



Does the acronym SA still have any value?

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Situational Awareness - 1

From Sport Psychology in the late '60s/early '70s.

It was generally applied to team ball games.

Relates to individual perception of the "Here-and-Now".

Never defined, but regarded as the ability of a person to project the present situation into the very near future.

In Rugby football, this could be seconds, but in Basketball - milliseconds



Situation Awareness - 2

" Situation Awareness is the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future"

Endsley, 1988



SA

Thus:

Two terms:

- Situational Awareness
- Situation Awareness

One Acronym:

- SA

Presumption: the acronym must be valid because an apparently valid definition exists.

But, the acronym refers to two different terms.

**Endsley's definition is very very good indeed,
the model is not.**



The Endsley Model

well, the core of it ...

Situation Awareness

**Perception
of elements
in current
situation**

LEVEL 1

**Comprehension
of current
situation**

LEVEL 2

**Projection
of future**

LEVEL 3



The Endsley Model

the problems ...

1. The definition cannot be operationalised
2. The three levels are treated as sequential
(And often called Perception, Comprehension, Prediction)

In the real world:

Perceptual inputs are both sequential and parallel

Comprehension starts with the first perceptual input

Prediction can start before comprehension completes

SO, Level 1 and Level 2 cannot be separated, and
it may be hard to distinguish Level 3



The 3-Questions Model

Refine the Endsley definition:

“a persons’s perception of elements in the environment within a volume of time and space”

WHO IS WHERE?

“the comprehension of their meaning”

WHAT ARE THEY DOING?

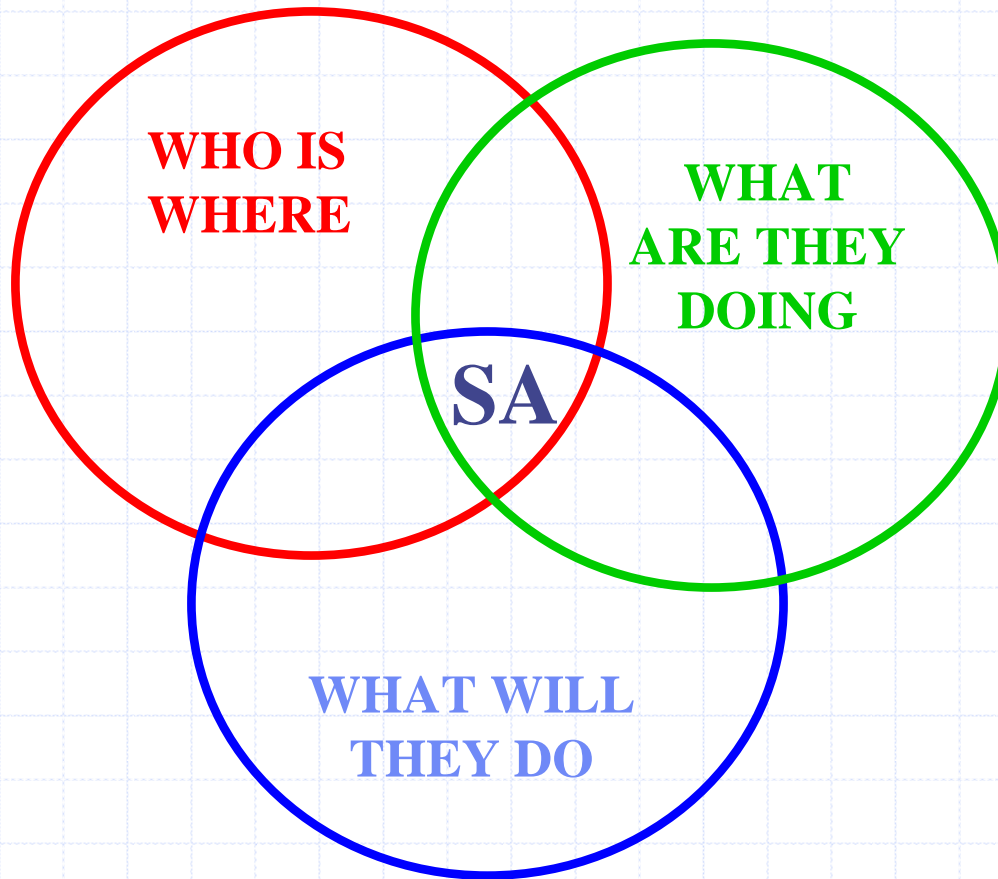
“the projection of their status in the near future”

WHAT WILL THEY DO?

And this gives Three Questions that can be operationalised



3-Q Model of Situational Awareness





That Confusing Acronym

In the model just shown, the acronym SA remains

That acronym referred to transitory events; time to change ...

