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A Review of Risk Perception in Construction Industry

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Abstract: The construction industry has been notorious for its high rates of accidents and injuries associated with social, financial, and legal implications. Previous studies mention that risk perception is related to workers´ safety behavior and, therefore, accidents. This review aims to identify in which context risk perception has been studied in recent years and the variables associated with it. Google Scholar and Science Direct databases were searched for articles using the following keywords: "risk perception," "construction industry", and "safety behavior." The inclusion criteria were that the articles answered the questions formulated in the spider methodology. Sixty-three articles were included in the literature review. The results indicated that risk perception is a subjective judgment that results from the combination of the likelihood perception of a specific risk being present and the severity perception of the risk if it occurs. The risk perception has been studied in different areas such as tourism, driving behavior, electricians, firefighters, and confrontation to viruses or pandemic, and the construction industry. Personal traits, sociodemographic variables, cultural factors, and occupational characteristics (training in security, experience, and seniority at work) have been addressed to study risk perception in construction workers. Safety must be a priority for construction organizations. This study highlights the importance of studying risk perception in the workplace since construction workers are exposed to risky activities at work. Also, it is important to understand the risk perception process and its contributory factors for construction workers. It is possible to have specific information that helps design actions for effective risk management and prevent the number of accidents and fatalities from increasing.

Keywords: Risk perception, Safety, Construction industry

1. Introduction

The construction industry has grown worldwide in the last decade (Abukhashabah, Summan, and Balkhyour 2020), in which jobs such as manufacturing new structures, remodeling, maintenance, demolition, and repair of buildings among others are carried out (Bureau of Labor Statistics BLS 2020). This sector is known to be one of the most critical areas for its contribution to a country's Gross Domestic Product, the number of jobs it generates, and the use of technological advances (Franco et al. 2019; OIT 2020). On the other hand, this industry is also associated with the highest number of accidents and deaths per year (Alkaissy et al. 2020). This high injury and death rate is due to the nature of the work, the equipment used to do it (Li et al. 2021), and the precarious conditions under which these tasks are carried out (Sánchez-Aguilar et al. 2017), resulting in the reason why the activities performed by construction workers are classified as high-risk tasks (Man, Ng, and Chan 2020). Worldwide, one of every six fatal accidents reported corresponds to the construction industry, equivalent to 60,000 accidents per year (OIT 2015).

Working conditions are different around the world (OIT 2020). However, construction workers, in general, are exposed to different physical hazards that can result in accidents such as being hit by vehicles or objects, falls, rollovers, electrocution, manual material handling, and being caught in between (Ellaban et al. 2018; Gürcanli, Baradan, and Uzun 2015; NIOSH 2014; Shao et al. 2019). For example, in Mexico, 2018 data revealed that there were 10,022 work accidents involving

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construction workers, where the leading causes were exposure to inanimate mechanical forces, falls, and excessive effort, travel, and deprivation, among others, as shown in Table 1 (IMSS 2019).

Table 1. Register of construction accidents in Mexico. (IMSS, 2019)

Accident	Cases
Exposure to inanimate mechanical forces	4,881
Falls	3,083
Overexertion, travel, and deprivation	1,333
Motorcyclist injured in transportation accident	48
Assaults	175
Contact with Heat and Hot Substances	99
Car occupant injured in transportation accident	40
Exposure to occupational, socioeconomic, and psychosocial risk factors	108
Exposure to animated mechanical forces	46
Pickup or van occupant injured in transportation accident	38
Various lower frequency	171
Total	10,022

It is essential to understand the factors that cause accidents in the construction industry since these impact the company's social, economic, legal context, and reputation (Oswald et al. 2020). Furthermore, apart from the worker's suffering, accidents affect employers and organizations, causing work stoppages due to workers' disabilities, delays in construction projects, and productivity losses (Leung, Liang, and Olomolaiye 2016). However, despite the investigations carried out in occupational safety, accidents in the construction area are still common (Pandit et al. 2019).

