Introduction

Introduction to Fratricide

On 25 March 2003, at 00.50, a Challenger II Tank Commander on the outskirts of Basra notices a number of hot spots moving in and out of an object through his thermal imaging equipment. The Commander identifies these as enemy personnel entering and exiting a bunker. He requests and receives permission to engage and a High Explosive Squash Head (HESH) round is fired. Approximately six minutes later the Commander observes a second moving object, which he identifies as an enemy armoured vehicle and a second HESH round is fired destroying the vehicle. (Adapted from the Ministry of Defence 2004)

This is a description of an incident of fratricide in which British fire killed two British military personnel and left a further two seriously injured.

The most commonly utilised definition of ‘fratricide’ is by the US Army Training And Doctrine Command (TRADOC) Fratricide Action Plan, which defines fratricide as ‘the employment of friendly weapons and munitions with the intent to kill the enemy or destroy his equipment or facilities, which results in unforeseen and unintentional death or injury to friendly personnel’ (US Army; cited in Wilson, Salas, Priest and Andrews 2007, Kogler 2003, Doton 1996, Hart 2004, Jamieson and Wang 2007, Steinweg 1995, Greitzer and Andrews 2008, 2009). Informally fratricide has been labelled ‘friendly fire describing the engagement of troops by ones own side’.

In recent years the media has played a key role in accentuating public awareness of fratricide incidents (Ministry of Defence 2002, Hart 2004, US Congress 1993, Jamieson and Wang 2007, Dean and Handley 2006, Jarmasz et al. 2009), with headlines such as ‘2nd “friendly fire” death in 24hrs’ (Sun 2009) and ‘Nine paratroopers shot by British gunship after being mistaken for Taliban’ (Daily Mail 2008). Unfortunately the headlines reflect the truth, with recent figures stating that 43 per cent of UK deaths in Operation Iraqi Freedom were caused by fratricide (Gadsen et al. 2008). During World War II the number of fratricide-related deaths was thought to be 14 per cent (Steinweg 1995).

Previous research into fratricide has highlighted numerous reasons for the increasing rate of these incidents. There is little to distinguish the enemy from friendly or neutral personnel, the enemy uses equipment that looks very like that of friendly forces and fight in a covert fashion, as opposed to the enemy forming up an opposing front as in traditional Cold War-style warfare (Pirnie et al. 2005, Zobarich, Bruyn-Martin and Lamoureux 2009, Jarmasz et al. 2009, Barnet 2009). Modern warfare is complex (Moffat 2003b, Bar Yam 2003) and technological advances in war-fighting capability means that when friendly or allied troops are incorrectly targeted as enemy, weapons are able to destroy the target from far beyond the human visual identification range (Center for Army Lessons Learned 2005, Ministry of Defence 2002, Kogler 2003, Doton 1996, US Congress 1993, Greitzer and Andrews 2008, 2009, Hawley, Mares and Marcon 2009). According to Barnet, warfare has:

moved from face-to-face close combat, to lines of musket men, to direct fire at the limits of visual range, to beyond visual range (BVR), where friendly and enemy units are represented iconically on display screens. This distance has complicated combat identification and made it more difficult for soldiers to identify friend from foe. (2009: 313)

The combination of these factors, and the consequences outlined above, emphasize the need to comprehend the causality of fratricide incidents fully and identify preventive measures to protect personnel from such incidents.

There has been a large amount of research undertaken within this domain into the development of technological solutions such as combat identification aids to decipher enemy and friendly personnel (Jamieson and Wang 2007, Wilson et al. 2007, Kogler 2003, Barnet 2009, Pharaon 2009, Hawley, Mares and Marcon 2009, Dzindolet, Pierce and Beck 2009, Neyedli et al. 2009, Rice, Clayton and McCarley 2009). Research, for instance by Kogler (2003), has illustrated the benefit associated with such solutions. In a comparison of technological decision aids, Kogler found that the absence of any decision aid was correlated with the greatest number of fratricide engagements and that a decision aid ‘performing at 100 per cent reliability completely eliminated fratricide in the context of this study’ (2003: 35). There has also been a great deal of research into the problems

In addition to the complexities related to technological solutions, recent research into fratricide has highlighted the need to explore the problem from a Human Factors perspective, focusing on the humans involved and how they interact with the technology (Hart 2004, Wilson et al. 2007, Gadsen et al. 2008, Gadsen and Outteridge 2006, US Congress 1993, Greitzer and Andrews 2008, 2009). For example, Hart argues that:

the human element, present at every level of decision making before a weapon is launched at a target, is the most critical link in the fratricide chain. (2004: 14)


believing that the application of technology alone will solve the problem is fallacious and foolhardy. (1996: 7)

In light of this it is believed that research is required into the decision-making process and the associated contextual factors involved in fratricide incidents.

