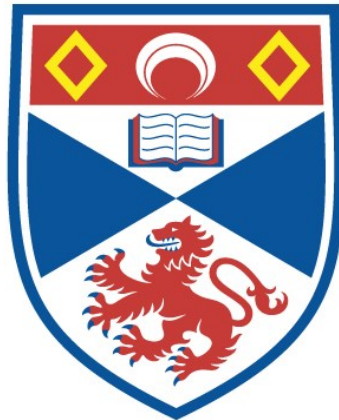


THE APPLICATION OF CROSS-CULTURAL RESEARCH IN
EMERGENCY SERVICE WORK-TRAUMA

Robert Guy Ramsay

A Thesis Submitted for the Degree of PhD
at the
University of St Andrews



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THESIS FOR THE DEGREE OF PhD

**THE APPLICATION OF CROSS-CULTURAL RESEARCH
IN EMERGENCY SERVICE WORK-TRAUMA**

September, 1995



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To Chiang Yan-wa

Chong xin nian kai qi
dau zhong chong jie

DECLARATIONS

I, ROBERT GUY RAMSAY, hereby certify that this thesis, which is approximately 99,000 words in length, has been written by me, that it is the record of work carried out by me and that it has not been submitted in any previous application for a higher degree.

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ABSTRACT

ABSTRACT

Work-trauma, conceptually related to post-traumatic stress disorder (PTSD), can impact general pathology as well as traumatic reactivity. Whilst usually associated with the emergency services, work-trauma occurs in all personnel repetitively exposed, as part of their job, to actual or potential traumatic incidents (such as fatalities, serious injuries, fires, riots, harassment, shooting incidents, rape incidents etc.).

The (limited) understanding of work-trauma is essentially predicated on mono-cultural (North American) data and approaches. Although a useful start, this does not accommodate underlying cultural differences. It is argued these differences fundamentally impact reliability.

Two approaches are used here to begin the application of cross-cultural factors to work-trauma:

1. Using sources based on Hofstede's cultural differences in individualism/collectivism, masculinity/feminism, power distance, and uncertainty avoidance, a link is established with certain stages of the eco-systemic model of traumatic reaction (Peterson et al, 1991).
2. A detailed review of the emergency service environment including examination stressors, call-out rates, and general pressure to perform as well as broader social differences in economic conditions, working hours, quality of life and several other factors quantifies the extensive differences researchers need to acknowledge.

Using unique data from three cultural settings (Japan, Hong Kong and the UK), preliminary analysis suggests nine variables consistently associate with work-trauma symptomatology: age, child-bearing status, usual alcohol consumption, change in alcohol consumption, exercise frequency, social support from a partner, social support from a close

friend, contemplation of counselling, and action on counselling. When applied to a model, however, cultural variations in R^2 were large.

This begins to suggest diverse cultural experiences are impacting work-trauma. Although phenomena such as resistance to counselling, the 'macho ethic' and alcohol habits within the emergency services are - as expected - culturally consistent, this is in itself inadequate for understanding work-trauma.

At a theoretical level, researchers need to further explore the documented aspects of the emergency service and social environments with a view to developing instruments which measure cultural diversity. At a practical level, given the culturally consistent alcohol habits in emergency services, future researchers should consider the use of emergency service personnel as front-line diagnosticians of work-trauma. Counselling needs are assessed in this light.

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CHAPTER ONE

ABBREVIATIONS USED IN THE TEXT†

4-4-8 shift	Four days on, four night on, eight days off
2-2-4 shift	Two days on, two nights on, four days off
C	Civilians
CAD	Coronary-artery disease
CI	Critical incident
CNS	Central Nervous System
DSM (III/IV)	Diagnostic & Statistical Manual of Mental Disorders
FFs	Fire-fighters
GDP	Gross Domestic Product
GHQ	General Health Questionnaire
HAD	Hospital Anxiety and Depression Scale
HK	Hong Kong
HKFS	Hong Kong Fire Services
HR	Heart rate
HSCL	Hopkins symptom check-list
ICD (9)	International Classification of Diseases
IES	Impact of Event scale
ILO	International Labour Organisation
LBFB	Lothian & Borders Fire Brigade
LTO	Long-term orientation index
PVC	Poly-vinyl chloride
PTSD	Post-traumatic stress disorder
RTA	Road traffic accident
SCBA	Self-contained breathing apparatus
UK	United Kingdom of Great Britain & Northern Ireland
US	United States of America
WHO	World Health Organisation

† Written in full at the first text occurrence only.