Mavor *et al* suggested that (Endsley's) SA be divided:

Local Awareness \leftrightarrow Global Awareness

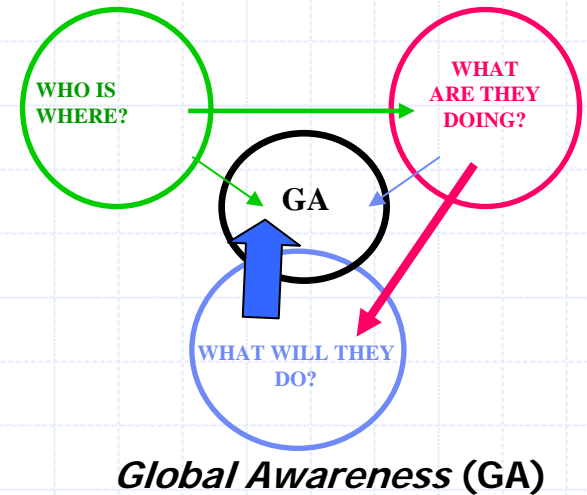
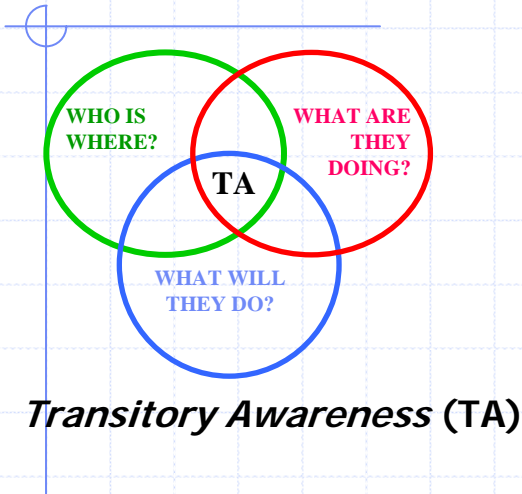
Andre *et al* split awareness three ways as well

The 3-Q model can be expanded into three types of awareness

Transitory Awareness Local Awareness Global Awareness

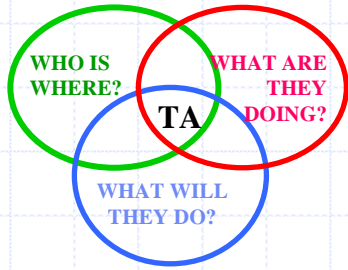


The Full 3-Q Model





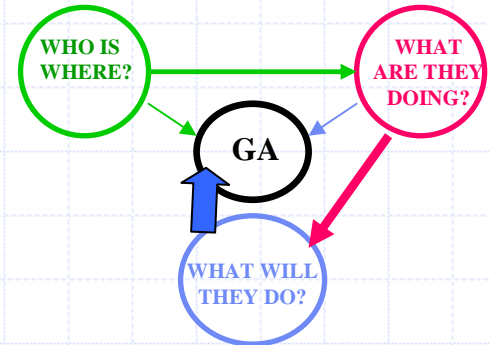
TA, LA, GA – the differences



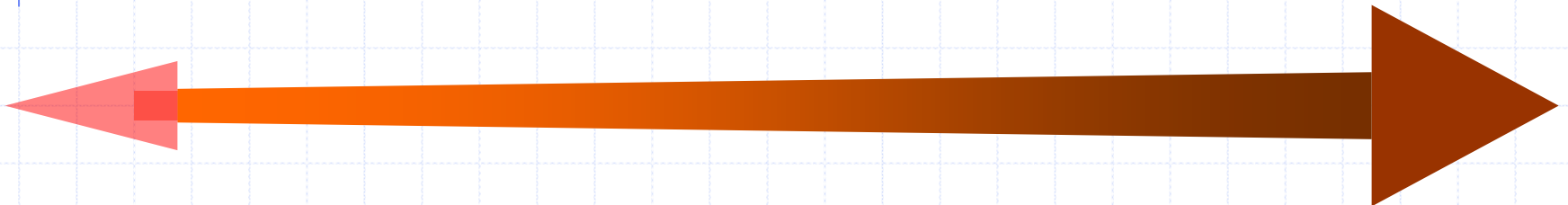
Transitory Awareness (TA)



Local Awareness (LA)



Global Awareness (GA)



