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“The Awareness-Order-Action cycle and Battle-space Awareness ”

C2 Concepts Theory and Policy, Organizational Issues, Cognitive and Social Issues

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Title of Paper: The Awareness-Order-Action cycle and Battle-space Awareness

Abstract

We have argued (Hone, Whitworth, Martin; 2006) that Awareness is best considered in terms of Battle-space Awareness, but also seen as a component of a larger Awareness-Order-Action (AOA) cycle. A key factor in the AOA cycle was the influence of culture and doctrine on multi-force and multi-national operations. At a time when a number of “Cycle” models (e.g. OODA, ODOA, OPAM, RUDE) are in use – and many of which are probably best related to specific aspects of combat – we believe that insufficient attention is being paid to fostering a general awareness of the battle-space, or to integrating such awareness into a generic model of the combat process (particularly from the viewpoint of ground and littoral combat). Developed from the 3-Q model of awareness (Hone, Martin and Ayres, 2006), the AOA Cycle is offered as a means of exploring the way in which information flow, as well as the influences of culture and doctrine, can affect combat events. This requires a new approach to the assessment of awareness, and in particular to the separate awareness of “Blue” versus “Red” forces, and such an approach can be enabled by the 3-Q model amongst others.

Keywords:

Awareness, A-O-A Cycle, Coalition operations, Culture, Doctrine, Language

Introduction

In the last two decades there have been many approaches to “Awareness”. The dominant approach is the Situation Awareness (SA) of Mica Endsley (e.g. Endsley, 1988); but all approaches and all models have to contend with a view that sees Awareness as an individual’s internal model of the external world. This view is explicit in the publications of the CCRP, and can be summarised, as “Awareness is a cognitive construct”. The aim of this paper is to argue that the cognitive construct is a continuous process, which can be moderated by the culture and doctrine of the commanders involved in an operation, and to show where this moderation may affect the whole combat process.

The A-O-A Cycle

To accept Awareness as a cognitive construct is to accept that it will be based – in part - on the information available to an individual, and hence that a change of information may result in a change in the construct. Information – in this context – refers to the sensory inputs available to an individual. Thus, the predominant source of information will be visual (whether this be from direct observation of the terrain, from a map, from photographic material, or from words on paper; a lesser amount of information is received aurally, although in some situations, aural information, via a communication network, may predominate. The Awareness-Order-Action (A-O-A) cycle (Hone

Whitworth and Martin, 2006) was offered as a way of depicting some of the factors which may affect the construct, leading to a situation where following the orders, which derive from that construct, will change the information from which the construct stems. This was hinted at in the original Endsley model (Endsley, 1988a), in the form of a feedback loop, and it should be recalled that her model was located at the core of a decision-making process. The Hone, Whitworth and Martin (2006) argument holds that Awareness forms only one part of battlefield C2, must be considered in a wider context, and hence that Battlespace Awareness is a more appropriate term.

It is generally agreed that C2 – and especially military C2 – must involve other factors, particularly in a climate of joint and coalition operations. Different nationalities will have different cultures, use different languages, and follow different doctrines, and even different forces from one single country will try to use their own preferred approach. There are, therefore, three different but interlocking aspects of C2 to be considered when discussing coalition operations: language, culture, and doctrine, each of which must be taken into account separately, and then as a whole.

Work on the A-O-A cycle was commenced as a way of identifying where the cultural and doctrinal influences (in particular) might moderate any commander's decision, and thence bear on any orders that may stem from that decision. The core of this model is shown in Figure 1, and is a reflection of the fact that combat is not a static activity.

