Crisis communication and multimodal decision making on the fireground

Valerie Ingham offers the new concept of 'multimodal decision making' to help understand decision making in crisis situations.

Abstract

A crisis situation calls for multiple decisions to be made and communicated rapidly. Despite its lack of visibility and explanation there is an art to communication and decision making in dynamic high pressured situations, which I term Multimodal Decision Making.

Multimodal Decision Making provides an holistic approach to understanding decision making in time pressured, uncertain conditions where incident commanders find themselves having to distinguish between what is read at face-value and what is intuitively understood to be happening.

I interviewed Inspectors from within a large Australian fire fighting organisation and found their visual perception and somatic awareness to be integral to their understanding of what was happening and their subsequent communication of decisions.

Through the analysis of a fireground incident I will demonstrate the vital importance of visual perception and somatic awareness when contradictory and incomplete information has to be processed and communicated quickly.

Introduction

The technical aspects of fire behaviour may be described in scientific language without difficulty. The indeterminate, messy and confusing problems encountered by incident commanders on the fireground cannot be so easily or fully explained. In these complex situations incident commanders are visually and somatically informed, relying on an intuitive and embodied reading of the fireground that is difficult to express in the measurable and objective scientific language that is demanded by emergency communications.

Within the realist construct risk is identified through scientific measurement and analysis and then communicated and managed using quantifiable and objective language. The impulse within us to categorise, sort and delineate is exceptionally strong and through the infiltration of the scientific perspective we have been programmed to think perception is all about distinguishing these elements. Typically somatic awareness, which is the concept of a decisions-maker during an emergency using all the senses, as a 'whole' body, to evaluate and act, is not recognised as crucial.

There is a ground swell towards an holistic approach to risk perception and decision making in a number of disciplines. In physical therapy, Taylor argues for a new philosophical foundation with an integrative approach encompassing the physical, emotional and intellectual body (Taylor 2002). And in nursing, 'personal knowing' and 'clinical judgment' are recognised as 'important in enabling nurses to respond to new situations creatively, using imagination and abstract thinking' (Rose and Parker 1994, p. 1007,8).

The focus of this paper is decision making on the fireground. It is standard practice for fire services to plan and prepare for a procedure-based approach to various anticipated fireground situations. Contained within these procedures are directives concerned with communications between fire commanders and their crews, the communications centre and dealing with inter-agency communication. There is little, if any, official recognition which acknowledges or incorporates the importance of the somatic awareness of incident commanders. My interest lies in the incident commander's holistic and multidimensional perception of the fireground and their communication of decisions contingent upon this awareness. I found the manner in which complex incidents were negotiated, how competing demands and conflicting information was resolved, and the incident commander's ability to decode the situation in order to precipitate and communicate a plan of response, involved their whole body in a continuous and holistic awareness of the scene.

Recent research in emergency communication focuses on the individual or the team in relation to word-based and verbal communications, the result of radio messages, computer generated or electronically transmitted print-outs, and the like. These word-based, verbal and written communications are consequently collated, interpreted and disseminated into further forms of communication (Paton, Johnstone and Houghton 1998, p.8). Inter-agency communication is a major area in need of addressing (Banipal 2006) and some researchers have proposed multimedia solutions (Nikolic, Savic & Stankovic 2007).

In 1997, Quarentelli warned of the challenging aspects of the, then, increasing move towards using information technology in disaster planning and response. He pinpointed ten potentially problematic aspects. One related to non-verbal communication, and highlighted his concern that an individual's ability to collect information using non verbal cues would be weakened by increasing reliance upon technology, resulting in diminished voice and body response. He also warned that this situation would lead to a breakdown in the hierarchical powerbase necessary to drive an effective emergency response. He stressed that:

> *"Meaningful communication is dependent in many ways on gestures, inflections, body language and affective tones, etc., over and beyond the cognitive symbols involved (Quarentelli 1997, p.100)."*

The gestures, affective tones and other non verbal responses Quarentelli lists are somatic—that is they relate to the whole body being involved in the communication process, indicating that words alone are not enough for meaningful communication.

