thirds of the world's population will live in large cities by 2050, seeks answers to questions about how global mobility will be adapted to and developed under future conditions (ICAO, n.d.).

The unique conditions encountered in air transportation and the special rules applied distinguish it from other transportation methods such as road, rail, and sea transportation. All activities in the aviation sector are conducted within the framework of international rules. These rules establish the standards necessary for the conduct of all aviation activities, including the operation of airports, the use of airspace, and flight and ground operations (Çoban, 2022; Siregar, 2019). Safety rules in the aviation sector emerge as a dominant force guiding the corporate policies and commercial activities of airline operators globally (Savage, 2013). The International Civil Aviation Organization (ICAO), which guides aviation activities worldwide, defines safety as a state where the probability of causing harm to individuals and property is kept at an acceptable level or below, with risks continuously identified and managed. In other words, safety implies the protection of human life and health against hazards (Ustaömer, 2020). In addition to technological developments resulting from historical aviation accidents, modern safety management practices adopted over time have contributed to making aviation activities safer. Commercial air travel is now perceived as the safest and most secure mode of transportation. Still, safety practices in aviation continue to evolve (Savage, 2013).

Airlines design safety management systems with the understanding that there will always be risks related to safety in their operations. The purpose of the safety management system is to identify risks before accidents and incidents occur and manage these risks by taking necessary measures. In establishing an effective and sustainable safety management system, the creation of a positive safety culture within the organization is crucial (Gill & Shergill, 2004). Safety culture encompasses a set of values that guide the behaviours of employees to reduce risks and enhance safety within an organization (Ritcher & Koch, 2004). Values shared by employees at every level of the organization, along with organizational policies, practices, and

standards related to safety, are the fundamental building blocks of safety culture (Reason & Hobbs, 2003).

Safety culture in aviation organizations comprises five interrelated sub-dimensions: informed culture, reporting culture, just culture, learning culture, and flexible culture (Reason, 1997). Informed culture refers to the current knowledge of managers about human, technical, organizational, and environmental factors that affect the safety of the entire system within an organization. In an informed culture, managers encourage behaviours and actions that help employees understand safety risks. The development of an informed culture requires a strong reporting culture (Ustaömer & Şengür, 2020). Reporting culture involves beliefs and behaviours that encourage employees to report any safety-related issues within the organization without fear and voluntarily. Just culture, closely related to reporting culture, is a culture that distinguishes between acceptable and unacceptable behaviours related to safety. In Turkish literature, just culture in aircraft maintenance organizations was discussed for the first time in a doctoral thesis (Bükeç, 2015). On the other hand, just culture, which was introduced into the legislation with SHY-SMS (2012), aims to enable employees to report their mistakes without fear in an organizational environment where the values and attitudes subject to this research are developed. In an organizational environment where this sub-dimension has developed, employees are expected to report their errors without fear in a culture dominated by trust and free from a punitive approach. In a learning culture, attitudes, behaviours, and actions that promote organizational learning against safety hazards are valued (Bükeç & Gerece, 2017; Dekker, 2007). Flexible culture, on the other hand, denotes an organization's effective adaptation to changing circumstances. Flexible organizations respond quickly to change, take advantage of emerging opportunities, avoid risks, and easily adapt to the unforeseen consequences of change (Nemli, 1998).

Just culture, a significant sub-dimension of safety culture, has been a topic of discussion and interest in aviation safety in recent years. Because in order to create a safety culture and make it sustainable in an aviation company, it is necessary to first create a just culture. In an organization dominated by a culture of fear and a punitive approach, where employees are afraid, no employee will trust their manager, and they will not voluntarily report unsafe behaviour. However, it is also not feasible to claim that a culture where blame is entirely absent is applicable. This is because, due to violations that endanger safety, employees must be held accountable, and a clear distinction must be made between errors and violations (Reason & Hobbs, 2003).

A literature review reveals that studies on the concept of just culture in the aviation sector have remained theoretical, with very limited quantitative or qualitative research focusing on the concept. In this context, this research aims to reveal the fundamental characteristics of the concept of just culture through a metaphorical qualitative study conducted on aircraft maintenance students, who will work as technicians in the aircraft maintenance sector -one of the

fundamental components of the aviation sector. It is believed that the results of the research will make an original contribution to the literature on aviation safety, safety culture, and the concept of just culture.

Literature Review

Just Culture in the Aviation Sector

According to Reason (1997), the concept of a just culture in the aviation sector, particularly in safety culture, refers to a work environment where employees are motivated to provide essential safety-related information. In such a culture, there is a clear distinction between acceptable and unacceptable behaviours. In an organization with a just culture, unintentional errors of employees can be considered acceptable, while intentional violations may be subject to punishment (Karanikas & Chionis, 2017). Just culture, a significant component of safety culture, is a culture that learns and evolves by openly identifying and examining its weaknesses. An organization with a just culture is willing to expose its weaknesses as much as it focuses on highlighting its strengths, thus having transparent practices. In a just culture, employees feel safe expressing their safety concerns (Dekker, 2002).

The primary purpose of a just culture is to encourage employees to report safety issues by providing fair treatment (Dekker, 2017). In an organization with a just culture, employees believe they will be treated fairly when facing a negative situation. In a just culture, unsafe employee behaviours are evaluated within a comprehensive process. The goal of this process is to determine whether unsafe behaviour or an incident is a result of organizational system errors or an individual's actions. The process aims to balance between not approaching the individual with a punitive perspective but rather striving to balance innocence and culpability. However, if an individual is found responsible for a negative incident at the end of the process, that person must be held accountable (Petschonek et al., 2013).

