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Assessing The Reliability Of Workplace Safety Inspections And Audits That Utilize The Observation Of Hazards

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Every working day, thousands of Environmental Health and Safety Professionals (EHSPs) visit organizations to conduct visual inspections, assessing workplace safety standards for risk assessment, compliance, and auditing purposes. These inspections typically involve three distinct procedures: observing hazards by visually inspecting rooms and areas in the building under analysis, asking questions, and reviewing safety-related documents relevant to the site (EU-OSHA, 2023; ILO, 2006, 2017). However, there is growing evidence indicating that the reliability of these inspections is problematic due to routine non-observation of hazards arising from our normal human cognitive and visual limitations (Hrymak and deVries, 2020; Hrymak and Codd, 2021; Hrymak, 2022). As evidence accumulates suggesting that hazard observation is the primary source of evidence used by EHSPs to assess workplace safety during inspections, there is an increasing need to quantify and, where possible, improve the reliability of visual inspections. This is because the routine non-observation of readily visible workplace safety-related hazards has been, and continues to be a cause of workplace accidents, ill health, and fatalities (Hrymak and deVries, 2020).

To evidence the role of hazard observation in assessing workplace safety during inspections, this study recruited twenty EHSPs working in various European countries. Twelve of these EHSPs were Labour Inspectors with statutory enforcement powers regarding occupational safety and health (OSH) legislation applicable to their jurisdictions. The remaining participants were EHSPs working as OSH consultants, providing workplace safety advice to clients, or as OSH managers employed by specific organizations. All EHSPs were asked about their methods for conducting workplace safety-related inspections and how they reached decisions regarding the encountered safety standards. They were interviewed by the author, who adopted an interpretative phenomenological analysis approach as described by (Smith, Flowers and Larkin, 2009)

All the EHSPs interviewed reported that it was the observation of hazards during inspections that was the predominant evidence base from which they formed an opinion on the standard of safety encountered. When asked how the visual component of the inspection was conducted, no overall pattern emerged. There were no set procedures routinely followed as to where to look, how to look or for how long to look. Asking questions and reading site related documents routinely occurred during their inspections. However, questioning and site documents had less influence when compared to hazard observation and they served more to validate and reinforce their overall decision on the level of safety at the workplace.

The problem of visual inspection reliability is rooted in decades of research that have demonstrated that the observation of hazards has a wide range of reported accuracy in professional practice. For example, studies have found visual inspections conducted by EHSPs under real world conditions demonstrated that circa 60-70% of observable hazards present were not seen. (Albert et al., 2014, 2018; Hrymak and deVries 2020; Hrymak and Codd 2021; Hrymak, 2022). If the decision on the standard or safety encountered is greatly influenced by how many hazards are observed during inspections, then this becomes an important metric. This is primarily because the number of hazards not observed during inspections becomes indicative of the reliability of the inspection itself.

Visual inspection failures resulting in fatalities have been reported. One illustrative example investigated under judicial conditions is the Rosepark nursing home fire in Scotland in 2011 when 14 residents died (Lockhart 2013). The coroner's report directly detailed the failure of the inspecting EHSP to observe the inappropriate storage of flammable aerosol cans in an electrical cabinet that was found to be the source of the fire that caused the fatalities.

It has long been known that due to cognitive limitations we as humans all possess, visual search is an error prone task that is difficult to do well; for example see (Albert et al., 2014, 2018; Biggs et al., 2014, 2018, Eckstein, 2011; Hrymak and deVries, 2020; See, 2012; Wolfe et al., 2022). In addition, there are further aspects that can adversely affect how EHSPs report on their inspections, particularly when they engage in their decision making processes as to the standard of safety encountered. A study by Montibeller and von Winterfeldt, (2015) gives a detailed overview of the types of motivational and cognitive bias that can adversely affect decision making by EHSPs. One of these, confirmation bias has been described as seeing what you expect to see (Kahneman, 2011) and has been reported on by (Hrymak and Codd, 2022).

It is crucial for the reliability of inspections conducted by EHSPs to acknowledge the error-prone nature of visual search tasks due to the motivational and cognitive limitations inherent to all humans. This acknowledgment does not serve as criticism but rather recognizes our normal human condition. Furthermore, recent research suggests that the reliability of visual inspections can be improved by adopting practical and easily learned observational skills using visual search behavioral algorithms as exemplified by (Albert et al., 2014, 2018; EU-OSHA, 2023; Hrymak and deVries, 2020; Hrymak and Codd 2021; Hrymak, 2022).

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