

Abstract

The development and trial of systematic visual search; a novel training method designed to improve the observation of workplace hazards during visual inspections conducted for risk assessment and safety auditing purposes.

Victor Hrymak

Background

Visual inspections are used to evaluate workplace safety and are conducted on a vast scale by environmental health and safety professionals. However when the practice of observing workplace hazards is empirically evaluated, the evidence demonstrates an error prone task that is difficult to do well.

Research Question

This thesis therefore asked the question; why are visual inspections often flawed and how can these flaws be overcome?. The literature offers an explanation for the non-observation of observable workplace hazards and by introducing systematic visual search, a method is presented that has the potential to improve visual inspection performance.

Method

Systematic visual search is a novel method that differs from current custom and practice by precisely specifying an order for the selection of areas, before using a set eye scanning pattern to ensure an exhaustive visual search of the area selected. This method was evaluated in two separate studies with 211 participants given a kitchen safety & hygiene inspection task, and 26 participants given a light aircraft pre-flight inspection task. The methodology used was randomised controlled trials under ecologically valid conditions.

Results

Systematic visual search improved the mean observation of hazards from circa 32% to circa 50% in the kitchen study. In the aviation study, mean observation went from circa 38% to circa 64%. Nevertheless both studies demonstrated levels of visual inspection performance that were below industry standards of expectation.

Discussion

The literature on visual search error reveals the many sensory perceptual, cognitive bias and organisational causes, that could have played their part in these findings. However, there is one cause in particular that seems to have played a large part. As humans we all have visual search limitations meaning that when a high degree of observational accuracy is required, we are not that well suited. Without an intervention such as systematic visual search, it seems likely that such limitations will be demonstrated whenever visual inspections are required.

Conclusions & Implications

The findings are a matter of concern. Simply put, unobserved hazards are preventable accidents waiting to happen. Therefore further research is needed to improve visual inspection performance. In this way, the observation of workplace hazards can be maximised for the millions of workers who rely on the inspection process for their safety.