Checklists or Observational Training for Workplace Inspections

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What is a Workplace Inspection

hazard identification, risk assessments, risk audits, risk reviews, risk surveys, safety inspections, safety reviews, safety checks, safety tours, safety visits, safety surveys, safety walkthroughs, health and safety walks, health and safety audits, due diligence visits, accident investigations, inspections, surveys, scoping visits, familiarisation exercises, management safety walkabouts, Gemba walks and forensic investigations.

$$25! = 1.55 \times 10^{25}$$

Types of Workplace Inspection

A visit to a site when you look around for safety related reasons

So How Are Workplace Inspections Currently Conducted

An overarching strategy of "Look Ask & Read"

But with a lot of variation

Methods of Workplace Inspection

➢ Observation (visual inspections)

➢ Checklists

➢ Interviews & questions

➢ Read reliable site related documentation

➢ Use analytical equipment

➢ Think about what might go wrong

Observational Methods

➢ Random observation

➢ Checklists, templates or set items

➢ Systematic visual search method

Random Observation

Walk around the site as you see necessary

Checklists, Templates, Set Items

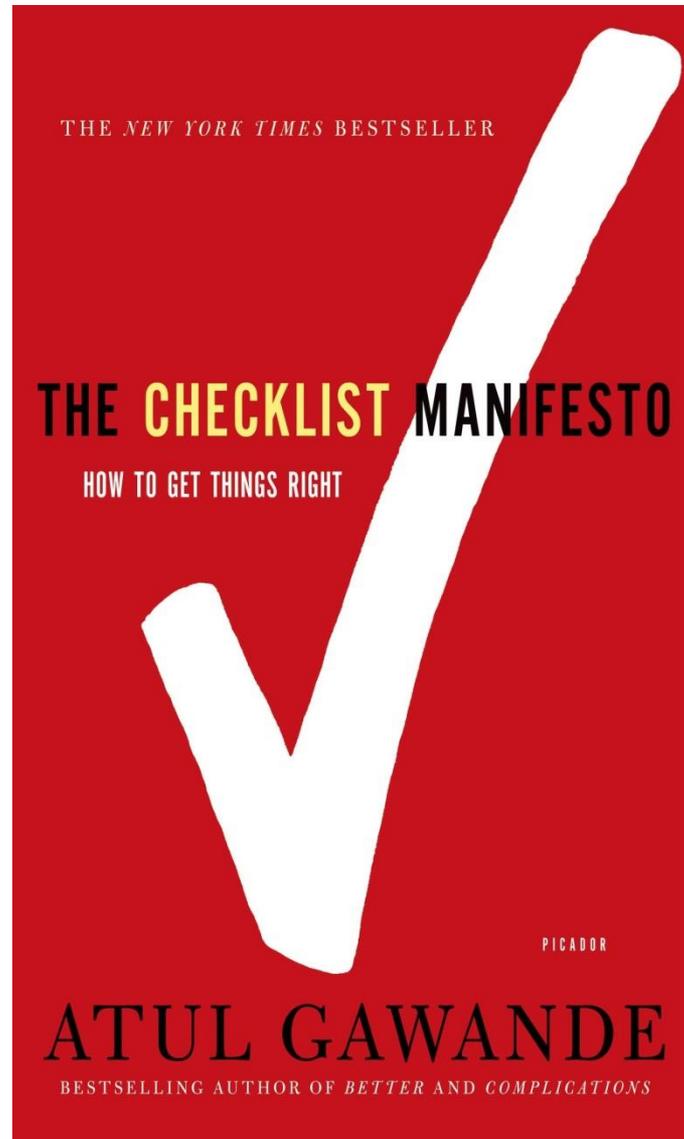Thousands available

Collectively referred to here as "checklists"

Checklist Advantages

➢ Cheap

➢ Easy to use with little if any training

➢ Quick

➢ Readily available

➢ Ubiquitous

➢ Excellent as prompts

Checklist Advantages

Checklist Disadvatages

➢ Far too simplistic for competent assessment using the reasonably foreseeable criteria