Therefore, it is believed that the increase in accidents is related to the risky behavior of construction workers (Man, Chan, and Alabdulkarim 2019), which in turn is influenced by the perception of risk (Xia et al. 2020). Workers may perceive different risks even when exposed to the same situation (Huang et al. 2016). Although previous research has tried to clarify the factors related to the perception of risk of construction workers, it is still an area requiring further research (Wu et al. 2019). Therefore, this study aims to identify the main concepts of risk, the different contexts in which risk perception has been studied, and its related variables.

2. Methodology

Scientific articles were searched in Google Scholar and ScienceDirect, which were filtered by year, reviewing published works between 2015 and 2021 using the following keywords: "risk perception", "construction industry," and "safety behavior." Once the articles were reviewed, a matrix was developed to analyze the information. The matrix contained each article's primary data, such as the author's name, year of publication, objective, research design, study population, sample, study context, problem, results, and keywords. Once the articles were analyzed, variables were identified that had been measured concerning risk perception.

3. Literature Review

3.1 Risk Perception

People face risk daily (Schmälzle, Renner, and Schupp 2017). People use the concept of risk as a preventive way to avoid harm (Fierro 2019). It is defined as the combination of the probability and consequence of events produced by physical and natural processes (Paek and Hove 2017), and how people are concerned about these consequences. According to Aven and Renn (2009), risk is the uncertainty and severity of an activity's consequence concerning something valuable to the human being. Risk can be perceived in different ways by people.

Risk perception is an intuitive judgment of risk (Slovic 1986) about the frequency and severity of risk (Hallowell 2010). However, some factors can influence the way people perceive risks, such as the characteristics of the risk source, gender, age, academic level, knowledge, origin, political affiliation, level of trust, experience, and environmental factors (Fajardo et al. 2019; Rundmo and Nordfjærn 2017; Slovic 2010), as well as psychological, social, institutional and cultural characteristics (Chaswa et al. 2020). All these mentioned factors can influence the way people perceive risks and why they perceive them differently despite facing the same situation. These differences in risk perception may contribute to increased accident rates in

the construction industry (Dao, Hasanzadeh, and Esmaeili 2018). Therefore, it is essential to understand how workers perceive risks to prevent high rates of accidents through effective risk management.

Risk perception has recently been measured based on perceived probability and severity since they are recognized as the main risk components (Schmälzle et al. 2017). Here, the probability is the subject's possibility of experiencing a negative result as a product of a behavior, while severity is the degree of damage that arises from the negative result of a behavior (Gaube, Lermer, and Fischer 2019).

Risk perception has been studied in different contexts. In tourism, it has been used to analyze the influence of risk perception to choose tourist destinations (Wolff, Larsen, and Øgaard 2019). In road safety, some studies have been developed to understand how people perceive risk in urban transport (Rundmo and Nordfjærn 2017) and the relationship between safety behavior while driving and perception of risk (Ngueutsa and Kouabenan 2017). The relationship between risk perception and risky behaviors has been studied in different occupational contexts such as carpentry (Inah et al. 2019), mining (Fadlallah, Pal, and Hoe 2020), electrical installations (Jazayeri and Dadi 2020), and firefighters (Martínez-Fiestas, Rodríguez-Garzón, and Delgado-Padial 2020). In the case of viruses and diseases, the relationship between diseases and how people perceive the risk of acquiring these diseases has been analyzed, such as COVID-19 currently, which has studied how people perceive this virus and how it impacts responsible behavior in the face of contingency measures (Xie et al. 2020).

In the construction industry, risk perception has been studied due to the industry's high injury rates, aiming to determine the roodt causes for the same and provide tools that can be used as preventive measures to help minimize these injury statistics. For example, Gürcanli, Baradan, and Uzun (2015) analyzed the perception of risk in heavy machinery operators in construction works. They found that training has a significant influence on the way they perceive risks, since workers who took safety training gave higher scores for consequence or severity of accidentes than workers without training. These results coincide with Loosemore and Malouf (2019) and Namian et al. (2016), who found that induction courses provided to the workers influenced behaviors and safety attitudes, they found that construction workers with safety training have a better understanding of hazards and safety behavior, and even this training is more effective for young workers.