There are two views on evaluating human error: the old view and the new view. The old view sees human error or violation as the cause of incidents, adopting a punitive justice approach. Therefore, action must be taken against the person responsible for the incident if the error or violation harms someone. In contrast, the new view sees human error as not the cause of a negative event but as a sign of a deeper problem in a faulty system. According to this view, when an adverse situation occurs, people should focus on improvement rather than punishment. Constructive justice suggests that if an error or violation causes harm, the response should aim to remedy the situation. Constructive justice recognizes the existence of various scenarios and perspectives on how things may have gone wrong. In a just culture, a constructive approach is adopted toward errors and violations (Dekker, 2016).

Just culture is a mechanism that balances between a transparent reporting environment and quality organizational learning. In a fair work environment, both the organization and employees are responsible for their choices and actions. Just culture requires a shift in perspective on many

aspects, from acknowledging individual mistakes and their consequences to considering the design of the system and managing the behavioural choices of all employees (Boysen, 2013). In a just culture, managers, when judging employees exhibiting unsafe behaviours, act deliberately and systematically. This is because unsafe employee behaviour may arise from various organizational factors such as excessive workload, fatigue, stress, resource inadequacy, and adverse working conditions (Reason, 2008).

Factors Influencing Just Culture

Although the concept of a just culture initially emerged in aviation safety literature, it has gained importance in high-risk sectors such as the healthcare industry. In both sectors, there is no consensus on the sub-dimensions constituting a just culture. However, a study conducted in the healthcare sector by Petschonek et al. (2013) identified six dimensions influencing a just culture. These dimensions are balance, trust, openness to communication, the quality of the incident reporting process, feedback on incidents, and communication with the general goal of continuous improvement.

Balance represents the fair treatment exhibited within the system approach to errors. Trust is related to the extent to which employees trust the organization, managers, and colleagues. Openness to communication describes employees' willingness to report incident information to managers, reveal incidents, and make safety improvement suggestions within the organization. The quality of the incident reporting process refers to employees' belief in the reporting system, the ability to follow up on these reports, whether employees are given sufficient time for reporting, and employees' confidence in the traceability of the reporting system. Feedback on incidents and communication indicates the belief among employees in the organization's effectiveness in sharing information and assessment results regarding unsafe incidents. The overall goal of continuous improvement signifies the belief of an employee in the organization's continuous efforts to learn from unsafe incidents and make improvements in the organizational system (Petschonek et al., 2013).

At the core of achieving a just culture is the ability to distinguish between acceptable and unacceptable behaviours in terms of safety. The practices of a just culture acknowledge that even professional employees can make mistakes but are intolerant of thoughtless and indifferent behaviours. From this perspective, just culture practices contribute to decision-makers exhibiting ethical behaviour in their responses to classified faulty behaviours. It is possible to classify these faulty behaviors, which do not require disciplinary punishment, into four groups: human error, negligent conduct, careless behavior and intentional violations (Marx, 2001).

One frustrating situation for an employee causing an unsafe incident is when those judging the incident do not fully understand how the tasks were performed. Those in a judgmental position, such as supervisors, inspectors, or police officers, lack knowledge of the crowded rules, details, and constraints of the job. Additionally, they may lack technical knowledge. Moreover, these

individuals may have a motivation to disadvantage the person involved in the incident. However, human behaviour is systematically related to the work, tools used, and the environment. Therefore, the initial response of those in a judgmental position to an unsafe behaviour should be to ask not who is responsible but what is responsible (Dekker, 2013).

The purpose of the reporting system in the aviation sector is to identify factors contributing to incidents and accidents that result in unsafe outcomes and make the system resilient to similar errors. A reporting system should enable and encourage employees to report any potentially safety-related incidents without fear and openly. Employees should not be inappropriately penalized for reporting or collaborating in incident investigations. However, providing feedback to reporters is essential to maintaining employees' support for the reporting process (EASA, 2003). Preventing reporting for various reasons would inevitably lead to the repetition of errors and violations, hindering learning from unsafe situations and impeding organizational learning (Aral, 2010). Therefore, factors influencing the encouragement or discouragement of reporting behaviour and the accurate differentiation of reported behaviours play significant roles in establishing a just culture (Bükeç, 2020; Clarke, 1998; Fleming et al., 1998; Önen, 2017).

Establishing a just culture in an aviation organization requires the critical role of managers. Managers should be goal-oriented and clear in implementing necessary practices and actions to create a just culture within an organization. Creating a just culture first requires the establishment of new and sufficient behavioural norms (Cooper, 2000). In the assessment process of unsafe behaviours, managers can create a decision tree to reach a fair judgment. To arrive at a correct judgment, questions such as the purposes and consequences of behaviours, whether the use of substances such as alcohol and drugs led to the behaviour, the intentional violation of rules, and whether violations have become part of the work, can be asked (Reason, 1997).

It is possible to see that there are some difficulties in implementing a just culture in the aviation industry. Employees tend to hide their mistakes because they believe they will be punished if they report them. Therefore, in order to create a healthy, just culture environment where employees feel safe and can report freely, there must be trust in both the fairness of managers and the honesty of employees (Byrne, 2012). As punishment and disciplinary practices become harsher within the framework of a just culture, the organizational trust levels of employees decrease. Although blame may be an appropriate solution in some cases since it prevents employees from reporting daily safety incidents (Ingalls, 2002). On the other hand, some personal reasons, concerns about poor performance, fear of dismissal, different legal practices of countries, the possibility that behaviours known as mistakes will be seen as violations by managers, employees' concerns about being ostracized by their friends, reporting unsafe behaviour as failure, the reporting system being complicated and time-consuming, and many individual and organizational factors, such as managers' lack of feedback against reporting

behaviour, can be an obstacle to a just culture (Bükeç, 2020; Clarke, 1998; Fleming et al., 1998; Önen, 2017;).