Less

Time

More

Lesser

or

Span of Command

Greater

or

Area of Interest

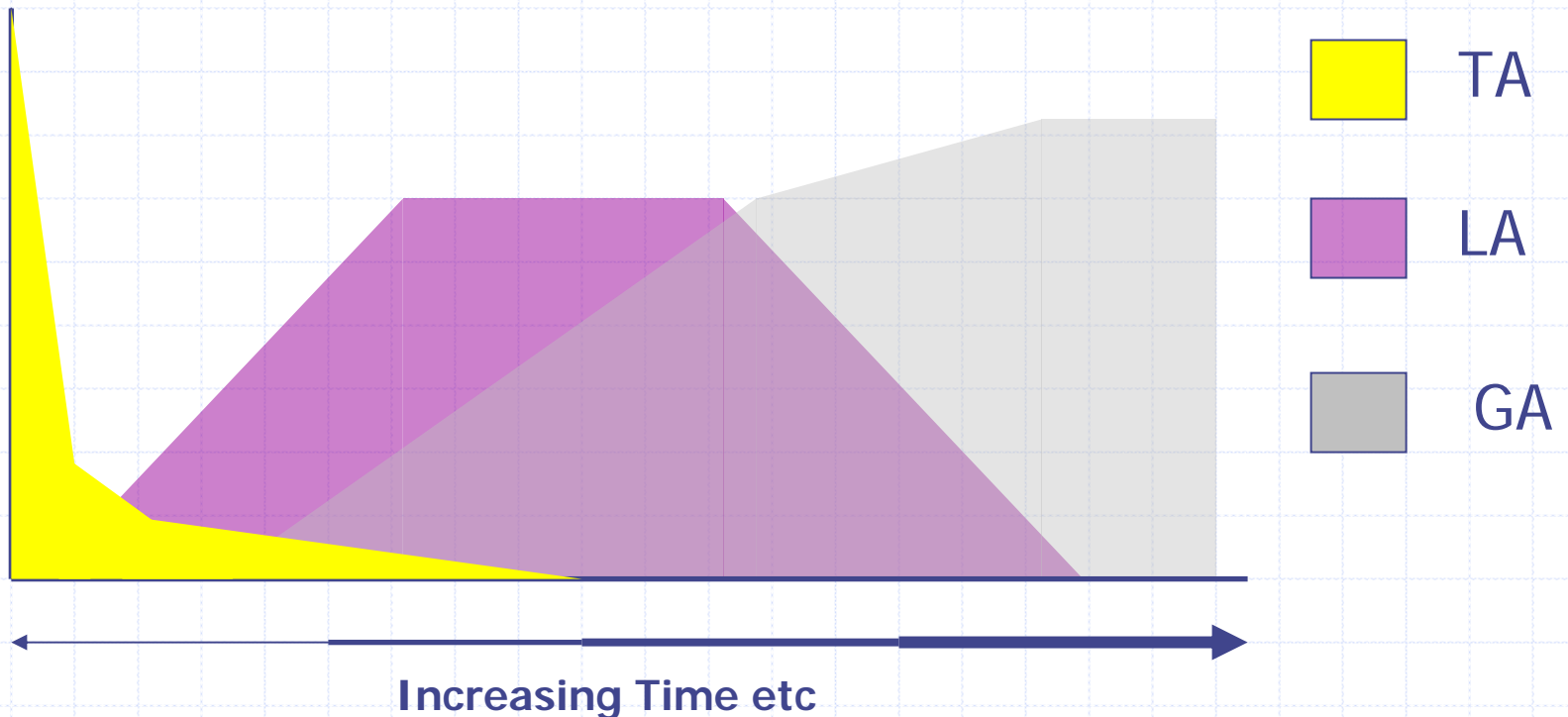
Larger

Smaller



Multiple Awareness

It must be accepted that any person may have simultaneous awareness at more than one level





Measurement or assessment?

With the Endsley model, measurement means interrupting the subject and running a quick questionnaire process.

This is fine if the task is not time or resource critical

- Not in the middle of a fire-fight
- OK for transport pilot 50 miles from touchdown (perhaps)

If the task is not critical, then it probably comes under the heading of Local or Global Awareness

Many people have queried the validity of interrupting a task



Measurement or assessment - 2

There are many variations to SAGAT (the Endsley tool)

They also rely in an interruption

Miller and Shattuck used a method that truly minimised the interruption and extracted the key features of the subject's perception/cognition.

This could handle marine applications of TA and LA

Other researchers question the measurement process, and look for observable actions and behaviours that will permit assessment.

This can be done in the real world, but is better tested in a simulator



Measurement or assessment - 3

With the 3-Q model, we believe that assessment of observables keeps the subject behaviour true to task.

Assessment is easier when it is kept simple

- Did the commander spot that APC?
- Did the pilot spot that crossing aircraft?
- Has the rate of inter-crew communication risen?
- Why did the subject do that?
- Why did the subject do nothing?

The next problem is whether the assessment should be at Random Intervals or at the Observer's Choice



Measurement or assessment - 4

Random assessment, or time schedule assessment may (possibly) record a lot of nothing

- but is scientifically valid

Observer Choice enables key events to be assessed – regardless of the random interval

- but may be considered as biased

We think that the best way is a combination of both



Measurement or assessment - 5

We are now working on tools (computer and flat paper) to enable assessment on a combined Random/Observer Choice basis

This means:

- Getting a simulation with the right features to produce (or not) the observable behaviour
- Generating the right question set for the observer to answer

Vitally, different applications will need different questions



And in conclusion ...

The 3-Q model of Awareness handles different timescales

The 3-Q model of Awareness handles different command levels

The 3-Q model of Awareness removes a confusing acronym

The 3-Q model of Awareness accomodates a wide range of military and civilian activities

The 3-Q model of Awareness plus Observer Assessment permits the collection of Awareness data without interrupting the task



RIP

SA

2006