Apart from studying the effect of safety training on risk perception, personal traits of workers have also been analyzed. Xia et al. (2020) analyzed risk perception and its effect on safety behavior among construction workers and supervisors. They concluded there was a relationship with personality variables such as extraversion, kindness, conscientiousness, emotional stability, and openness to experience, where they found that when motivation and work environment were positive, it helped change people's perceptions, coinciding with the results of Kouabenan, Ngueutsa, and Mbaye (2015), and Pandit et al. (2019). They also mention that it is important to investigate and understand the factors that influence the perception of risk in order to reduce injury rates.

Regarding individual characteristics of workers sucha as gender, age, educational level, work experience, Trillo-Cabello, Carrillo-Castillo, and Rubio-Romero (2021), identified that experience has a significant influence on the perception of risk. According to their results, workers who had more than 15 years of work experience perceived greater risk than those who had less work experience, a result that was also supported by the research of Wu et al. (2019).

Habibnezhad and Esmaeili (2016) integrated cultural factors into the study of risk perception in students of Construction Administration and Civil Engineering, finding that people with higher degrees of uncertainty and collectivism perceived fewer consequences in the same risk situation, similar to people with high masculinity indices who perceive lower risks than those with lower levels of this variable.

3.2 Relationship between Risk Perception and Safety Behavior

Risk perception is recognized as one of the main factors that affect the safety of workers in construction (Habibnezhad et al. 2016) because it is an important precursor of behavior or conduct adopted by people (Paek and Hove 2017). When workers in a workplace accurately perceive the risk, that is, when they associate the appropriate level of risk to each risky situation,they are more likely to adopt appropriate behaviors and measures to prevent accidents and injuries (Guo, Yiu, and González 2016). Therefore, risk perception is based on understanding the interaction of people with hazards, whether natural or technological (Marshall 2020).

Workers have different perceptions of risk, they judge risks differently actions when facing the same situations (Alomari, Gambatese, and Tymvios 2018). Therefore, risk perception can influence individuals' decisions and result in risky behaviors (Marshall 2020; Schmälzle et al. 2017), if in a high-risk situation the worker perceives a low level of risk, it can lead him to commit an unsafe act with the probability of experiencing an accident. However, research has clarified little about the impact of risk perception on risky behaviors, especially in the construction industry, represented through compliance and safety participation. The safety behavior of workers directly affects workplace health and safety—this is why workers must adhere to safe behaviors in the workplace (Leung et al. 2016).

3. Concluding Remarks

This paper conducted a literature review of risk perception in the construction sector. This context has high accident rates and represents high risks for workers, due to the nature of construction activities and the working conditions in which they are carried out, such as work at heights. It was found that there are different factors that can influence the perception of risk, such as demographic characteristics of people, as well as psychological, social, and cultural variables. It is important to understand how workers perceive risks. Thus, proper identification of factors that influence the recognition and perception of risk is required to reduce the number of accidents and injuries at work. Therefore, a better knowledge of the risk perception is necessary, as it can help design a comprehensive risk management system for construction companies, laying a basis for assessing risks and developing risk management strategies. Investigating the effect of demographic characteristics, personal traits, psychological and organizational factors have on risk perception might be helpful to identify factors that have a significant impact and take actions to reduce accidents in construction industry.

Some limitations that were found in the consulted literature are that some studies have been carried out in laboratories through simulations and using students related to construction activities, it is necessary to expand the investigations in real activities and with construction workers. Most of the studies found were carried out in the United States, China, Hong Kong, Spain, and Italy, so future research should include other populations and observe the cultural effect on risk perception.

It is necessary to identify those factors that influence risk perceptions and prevent construction workers' unsafe behaviors using safety management. This work's importance is that understanding the nature of uncertainty about workers´ risk perception can reduce inconsistency in risk perception and strengthen the safety management system in construction industries. Hazard recognition and risk perception are critical to the success of any safety program (Hallowell 2010). In this literature review, we identified some individuals and organizational factors that have been related with risk perception [age, gender, academic level, knowledge, safety training, level of trust, experience], and workers' behavior that trigger accidents that may have consequences for both workers and industry, for example when they perceive low levels of risk in high-risk situations, they are more likely to perform unsafe acts. In every workplace, safety must be an essential element. Therefore, management must ensure that all personal work together to promote a safe workplace.