The Impact of Just culture on Aviation Safety

Today, just culture practices in aviation businesses are recommended by international aviation authorities. It is evident that organizations adopting a just culture witness improvements related to aviation safety (Amalia, 2019). In an environment with a just culture, rather than blaming or punishing employees, accountability is emphasized. This motivates employees to take responsibility for their tasks proactively. Actively involving employees in operational improvement and organizational learning contributes to learning from past experiences and leads to better practices (Dekker, 2017; Wiegmann & Shappel, 2003).

Just culture can form the foundation of an organizational environment that encourages organizational learning. In industries with complex systems and processes like the aviation sector, learning is essential to ensure a high level of safety. Investigating unsafe incidents, learning from them, and taking action are challenging but necessary activities for learning. Managers often struggle to take responsibility for failures and fail to draw important lessons. However, mistakes and failures provide opportunities to learn and improve safety. Learning organizations accept mistakes rather than blaming employees and extract all possible lessons from them (Vaisanen, 2020).

If employees in aviation perceive that reports are handled unfairly or lead to negative consequences, their reporting behaviour is likely to decrease. Over the past two decades, the literature on just culture suggests that accountability and learning constitute two conflicting aspects of the just culture concept. Stakeholders like employers and regulators want to know everything that's going on, but they don't acknowledge everything that's going on. Instead, they want to fulfill the requirements of their own positions. Therefore, labelling a specific behaviour as guilty is not only about that behaviour or its precursor intentions. It serves a broader function, such as distinguishing between normal and abnormal, regulating order and disorder (Dekker, 2009).

A well-functioning just culture, by moving away from a blame culture, contributes to increased organizational performance by establishing a delicate balance between aviation safety and fair management (Balcerzak, 2017). However, intentional violations jeopardizing aviation safety should not go unpunished in a just culture. A just culture environment that fails to address unsafe behaviours, especially violations, fosters a negative organizational climate and may encourage employees to engage in new rule violations (Dekker, 2017; Wiegmann & Shappel, 2003).

Methodology

The aim of this study is to reveal the perceptions of aircraft maintenance students about the concept of just culture in the aviation sector. In the context of the study objective, a qualitative research method has been adopted to elucidate students' perceptions of the just culture concept through

metaphors. The phenomenological research design, one of the qualitative research patterns, has been used to guide the research. The phenomenological research design focuses on phenomena that we are aware of but not thoroughly understood, addressing events, experiences, perceptions, trends, and concepts in daily life (Yıldırım & Şimşek, 2018). The research aims to answer the questions, “*With which metaphors do aircraft maintenance students associate the just culture concept in the aviation sector?*” and “*How do aircraft maintenance students explain the metaphors they associate with the just culture concept in the aviation sector?*”

In order to conduct the research, approval was received from the Science and Humanities Ethics Committee of the University of Kyrenia, Turkish Republic of Northern Cyprus, dated 19 June 2023 and meeting number FSBB/14.

Sample

The sample of the research consists of aircraft maintenance students enrolled in an associate degree program at a public university in Turkey. Purposive sampling was used to select participants who best contribute to understanding the research problem (Creswell, 2017). Second-year students in the mechanical department were included in the research sample because these students are theoretically knowledgeable about aviation safety, safety culture, and human factors in aviation, and thus, they are assumed to have awareness regarding the just culture concept in the aviation sector. The total number of students in the mechanical department is 160. All students are male, aged between 19-22, and come from different cities and high schools in Turkey. A total of 78 students participated in the research.

Data Collection Tools and Process

The research employed the metaphor technique, which is a qualitative data collection technique. Metaphors are mental tools and comparisons used to explain and understand complex and abstract phenomena more easily. Metaphors serve as symbols, representing the concept or phenomenon, not the phenomenon itself (Demirbilek, 2021). A semi-structured interview form was used during the literature review to determine students' perceptions of the just culture concept in the aviation sector through metaphors.

The interview form consisted of an introduction and two parts. In the first stage, students were asked to complete the sentence “*Just culture in the aviation sector is like...*” to identify which metaphor they associated with the just culture concept. In the second stage, students were asked to explain the metaphor they associated with the just culture concept in detail, starting with the phrase “*Because...*” The purpose of using this approach is to treat the forms written by students in their own handwriting as documents and use them as the primary data collection tool in the research. The form was given to the students during class, and they were given 25 minutes to complete it.

The researchers informed the participants that the research was voluntary and that the participants had the right to withdraw from the research at any time. Participants who voluntarily participated in the research provided

their consent before the research was conducted. Non-participating or withdrawn students were assured that they would not suffer any harm due to their decision. During the interview process, it was explicitly stated in the introduction section of the interview form that all data collected from participants would be kept confidential, not shared with anyone outside the researchers, and participants' names would not be disclosed when reporting the research results.

Data Analysis

The collected data were analyzed using the content analysis method. The purpose of content analysis is to summarize, interpret, and process the data descriptively and inductively, aiming to identify unnoticed codes, categories, and themes and organize them in a way that readers can understand. Content analysis in qualitative research involves coding the data, finding categories and themes, organizing the emerging codes, categories, and themes, and interpreting the findings (Yıldırım & Şimşek, 2018). During content analysis, seven metaphors out of the 85 used by participants were deemed to have no relevance to the understanding of just culture or literature. These were excluded by mutual agreement of the researchers. The remaining 78 metaphors and participant expressions regarding the relationship between these metaphors and just culture were evaluated. The data were systematically examined separately by both researchers and then together, resulting in the final themes of the research. The emerged themes were supported with quotes from participant expressions, and the researchers interpreted the findings in the conclusion section. In addition, the metaphors used in the research were visualized by creating word clouds with the Word Art program.

