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How institutional logics shape safety perceptions and practices: Aircraft maintenance safety perspective.

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Abstract

Professionals' perceptions of safety related thinking in aircraft maintenance operations are still underrepresented, despite increased of safety research in aviation industry. By employing an institutional logics (ILs) theory, this article aims to explain how ILs influence safety perceptions, practices and behaviours in organizational safety. Based on a case study in an under-studied context, 13 semi-structured interviews were conducted with aircraft maintenance engineers in an airline based in MENA region. The interviews focused mainly on family and religion logics and how they interact with actors' safety perceptions and practices. The findings showed that safety practices and perceptions were strongly influenced by cultural values and religious beliefs. For the first time, this article reveals that ILs offer valuable insights into the logic of family and religion in the context of aircraft maintenance safety and operations. The results showed that these logics play a basic approach in organizational safety. This study advances the current safety research in aviation and ILs literature in addressing the contextual elements on safety perception and practices of organizational safety. Therefore, it demonstrates that investigating safety perception through ILs framework improves our comprehension of safety and offers a number of explanations for safety related behaviours and beliefs that might otherwise have been perceived as illogical. Safety managers, experts, and accident investigators can assess aviation safety incidents and accidents and their prevention measures through the use of ILs approach.

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Keywords: Accident investigations, Institutional logics, Organizational safety, Safety perceptions, Aircraft maintenance, Aviation safety.

كيف يشكل المنطق المؤسساتي تصورات وممارسات السلامة: من منظور سلامة صيانة الطائرات.

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الملخص:

لا تزال تصورات المهنيين حول التفكير المتعلق بالسلامة في عمليات صيانة الطائرات ممثلة تمثيلاً ناقصًا، على الرغم من زيادة أبحاث السلامة في صناعة الطيران. من خلال استخدام نظرية المنطق المؤسسي، يشرح هذا المقال كيف يؤثر المنطق المؤسسي على تصورات السلامة وممارساتها وسلوكياتها في السلامة التنظيمية. واستنادًا إلى دراسة حالة في سياق غير مدروس جيدًا، تم إجراء 13 مقابلة شبه منظمة مع مهندسي صيانة الطائرات في شركة طيران مقرها في منطقة الشرق الأوسط وشمال أفريقيا. ركزت المقابلات بشكل أساسي على منطق الأسرة والدين وكيفية تفاعلهما مع تصورات وممارسات السلامة لدي الأفراد. وأظهرت النتائج أن ممارسات وتصورات السلامة تأثرت بشدة بالقيم الثقافية والمعتقدات الدينية. لأول مرة، تكشف هذه المقالة أن المنطق المؤسسي يقدم رؤى قيمة حول منطق الأسرة والدين في سياق سلامة عمليات صيانة الطائرات. وأظهرت النتائج أن هذين المنطقين يلعبان دوراً أساسياً في السلامة التنظيمية. تعمل هذه الدراسة على تطوير أبحاث السلامة الحالية في أدبيات الطيران والمنطق المؤسسي في معالجة العناصر السياقية لإدراك السلامة وممارسات السلامة التنظيمية. ولذلك، فهي توضح أن التحقيق في إدراك السلامة من خلال إطار المنطقي المؤسسي يحسن فهمنا للسلامة ويقدم عددًا من التفسيرات للسلوكيات والمعتقدات المتعلقة بالسلامة والتي كان من الممكن أن يُنظر

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إليها على أنها غير منطقية. يمكن لمديري السلامة والخبراء والمحققين في الحوادث تقييم حوادث ووقائع سلامة الطيران وتدابير الوقاية منها من خلال نظرية المنطق المؤسسي.

الكلمات المفتاحية: تحقيقات الحوادث;المنطق المؤسسي; سلامة المؤسسات; تصورات السلامة; صيانة الطائرات; سلامة الطيران.

1. Introduction

Organizational safety represents a special pillar of organizational behaviors that are influenced by multiple ILs (Cornelissen et al., 2020). These ILs are comprehensive forms of principles that define what constitutes appropriate behavior (Thornton, 2004). Individuals in organizations navigate through several logics, related to family, religion, state, market, community, profession, and corporation (Cornelissen et al., 2020; Soleimanof et al., 2018; Thornton & Ocasio, 2012), and they face tensions when these logics are in conflict (Greenwood et al., 2011). While the body of research on ILs is growing, little is known about how safety perceptions draw on these logics. The existing literature has generally centered on the logics of profession, corporate, market, and state and neglected the logic of family and religion in certain contexts where these contexts play a significant role.