This work highlights the importance of developing research focused on the construction industry, which helps to explain how people perceive risk and the factors that have a significant impact on safety, so that this information can be used for improving risk management which can help reduce the occurrence of accidents and fatalities. Above all, the cultural aspect should be investigated, and not just the demographic characteristics of individuals.

4. References

Abukhashabah, Emad, Ahmed Summan, and Mansour Balkhyour. 2020. "Occupational Accidents and Injuries in Construction Industry in Jeddah City." *Saudi Journal of Biological Sciences* 27(8):1993–98.

Alkaissy, Maryam, Mehrdad Arashpour, Baabak Ashuri, Yu Bai, and Reza Hosseini. 2020. "Safety Management in Construction: 20 Years of Risk Modeling." *Safety Science* 129(May):104805.

Alomari, Kasim A., John A. Gambatese, and Nicholas Tymvios. 2018. "Risk Perception Comparison among Construction Safety Professionals: Delphi Perspective." *Journal of Construction Engineering and Management* 144(12):04018107.

Aven, Terje, and Ortwin Renn. 2009. "On Risk Defined as an Event Where the Outcome Is Uncertain." *Journal of Risk Research* 12(1):1–11.

Bureau of Labor Statistics BLS. 2020. "About the Construction Sector Workforce Statistics."

Chaswa, Esther Nkhawazawo, Ishmael Bobby Mphangwe Kosamu, Save Kumwenda, and Wells Utembe. 2020. "Risk Perception and Its Influencing Factors among Construction Workers in Malawi." *Safety* 6(2):1–12.

Dao, Bac, Sogand Hasanzadeh, and Behzad Esmaeili. 2018. "The Association between Risk Perception and the Risk-Taking Behaviors of Construction Workers." *Construction Research Congress 2018* 433–42.

Ellaban, Manar, Mervat Rady, Gabal Hebat Allah, and Nayera Mostafa. 2018. "Risk Perception and Occupational Accidents among a Group of Egyptian Construction Workers in a Construction Company in Cairo." *Medical Integrated Student Research Journal* 1(1):9–18.

Fadlallah, Mahmoud Ali, Indrajit Pal, and Victor Cw Hoe. 2020. "Determinants of Perceived Risk among Artisanal Gold Miners: A Case Study of Berber Locality, Sudan." *Extractive Industries and Society* 7(2):748–57.

Fajardo, Álvaro, Jenny Fabiola Hernández, Yuri Lilian González, Héctor Andrés Hernández, and Myriam Leonor Torres. 2019. "Percepción Del Riesgo Mediante Sus Atributos Psicosociales En Trabajadores de La Industria Metalmecánica En La Ciudad de Bogotá, D.C (Colombia)." *Nova* 17(31):79–86.

Fierro, Andrea Karina. 2019. "Percepción Del Riesgo En Trabajos En Alturas En Empresas de Telecomunicaciones de Ecuador y Colombia (Agosto - Diciembre 2018)." *MLS Psychology Research* 2(2).

Franco, Jesús Gabriel, Raúl Castillo, Enrique Gaona, Jesús Gabriel, and Franco Enríquez. 2019. "Los Peligros Para La Salud