CHAPTER ONE

A PARADOX FOR WORK-TRAUMA STUDIES TO ADDRESS

"By making long excursions...we may find our ordinary rules completely upset, and these great upsettings will give us a clearer view and better comprehension of such small changes as may occur nearer us, in the small corner of the world in which we are called to live and move. We shall know this corner better for the journey we have taken into distant lands where we had no concern."

*Source: Poincare (1908), Science and Method.
Quoted in Jahoda (1988). My italics.*

"Job stress can cause physical illness and psychological disturbance with psychosomatic as well as physical changes. While stress is an inevitable part of living and working, excessive pressure costs dearly in ill health, lost productivity, and increased personal problems. A growing stream of research has confirmed the relationship between work place stressors and such illnesses as varying degrees of emotional distress without physical symptoms, cardiovascular conditions in varying stages, gastrointestinal disorders, respiratory disorders, and infection and medicine abuse. Some courts have concluded that management has a responsibility for employee well-being and have asked what steps the company has taken to help an employee cope with stress.."

*Source: Harvard Business Review, 'Who is Liable for Stress on the Job?'
Quoted in Phil Shovar (1987). My italics.*

In this introductory chapter, the following question is addressed: "Why study work-trauma within a cross-cultural framework?" Why, in the words of Poincare, journey into distant lands to observe the same ordinary rules? How does travel to distant lands help us better understand work-trauma?

In this chapter, and throughout, it is argued the key reason lies in what the above allude to. First, there is a paradox for work-place trauma: whilst it is experienced (or endured) by many personnel in a diversity of cultural settings, our understanding - still limited - is essentially mono-cultural. Second, there is a global

'reality' that certain psychological conditions such as work-trauma are worthy of financial compensation. The remark from Poincare may be over 85 years old but it remains apposite for theoreticians. The more contemporary remarks from the Harvard Business Review are apposite for many emergency service organisations. Whilst compensation is a developing issue more associated with PTSD (post-traumatic stress disorder), emergency services are inevitably interested in traumatic reactivity.

When answering the question "Why study work-trauma within a cross-cultural framework?", however, there is little literature to provide direction. This is important to the structure and focus of this thesis, so should be clearly stated at the outset. The limitations in available literature impose needs for inductive methods and exploration.

Perhaps the absence of literature is pronounced due to specialised, necessarily unique, aspects of emergency service work. Perhaps this is due to the traditional focus on traumatic reactions: this has certainly covered a diversity of populations, but these have often been more identifiable 'victims.' For example: battered wives, prisoners of war, victims of riots, and even witnesses of riots on TV. Soldiers and other combatants are a particularly well-known example.¹ Traumatic reactivity in 'volunteers,' by contrast, is perhaps less persuasive as a focus precisely because they take positive, voluntary action to expose themselves to traumatic situations. Given this is on a repeated basis the volunteer population becomes even less persuasive as a subject of study.

It should also be stated at the outset that the above studies have tended to emphasise the more severe traumatic reaction, post-traumatic stress disorder, or PTSD. Post traumatic stress, which is potentially equally distressing, has not been emphasized despite the fact it may be conceptualised as a continuum from PTSD. Work-trauma study has particularly been restricted, if unintentionally, to non-scholarly and organisation-specific reviews by solo emergency services.² In many ways - other than the 'they're all volunteers' argument - this seems paradoxical: given the extensive interest in

PTSD since the early 1980s, why should related concepts, potentially affecting a far wider range of victims in potentially equally distressing ways, not have progressed at nearly the same rate?

It should be noted that such a focus is changing. 'Helpers' are now seen to require psychological assistance in performing their job as much as victims (eg, Paton, 1994). 'Acute stress disorder' diagnosis has been added to DSM (Diagnostic and Statistical Manual of Mental Disorders, American Psychiatric Association, Washington DC). There is a growing awareness in most emergency service communities about traumatic reactions, and the impact this can have on personnel. But in answering the question, "Why study work-trauma within a cross-cultural framework?" it should also be noted that this focus will remain odd if it continues to be organisation-specific and ethnocentric.

A cross-cultural understanding of traumatic reactivity will elucidate not only the validity of models and understanding in 'the far corners' mentioned by Poincare, but also provide exploratory examination of cultural variables at a general level. It will determine whether the trauma response is a unique field of the human psyche or whether it is culturally determined. Cross-cultural focus will not only rectify what is odd about the study of traumatic reactions. It is also an opportunity to apply understanding 'in the field'. A trend in cross-cultural research in general psychological stress has been to study or to use students. Often these studies have been in the laboratory.