Despite their significance in organizational safety, religion and family are often overlooked in studies looking at IL in organizations (Gümüsay, 2020; Jaskiewicz et al., 2016; Tracey, 2012). Therefore, some studies called more research need to be conducted to explore the role of religion and family logic (Cornelissen et al., 2020). Thus, it is important to understand how individuals and managers balance their values related to family and religious beliefs when facing ethical challenges that might have implications to organizational objectives (Fathallah et al., 2020).

Since our understanding regarding the role of family and religion to organizational safety is very limited, this article undertakes an exploratory study to address the following questions: (1) how are safety practices and perceptions influenced by family and religion logic?, (2) how these logics influence organizational safety when they consider ethical challenges?. This article follows a case study

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technique with an inductive investigation to offer a novel view from the field-based case. This study contributes to the literature on organizational safety by explaining various dynamics of logics (Reay et al., 2015) in domain of organizational safety through explaining how actors interpret the safety perceptions across the family and religion ILs.

Following the introduction of the concept of IL, details of the methods and the results of this study are presented, respectively, in section 2 and 3. This is followed by a discussion of role IL in areas of organizational safety in section 4, and finally presents the conclusion in section 5.

2. Methods

2.1 Research design

Previous research on IL build on qualitative research (Reay & Jones, 2016). The understanding of the IL in safety domain can be enriched by also taking into consideration cross-cultural differences in safety perception and execution of safety practices and behaviors (Cornelissen et al., 2020). Thus, to complement existing IL research, this article follows a qualitative methodological approach, employing an interpretive case study research design (Burkholder & Hulsink, 2022; Cornelissen et al., 2020; Reay & Jones, 2016) to reveal how IL operationalized in an under-presented contextual setting in which differences in safety perceptions and practices arose (Ben-Saed & Pilbeam, 2022).

2.2 Sampling and settings selection

A snowball and purposive sampling technique, considered valuable when the aim is developing theory in lieu of generalizing of findings, was adopted (Creswell & Poth, 2016). The sample was aircraft maintenance professionals' in an airline in Middle East and North Africa (MENA) region. This included 13 in-depth interviews with aircraft engineers with technical qualification range from license B1 and B2 (see table 1). The sample covered in this setting to access the reality of safety logics and to expose the contextual organizational safety competing logics. Therefore, this article aims to explore new thoughts about how multiple IL affect safety norms and practices. All participants in this study were male informants.

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The participants were mainly targeted because they have the skilled discretion and balance of the organizational competing logics such as safety assurance and production, and they hold organizational safety values, beliefs and practices that are ingrained into them (Ben-Saed & Pilbeam, 2022). The authors mainly targeted senior and experienced supervisors and managers in aviation context where safety plays a considerable role.

The sample size of participants is in line with other studies of aviation safety culture (Liao, 2015): 10 participants and (Ben-Saed & Pilbeam, 2022): 28 respondents; (Cornelissen et al., 2020) 22 interviewee about IL in OHS. Knowing that validity in qualitative research is established by data richness instead of sample population (Glesne, 2016; Saunders & Townsend, 2016) the saturation point was achieved within the first 11 interviews. This process came into an end when no further information emerged, and therefore data saturation was achieved.

Table 1. Participants demographic details.

Respondent Number	Position when interviewed	Experience	License type
R1	Safety manager	23y	ATPL
R2	Maintenance manager	32y	B1& B2
R3	Deputy safety manager	37y	B1
R4	Shift supervisor	20y	B2
R5	Deputy shift supervisor	30y	B2
R6	Safety Inspector	35y	B1
R7	Maintenance engineer	30y	B2
R8	Maintenance engineer	28y	B1
R9	Defect controller	36y	B1
R10	Maintenance engineer	28y	B1
R11	Maintenance engineer	35y	B1
R12	Maintenance engineer	30y	B1
R13	Chief of avionics	07y	B2

2.3 Data collection

Methods of qualitative inquiry are often used for investigating IL (Reay & Jones, 2016). Data were then sourced from semi-structured

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interviews with aircraft maintenance engineers/technicians about safety in workplace. The author developed a set of interview questions before starting recruitment process. The questions were borrowed from the organizational safety culture literature to cover areas such as compliance to organizational safety rules and procedures (Gao et al., 2015; Parker et al., 2017), safety responsibility and accountability (Ghahramani & Khalkhali, 2015), and managers' commitment to safety (Kines et al., 2011). The interview questions were pilot tested before starting data collection to ensure clarity.