Paton, Johnston and Houghton observe that meaningful communication in a crisis situation is also non-linear, as '[p]rescriptive decision making, likely to typify routine decision making, is inappropriate for crisis circumstances' (1998, p.9). In recent years crisis communication in the media has moved from a linear model in which network gatekeepers defined details to be released upon the general public, towards interactive technology—thus transforming the general public into a global community. Today information is continuously reviewed and exchanged through a variety of platforms such as mobile phone communications, blogs, Google, YouTube, and other web spaces which encourage debate (Volkmer 2008, p. 97). This multidimensional aspect to crisis communication, in which geographical, political and cultural borders have been superseded by 'spheres' of communication, newly defined by Volkmer as the 'culture of spatial reach' (2008, p. 97) connects the complex world of crisis communication in the media and, more specifically within this paper, the fireground, by transcending locally imposed boundaries and providing an holistically integrated perspective.

In terms of decision making, the popular current theory usually applied to explain time-critical decision making is Naturalistic Decision Making (NDM). Although NDM recognizes the importance of intuition as experiences that may be subconscious and unanalysed, it is typically researched through the breaking down of a task into its constitutive parts, examining, and then reassembling for further insight, in a process known as Cognitive Task Analysis (Flin, Salas et al. 1997; Klein 1998). I understand this approach to be counterproductive to the fluid and non verbal nature of intuition and somatic awareness.

Although acknowledging the important contribution of NDM in raising awareness of decision making in time pressured crises, my approach is from the somatic perspective and is multimodal and holistic in that I understand information received through various modes of awareness to be integrated and inseparable. I understand intuition to be informed through visual perception and somatic awareness and I make the case that visual perception and somatic awareness are important and essential in the decision making processes of incident commanders on the fireground.

Emergency communication involves being able to negotiate the competing demands of not only the fire, but of the entire incident ground. This incorporates risk, danger, sparse pieces of conflicting information, and the pressure to communicate rapidly. These elements form the image that incident commanders have to mold and shape.

In the following excerpt a newly promoted Inspector expresses his frustration when managing the competing demands of the public, his own organisation and the fire itself, resulting in having to make and communicate decisions without being able to size up the incident for himself:

> *"So many people are coming at you. The police are coming at you. The managers of the shop or factory are coming to you. Now the fire fighters and then you have got senior officers coming at you to make sure you have done everything right for them. You know - like drawn it, put a time, sent your messages; and all you want to do is get down there to get your head around it. (unpublished interview)."*

Multimodal Decision Making has an holistic approach to recognising the importance of visual perception and somatic awareness in decision making when contradictory and incomplete information has to be processed quickly. Multimodality is distinguished from formal rationality and informal sense-based rationality in that it approaches art, science and practice as an irreducible whole; a linear, monomodal approach is not conducive to capturing the holistic dimensions of the decision making experience.

I collected and have processed a substantial amount of extended interview texts and images. Twelve recently promoted Inspectors from a large Australian fire fighting organisation participated in the interview process. The following interview excerpt demonstrates that the thread of somatic response is inextricably woven into the fabric of what informs crisis communication.

Case study - rural factory fire

Early one morning a country Inspector is called out to a factory fire in a town, normally one hour's drive away. It takes him 40 minutes to drive to the fire, and on the way he busies himself receiving two updates from the communications centre and talking by radio to the first arriving officer at the incident. Nothing the first arriving officer said was unusual or alarming. What was alarming, said the Inspector, was the very slight tremor in the officer's voice. It contained a hint of fear.

The Inspector deduced the incident was possibly more serious than the communications centre had so far anticipated. He organised backup, no mean feat considering the distance to be covered by the backup appliances and the country towns which required their own fire protection maintained, and the speed at which he was driving. These decisions, maintained the Inspector, were prompted by 'the quivering' in the first arriving officer's voice. As he pulled up to the fireground the Inspector saw immediately that his call for backup was indeed necessary, as the fire was moving out of control with the possibility of spreading.