There are inevitable limits in applying the findings of these studies. Students tend to have above-average levels of education, life experience, sensitivity to emotional disclosure and general lucidity (eg, Bond and Cheung, 1983). This is quite different from emergency service personnel or others exposed to trauma. Moreover, given these experiments often concerned psychological responses to physical stressors or stimuli in the laboratory, this suggests several more limitations (eg, Bond, 1988; Draguns et al, 1971; Jahoda, 1988; Lazarus et al, 1962, 1966; Martin, 1989; Neufeld, 1989; Kuo, 1988; Triandis, 1988. For two more recent reviews of this approach see also Laux and Vossell, 1982; and Neufeld, 1989).

These studies raise a number of useful methodological questions about psychological stress in a cross-cultural context. For example: on the validity of self-report data amongst differing occupational groups (eg, Doi, 1986; Ho, 1986; Laufer, 1988); the responses of students versus adults (eg, Shek and Cheung, 1990); how reliable is data based on translation; cultural differences in understanding, and reacting to, symptoms; different norms of self-expression, or 'emotional disclosure' (Pennebaker et al, 1988b); variations between student groups (medical versus social science versus engineering readers etc.) and cultures etc.. However, they tend to avoid specific cultural factors which might be explaining the dramatic empirical variations. In so doing, they begin to answer the question: "Why study work-trauma within a cross-cultural framework?"

The future of work-trauma studies in the emergency services

In the following section, the eco-systemic model of work-trauma is reviewed. The theoretical link with cultural differences is discussed. First, though, we describe eight key, practical answers to the question of "Why study work trauma within a cross-cultural framework?"; of which (8) is clarified in some depth. This concerns cultural differences which impact our whole understanding of work-trauma.

1. **Interest in 'performance benefits' by emergency services.** First, outwith a specifically theoretical understanding, emergency services throughout the industrialized world are traditionally receptive to, and curious about, research (and related interventions) which benefit work performance. Besides the fact emergency services (fire services) '...[are] a profession very much under public scrutiny' (Paton, 1989a), this is probably a reflection of legal requirements. Emergency services throughout the industrialized world must ensure personnel perform at maximum efficiency.

Research about emergency service work and personnel is therefore welcomed in quite diverse areas. This can be from personnel management to technical and chemical knowledge, traditional training methodologies, to even quite abstract training in self-mastery and meditation. In the case of work-trauma management, which has been demonstrated in US (United States of America) emergency services to reduce absenteeism and even increase morale and some occupational performance indicators, the 'performance benefits' are increasingly apparent.³ (See, for example, Cooper et al, 1989; Duckworth, 1990; Herrick, 1992; Medd, 1991; Novaco et al, 1989 etc.) Interest in traumatic reactivity is probably enhanced by awareness of psychological phenomena such as burnout or increased anxiety and depression symptoms. Work-trauma tends to be a perceived, if not necessarily logical, extension.

2. **Interest in the activities of other emergency services.** Second, related to the above, emergency services tend to be interested in other emergency service research work. The police in the US and UK (United Kingdom of Great Britain & Northern Ireland), for example, have sustained reasonably symbiotic interest in traumatic reactions at work for some time.⁴ Other emergency service workers, such as fire-services and paramedics are catching up.

They were traditionally perceived to have the unique coping resource of the watch. This ensured cohesive social support in the appraisal of and coping with traumatic experiences. It has become clear this traditional view is erroneous and, in fact, there are a diversity of stressors to which all emergency service workers are exposed. Thus, the interest in stress and the effect of traumatic stressors will inevitably be applied in other emergency services (Anzai, 1991; Brindley, 1989; Huffman, 1983; Innes and Clarke, 1983; Medd, 1991; Miletì, 1983; Mikami and Imeda, 1985; Okabe and Hirose, 1985; Shiobera and Katagiri, 1986 etc.).

3. **Interest in the 'fact' of analogous traumata.** Third, and again at the practical level, emergency services throughout the industrialized world are increasingly exposed to similar types of

CI (critical incidents). One consequence of this is the need to utilize similar, complex management techniques and structures. These imply, probably necessitate, increasing interaction and shared research programmes (enforcing point 2 above). Simply speaking, emergency services tend to borrow management techniques and approaches from each other.