Participants were approached by the author. All interviewees were approached in person. The interviews lasted on average 1 hour resulting in 11 hours of interview data. Data collection occurred over seven months. At the beginning of each interview, the author informed the participants of the study's aim and they had the choice to withdraw at any time. The interviews were recorded with the participants' approval and later transcribed for analysis. The interviews were conducted in an airport where the participants involved in an ongoing maintenance operations.

2.4 Data analysis and reporting

All interviews were audio-recorded and immediately transcribed verbatim. The process followed a form of thematic analysis (Strauss & Corbin, 2008) guided by (Braun & Clarke, 2006) methodology to identify, analyze and reporting patterns related to multiple IL (themes) in organizational safety from the perspective of safety perceptions and practices. The author began the analysis process by listening to recordings of interviews and reading the transcripts at the same time, while looking for meanings and patterns before rigorous coding. The subsequent step involved was coding the transcripts into first order codes using the participants' language. The obtained first-order codes from each of the 13 interviews were after that collated. Using Gioia et al., (2012) template analysis method, the first-order codes related to various aspects of safety perceptions, beliefs and practices, and multiple ILs were taken into account and then merged together through axial coding to form second order themes. These themes were then labelled using more

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generic descriptions. These second-order themes were finally combined into broader aggregate elements at a higher level.

During the analysis, an inductive approach was employed entailing iteration between data and themes gained from the interviews and previous theories related to organizational safety and IL theories (Dubois & Gadde, 2002). Following an approach for the analysis of qualitative data reported by others (Jimmieson et al., 2021), the coding and grouping into themes was conducted by the author. Two academic volunteers then checked the text-code and code-theme correspondences provided by the author. Any disagreements were resolved by referring to the data collected, and the codes generated.

3. Findings

Table 2 illustrates the coding and theme structures that developed from the data. The results outlined in this section summarizes the responses received from various respondents in correspondence with the participant number (Table 1) and backed up with verbatim quotes from respondent.

Table 2: Coding structure for data analysis.

1st Order Codes	2nd Order Themes	Aggregate Dimension
Family caretaking Family in business Training family line	Obligation to family	Family logic
Family commitments Caretaking values.	Perceptions to family needs	
Belief's awareness Role of belief	Faith exegesis	Religion logic
Contextualizing religious values Justice values. Forgiveness values. beliefs'' awareness Morality values	Faith values	

3.1. Institutional safety logics

The findings summarize that participants explained their safety related practices and attitudes through family and religion logics. The participants' rationales for safety related practices were grounded in the family and religion institutional orders and were articulated arguments associated with the fundamental orders within logics.

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3.1.1 Logic of the family

This logic refers to the participants' perception and rationalization of safety related practices and attitudes toward the logic of family, in particular addressing the influence of training and caretaking on family members' safety (Table 3). The interviewees contended that while, they maintain organizational safety, they enhance occupational health and safety standards through offering their family members the correct safety training they need in their every day's life. Engineers use their experience gained from aircraft maintenance practices as an approach to train their families about safety procedures to behave safely: *"In my house, I continuously keep teaching my kids safety essentials at home. I teach them how and when to use the cutlery sets, I also teach them when to cross the traffic lights for their safety and others safety too. I got this attitude from day one when I was an apprentice"* (I2).

Engineers confirmed that they prioritize their safety and their colleagues' safety by not taking risk for the sake of their families. Throughout the interviews, interviewees highlighted the value of the family logic over time pressure even when they are at workplace environment. It was noted that managers do not allocate their engineers and mechanic colleagues to unsafe tasks because they aware of the hazardous tasks and the related consequences on them and then on their families too:

I [line manager] know how their lives matter to their families. I cannot tell them to do what I shouldn't do myself as we have some maintenance tasks that are very dangerous and I know doing them without full team assistance would get them to the hell, so then how about their children, parents and families and so on. I am morally and socially responsible for their own safety and that is part of my job." (I4).

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Table 3. Illustrative quotations of the first order codes evidencing safety reasoning of family logic.