de Los Trabajadores de La Industria de La Construcción." 20(3):8–15.
Gaube, Susanne, Eva Lermer, and Peter Fischer. 2019. "The Concept of Risk Perception in Health-Related Behavior Theory and Behavior Change." Pp. 101–18 in *Perceived Safety: A Multidisciplinary Perspective* , edited by M. Raue, B. Streicher, and E. L. Lermer. Springer.
Guo, Brian H. W., Tak Wing Yiu, and Vicente A. González. 2016. "Predicting Safety Behavior in the Construction Industry: Development and Test of an Integrative Model." *Safety Science* 84:1–11.
Gürcanli, G. E., S. Baradan, and M. Uzun. 2015. "Risk Perception of Construction Equipment Operators on Construction Sites of Turkey." *International Journal of Industrial Ergonomics* 46:59–68.
Habibnezhad, Mahmoud, and Behzad Esmaeili. 2016. "The Influence of Individual Cultural Values on Construction Workers' Risk Perception." *52nd ASC Annual International Conference Proceedings*.
Habibnezhad, Mahmoud, Sadra Fardhosseini, Ali Moghaddam Vahed, Behzad Esmaeili, and Michael D. Dodd. 2016. "The Relationship between Construction Workers' Risk Perception and Eye Movement in Hazard Identification." *Construction Research Congress 2016* 2984–94.
Hallowell, Matthew. 2010. "Safety Risk Perception in Construction Companies in the Pacific Northwest of the USA." *Construction Management and Economics* 28(4):403–13.
Huang, Y. P., X. Q. Wang, R. X. Ding, and N. N. Xia. 2016. "Risk Perception, Risk Propensity, and Unsafe Behavior: An Empirical Study of Workers in Chinese Construction Industry." *IEEE International Conference on Industrial Engineering and Engineering Management* 2016-Decem:1121–25.
IMSS. 2019. "Memoria Estadística 2019." Retrieved September 5, 2020 (http://www.imss.gob.mx/conoce-al-imss/memoria-estadistica-2019).
Inah, Simon Alain, Jimmy Ebi Eko, Eze James Nwachukwu, Fidelis Takim Otu, Nkese Obot, and Bassey Archibong. 2019. "Knowledge, Risk Perception of Occupational Hazards and Safety Practices amongst Carpenters in Southern Nigeria: A Cross-Sectional Study." *Asian Journal of Advanced Research and Reports* 6(2):1–9.
Jazayeri, Elyas, and Gabriel B. Dadi. 2020. "Hazard Recognition and Risk Perception Skills among Union Electricians." *Journal of Construction Engineering and Management* 146(9):04020108.
Kouabenan, Dongo Rémi, Robert Ngueutsa, and Safiétou Mbaye. 2015. "Safety Climate, Perceived Risk, and Involvement in Safety Management." *Safety Science* 77:72–79.
Leung, Mei Yung, Qi Liang, and Paul Olomolaiye. 2016. "Impact of Job Stressors and Stress on the Safety Behavior and Accidents of Construction Workers." *Journal of Management in Engineering* 32(1):1–10.
Li, Jue, Heng Li, Fan Wang, Andy S. K. Cheng, Xincong Yang, and Hongwei Wang. 2021. "Proactive Analysis of Construction Equipment Operators' Hazard Perception Error Based on Cognitive Modeling and a Dynamic Bayesian Network." *Reliability Engineering and System Safety* 205(August 2020):107203.
Loosemore, M., and N. Malouf. 2019. "Safety Training and Positive Safety Attitude Formation in the Australian Construction Industry." *Safety Science* 113(August 2018):233–43.
Man, Siu Shing, Alan Hoi Shou Chan, and Saad Alabdulkarim. 2019. "Quantification of Risk Perception: Development and Validation of the Construction Worker Risk Perception (CoWoRP) Scale." *Journal of Safety Research* 71:25–39.
Man, Siu Shing, Jacky Yu Ki Ng, and Alan Hoi Shou Chan. 2020. "A Review of the Risk Perception of Construction Workers in Construction Safety." Pp. 637–43 in *Advances in Intelligent Systems and Computing*. Vol. 1026.
Marshall, Tracy M. 2020. "Risk Perception and Safety Culture: Tools for Improving the Implementation of Disaster Risk Reduction Strategies." *International Journal of Disaster Risk Reduction* 47(February):101557.
Martínez-Fiestas, Myriam, Ignacio Rodríguez-Garzón, and Antonio Delgado-Padial. 2020. "Firefighter Perception of Risk: A Multinational Analysis." *Safety Science* 123(November 2019):104545.
Namian, Mostafa, Alex Albert, Carlos M. Zuluaga, and Michael Behm. 2016. "Role of Safety Training: Impact on Hazard Recognition and Safety Risk Perception." *Journal of Construction Engineering and Management* 142(12):1–10.
Ngueutsa, Robert, and Dongo Rémi Kouabenan. 2017. "Accident History, Risk Perception and Traffic Safe Behaviour." *Ergonomics* 60(9):1273–82.
NIOSH. 2014. "Prevención de Caídas Desde Alturas Por Medio Del Diseño de Elementos de Seguridad Integrados."
OIT. 2015. *Buenas Prácticas y Desafíos En La Promoción Del Trabajo Decente En Proyectos de Construcción e Infraestructuras*.
OIT. 2020. "Construction Sector." Retrieved September 3, 2020 (https://www.ilo.org/global/industries-and-sectors/construction/lang--es/index.htm).
Oswald, David, Dominic D. Ahiaga-Dagbui, Fred Sherratt, and Simon D. Smith. 2020. "An Industry Structured for Unsafety? An Exploration of the Cost-Safety Conundrum in Construction Project Delivery." *Safety Science* 122(October 2019):104535.
Paek, Hye-Jin, and Thomas Hove. 2017. *Risk Perceptions and Risk Characteristics*. Oxford Research Encyclopedia of Communication.