This merely increases the importance of understanding cultural factors which impact the application of 'borrowed' programmes. Questions will, or should, be raised about the applicability of work-trauma data in different cultural settings. The same holds for other interventions such as training programmes and leadership development. Does what applies in the North American cultural setting apply in the Latin American setting just because there is the fact of analogous traumata? Are British and Japanese fire-fighters experiencing intrusive imagery for similar reasons?

4. Interest in academic understanding about traumatic reactions.

Fourth, at a more theoretical level, academics are increasingly involved in disseminating knowledge about traumatic reactivity, plus its management, to emergency services. Partly, no doubt, this has arisen because emergency services, for the reasons stated above, finance projects and consultancy in return for the 'performance benefits' they need. Emergency services have among the more extensive research budgets in the public sector. Partly, it is probably a reflection that 'work-trauma' is perceived by emergency service personnel, rightly or wrongly, as a clinical condition properly and best 'owned' by experts outside the emergency services. (This in itself is an important issue as it suggests understanding traumatic reactions and interventions in chemical, physiological terms will render a focus on organisational and cultural issues less likely.)

The research which this study is based on are cases in point. They illustrate how academic projects are perceived to have practical benefits for emergency service personnel in quite different cultural settings. Even in Japan, often said to be reticent in adapting to new psychological work, this seems

apparent.⁵ Again, it is tangible 'performance benefits' which drive the likely success. In future, interventions in work-trauma by academics may result in a broad sweep of concern: from enhanced pro-active and preventative management skills and training to nurturing awareness in personnel of the causes and symptoms of traumatic reactivity.

5. **Interest in changing attitudes towards work-trauma amongst emergency service personnel.** Fifth, both at a practical and theoretical level, emergency services are themselves already nurturing an interest, probably 'concern' is more appropriate, that there is a latent potential in some personnel for traumatic reactivity to become talismans of the macho work ethic. Some may seek, in effect, the reversal of their present position of disparaging traumatic reactions as 'Doesn't bother me!' Instead, they may seek to 'have work-trauma' or, in more severe cases, 'have PTSD'. This hypothesis has only recently been suggested by academics such as Healy (1992) and Marmar and Freeman (1988) on narcissistic regression and PTSD but it is a clear concern in many emergency services. (The full implications of this for financial compensation are discussed below, in [7].)

6. **Increased duality of tasks by emergency service workers.** One reason for changing attitudes towards traumatic reactivity in some personnel is that at the present time, throughout a diversity of cultural settings, we are seeing the early stages of a task shift, or enlargement, in emergency service work. This may be stimulating a related perceptual shift in some personnel. As the following chapter details, in large-scale disasters as much as day-to-day incidents most emergency service personnel must now, and increasingly, act as both 'rescuer and saviour' (the traditional role) but also perceive themselves (a new role) as 'failed preventer'. The dual role is founded on increased government expectations that emergency services perform as much 'prevention' as 'cure'. The new role demands prevention of a wide range of accidents: from kitchen fires, to domestic fires, road traffic

accidents and even broad industrial safety issues. Yet, personnel must also save lives, or recover bodies, when these same disasters or accidents occur. The dual requirements of all emergency services are evidenced in sub-services such as fire prevention and community education, seen in most emergency services.

This duality may not be extreme for all emergency services. Some police and paramedic type emergency services, for example, tend to be exposed to traumatic experiences in a closely defined, and limited, situation-reactive role. Murder, suicide and family violence, for example, are far broader aspects of prevention than an emergency service can prevent or manage. As such, traumatic exposure probably engenders different emotions (James, 1988).⁶

Dual perception is also not apparent in all emergency services in all cultural settings for all situations. The Lockerbie disaster in the UK is one example of incidents that all emergency services must now address in all cultures, but shows how traumatic and unexpected critical incidents can happen rapidly and affect a substantial number of civilians and operational personnel, and where there is no real perceived, or possible, preventative role. Similarly, one reason why Japan has become interested in the effects of traumatic reactions is the prevalence of inevitable 'Class A' risks (where 'significant' loss of life may occur in a short amount of time) in their densely populated urban areas. There is also a constant exposure to earthquakes in Japan and other countries which, as shown later, probably have fundamentally severe effects on the environment and risk context within which emergency service personnel must work.

However, the methodological implications of perceived duality remains potentially significant and, given that all modern emergency services will tend to experience this in some way, culturally universal. We are now in an age where data collected from any emergency service may be inferred to be potentially influenced by this emotion (eg, Alexander and Wells, 1991; Medd, 1991; Mitchell, 1990; James, 1988).