Illustrative quotes	1st Order Codes	2nd Order Themes
In my house, I continuously keep teaching my kids safety essentials at home. I teach them how and when to use the cutlery sets, I also teach them when to cross the traffic lights for their safety and others safety too. And I got this attitude from day one when I was an apprentice.	Training family line	Obligation to family
I cannot take a risk because I have family and children.	Compliance towards family	
Most of the relatives are flight crews, some pilots recruit their sons and others train theirs in flight schools to succeed them.	Family in business practices	
Some people come to the job and they have social issues with their respective families or relatives. They do the job as fast as they can and go to have some cigarette to relax. do not think that everyone is socially well; many of them have social challenges, especially when it comes to finance; they have a social commitment towards their wives and children.	Family commitments	Perceptions to family Needs
I [line manager] know how their [staff] lives matter to their families.	Caretaking values	
When I have a lot of problems like social issues, believe me I work unsafe.	Social issues	
My father is a senior engineer, and keeps telling me you are responsible for your safety at work and your children's safety at home as well, you got a family and you need to keep them safe by keeping yourself safe.	Caretaking values	
Many people speak about safety, but for myself I speak about human safety and that could be our families' safety.	Family in safety context	Conceptualization of family safety

3.1.2 Logic of the religion

Religion influenced the participants' perceptions and practices in terms of what is tolerable and what is not. These practices formed overall values and beliefs guiding individuals. Participants' awareness with and esteem for these values and beliefs and were reflected in their answers.

Through a religion-based approach (Table 4), participants were able to articulate their views on specific safety practices and the right

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way to respond to them. For example, some participants expressed that they were not willing to do maintenance tasks without taking Asbab (actions and precautions) like cautions and warnings displayed in the aircraft maintenance manual "*Our religion encourages us to take Asbab (actions and precautions) and to do what we can do to keep ourselves safe*" (I4). Many explained how taking Asbab helped them to avoid hazardous practices. The religion logic also encourages ethical safety behaviours in other instances, including the belief of responsibility toward everyone's safety. One of the duty supervisors unequivocally explained the role of religion in defining his responsibility toward others safety:

"*As Messenger of God saying, "All of you are guardians and are responsible for your wards. The ruler is a guardian and responsible for his subjects; the man is a guardian and responsible for his family; the woman is a guardian and is responsible for her husband's house and his offspring, and so all of you are guardians and are responsible for your wards." The guys under my supervision are my main responsibility. I always keep asking them to keep safe all the time when they are in*" (I6).

The data showed participants relied counted unequivocally on the logic of religion. According to their responses, religious tenets must be followed to keep their safety and others safety for the sake of God "*I am very responsible on everyone's safety, otherwise, I would not be a devout Muslim, Would not I?, my faith urges me to save lives* " (I7). Religion was interpreted as a logic offering basic concepts that direct the way people think and act allowing for a degree of independence, while emphasizing the overall result. The flexibility of the religion logic helped participants keep their work going safe despite some technical challenges. Religion influenced individuals' practices in terms of what to do when their junior colleagues conduct unintended safety-related mistakes.

They cherished the values of forgiveness and justice in guiding the mechanics and engineers to the correct safety practices and behaviors. The participants showed their knowledge of and interest to those values and beliefs.

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Table 4. Illustrative quotations of the first order codes evidencing safety reasoning of religion logic.

Illustrative quotes	1st Order Codes	2nd Order Themes
Our religion encourages us to take Asbab (actions and precautions) and do what we can do to keep ourselves safe.	Role of belief	Faith exegesis
In my opinion and from a manager point of view, I think we need to aware and remind all our staff members of the importance of taking (Asbab) when performing tasks.	beliefs'' awareness	
Do not be reckless and say Allah will protect me, it is not like that, Quran encourages us not to take risks and Allah says (do not throw yourselves into destruction).	Family in business practices	
As a person and as a pilot, even when I drive home I always take (Asbab) and I teach my daughters not to take risks whatsoever also I ask them to drive slowly and fasten seat belts and that is a real example of taking(Asbab). So if things go wrong after taking Asbab (actions and precautions), that is then what we need to find out in the investigations.	Contextualizing religious values	Faith values
When it comes to accidents I have an opinion which is in general as Muslims, we do Twakul(dependence) on ALLAH, and he saves us most of the time because some situations were very risky and Allah saved me in most of them. When I go back home and remember how risky the job was, I praise him because I was not to survive unless Allah saved me.	Islamic values	
I am very responsible on everyone' safety, otherwise I would not be a devout Muslim, Would not I?	Morality values	
from my point of view and if you want my view, I will not punish anyone here even If I was the CEO. "If you show mercy to those who are on the earth, He who is in the heaven will show mercy to you", this is what Prophet Mohammed said. I think there should not be why anymore [laugher].	Forgiveness values	
I will treat him [my son]as the others, like the prophet's Muhammed companion Umar ibn al-Khattab did to his son back then	Justice values	