Findings and Analysis

The five themes that emerged as a result of the analysis of participant expressions regarding the metaphors used in the research and their relationship with the just culture, and which are thought to reveal the basic characteristics of the just culture, and the categories of these themes are presented in Table 1.

Table 1
Themes of the Research

S/N	Themes	Categories	Metaphors	f	%	
1	Establishing Balance and Trust	1. Being Fair and Balance Focused	Scales	11	28% (22)	
			2. Requiring Discriminatory Evaluation	Cell Membrane		1
				Spider Web		1
		Filter		1		
		The Sword in the Owl's Hand		1		
		Glasses		1		
		Religion		1		
		3. Establishing Cause and Effect Relationships	Court	2		
			Murder Case	1		
			Detective	1		
			Video Assistant Referee (VAR)	1		
2	Building on Mutual Relationships		Judge and Defendant Relationship	3	13% (10)	
			Referee and Player Relationship	1		
			God and Servant Relationship	1		
			Cat and Human Relationship	1		
			Dog and Human Relationship	1		
			Shepherd and Donkey Relationship	1		
			Double Doves	1		
			Parent and Child Relationship	1		
3	Having a Systematic Mechanism		Ideal Family	2	19% (15)	
			Anthill	2		
			Forest/Eco System	3		
			Car	2		
			Alarm Clock	1		
			Hunting Lion Pride	1		
			Meal	1		
			Pizza	1		
			Swiss Wristwatch	1		
			Working Machine	1		
4	Being Contradictory		Medal	1	17% (13)	
			Tiger	1		
			Iron	1		
			Water	1		
			Fish	1		
			Tail of Snake	1		
			Safety Wire	1		
			Broken Clock	1		
			Chair with Broken Leg	1		
			Weak Building	1		
			Witness	1		
			Lizard	1		

			Statue of a Man with the World on His Back	1	
5	Being Unique	1. Providing Guidance	Leadership	1	23% (18)
			North Star	1	
			Trabzonspor Football Team	1	
		2. Protective and Supportive	Building Foundation	1	
			State	2	
			Helmet	1	
		3. Focus on Ethical Values	Umbrella	1	
			Diary	1	
			Mutual Trust Between Friends	2	
			Conscience	1	
			Effort	1	
		4. Being Unreal	Responsible Boss	1	
			Utopia	4	
			Total	78	100%

In order to create a visual impression in the minds of the readers about the concept of just culture in the aviation industry, the metaphors used in the research are presented as a word cloud in Figure 1. Word sizes of metaphors were determined according to the number of repetitions.

Figure 1
Word Cloud Created With Metaphors



When Figure 1 is examined, it is seen that the most repeated metaphor is scales, followed by the utopia metaphor.

Theme 1: Establishing Balance and Trust

The first theme of the research, Establishing Balance and Trust, was reached by examining 22 (28%) metaphors. Theme 1 includes three different

categories reflecting the characteristics of just culture, presented in the following order.

Category 1: Being Fair and Balance Focused

The metaphor with the highest frequency in data analysis (11) was identified as “*scales*.” In this finding, the influence of the fundamental symbol of justice, the scales held by the mythological goddess Themis, is evident. Participants, however, used the metaphor of the scales with different perspectives. For example, a participant suggests that “*an increase in pressure in the attitudes and behaviours of managers in aviation organizations will disrupt the balance, leading to the disappearance of just culture and endangering safety.*” Another participant “*questions and defines balance in the treatment of employees when they make mistakes or violations.*” Another participant proposed “*putting punishment and forgiveness on the scales and argued that mistakes placed on the scales must pass through the filter of justice.*” One participant contextualized the balance “*by placing employees who make similar mistakes on the scales, ensuring they always receive the same treatment.*”

Another participant used the scales metaphor “*associated balance with mutual trust between the organization and the employees in the defined interest relationship. Here, being fair in organizational communication is suggested to have a positive impact on performance.*” Another participant with a similar approach expressed that “*recurring mistakes or violations would disrupt the balance.*” One participant emphasized that “*top management holds the scales.*” Another participant, “*while associating the scales with the balance between management and employees, highlighted the importance of communication between the two in determining balance.*” Other participants defined the function of the scales similarly. Another participant described “*balance as both managers and employees taking responsibility for their duties, emphasizing the importance of not giving up clear communication.*” Similarly, another participant expressed that “*using the scales metaphor would increase consistency in a professional approach and maintain balance.*”

It is evident from the expressions of participants using the scales metaphor that there is an obligation for managers throughout the organization to exhibit balanced attitudes and behaviours toward employees. Therefore, both the literature review and the expressions of the participants in this study directly or indirectly indicate the importance of top management support in creating and maintaining a just culture. The balance between managers and employees in a just culture depends on professionalism, open communication, consistent practices, and mutual trust established between the two parties. According to participants, points where these can be observed include managerial attitudes, absence of deficiencies in relevant procedures, organization management's reaction to errors and violations, similar punishments for similar violations, and the level of support for just culture in organizational communication and reporting processes.