Pandit, Bhavana, Alex Albert, Yashwardhan Patil, and Ahmed Jalil Al-Bayati. 2019. "Impact of Safety Climate on Hazard Recognition and Safety Risk Perception." *Safety Science* 113(November 2018):44–53.

Rundmo, T., and T. Nordfjærn. 2017. "Does Risk Perception Really Exist?" *Safety Science* 93:230–40.

Sánchez-Aguilar, Mónica, Gabriela Betzabé Pérez-Manriquez, Guadalupe González, and Ignacio Peón-Escalante. 2017. "Enfermedades Actuales Asociadas a Los Factores de Riesgo Laborales de La Industria de La Construcción En México." *Medicina y Seguridad Del Trabajo* 63(246):28–39.

Schmälzle, Ralf, Britta Renner, and Harald T. Schupp. 2017. "Health Risk Perception and Risk Communication." *Policy Insights from the Behavioral and Brain Sciences* 4(2):163–69.

Shao, Bo, Zhigen Hu, Quan Liu, Shu Chen, and Wenqin He. 2019. "Fatal Accident Patterns of Building Construction Activities in China." *Safety Science* 111(June):253–63.

Slovic, Paul. 1986. "Perception of Risk." 236(4799):280–85.

Slovic, Paul. 2010. "The Psychology of Risk." *Saude e Sociedade* 19(4):731–47.

Trillo-Cabello, Antonio F., Jesús A. Carrillo-Castrillo, and Juan C. Rubio-Romero. 2021. "Perception of Risk in Construction. Exploring the Factors That Influence Experts in Occupational Health and Safety." *Safety Science* 133(August 2020):104990.

Wolff, Katharina, Svein Larsen, and Torvald Øgaard. 2019. "How to Define and Measure Risk Perceptions." *Annals of Tourism Research* 79(July):102759.

Wu, Ping, Yidong Xu, Ruoyu Jin, Qingqing Lu, Della Madgwick, and Craig Matthew Hancock. 2019. "Perceptions towards Risks Involved in Off-Site Construction in the Integrated Design & Construction Project Delivery." *Journal of Cleaner Production* 213:899–914.

Xia, Nini, Qiuhao Xie, Xiaowen Hu, Xueqing Wang, and Hao Meng. 2020. "A Dual Perspective on Risk Perception and Its Effect on Safety Behavior: A Moderated Mediation Model of Safety Motivation, and Supervisor's and Coworkers' Safety Climate." *Accident Analysis and Prevention* 134(August 2019):105350.

Xie, Kefan, Benbu Liang, Maxim A. Dulebenets, and Yanlan Mei. 2020. "The Impact of Risk Perception on Social Distancing during the COVID-19 Pandemic in China." *International Journal of Environmental Research and Public Health* 17(17):1–17.