➢ Far too many hazards omitted unless very specific

➢ Subject to visual search errors

Example Checklist

Problems to look for when making an assessment	Tick answer YES NO	Ways of reducing the risk	Action to take
2 Keyboards			
Is the keyboard separate from the screen?	☐ ☐	This is a requirement, unless the task makes it impracticable (eg where there is a need to use a portable).	
Does the keyboard tilt?	☐ ☐	Tilt need not be built in.	
Is it possible to find a comfortable keying position?	☐ ☐	Try pushing the display screen further back to create more room for the keyboard, hands and wrists. Users of thick, raised keyboards may need a wrist rest.	
✔ ✘ ✘ ✘			
Does the user have good keyboard technique?	☐ ☐	Training can be used to prevent: ■ hands bent up at wrist; ■ hitting the keys too hard; ■ overstretching the fingers.	
Are the characters on the keys easily readable?	☐ ☐	Keyboards should be kept clean. If characters still can't be read, the keyboard may need modifying or replacing. Use a keyboard with a matt finish to reduce glare and/or reflection.	

Example Checklist

Risk factors	Colour band (G, A, R or P)			Numerical score (for comparison)			Possible control measures to reduce the risk of red/amber factors – see http://www.hse.gov.uk/msd/mac/control-measures-scoresheet.htm for more information
	Lift	Carry	Team	Lift	Carry	Team	
Load weight/frequency							
Hand distance from the lower back							
Vertical lift zones		N/A			N/A		
Torso twisting and sideways bending OR Asymmetrical torso or load (carrying)							
Postural constraints							
Grip on the load							
Floor surface							
Carry distance	N/A			N/A			
Obstacles on route	N/A			N/A			
Communication, co-ordination and control	N/A	N/A		N/A	N/A		
Environmental factors							
	Total score:						

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Example Checklist

Name of inspector

Time Date

Y = Yes   N = No   NA = Not Applicable

1. Site Control

a. Hazard board and signage up-to-date
b. Environmental plans/measures
c. Toolbox talk last date   /   /
d. Safety inductions for all on site
e. Safety notice board current

2. Site Facilities

a. Offices clean, adequate & good lighting
b. Smoko sheds – clean, potable water
c. Toilets – clean, washing water
d. Tool/equipment sheds adequate

3. General Site Tidiness & Accessways

a. Clear, safe access to work areas
b. Stairways and accessways clear
c. Hoardings/fence and gates secure
d. Loose materials secure from wind

4. Personal Safety Equipment

a. Signage displayed and legible
b. Hardhats being worn
c. Correct footwear being worn
d. Glasses/ear muffs/vests/masks used

5. First Aid/Fire Prevention

a. First aid box   *Available*
b. Accident register
c. Fire extinguishers *Available*
                      Current (12 mth)
                      Sufficient number
d. Evacuation   *Procedure current*
                      All emergencies incl

6. Cranes/Hoist/Lifting Equipment

a. Proper lift assessment plan done
b. Crane certification current
c. Slings/chains certified
d. Operator procedures in place
e. Inspections being done
f. Man cage available
g. Emergency plan in place

7. Compressed Air Equipment

a. In good condition
b. Appropriate guards fitted
c. Trained user

8. Excavations

a. Correctly shored
b. Access controlled

9. Hot Works

a. Hot work permits being issued
b. Fire extinguishers on hand
c. Operators using PPE

10. Electrical Equipment/Plant

a. Main board lockable/weatherproof
b. Current tagged and damage-free leads
c. Current tagged plant
d. Current tagged lifeguards
e. Leads safely placed
f. Electrical equipment/plant – good condition
g. Electrical equipment/plant – appropriate guards on plant
h. Adequate temporary lighting

11. Hazardous Products/Substances

a. Correctly stored
b. Safety Data Sheet (SDS) available
c. Operators using PPE

12. PAT's and Nailers

a. PAT tool WoF current and secure
b. Staff trained in tool use (SWPS)
c. PAT signage on site

13. Scaffolding

a. Notifiable weekly Scaftag/current
b. Handrails/mid-rails
c. Toe boards
d. Platforms
e. Ladders/stairs
f. Base sound
g. Work platforms clear
h. Platforms trip free
i. Planks tied down
j. Headroom clear
k. Ties/bracing adequate