Inevitably this suggests, as Martin (1992) argues in his seminal review of data acquisition techniques, a necessary emphasis on specific contextual - as well as cultural - factors:

"...[there are] three separate domains that need to be sampled in stress research: [1] characteristics of the environment (the independent variables); [2] characteristics, resources, and actions of the individual such as personality variables, appraisal, cognitive styles, social support, and coping strategies (the moderating variables); and [3] the effects of this stressful transaction on the individual, such as physiological and psychological illness outcomes (the dependent variables). Although researchers differ in their use of terminology (eg, some use the term 'stress' to refer to the independent variable while others use it for the dependent variable), most would agree that these three classes of variable may be conceptually distinguished" (1992: 196-197).

These contextual factors that are unique to each cultural setting in their form are explored in detail in the following chapter.

7. **Financial-legal implications of compensation for emergency services.** Although the above perceptual shift may appear intangible (and has yet to be empirically validated), another reason why emergency services will continue an interest in traumatic reactions is a more tangible financial-legal reason: personal damages. In part, this trend is probably derived from the 'autonomous' nature of PTSD. This implies a reaction can occur in any individual independent of pre-existing emotivity.⁷

In part, though, this effect may be another reflection of the perceptual shift emergency service workers are experiencing: 'from rescuer to rescuer-and-preventer.' Although some degree of personal and psychological demand is beneficial for personal development, it is now apparent to many that an extra benefit of 'work-trauma reactions' is financial compensation. Although unexpected by some, this is historically and culturally universal.⁸

Given the financial implications of negligence in managing work-trauma, most emergency services are inevitably concerned. In a sense, this makes their focus on both 'performance benefits' and damage limitation. They can probably agree that the benefits of 'taking an interest' is suggested to reduce stress during the training of US Marines (Novaco et al, 1988). They realize that work-trauma can have a destructive effect on the cohesion and morale of their work-force.

This said, the response of emergency services to traumatic reactions in their personnel in some cultural settings has been (predictable) hostility. Several articles in international emergency service journals have raised concerns about the validity of PTSD. They question if the autonomous nature of the disorder is valid, point out its unique nature among DSM diagnoses.

And they perceive a greedy minority claiming to be affected by an incident '...to the point at which it starts to interfere with their ability to cope effectively with either their job or their non-occupational life' (Hargreaves, 1992). They do not think, or argue, that traumatic reactions are an 'imaginary ailment'. But the fact that personnel seek financial compensation for a psychological reaction that is part-and-parcel of their job is disparaged:

"...[it is] better for all concerned that there should be tests applied by those medically qualified to detect any propensity to this possibility [of susceptibility to work-trauma] and these tests should be introduced into recruitment procedures..." (1991: 23).

"...No-one would wish to see a return to the attitude which prevailed in the trenches of the First World War, when victims of what we now know as 'post traumatic stress disorder' were dismissed as being of not the right 'material.' But we must be careful that the pendulum does not swing too far the other way, or we will be in the same unhappy situation as America, where legal blame is attributed for every human misfortune, and damages for stress-related injuries are an everyday occurrence..." (Fire, February 1991: 3)

8. Extensive evidence on cultural differences but no acknowledgment in DSM diagnostic criteria. The final reason for "Why study work-trauma in a cross-cultural framework?" is methodological and sets the base for this thesis. Strong words have been used to describe the lack of cultural understanding/acknowledgment in trauma research.⁹ Definitions used for PTSD in 1983 and 1994, and acute stress disorder in 1994 (see Appendix II for text), make no mention of cultural factors. There is little evidence that cultural factors are probably important.

Yet writers on culture and cultural differences have persistently questioned the validity of this approach. They have argued that culture or as it is often referred to the 'concept of culture' operates at a number of fundamental layers.¹⁰ Although each are, in turn, fundamentally different from the other, they are universal in their impact on psychological processes, or what Hofstede called 'the software of the mind' (1991: 4).

Without pursuing the subtleties of this debate here (see Trompenaars, 1993: 1-11 for a summary and a review of definitions), for the purposes of this study and also future DSM definitions of traumatic reactivity it must be considered crucially important that acknowledgement is made of two factors in the cross-cultural debate:

- First, that there are certain differences between national culture and organisational culture which researchers need to explore. Here, researchers must note that national culture carries a broad connotation of psychological state and organisational culture a specific connotation of interaction with others in limited conditions. Reber defines organisational culture as "The system of information that codes the manners in which the people in an organized group...interact with their social and physical environment" (Reber, 1985: 170); Hofstede defines national culture as a broader medium for distinguishing broad groups or entities: "...the collective programming of the

mind which distinguishes the members of one group or category of people from another" (1991: 5).