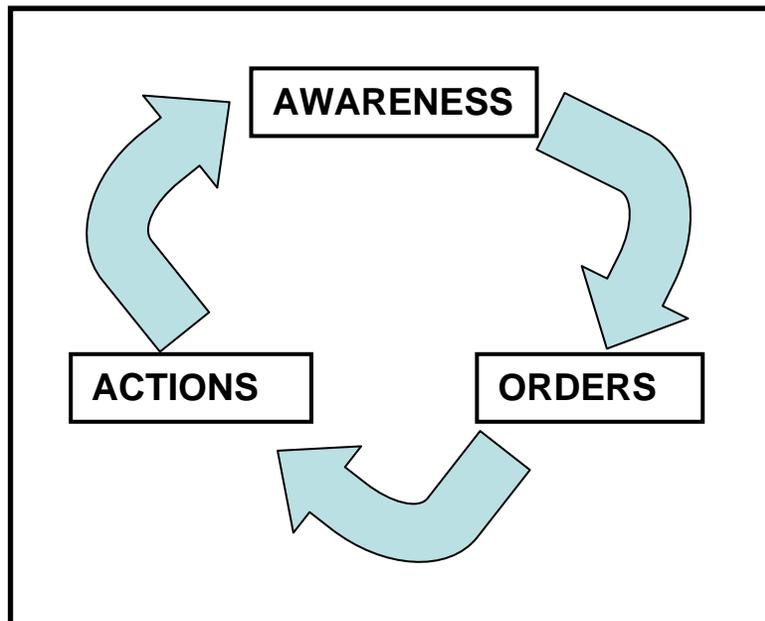


Figure 1: The A-O-A Cycle

The full original model is shown in Figure 2, and uses the 3-Questions (3-Q) model of awareness (Hone, Martin and Ayres, 2006), but any awareness approach that is inherently dynamic in structure could replace the 3-Q model in the A-O-A cycle. Some of this work will also draw on research on the transmission of command intent (some reported in

Hone, Whitworth and Farmilo, 2007), which has observed differences - in one single arm within one country – between written doctrine and doctrine in practice,

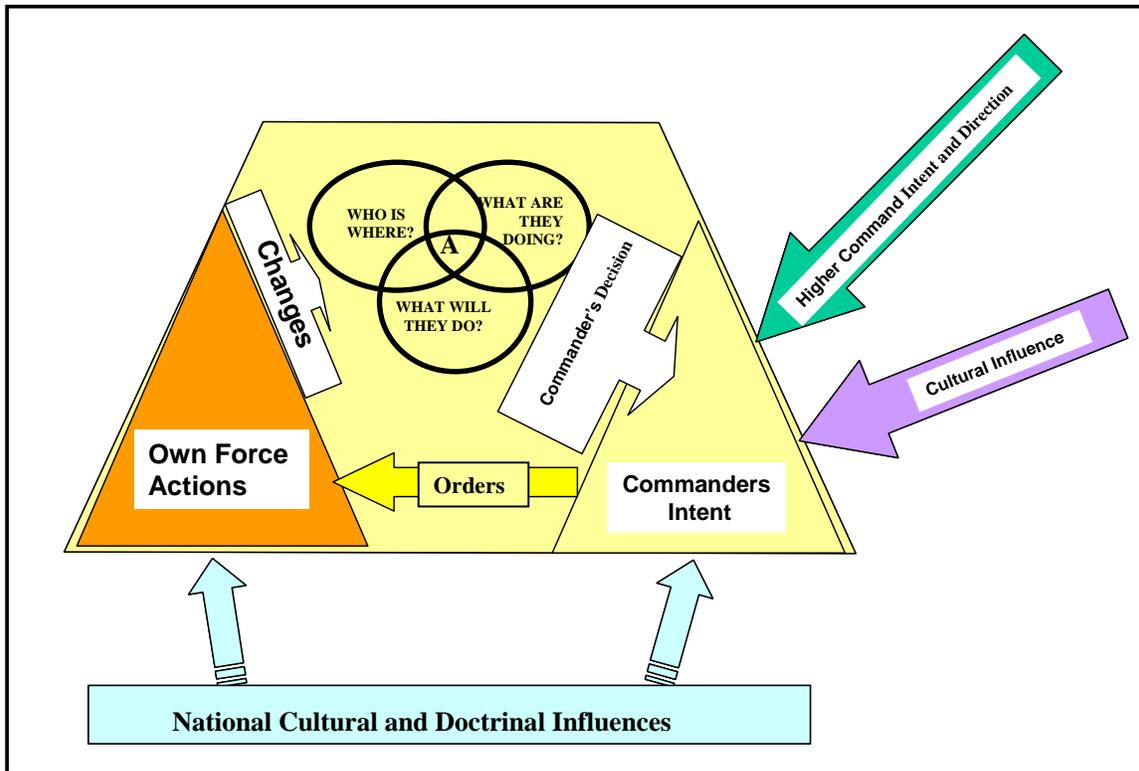


Figure 2: The A-O-A Cycle (from Hone et al, 2006)

The A-O-A Cycle as shown in Figure 2 uses the 3-Q model of awareness, but it must be stressed that any dynamic model of awareness will be equally relevant here. It is a commander's appreciation of the Operational Picture presented to him that will drive the mental construct that is his battle-space awareness, and influence the framing of his intent and thence of his orders.

Language

The first time when complications may arise in the multi-cultural HQ, is as a result of differences in the language used. We believe that this can be discussed as if each individual below the commander (perhaps even the commander) functions as a translation module.