14. Ladders

a. Good condition
b. Secured top and bottom
c. Stays to step ladders
d. Working 2 steps down

15. Fall Hazards

a. Floor edges   *Floor openings*
b. Lift shafts   *Stairs*

Example Checklist

Workplace Inspection Checklist			
Item	Yes	No	N/A
1 Fire			
- Extinguishers are in place			
- Are clearly marked			
- Have been serviced in the past 6 months			
- Area around extinguisher is clear for a 1 meter radius			
- Fire exit signs are in working order			
- Exit doors are not blocked			
- Exit doors can easily be opened			
- Fire alarm is in working order			
- Emergency plan is displayed			
- Emergency drill caried out within the last 6 months			
2 Electrical			
- No broken plugs, sockets or switches			
- No frayed or damaged leads			
- Portable power tools in good condition			
- No temporary leads on the floor			
- Testing and tagging of electrical items has been attended within the last 12 months			
3 General Lighting			
- There is adequate illumination in working areas			
- There is good natural lighting			
- There is no direct or reflected glare			
- Light fittings are in good working condition and are clean			
- Emergency lighting is operational			
4 Walkways			
- No oil or grease			
- Walkways are clearly marked			
- Walkways are clear of obstructions			
- There is unobstructed vision at intersections			
- Stairs not blocked and are in good condition			

Common to all Checklists

The use of the visual senses

So how good are your visual senses during inspections?

Vision is our dominant sense. It provide us with most of the information about our world in terms of location, motion and object recognition

*Wade N.J., Swanston M.T. 2013. Visual Perception; an Introduction. Psychology Press

Visual Inspection Failures

➢ Rosepark Nursing Home, 14 Deaths 2011

➢ US, 2No. Nursing Homes 2004, 40 Deaths

➢ Macondo Oil Well Explosion 2010, 11 Deaths

➢ Industrial Engineering Sector 15-85% accuracy

Visual Inspection Failures

➢ I don't make mistakes, I'm too professional

➢ I don't miss hazards, I can smell them a mile off

➢ They don't get past me, I'm far too experienced

➢ You're approach is caveman. Paperwork and auditing, that's the way to go

Visual Inspection Errors

There are many sensory-perceptual, cognitive and organisational causes of visual error

Waterfall; MC Escher 1961

Causes of Visual Inspection Error

Cause	Brief Explanation
Limitations in Memory	Holding data in visual search memory reduces the rate of evaluation of new targets
Interference between memory sets	Missing that an M6 sized bolt is incorrectly stored in an M8 container
Capacity of memory	Too many objects to memorise correctly
Memory degredation	A decay in the amount of memory from age or disease
Subsequent search misses	The observation of a target negatively affects the observation of subsequent targets
Target prevalence	Lower visual inspection performance is related to very low levels of target prevalence
Speed accuracy trade off	The speed of search and observational accuracy are inversely related
Vigilance and Diligence	How well the observational task is conducted, affects visual inspection performance
In-attentional blindness	When a given attentional set is adopted, an unexpected object may go undetected if it does not share the same set properties
Hybrid foraging search behaviour	Visual inspection performance is influenced by previous mean times taken to observe targets
Expert judgement	Professional judgement accuracy varies
Confirmation bias	A tendency to see what you expect to see
Outcome bias	A tendency to ignore warnings
Ambiguity in definitions	A lack of precision in defining a hazard allowing that object to be mis-interpreted as not of interest
The lack of guidance in visual inspection conduct	Idiosyncratic behaviour resulting in some objects of interest not being observed due to visual inspection conduct
Degrading resolution away from the fovea	Objects in peripheral vision are more difficult to clearly observe
Variability in the visual environment	The complexity of the visual search environment affects performance