- Second, and somewhat related to the difference of organisational and national culture, we need to acknowledge that one of the underlying problems with the concept of culture when applied at a national level is that it assumes a homogeneity which is not always evident. Again, this brings us to the issue of layers within culture. As Hofstede (1991) notes, there are layers permeating the whole of national cultures, from the culture of different generations to different regions, which may render national entities little more than geographical collections whose only commonality are passports (1991: 63). Indeed, given this potential weakness in cultural homogeneity, emergency services may in fact logically be '...a common group with common cultural traditions and a sense of identity' which on strict logic, may make them a trans-cultural ethnicity! (Reber, 1985: 251).

Inevitably, these points suggest a central issue in the DSM definition and indeed in the broader issue of cross-cultural research in traumatic reactivity. Are there cultural universals? And if so, what is universal to organisations? And what to national cultures?

Moreover, what is specific to certain cultural settings? Are some psychological experiences endemic to human experience? Is work-trauma experienced in identical ways in all cultural settings?

In some senses there are cultural universals. Berkman (1985), for example, suggested there may be culturally universal mediating factors of social support on morbidity and ultimately mortality. He considered three cultural settings: California (note sample = Japanese-Americans), Israel and the UK. His work raises a question: if social support is a culturally universal mediating factor works in morbidity, might it not also be for intrusive imagery, depression or other factors associated with work-trauma?

How are traumatic reactions expressed in different cultural settings?

Triandis (1988) has also suggested cultural universals exist. He considered some forms of expressions and needs, and suggested the following were culturally universal:

TABLE I: SIXTEEN TYPES OF CULTURALLY CONSISTENT EXPRESSIONS AND NEEDS

	NEED FOR STABILITY ('Being')		NEED FOR GROWTH ('Becoming')	
	REACTIVE	ACTIVE	REACTIVE	ACTIVE
AFFECTIVE GOALS				
Internalised	<i>Ego-defense</i> †	<i>Tension reduction</i> #	<i>Identity</i> †	<i>Attraction</i> †
Externalised	<i>Repetition</i> #	<i>Expression</i> #	<i>Contagion</i> #	<i>Assertion</i> †
COGNITIVE GOALS				
Internalised	<i>Categorization</i> †	<i>Consistency</i>	<i>Utilitarian</i> †	<i>Stimulation</i> †
Externalised	<i>Induction</i> †	<i>Hermeneutics</i> †	<i>Template</i> †	<i>Autonomy</i> †

'Probably' culturally universal
 † 'Somewhat' culturally inconsistent
 ‡ 'Greatly' culturally inconsistent
 Source: Adapted from Triandis (1988: 126).

How far can this be taken? Can we infer that traumatic reactions are expressed in analogous ways? And coped with in analogous ways?

There are several limitations to the cultural 'universal' approach. First, the above work cannot be taken too broadly. Berkman's work remains un-substantiated (in common with much literature on mortality, see Appendix XXIV). Triandis suggests evidence for culturally universal expressions/needs must be taken cautiously. Of the sixteen expressions he outlined, note only five are potentially 'greatly' culturally universal.

Second, there is the simple and inevitable question of how many cultural settings there actually are - and where the above would need to be applicable. At first sight, the literature on work-trauma tempts an assumption there are only three cultural settings! The North American, Western European and Australasian cultural settings (which are also, of course, anthropologically analogous, being predominately Caucasian). But inevitably this is too simplistic.

Even using a relatively simple attitudinal differentiation, Ronen and Shenkar (1985) suggested global attitudes differentiated 42 countries worldwide into eight cultural clusters (plus four 'independent' countries which did not logically cluster):

TABLE II: NINE CULTURAL CLUSTERS USING ATTITUDINAL DIFFERENTIATION

CULTURAL CLUSTER	EXAMPLES OF COUNTRIES WITHIN THE CLUSTER
1. Arab	Saudi Arabia, Oman
2. Near Eastern	Greece, Turkey
3. Nordic	Finland, Sweden
4. Germanic	Austria, Switzerland
5. Anglo	United Kingdom, United States, Australia
6. Latin European	Spain, France
7. Latin American	Mexico, Argentina
8. Far Eastern	Hong Kong, Taiwan
9. Independent	Brazil, India, Israel, Japan

Source: Adapted from Ronen and Shenkar (1985).