Category 2: Requiring Discriminatory Evaluation

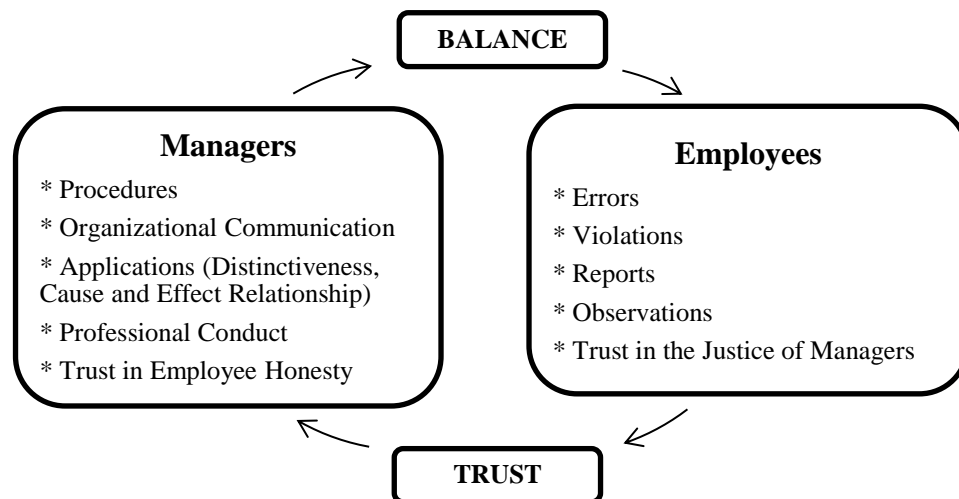
Some participants supported factors that would nourish just culture with other metaphors, but ultimately emphasized justice and balance within the organization. One participant explained just culture with the **“cell membrane”** metaphor. In this analogy, it is stated that *“just culture needs to exclude an acceptable external factor or incorporate its negativity by filtering and eliminating it.”* Another participant, considering tolerance and selectivity necessary, used the **“spider web”** metaphor. The participant described *“the accumulation in the web as system failures and imagined the management as the spider that feeds on them, repairing and expanding the web for the development of just culture.”*

Another participant likened just culture to the **“filter”** metaphor with the same logic. Another participant used the **“owl”** metaphor by giving it a sword. *“The sharpness of the sword is also stated to enhance the deterrent effect of the punishment.”* Another participant using the **“glasses”** metaphor emphasized *“the necessity of good visibility of events within the organization.”* Another participant, focusing on the evaluation of employees' actions, used the **“religion”** metaphor. With this analogy, the participant *“established a relationship between the forgiveness of religion, the consideration of the individual's intention in actions, and the belief that religion will evaluate errors and violations in the fairest way.”*

Category 3: Establishing Cause and Effect Relationships

Some participants focused on the decision that would be given in response to employees' mistakes and violations. One participant used the **“court”** metaphor. In this metaphor, it is highlighted that *“the actions' cause and effect should be evaluated with the precision of the court and on a legal basis.”* Another participant using the **“murder case”** metaphor expressed *“the conditions of the blame culture that contradicts just culture.”* Another participant, emphasizing the need to define cause and effect relationships through evidence and logic, used the **“detective”** metaphor and highlighted *“the importance of making efforts to ensure that no hidden matter remains.”* Another participant used the **“VAR system”** used in football matches as a metaphor, *“focusing on evaluating the actions of employees.”* The above metaphors emphasize the need for a detailed examination and a focus on cause-and-effect relationships in the process of determining whether employee behaviour constitutes a crime.

Figure 2, created by considering the metaphors constituting Theme 1 and the expressions of the participants regarding these metaphors, is presented below.

Figure 2*Balance and Trust in a Just Culture*

According to Figure 2, in the process of establishing a just culture in an aviation organization, both managers and employees need to act in balance to establish mutual trust. On one side of this balance mechanism are the procedures applied by managers for ensuring just culture, organizational communication channels, consistency in evaluating employees' error and violation behaviours, and professional behaviour patterns in the workplace. On the other side are inevitable errors and violations related to safety by employees, necessary conditions for reporting unsafe situations, and personal observations regarding all practices in the organization. However, it is essential for reporting unsafe behaviours and establishing a just culture that managers trust the honesty of employees, and employees trust the fairness of managers.

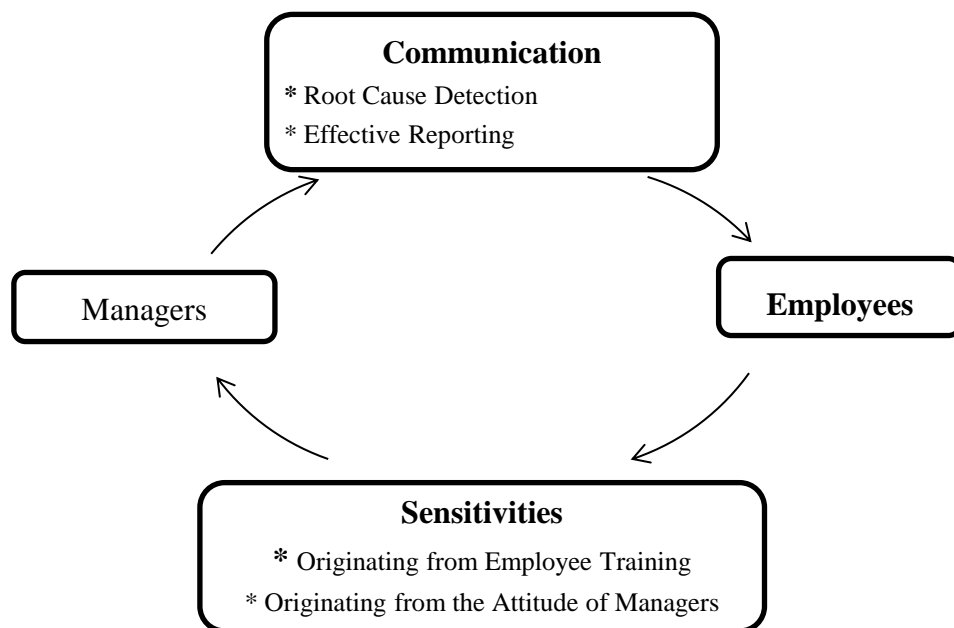
Theme 2 - Building on Mutual Relationships

