



JDiBrief – Security

Visual Inspection with X-rays: NEW KNOWLEDGE AND APPLICATIONS (4 of 5)

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COMPARABLE CHALLENGES: A parallel can be drawn between a typical security screening task and a well-known neuropsychological test – the Embedded Figures Test (EFT). Like a screening task, the EFT requires object localisation and recognition within a cluster of confounding shapes (see Figure 1).

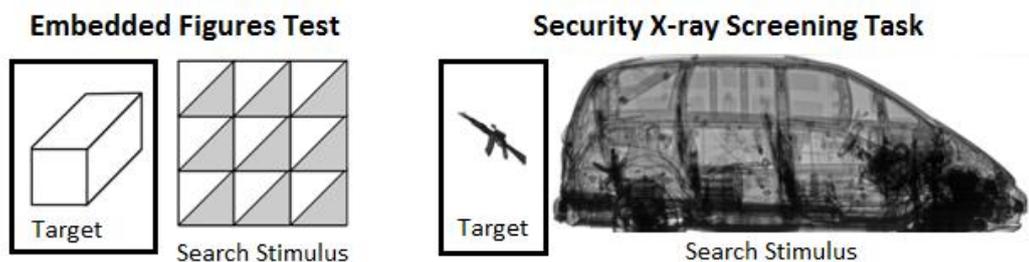


Figure 1 – the comparable challenges presented by the EFT and the X-ray screening test

Fact 1: Individuals with a diagnosis of autism spectrum disorder (ASD) outperform non-autistic individuals in the EFT. Their enhanced abilities are attributed to heightened attention to visual detail and sensitivity to trivial changes in the visual environment.

Fact 2: ASD traits are present in the non-clinical population and individuals can be localised on a continuum from normality to clinical relevance for each trait. A psychometrically validated self-report questionnaire (AQ) is available to measure where any given individual lies on the continuum of ASD traits.

PREDICTION: Scores on the ‘attention to detail’ subscale of AQ could be used to predict individual differences in performance on a security X-ray screening task.

HYPOTHESIS TESTING: Two groups of participants were randomly selected from the lower and the upper tail of the distribution of attention to detail scores in a sample of the general population (see Figure 2). None of them had worked in the security sector. A series of small-vehicle security X-ray images were displayed in a laboratory simulation of the screening task, where participants had to decide whether at least one of five target threats (Glock, Colt, Kalashnikov, bowie knife, pipe bomb) was present. As predicted, the group with higher attention to detail were found to have a significantly higher *hit minus false alarms rate* (but they were not slower at responding) than the group with lower attention to detail.

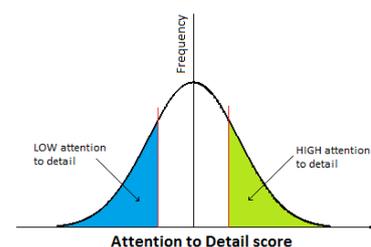


Figure 2 – schematic of the participant-to-group assignment logic based on the distribution of attention to detail scores in a population sample

CONCLUSION: Although further research is needed, an individual differences approach looks very promising in this field. Experimental testing instruments can be borrowed by neuropsychology and directly applied, to improve the process of visual inspection. The author is currently engaged in research concerning the psychometric validation of an ad-hoc personnel selection instrument.