Second, we are also faced with a question on how cultural differences in values impact individual development and the developmental process. How do cultural differences in individual values impact the environmental impact of work-trauma, such as social support and alcohol and tobacco use? How do these value differences impact the recovery stage?

To answer this question, the work of Hofstede (1991, 1983, 1980a, 1980b) on cultural 'differences,' or as he terms them

'consequences,' is a notable work. This is often quoted in cross-cultural work, probably due to the sample size as much to some subsequent works which have found these cultural consequences reliable (eg, Trompenaars, 1993; Shackleton and Ali, 1990). Although some rarely commented limitations on Hofstede's work should be noted,¹¹ his four dimensions of values which delineate cultures are an inevitable starting point for considering cultural diversity; for answering the question "Why study work-trauma in different cultural settings?" Consider the well-known values Hofstede delineates:

1. **Individualism versus collectivism:** the prevalence of family values and orientation versus a more social, non-family orientation;
2. **Power distance:** which describes the degree to which cultures can accept unequal power distribution;
3. **Uncertainty avoidance:** the degree to which cultures feel threatened by uncertain situations and will - in consequence - try to avoid them;
4. **Masculinity versus femininity:** the prevalence of social values such as assertiveness and material acquisition versus a more relationship-oriented and concern for others value system.

How can these impact work-trauma? Can it be that cultural differences in masculinity influence the macho ethic in some cultural settings more than others? And that this impacts the coping resources used in response to traumatic experiences? Can it be that high or low cultural tendency towards individualism impacts the guilt volunteers feel at under-performance in CIs? Can cultural differences in avoiding uncertainty impact the way traumatic incidents are perceived?

Conceptually, we may infer that if these cultural differences are not fundamental and impactful on the process of work-trauma, we need at least to be certain. If the position of Berkman or Triandis is to be fully dismissed - or accepted - we need to know how these cultural differences impact work-trauma. Can we be certain that these cultural differences do not influence the experience, management and resolution of traumatic experiences?

In statistical terms, there is a challenging case to answer. The following table provides an empirical indication of how Hofstede takes these values and quantifies them for Japan and Hong Kong as well as the Anglo cultures of Australia, US and the UK. Based on this data, Hofstede described the UK cultural setting as 'High individualism'; Hong Kong as 'Low uncertainty avoidance' and Japan as 'High uncertainty avoidance; high masculinity; a strong uncertainty avoidance country...[with] few formal rules and laws by Western standards. Japanese society is [clearly] more collectivist than Western societies...rules are implicit and informal rather than formal" (1991: 138).

TABLE III: KEY INDICATORS OF HOFSTEDE'S CULTURAL VARIABLES

	INDIVIDUALISM COLLECTIVISM		POWER DISTANCE		UNCERTAINTY AVOIDANCE		MASCULINITY FEMINISM	
	Score	†Rank	Score	Rank	Score	Rank	Score	Rank
UK	89	(3)	35	(42=)	35	(47=)	66	(9=)
Japan	46	(22=)	54	(33)	92	(7)	95	(1)
Hong Kong	25	(37)	68	(15=)	29	(49=)	57	(18=)
US	91	(1)	40	(38)	46	(43)	62	(15)
Australia	90	(2)	36	(41)	51	(37)	61	(16)

† Based on values for 50 countries
 Source: Adapted from Hofstede (1991).

The above provides a framework which suggests there are, contrary to Berkman and Triandis, actually quite compelling differences between cultural settings, indeed even within the cultural clusters proposed by Ronen and Schenkar.

How far can the work of Hofstede be taken in outlining a framework for future work-trauma studies? As with the work of Berkman and Triandis, there are limitations. Certainly, the work delineates broad cultural values that may be impacting work-

trauma. But the work of Hofstede falls short of documenting the organisation. The immediate work-place context.

For an understanding of the work-place context, the following tables (adapted from Trompenaars, 1993) are insightful. Although drawn from a smaller sample than Hofstede,¹² and from only 47 countries (versus Hofstede's 60) the data provides a greater organisational focus on cultural differences in values which, in some ways, is more precise than Hofstede.

Trompenaars suggests, for example, that little differentiates Hong Kong and UK cultural setting in their preference for values of individual freedom but that much differentiates their attitude towards the value of individual responsibility. In this, Hong Kong not only exceeds the UK, but also Japan.