Some participants used metaphors related to mutual relationships between those who commit errors or violations and those who make legal decisions about these behaviours. The metaphor of the *“judge and the defendant”* was reiterated by three different participants under this theme. With this metaphor, participants identified *“managers as judges and employees as defendants, emphasizing the need for the careful examination of employees' errors and violations in this relationship and the necessity of formal mutual communication.”* A participant using the relationship metaphor between the *“referee and the player”* stated that *“when the referee makes decisions about the player's actions, he should not only rely on communication with the player but also consider the statements of other players related to that action.”* In this metaphor, the statements of other players were likened to the reporting system of just culture. Another participant used the relationship between *“God and servant”* as a metaphor, suggesting “the need to decide

based on the reasons known to God rather than the visible reasons when evaluating actions.” Another participant focused on the positive or negative consequences of management’s attitude toward employees in organizational communication, using the metaphor of the relationship between a **“cat and a human.”** The participant stated that in this relationship, *“if a person behaves badly, the cat will react negatively, but if treated well and approached correctly, it may be possible to love the cat.”* A participant operating on almost the same logic determined the relationship between a **“dog and a human”** as a metaphor. Another participant focused on the relationship between a **“shepherd and a donkey,”** expressing that *“the performance of employees in the context of just culture is related to the treatment of employees.”* A participant using the metaphor of **“double doves”** living as a couple emphasized *“collaboration, respect, acting together, and information sharing in the communication between doves.”* Another participant described the same relationship with the metaphor of the delicate relationship between **“parents and children.”** The participant suggested that *“errors made by employees should be distinguished and managed by managers with parental sensitivity, and the results should be accepted and embraced with family responsibility.”*

In Figure 3, relationships and sensitivities that should exist between managers and employees, according to the metaphors constituting Theme 2 and the expressions of the participants regarding these metaphors, are presented.

Figure 3
Mutual Relations and Sensitivities in a Just Culture



In Figure 3, the presented mutual relationships and sensitivities not only emphasize the necessity of open communication, one of the fundamental components of a just culture, but also highlight the importance of paying attention to unseen or hidden issues in relationships. In this context, it is believed that displaying a sympathetic and positive approach in relationships between managers and employees, similar to human-animal relationships, will enhance mutual relationships within the scope of a just culture.

Theme 3: Having a Systematic Mechanism

Participants who considered it necessary for a just culture to have a “*systematic mechanism consisting of components*” used metaphors advocating systematic operation and aimed to explain it. The first of these metaphors is the “*ideal family*” metaphor. In this metaphor, which argues that “*behaviours learned within the family constitute the basis of behaviours in the workplace within the scope of a just culture, emphasis was placed on organizational roles, division of labour, and solidarity.*” The metaphor vividly illustrates that “*a punishment should benefit the learner and progress towards the betterment of family unity.*” Another metaphor “*supporting collaboration and systematic operation*” is the “*anthill*” metaphor, used by two different participants. The “*forest/ecosystem*” metaphor, symbolizing a system and order, was used by three different participants. With this metaphor, participants emphasized “*not only systematic operation but also mutual dependence and the necessity of being obligatory to each other to survive.*”

The “*car*” metaphor, which “*foresees a systematic approach in detecting and resolving errors, particularly highlighted the necessity of systematic operation.*” This metaphor emphasizes “*the need for analytical thinking and systematic problem-solving to prevent errors or malfunctions.*” The “*alarm clock*” metaphor highlighted “*the importance of actions and decisions occurring in a timely manner.*” The “*hunting lion pride*” metaphor is another metaphor emphasizing systematic operation. In this metaphor, “*the personal interests of individuals combine with group interests during hunting, requiring each individual to fulfill their responsibilities without neglect. The chief lion, while having the largest share, is responsible for monitoring and evaluating how well each member of the pride fulfills their responsibility.*” Another metaphor focusing on systematic operation is the “*meal*” metaphor. In this metaphor, the participant stated that “*the meal itself, which consists of different components, resembles the employees, and the taste, salt and consistency of the food are determined by the managers, like a cook.*” While a similar process is deemed necessary in the “*pizza*” metaphor as in the meal metaphor, it has been likened to “*the concept of trust because the pizza dough is placed on all the ingredients.*” One participant, who compared a perfectly functioning “*Swiss watch*” to a just culture with a focus on a systematic approach, emphasized the “*mutual harmony between the subsystems of the system.*” The participant who explained just culture with the metaphor of a “*working machine*” said the following. “*Just culture is like a working machine. These types of machines have a stop and a reset button. The stop*

button is pressed in case of employee violation behavior. Operational intervention is essential in case of errors and violations. If there is constant operational intervention, the management style should be changed. For this, the reset button must be pressed.”

Theme 4: Being Contradictory

Participants who focused on the nature of a just culture, which can produce both positive and negative results, expressed the contradictory (paradoxical) aspects of a just culture through metaphors. The **“medal”** metaphor explicitly expresses *“this contradiction, with the front side described as bright and receptive, representing the assurance of safety in an ideal aviation organization where a just culture is established. The back side, on the other hand, represents the conditions within the organization where errors and violations are hidden, managers cannot make correct decisions, and organizational conditions where tolerance, communication, and trust are lost.”* Describing the contradiction through managerial attitudes, one participant used the **“tiger”** metaphor, *“likening managers who focus on repression, lack of communication, and constant punishment to a wild tiger causing distrust and stress among employees.”*