What is Systematic Visual Search

The iterative selection of a specific room element

followed by the use a specific eye scanning pattern on that sole element

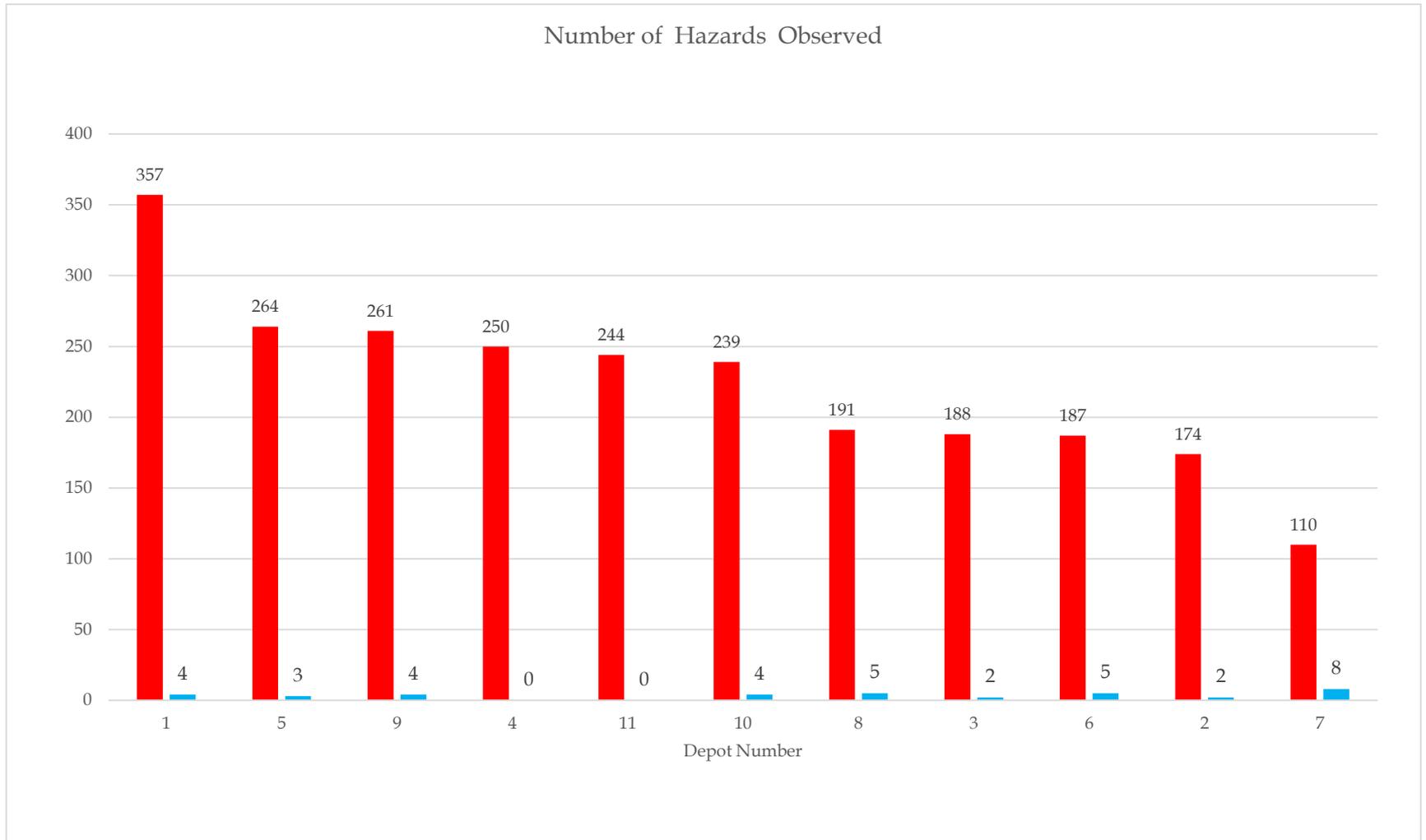# "Reading a book" eye scanning pattern

Checklists v SVS

A comparison was achieved by applying both methods to 11 Irish railway engineering depots and comparing how many hazards were identified by each method.