4. Discussion

This study aims to explore and increase our understanding of the elements drives safety related practices and behaviors. We suggested that through the use of the language of ILs, we explored how safety perception and safety practices are influenced by the

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logic of family and religion, and how these logics interact with other logics when addressing other contextual and cultural values. In MENA region which is the context of this study, communities are strongly influenced by the logic of family and religion (Fathallah et al., 2020). Our study employed ILs theory which could serve as a framework to rationalize and explain safety related perceptions and practices and therefore decisions that are often ignored or deemed inexplicable (Reader & Oconnor, 2014). Despite the influence of multiple competing logics on safety practices revealed in different contexts that did not include the role of family and religion Cornelissen et al., (2020), this study identified that family and religion logic play a significant role on safety climate in the context of our study.

In addition of being the first to look at ILs in organizational safety field in an unexplored context of MENA region, this study contributes to the theory in the following ways. First, it contributes to the current IL literature in exploring how institutional orders influence organizational safety climate and safety practices, and therefore understanding how safety climate perception operates from the lenses of institutional theory. The findings offer insights into the depth of family and religion, a little studied ILs (Thornton et al., 2012). Research suggests that examining the impact of IL in organizations should include different contexts and religious beliefs (Fathallah et al., 2020; Reay et al., 2015; Thornton et al., 2012). Adoption of cultural and religious values in devout contexts plays a pivotal role in shaping safety climate and safety perceptions (Ben-Saed & Pilbeam, 2022), as they could have a potential impact on other ILs in organizations (Fathallah et al., 2020) .We developed the work that differentiates between the competing logics, to reveal how safety climate perceptions are also different among different contexts (Ben-Saed & Pilbeam, 2022), form an ILs of view.

Second, this study contributes to our understanding of the elements drives safety related practices and behaviours. This study illustrates that ILs theory can be effectively used to empirical research to reveal and discern the overlooked distinctions in the explanations people make to justify their opinions about their safety perceptions

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and practices. By applying the theory of ILs into safety context in aviation maintenance domain, it was able to reveal the perception toward family logic was found to boost individuals' safe practices through valuing the role of caretaking of family members in enhancing families' safety practices. This led aircraft maintenance practitioners to transfer their experience gained in workplace environment to their family members. This was extended to the level of which they proactively avoid taking workplace related-risks as they considered it as a part of their responsibility for the sake of their families and children.

As part of social responsibility on the other hand, line managers and supervisors help in enforcing the presence of family logic by encouraging aircraft engineers and mechanics not to take part in unsafe behaviors. On the other hand, The religion logic guided managers to value safety over completing maintenance tasks and utilize this logic to encourage engineers and mechanics to follow religious values in order to enhance safety in workplace environment, whereas engineers, perceived religion logic as a catalyst toward following safety regulations while task completion on time whenever possible (Ben-Saed & Pilbeam, 2022; Cornelissen et al., 2020). This influence positively impacts organizational safety practices and promotes safety ethics driven by professional standards of engineers.

The institutional theory framework offers new concepts and elements, enabling researchers and practitioners to examine and assess safety climate and safety behaviors in different ways. These concepts bring explanation to seemingly inexplicable behaviors (Hopkins, 1999), and simplify complex structures based on multiple rationales (Jia et al., 2017; Lingard & Oswald, 2019). By showing how similar people in similar circumstances might arrive at different conclusions based on the dominant IL (Jia et al., 2017), this supports and expand upon the idea of the local rationality principle that Dekker, (2003) proposed to explain human error.

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5. Conclusion

Although it is generally known that organizational safety in aviation field in general and aircraft maintenance in specific enjoys a supra-level of safety practices and procedures, ILs theory however has not been employed in investigating aircraft maintenance professionals' perceptions of safety practices. The current study reveals that ILs can be used as an intervention tool to promoting workplace safety perceptions and practices in aircraft maintenance environment. Therefore, these logics offer new methods to reveal the different rationales underlying safety perceptions and therefore safety practices. The substantial, even not inclusive, two ILs identified by 13 experienced aircraft maintenance professionals' highlights, for the first time, the significance of the recognized logics (family, religion) on the improvement of safety thinking and practices of professionals and managers. A thorough understanding of the various logics and the rationales underlying these logics when it comes to safety practices can help in understanding the justifications behind the human errors and attitudes in aircraft accident investigations and preventions, which eventually leading to a proactive safety measures and interventions.

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