The Translation Module

This concept is based on one of the simplest models of a system –the IPO or Input-Process-Output model. In considering a coalition command structure, it is possible (if not probable) that a Commander of one nationality will have a Chief-of-Staff (C-o-S) of

another nationality and will be passing orders to 2nd Echelon commanders from a third and/or fourth. Thus, a Commander could express his intent to his C-o-S in his native English, the C-o-S would process the orders and output them to a 2nd Echelon commander in another version of English. The IPO will look like Fig 3.

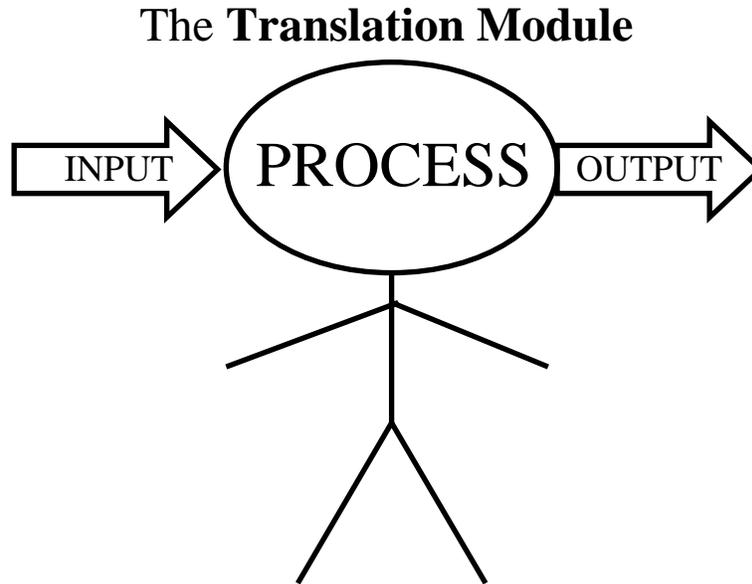


Figure 3: The Translation Module

In reality, the “Process” above may actually be a second (nested) IPO, taking a form like that shown below in Figure 4. Thus, for example, our Commander has used American English (CL, or Command Language), his German C-O-S has translated this into German, carried out whatever mental processing (thinking) has been required, translated this back into his own version of English (CL¹) and passed it on to one or more 2nd Echelon commanders who may or may not have some version of English as their native language – but who will – like the C-O-S – “think” in their own language. Even if we assume that all involved are able to see the same information display, and have the “same” Operational Picture, the original Command intent has been translated several times.

Even if our hypothetical coalition is restricted to NATO (and it may well be much wider) we have two “Official” languages: English and French. However, which variant of English and which variant of French, has never been specified.

English:

- UK English - US English - Canadian English

French:

French French - Canadian French - Belgian French (Walloon)
and even - Italian French (Val d’Aosta district)

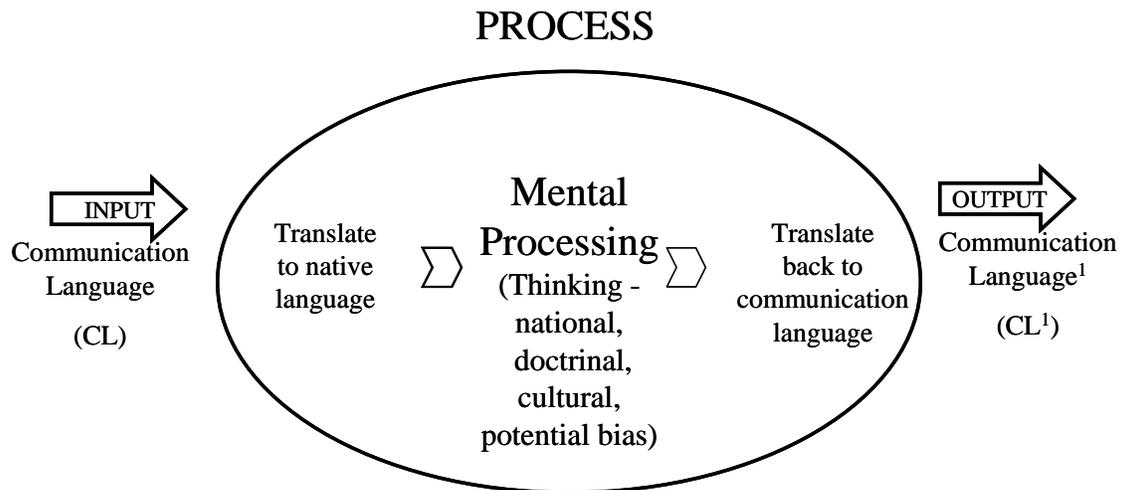


Figure 4: The translation process.