We pick up the story somewhere along the road as the Inspector is speeding towards the scene, after he has spoken directly to the first arriving officer:

> *"…so I got the message from the first pump that was on the scene. I could hear in his voice that he was quivering, so I thought 'I am not too sure if he is comfortable, I'd better get him some help' so I rang up the communications centre, and I said 'Listen, I know you have got these two trucks coming from A., you've got the rural fire service', I said 'you need to send U. up now…I may have waited another 10 or 15 minutes before I said 'Ok you better get G. there' - it's only another 40km maybe, I said 'get them on the road as well."*
>
> V – This is all while you are in the car?
>
> *"All while I am in the car driving to the incident, I am building a mental picture of what's happening, and from hearing his voice, I felt that he was maybe not in control because of the quivering in it."*
>
> V – Did you know him well already?
>
> *"Yeah I knew him sort of well enough… I could just tell, he sounded like he was in trouble…I felt once I arrived, he more or less - I could feel a weight come off his shoulders, 'You're here now, I don't have to deal with this anymore, its all yours." (Ingham 2007)*

Crisis communication involves deciphering between face value and intuitive understanding

As he speeds towards the incident the Inspector is continually readjusting his plan. First he organizes back up from one location, then twenty minutes before arrival he decides to call for even more back up. What precipitated this decision? Perhaps it was his increasing anxiety as he got nearer to the incident. Perhaps the quivering in the first arriving officer's voice was increasing. What we can say conclusively is that it was not the result of the literal content of the verbal reports, but rather his somatic response to the 'quivering voice' and his somatically informed imaging of the scene in his mind. His call for backup proved necessary as the fire was indeed raging out of control, and no effective plan was in place. Multimodal Decision Making acknowledges the somatic input this Inspector acted upon – the quivering in the officer's voice.

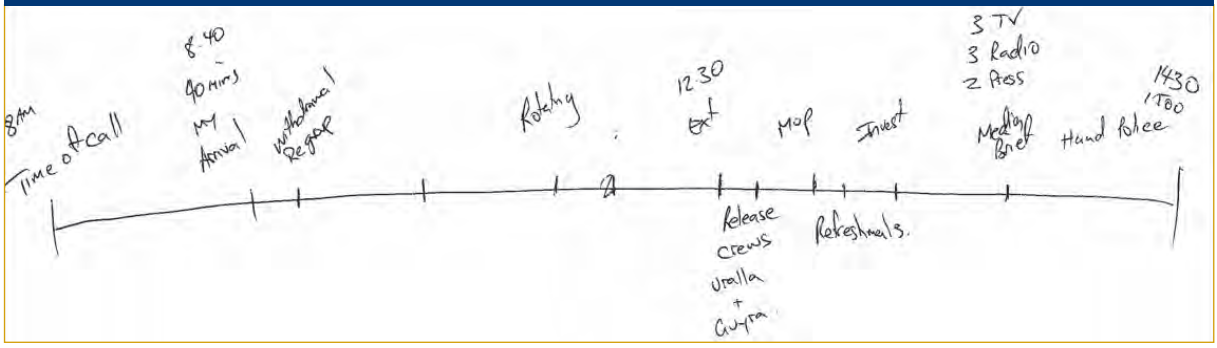
The Inspector could have understood the risk factor in scientifically measurable terms: 'factory well alight, two appliances in attendance…' and so on. Nothing unusual or is odd happening, a straightforward textbook factory fire. If the Inspector had only responded to the words of the message he would not have called for backup whilst driving towards the incident. In fact, what he responded to was not the information he received in the verbal words of the message, but rather it was a slight tremor in the first arriving officer's voice (Ingham 2007). According to Dewey (1934, p.119) '[i]n ordinary perception we recognise and identify things by their shapes; even words and sentences have shapes, when heard as well as when seen'. The Inspector recognised the 'shape' in the tremor of the Station Officer's voice. The shape equated to 'not handling the situation well', although the literal meaning of the words themselves did not. The Inspector's somatic perception informed his decision to call for backup, overriding the words communicated in the verbal report.