Another metaphor defined in the same theme is **“iron,”** *“when used in the right way and at the temperature, removes wrinkles that resemble organizational problems, otherwise it can burn the fabric.”* Similarly, in the **“water”** metaphor given, it is emphasized that *“it is not possible to know whether water is sweet or salty at first glance. If the water is clean, it will give health, but if there are additives or foreign substances in it, it will have a bad taste and cause stomach ache.”* Similarly, the **“fish”** metaphor depicted *“the organizational internal environment like the fish's living conditions, representing either life-giving or life-taking qualities.”* Another metaphor that depicts contrast is the **“tail of snake”** metaphor. *“Here, the similarity of the snake's head and tail is explained, and the development of a just culture without harming the system is likened to holding the snake's head with a glove.”* In the **“safety wire”** metaphor, it is stated that *“the safety wire made with the right method will secure a part or mechanism, otherwise the safety wire made with the wrong method will break and cause unsafety.”*

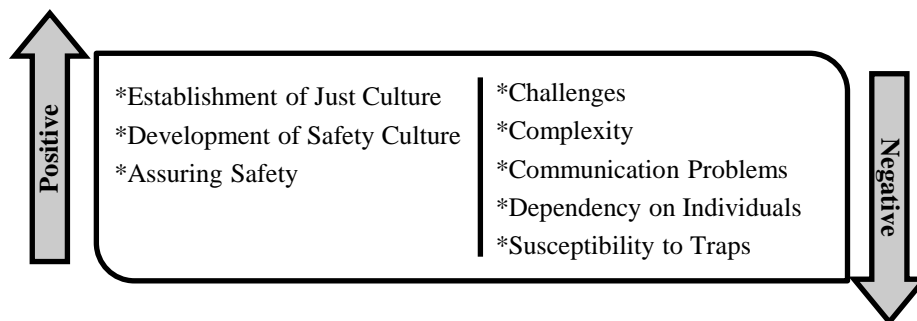
Another metaphor, the **“broken clock,”** represents the necessity of a systematic approach in a just culture, symbolizing that *“if the clock's incorrectness is not known, everything will go wrong.”* In the same line of thought, the **“chair with broken leg”** and **“weak building”** metaphors depicted *“the importance of noticing and gradually growing unnoticed malfunctions in organizational processes, emphasizing that they can result in serious negative consequences and, therefore, a just culture is indispensable for a safety culture.”* The **“witness”** metaphor likened the role of the witness, *“which is crucial in solving a murder, to the role of employees who have an effective role and reporting responsibility in ensuring safety.”* In the **“lizard”** metaphor, contradictions related to a just culture were expressed. According to the participant, *“the lizard leaving its tail while escaping is a move to mislead*

its pursuer. Similar to the lizard misleading its pursuer, the inability to accurately identify the root causes of errors and violations in the application of a just culture can lead to misunderstandings.” The last metaphor of this theme, **“the statue of a man carrying the world on his back,”** symbolizes *“the difficulties in establishing a just culture. It is necessary to carry it, but it is difficult.”*

In Figure 4, the positive and negative aspects of a just culture that emerged from the metaphors constituting Theme 4 and the expressions of the participants regarding these metaphors are presented.

Figure 4

Positive and Negative Aspects of Just Culture



When Figure 4 is examined, it can be seen that, while a just culture has significant positive outcomes for aviation safety, it also has inherent challenges. In this context, it can be said that despite its desired excellent results, establishing a just culture in an organization is difficult and complex; it involves processes filled with pitfalls; it is directly dependent on employees' safety performance; and it is easily influenced by the fragile outcomes of managerial attitudes. Additionally, difficulties in organizational communication and decision-making processes negatively affect the establishment of a just culture.

Theme 5: Being Unique

Participants emphasized the unique features of a just culture with another group of metaphors. It is evident that this unique management approach, focusing on individuals, highlighting their innocence, and rejecting blame by finding and solving organizational flaws, leads to special and positive thoughts among young aviation professionals interpreting it. In this context, the unique features of a just culture are presented in four different categories.

Category 1: Providing Guidance

In the first category reflecting the unique features of a just culture have a proactive and guiding quality. In the **“leadership”** metaphor, it is stated that *“a just culture leads and guides continuous improvement in aviation safety.”*

The guiding nature of a just culture is also expressed in the **“North Star”** metaphor. According to the participant, *“like the light of the North Star, a just culture will be a guide for everyone and will lead to trust by rejecting discrimination among employees.”* Another metaphor related to discrimination is presented with the **“Trabzonspor”** metaphor. According to the participant, *“Trabzonspor, by breaking the hegemony of Istanbul teams with its achievements, paved the way for Anatolian football teams. In this respect, Trabzonspor, symbolizing fair competition, is similar to a just culture that ensures equal treatment for all employees.”*

Category 2: Protective and Supportive

One participant used the metaphor of **“building foundation”** to emphasize the relationship between ensuring safety, the development of safety culture, and the development of just culture. In this metaphor, it is stated that *“when the foundation of the building is solid, it is possible to rise strongly towards the sky, but otherwise, the building will collapse.”* The **“state”** metaphor emphasizes that, *“like the state working for the well-being, security, and prosperity of its people, a just culture is likened to this function due to its essential functions for the survival of aviation safety.”* In the **“helmet”** metaphor, the participant highlighted *“the ability of a just culture to protect against danger and risks even in unexpected situations.”* The **“umbrella”** metaphor, *“explaining the protection of the organization and employees from accidents or losses, also emphasizes this feature.”*

When examined in general, the metaphors in this category suggest that in organizations where a just culture develops, aviation safety develops on a solid foundation, and employees are protected against unsafe situations.

Category 3: Focus on Ethical Values

Participants mentioned that a just culture focusing on ethical values would motivate employees. In this context, the first metaphor used is the **“diary”** metaphor. *“What is stated in the diary is associated with a just culture because it is the honest, sincere, and concise version of what happens in the real world.”* Two participants, emphasizing communication based on honesty, explained this approach with the metaphor of **“mutual trust between friends”** *“who do not fear facing mistakes.”* The **“conscience”** metaphor *“integrates the ethical attitude required to accept responsibility and work without harming others into a just culture.”* In the **“effort”** metaphor, an example of fighting a pandemic is given, and it is emphasized that *“shortcomings related to safety should be reported to prevent harm to other employees and organizational processes.”* The **“responsible boss”** metaphor advocates *“adopting ideal values in which honest reporting and not shying away from taking responsibility are essential.”*

The participant statements in this category indicate that a just culture should be nourished by ethical values.