The foregoing assumes that a commander has actual control of all the forces who are attached to the command. Alberts and Hayes (2005) have shown that this may not always be the case - leading to a complicated command structure - and Siegel (1996) discusses in some detail the way in which first US PSYOPS units, and then some German units came under their national control in Bosnia, rather than that of the force they were nominally attached to.

Culture

The term Culture is normally a reference to patterns of human activity and those symbolic structures that give such activities importance and significance. Within any culture, there may be a number of sub-cultures, and even a hierarchy of sub-cultures. The structures may (almost certainly will) differ from one sub-culture to another. Perhaps the best illustration of differences in culture, is one that may not be available in the future:

It has long been considered (by some) that wherever a British soldier fell in action was part of British soil. The British soldier was therefore buried on or near the battlefield. In contrast, the American soldier was considered to be a warrior for his nation and would be brought home to receive a hero's funeral. The British attitude is changing, driven by both a change in the public perception of British military action overseas, and by an increased awareness of the manner in which another country pays tribute to its dead.

On a much smaller scale (and hence a sub-cultural view) is the matter of whether junior officers are encouraged to query decisions made by their seniors (as part of their professional development) or whether no questions at all should ever be asked. This is undoubtedly a matter for the unit commander, who may be following regimental tradition, and is touched on again below. This may, however lead to blind obedience to an order, regardless of the consequences, and is exemplified by the "Charge of the Light Brigade" in the Crimean War (although examples abound from the American Civil War).

The Light Brigade (commanded by the Earl of Cardigan) consisted of five regiments of cavalry; in contrast to the Heavy Brigade which consisted of only four cavalry regiments. The overall Commander of Cavalry was Lord Lucan, reporting to the Army Commander (Lord Raglan). All involved would have shared a truly common language, so this can be discounted as a cause for subsequent events.

Raglan issued an order – via brigadier Airey – to the effect that:

"Lord Raglan wishes the cavalry to advance rapidly to the front, follow the enemy, and try to prevent the enemy carrying away the guns. Horse artillery may accompany. French cavalry is on your left. Immediate."

and this was carried to Lucan by a Maj Nolan (Aide-de-Camp, or ADC, to Airey).

Note here that historians have different views as to the precise number of formal Orders that Raglan actually issued (the numbers vary between one and four) and some commentators have omitted the sentence *"Horse artillery may accompany"* from the final order. It is, however, generally accepted that the final order is as set out above.

The order was mis-understood by Lucan, resulting in the decimation of the Light Brigade when they were given the task of taking "the guns", but not the guns that Raglan had intended. In fact, "the guns" in Raglan's order were not even visible to Lucan (or indeed to Cardigan). The order given by Lucan caused some 600-odd cavalry men to advance into the valley between the Fedyukhin Heights and the Causeway Heights, subsequently called "Valley of Death" by the poet Tennyson. Their objective was a substantial number of Russian field-artillery guns at the far end of the valley, with others deployed at the sides of the valley.

Unhappily, the "guns" that Raglan was concerned with were British naval guns that the Russians had captured, and which represented a substantial increase in Russian firepower (and also posed a threat to the British supply line). They were actually located on the reverse side of the Causeway Heights, visible to Raglan but not to Lucan (or indeed Cardigan). A further element in the confusion was that Major Nolan (ADC to Airey) also carried a supplementary, and verbal, order that the cavalry was to attack immediately.

Similar examples can, of course, be found in any conflict, and are usually considered to be part of "The Fog of War". Criticism after the event is often an easy matter, and it is easy to say that the original Commander's Intent was not made clear, or that the order was not well formulated. Neither of these points would explain why Cardigan believed it was his duty to follow his orders, immediately, even though it must have been apparent that there were some inherent flaws in those orders. To this day, there is a culture in some British cavalry regiments to the effect that no junior officer may query any order – even for clarification – since this represents a criticism of his superior.