Crisis communication requires multiple decisions to be made rapidly

Figures 1 and 2 were created by the Inspector as he related the incident.

Multimodal Decision Making understands time pressure as an important factor in fireground decision making and communication. Although colour is not shown in Figure 1, the Inspector depicts the trajectory of human interventions in his direct labeling of precisely where critical decisions were taken. For instance, on his arrival he withdrew all firefighters from the fire and regrouped them. Somewhere before 12:30 he rotated them around, and at 12:30 he released a couple of crews, indicating the crisis point was past. Mopping up, fire investigation

Figure 1: Timeline of Rural Factory Fire



and dealing with the media all occurred before formally handing over the incident to the Police.

The timeline of the *Rural Factory Fire* illustrates the perception that time appears longer during the crucial moments of the incident, and gradually speeds up to 'normal' time as the crisis point passes, i.e. the measures on the timeline are not all equal. The scale changed in calibration when so much action was packed into the first arriving minutes, and then gradually, as the fire came under control, the measurement of time on the timeline slowed down. Certainly, the somatically informed action during the first arriving moments on the incident ground has an otherworldly feeling about it. The unrelenting bombardment of information from other officers reporting in, by-standing public and constant requests for information from the communications centre, the media and other attending firefighters is processed and filtered by the experienced incident commander into specific, directive communications. If we add the incident commander's own fast speeding thoughts, it becomes clear that if each single request were attended to the fire may never be put out. All Inspectors alluded to or directly addressed the art of sifting and deciphering the important messages to respond to, including their own, amidst the backdrop of barrage and noise of the fireground.

Crisis communication involves interpreting and communicating 'reality'

In the West there is an expectation that life and property are to be preserved, but not at all cost - the associated cost or risk factor is culturally determined. Hodge and Kress state that '[s]ocial control rests on control over the representation of reality, which is accepted as the basis of judgment and action' (1988, p.147). Reality for the incident commander is contingent upon standard operating procedures as well as cultural norms, and 'reality' is represented in their communication and decision making. That is, how far an incident commander is willing to risk life and property is not only contingent upon standard operating procedures; whether consciously or subconsciously, incident commanders take into account socially and culturally determined values, and these values carry moral obligation associated with risk, communication and decision making.

One way of interpreting and communicating reality is to draw an image of the fireground. Fireground mudmaps serve two purposes. The first is immediate, as an aid to decision making in, for example, in the deployment of appliances and firefighters. The second is long term, as these images may form part of the documentation recording the incident, and can be called upon in a court of law, for instance in insurance cases or the coroner's court.

The fireground mudmap in Figure 2 is informed and enculturated with acknowledged fire brigade practice. For instance there are codes representing stations, the understanding of sectors, the importance of accuracy with the placement of vehicles and roadways in relation to one another, and the depiction has an aerial perspective similar to that of a draughtsperson. Incident commanders have to be able to read the fireground, constantly readjusting and interpreting 'reality' in order to anticipate the fire's next move, otherwise they are not fulfilling their role. This ability is somatically informed, and based as much in reality as it is 'scientific' and based on standard operating procedures.

Conclusion

Incident commanders are basing their decisions on something other than what is scientifically verifiable by measurement and calculation. They are visually perceptive and somatically attuned to employing non-verbal skills in order to understand the fast-moving image before them. They are making decisions and communicating rapidly using information gained through visual perception and somatic awareness that at present is little acknowledged because it is so difficult to recognise, describe and explain.

Figure 2: Mudmap of the Rural Factory Fire

Multimodal Decision Making is decision making in highly complex, time critical situations based on multimodal understandings from a range of inputs and perceptions. Visual perception and somatic awareness inextricably link and constantly inform communication and decision making in crisis situations, facilitating the anticipation and recognition of discrepancies and variations as the crisis progresses.

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