Category 4: Being Unreal

Participants who used the metaphors in the last group compared a just culture to **“utopia.”** The first participant using the metaphor thinks that *“a just*

culture represents an ideal in theory, but human desires will prevent it from becoming a reality in the real world.” The second participant thinks that *“the fragile conditions necessary for the application of a just culture in aviation organizations make it impossible for a just culture to go beyond being a dream.”* The third participant thinks that *“the cruelty of managers and the misconduct of employees will make the just culture unworkable.”* The last participant, *“quoting from Voltaire's Candide, associates his dream of everyone sweeping in front of their houses with the simplicity and unworkability of a just culture.”* Human-centred approaches and technologies in the aviation sector, such as Crew Resource Management or autopilot applications, were initially seen as utopian when they were first implemented in historical processes. In this context, the perception of a just culture as 'utopia' by a limited number of participants in recent years can be viewed as a natural perception that can be overcome over time.

Discussion and Conclusion

The aviation sector, which plays a significant role in achieving global economic growth and development, conducts all activities inherently in line with international safety rules and standards. Unsafe behaviours in aviation can lead to incidents and accidents with fatal consequences. Therefore, various technological and human approaches have been adopted throughout history to ensure safe conduct of activities in aviation. A sub-dimension of safety culture, which represents the sum of values that reduce risks while trying to increase safety-related behaviours, the concept of a just culture is a human management approach discussed and tried to be implemented in the aviation sector in recent years. In this context, this research attempted to explain the perceptions of aircraft maintenance students in an associate degree program at a public university about the concept of a just culture in the aviation sector through metaphors, using data collected from 78 participants through the interview method. The results were reached by subjecting the collected data to content analysis, revealing five themes related to a just culture. In this context, *“establishing balance and trust, building on mutual relationships, having a systematic mechanism, being contradictory, and being unique”* were seen as the fundamental characteristics of a just culture.

In the first theme of the research, it was seen that a just culture should primarily be established on balance and trust. For this reason, the most metaphors (28%) were collected under this theme, and the most repeated metaphor of this theme by the participants was *“scales.”* Healthy communication based on mutual trust between managers and employees forms the basis for the establishment of a just culture. According to Vaisanen (2020), there is no just culture in an organization where there is no mutual trust between managers and employees. In the first theme, it is emphasized that a just culture should be able to distinguish unsafe behaviours from the perspective of cause-effect relationship. At the core of a just culture is the clear distinction between acceptable and unacceptable behaviours related to safety (Marx, 2001; Reason, 1997).

In the second theme of the research, which was created through metaphors (13%) about people's relationships with each other and with animals, it was seen that there must be a constant mutual relationship or open communication between managers and employees in order to form and maintain a healthy just culture. In a study conducted in the health sector by Petschonek et al. (2013), openness in communication was reported as one of the six dimensions affecting a just culture. Positive behaviours displayed in mutual relationships between managers and employees will contribute to the development of a just culture.

The third theme of the research consists of metaphors (19%) that emphasize that a just culture should have a systematically functioning structure. In the formation of this theme, different systematic structures such as human, animal, plant and machine were used as metaphors, and the most repeated metaphor in this theme was the “*forest*.” Contributors to this theme have argued that unsafe behaviours, such as errors and violations, in a just culture should be evaluated not only from a one-sided perspective but also from a systematic perspective. According to Dekker (2016), unsafe behaviours can be a sign of a deeper problem in a faulty system rather than being the cause of a negative event. In such negative situations, instead of blaming people immediately, it is necessary to examine the root of unsafe behaviour with a systematic approach and different perspectives.

The fourth theme of the research, consisting of metaphors indicating that there are contradictions and difficulties in the nature of a just culture, which constitute 13% of the metaphors. Contributors to this theme stated that while a just culture has positive contributions to aviation safety and has a humane approach, there are some difficulties and negatives in applying a just culture in an organization. Various reasons such as employees' belief that they will receive punishment if they report unsafe behaviours (Byrne, 2012), harsh discipline and punishment practices, blame culture (Ingallas, 2002), different legal regulations in different countries, fear of poor performance and dismissal, ineffective and complex reporting system, exclusion of employees who report (Bükeç, 2020; Önen, 2017;), can create difficulties in the establishment and development of a just culture.

The fifth and last theme of the research was created as a result of metaphors (23%) that reveal the unique characteristics of just culture. In addition to being a guiding, protective and supportive feature in the formation and development of aviation safety, the fact that just culture includes ethical values such as taking responsibility, showing effort, honesty and trust makes just culture a unique managerial approach, especially for aviation safety. However, another unique feature of just culture was that it was viewed by participants as a utopia due to the difficulties in implementing it. This finding is thought to be a unique finding that adds value to the research, unlike the literature.

Overall, it can be said that the research findings are-consistent with the literature on a just culture. However, since the research is a qualitative study, it

is thought to make an original contribution to the literature by collecting data through metaphors to reveal different and unique aspects of a just culture. However, to overcome the limitations of the research conducted only with the participation of aircraft maintenance students, in the future, quantitative and qualitative studies can be conducted on different aviation employee groups such as flight crew, air traffic controllers, aircraft maintenance technicians, and ground staff regarding a just culture. In this context, the effects of variables such as personality traits of managers and employees, fear culture, organizational trust and organizational culture on just culture can be examined.

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