The critical command hierarchy at Balaklava can be depicted as in Figure 5 (below):

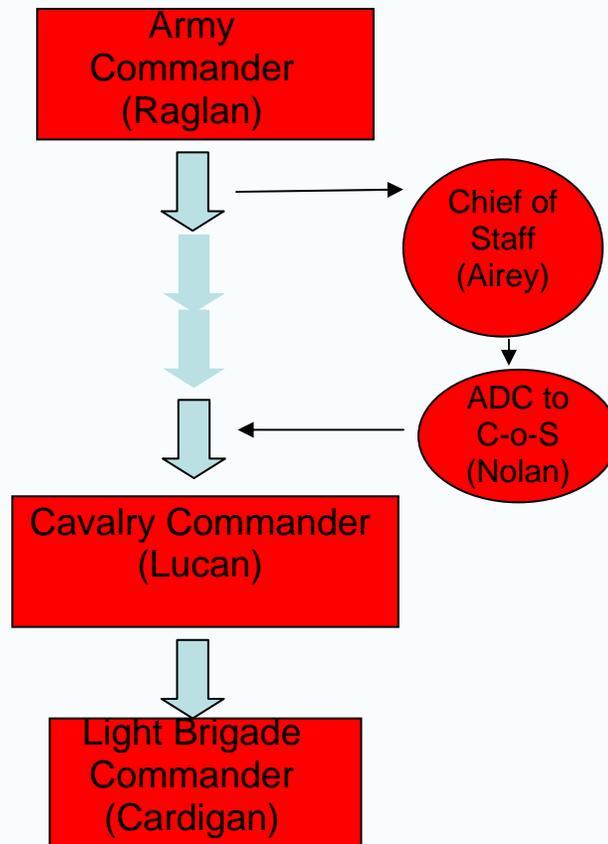


Figure 5: Command Structure at Balaklava

In current terms, we can say that there was a lack of shared awareness (and/or of a Common Operational Picture), and hence that Lord Raglan did not have an appreciation of what could happen after he had given his orders. That the orders were followed without question is a matter of the prevailing British Military culture of the era.

Doctrine

Doctrine, as with many other terms, has a range of meanings. For this paper, a definition from the Merriam Webster Online Dictionary (M-WOD) will be used:

“... a military principle or set of strategies ...”

We now have to consider a further problem with coalition operations, in that individuals will not only have to process orders via a translation module (Figure 3, above) for language, but will be influenced by their own military doctrine.

To illustrate this point, we need only look back to the last decade: UK doctrine for Armour, at that time, held that a tank commander traveled “hatch open, head out” and should take note of a “traffic light” threat warning system. At the same time, US Armor

doctrine held that a tank commander went to “head in, hatch closed” immediately after moving off. This has a direct influence on the awareness of each individual commander, in that there is a potential for differences in the available information.

Imagine now that a lower echelon commander in a coalition force has a native doctrine that says that there should be no assault without helicopter support. If this commander is instructed to advance against an opposing force, without helicopter support (or even with fixed-wing air support, rather than rotary-wing), then that commander must reconcile a conflict between orders and doctrine, at the same time as coping with the language variability.

The magnitude of this problem was discussed by Dzierzanowski (1990), in respect of the essential war-fighting doctrines of five national armies in NATO at the end of the “cold war” period. He concluded that these doctrines were not fully compatible, and could increase the vulnerabilities at unit boundaries. The problem was not new at that time: Kuehn (1997) showed how the potential problems faced by NATO, were essentially the same as those faced by the military coalitions confronting Napoleon during the Napoleonic Wars (1792-1815).

Conclusion

In summary then, we suggest that any military operation is a continuous function that can also be considered as cyclical in nature. An awareness of the situation is essential for the exercise of command, but exercising that command may then influence some of the factors informing that awareness. Language, culture, and doctrine, have always had an influence on military activity, but the trend to multinational operations is considered to increase the scope for their influence. At a time when there is a move away from a continual flow of written orders in favour of verbal reach-down and brief-back, it must now be considered a possibility that more 2nd and 3rd echelon commanders may look for more written orders (rather than less) as a means to avoiding potential confusion. One possible solution to this potential problem may be the adoption of a formal Multi-national Military Doctrine as proposed by Vittori (1998). Another may be the adoption of a formal Battle Command Language. This last may lead to a more formal consideration of the battlespace, and hence of Battlespace Awareness.

It is not the purpose of this paper to offer simple solutions to a complex problem; we do, however, seek to indicate where tactics and operations can potentially be influenced, and how an appreciation of the A-O-A cycle can show where those influences may come to bear. Most will be familiar with the dictum, usually ascribed to von Moltke the Elder, that “No Battle Plan survives contact with the enemy”. The A-O-A cycle is offered as a model of the manner in which a command decision may be affected (or influenced) by external factors, may then influence the intended events (the Battle Plan), and in turn lead to changes in some of the data that was considered prior to the original decision.

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