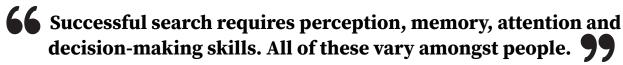# CREST
CENTRE FOR RESEARCH AND
EVIDENCE ON SECURITY THREATS

CREST GUIDE:
INDIVIDUAL DIFFERENCES IN ABILITY TO SEARCH

This guide presents an overview of some of the differences between people in finding targets.

> **Successful search requires perception, memory, attention and decision-making skills. All of these vary amongst people.**

DIFFERENCES IN DISCRIMINATION OF TARGET FROM NON-TARGET

Some differences between people affect the ability to discriminate targets from non-targets or to segregate targets from the background. These are differences based on either perceptual ability or ability to hold in mind sufficient information to make a good decision. The skills that affect this are cognitive abilities. Working memory capacity is how much information a person can keep in mind for a period of time. Speed of processing is how quickly something can be perceived or how quickly a simple response can be made.

Functional field of view is the breadth of the visual world from which information can be detected without moving the eyes. Attention to detail is the degree to which people can ignore peripheral or contextual information when

focused on a small region. Spatial ability is the degree to which people can orient to particular spatial locations and the degree to which they can mentally rotate images they hold in their minds. Finally, sustained attention ability is the degree to which a person can maintain the same task goals.

All of these abilities can be trained, but there is conflicting information about whether training on the basic ability transfers to complex tasks easily, or whether it only transfers when certain kinds of training are used.

Some of these abilities differ for people from different groups. It is important to understand, though, that group differences are average differences, and there is a lot of overlap between the groups. In other words, if one group performs worse than another, on average, there will still be high ability people in the first group

who will perform better than low ability people in the second group. Women on average have less spatial ability than men. This seems to be a difference that can sometimes be overcome by training, depending on what spatial task is being considered.

Older adults on average have slower processing speeds, poorer visual acuity, smaller functional fields of view, and smaller working memory capacity. Although training improves these skills as much for older adults as for younger adults, age differences remain after training.

People from collectivist cultures, such as the cultures in many Asian countries, as well as elsewhere, tend to be more influenced by contextual information than people from individualist cultures, such as Western Europe. We are unaware of training studies aimed at reducing this cultural effect.

DIFFERENCES IN HANDLING UNCERTAINTY

Many non-cognitive differences affect how people make decisions when the evidence is ambiguous. One facet of decision-making under uncertainty is that some people are diligent in searching for more evidence when unsure, and others are willing to make a decision more quickly, without seeking more information.

Further, some people are quite uncomfortable with being asked to make a decision when unsure, whereas others are more comfortable.

Finally, people vary in the amount of evidence with which they are willing to decide that a target is present, ranging from conservative (requiring a lot of evidence) to liberal (requiring little evidence).

This is a tendency that is relatively stable for a person across decision context, although it is also important to understand that the conservative/liberal bias in decision-making is easy for a person to change.

> **...some people are quite uncomfortable with being asked to make a decision when unsure, whereas others are more comfortable.**

All that is required to change bias is to reconsider the costs and benefits of making wrong decisions based on the different biases one might take. Under a conservative bias, people are unlikely to wrongly say a non-target is a target, but are more likely to miss targets. Under a liberal bias, people are unlikely to miss targets, but are more likely to wrongly say a non-target is a target.

Group differences that affect this class of issues are the following. Those who tend to be anxious will show a greater likelihood to report a threat target is present when evidence is ambiguous, and in fact are inclined to be vigilant

for evidence of threat. Those demonstrating intolerance of uncertainty, a particular kind of anxiety, will have a liberal threshold for saying a target is present under conditions of ambiguity.

Older adults tend to be more conservative than younger adults in their decisions under conditions of ambiguity. People who are more trusting of others are more conservative in detecting threatening or deceitful people than people who are less trusting of others. People having symptoms of obsessive compulsive disorder but not the full-blown disorder search longer for evidence of a target when it is not present.

DIFFERENCES IN GAUGING ONE'S OWN ACCURACY

As a rule, people are overconfident about their decisions, but they differ in the degree to which their confidence in their decisions matches the accuracy of their decisions. In work domains where it is important for people to act quickly, confidence can facilitate quick actions. However, poorly calibrated confidence can also lead to errors, and so managers of searchers should be encouraged to:

(a) evaluate accuracy of search decisions without relying on the searchers' confidence to do so.

!

BEAR IN MIND...

People who are more trusting of others are more conservative in detecting threatening or deceitful people than people who are less trusting of others.

(b) give searchers feedback that enables them to learn to better calibrate confidence to accuracy.

READ MORE

David A. Washburn, J. David Smith, and Lauren A. Taglialatela (2005). Individual differences in metacognitive responsiveness: Cognitive and personality correlates. *The Journal of General Psychology*, 132(4), 446-461. DOI: 10.3200/GENP.132.4.446-461

Karlene K. Ball, Bettina L. Beard, Daniel L. Roenker, Richard L. Miller, and David S. Griggs (1988). Age and visual search: Expanding the useful field of view. *JOSA A*, 5(12), 2210-2219. https://doi.org/10.1364/JOSAA.5.002210