Purpose of the Research

This research aims to explore fratricide systemically, looking at not only the core factors involved in these incidents but also the manner in which these factors interact with one another to cause an incident of fratricide. This approach may help to promote a better understanding of interactions within complex systems and help in the formulation of hypotheses and predictions concerning errors in teamwork, particularly incidents of fratricide. This research aims to explore the problem of fratricide at a number of systemic levels, beginning with a small-scale team and progressing to explore a larger team composed of teams. The exploration of multiple systemic levels is widely advocated in the Human Factors domain (Reason 1990, Svedung and Rasmussen 2002, Leveson 2001, 2002, Hollnagel 2005, Von Bertalanffy 1950). The overarching aim of this research is to provide a greater understanding of fratricide incidents in order to lower the rate of occurrence of incidents of fratricide.
Structure of this Book

This book presents a description of the research undertaken into the Human Factors issues associated with fratricide and the resultant conclusions. This Introduction, which provides a summary of the problem of fratricide and explains the purpose and objectives of the research, is followed by eight chapters. An overview of each of the chapters is presented below.

Chapter 1 presents an exploration of fratricide, critiquing current approaches to the study of the problem. A review of the literature from the domains of fratricide, teamwork, Situation Awareness (SA) and schemata is discussed and a fusion of core concepts from these domains enables the development of a prototypical model of fratricide causality.

Chapter 2 presents the application of the model of fratricide causality to an incident of fratricide and an ideal version of events in which the incident of fratricide could not have occurred. The model is able to identify clear divergence between the fratricide and non-fratricide examples, isolating clear performance indicators within the incident of fratricide. The chapter provides initial evidence of the applicability of the model to explaining fratricide causality.

Chapter 3 presents a summarised review of methods currently utilised within the fratricide and wider safety domains. The Event Analysis of Systemic Teamwork (EAST) method, which provides a systemic evaluation of events involving teams, is identified as most appropriate to the exploration of fratricide incidents from the theoretical perspective of this research. Theoretical criteria drawn from the literature are used to illustrate the method’s ability to convey the underlying causality of fratricide and adhere to the theoretical stance of this research.

In Chapter 4, EAST is applied to an example of fratricide within a training environment for British Army tank crews. A battle group was observed undertaking numerous pre-deployment training scenarios. In one scenario an incident of fratricide occurred and the EAST methodology was used to compare the tank crew involved with a tank crew who effectively completed the scenario without engaging friendly personnel. This case study represents a small, three-man team illustrative of a low level within the military organisation. Core differences between the effective performance and the fratricide incident were drawn from the case study and the results of the analysis provide further validation for the ability of the prototypical model to explore the complex interactions associated with incidents of fratricide.

A further case study is presented in Chapter 5. This discusses the observation of the Royal Air Force and the British Army undertaking joint pre-deployment training. The scenarios observed involved the two forces working together on Close Air Support missions, thus enabling an exploration of fratricide at a team of teams level. Effective and fratricide performance are compared, again highlighting clear points of divergence within the performances. The chapter highlights the ability of EAST to explore fratricide within a large multi-force situation and the
ability of the model to explain the variance between effective performance and the occurrence of an incident of fratricide.

Chapter 6 presents the results of another case study exploring the Royal Air Force and the British Army, in which they undertook training for Close Air Support missions. The focus of this case study was at the Fire Support Team level – a systemic level which sits between the ‘small’ tank crew study and the large team of teams level discussed previously. The research compared the performances of two teams in a training scenario: one team successfully completed the mission and the second team tasked an Apache attack helicopter to target the team’s own location. The causal factors that led to the occurrence of this engagement and the absence of these factors within the team that successfully completed the mission are explored. The results reveal continuity of causality with the results of Chapter 5 and provide further validation of the utility of the EAST method in the investigation of incidents of fratricide.

In Chapter 7, the models developed from the three case studies are compared and contrasted in order to draw out a series of high-level conclusions. The research highlights the commonalities and variances identified between the models and allows for a number of conclusions to be drawn regarding the Human Factors issues underlying incidents of fratricide.

Chapter 9, the Conclusion, provides a summary of the research and the theoretical notions derived from the work. The question of whether the research succeeded in meeting the initial research objectives is discussed alongside the articulation of potential future research paths.