Checklists v SVS

Method	Total N Hazards Observed	Total High Risk Hazards Observed
Checklist	37	0
SVS	2,465	329

Checklists v SVS
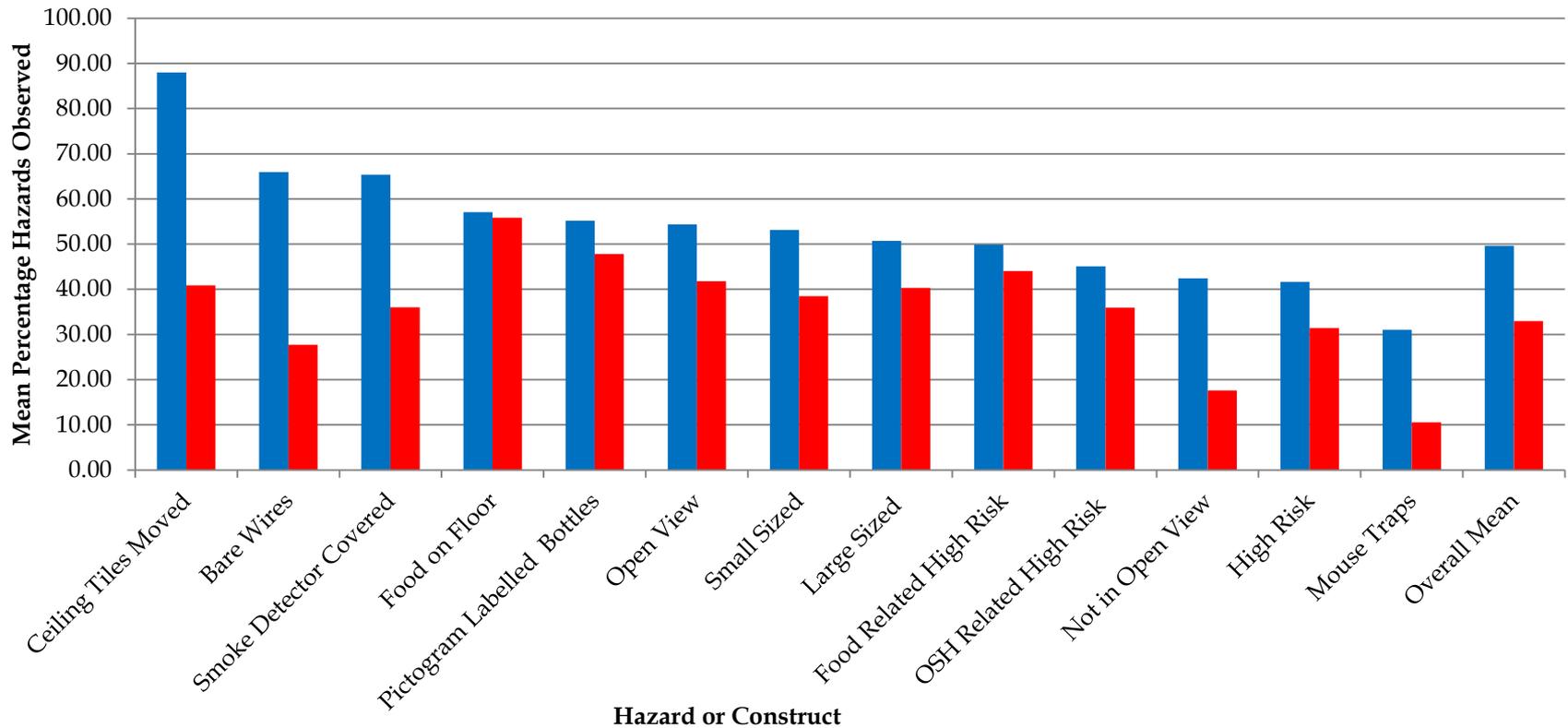
Number of Hazards Observed

Limitations of Study

➢ Sample size & power

➢ Checklist design

➢ Checklist use

➢ Time differences between methods

Systematic Visual Search Evidence

Red; Control
Blue; Experimental

Summary of Results

	N	Mean % hazards bserved	SD	95% CI's	p value	Cohen's d
Control	107	32.96	9.02	[31.24- 34.70]		
Experimental	104	49.64	10.88	[47.53- 51.76]	≤.001	1.84

Thank You

Checklists v SVS

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