TABLE IV: TROMPENAARS' CULTURAL PREFERENCES FOR INDIVIDUALISM

(PREFERENCE FOR...)	INDIVIDUAL FREEDOM		INDIVIDUAL DECISIONS		INDIVIDUAL RESPONSIBILITY		TO BE LEFT ALONE AT WORK	
	%	†Rank	%	Rank	%	Rank	%	Rank
UK	66	(9)	36	(11)	36	(36=)	78	(16)
Japan	60	(16)	24	(29)	36	(36=)	69	(27)
Hong Kong	69	(7)	-	(-)	45	(14=)	45	(47)
US	79	(1=)	40	(6=)	40	(23)	83	(9)
Australia	70	(6=)	-	(-)	-	(-)	97	(1)

† Based on values for 46 countries
 Source: Adapted from Trompenaars (1993).

Trompenaars' work is also useful as he explores cultural values around honesty, which impacts our understanding of self-expression. This is discussed later in this thesis (chapter five). He suggests Japanese tend to be relatively more honest in their ethical and personal systems but potentially less so in their dealings with superiors in the work-place, who they are least likely to refuse a request for personal assistance.

TABLE V: TROMPENAARS' CULTURAL INDICATORS OF HONESTY

(REFUSAL TO...)	WRITE A FALSE REVIEW		PROVIDE AN INSIDER TIP		EXPRESS BEING UPSET		HELP THE BOSS ON REQUEST†	
	%	†Rank	%	Rank	%	Rank	%	Rank
UK	51	(28)	65	(10)	71	(4)	78	(16)
Japan	69	(7=)	87	(1)	83	(1)	69	(27)
Hong Kong	41	(35)	47	(28)	55	(7)	45	(47)
US	64	(15=)	83	(3=)	40	(9)	83	(9)
Australia	65	(12=)	71	(7=)	-	(-)	97	(1)

† Based on values for 46 countries
 ‡ With house painting over the weekend
 Source: Adapted from Trompenaars (1993).

Trompenaars also notes there are broader issues beyond the organisation. He notes divergent values in self-control and general environmental (social) issues. This is particularly interesting given the coping skills required for traumatic appraisal, where fatalities need to be incorporated in psychological schema. Although the occupational circumstances of all emergency service personnel points towards increasing commonality in at least some aspects including traumata, the cultural settings within which emergency service personnel operate and where their psychological schema about the appraisal of trauma develop and are applied, are anything but common - or even convergent (Kuo, 1988).

TABLE VI: TROMPENAARS' CULTURAL INDICATORS OF SELF-CONTROL

(BELIEF IN...)	THE SYSTEM OVER GROUPS		ABILITY TO CONTROL NATURE		CONTROL OVER FATE		FUNCTION OVER PERSONALITY	
	%	†Rank	%	Rank	%	Rank	%	Rank
UK	31	(50)	35	(20)	75	(15)	93	(14=)
Japan	36	(49=)	10	(52)	56	(35)	80	(41=)
Hong Kong	75	(1)	36	(19=)	69	(24)	89	(30=)
US	54	(26)	14	(38)	89	(1)	92	(20=)
Australia	57	(22=)	-	(-)	81	(7=)	98	(6)

† Based on values for 46 countries
 ‡ With house painting over the weekend
 Source: Adapted from Trompenaars (1993).

Cultural differences and theoretical understanding of traumatic reactions

In short, the above suggests there are cultural differences that are potentially fundamental. Whether these can be at cultural levels as well as organizational levels, they need to be addressed in the study of traumatic reactions. They need to be eliminated, or validated, in our understanding.

In a sense, though, the data is not controversial. Ad hominem, cultural differences are to be expected. In this section, therefore, we review how some of the above cultural differences can impact traumatic reactions. This section describes and assesses the eco-systemic model proposed by Peterson et al (1991).

Whilst not necessarily applicable to acute stress disorder, the model is valuable as it integrates previous approaches to understanding traumatic reactions such as the psychosocial approach (Green et al, 1985) and ideas on classical conditioning (Lazarus and Folkman, 1984b). Given it is a de facto composite of existing theories/ideas the model is an inevitably useful starting point for cross-cultural theoretical understanding about work-trauma. It represents not only a framework for understanding cultural

differences influential in the process of work-trauma but also for a discussion of the future direction of research about cultural variables in work-trauma (Chapter five). It is this key - if unintended - value of the eco-systemic model which makes it inevitably useful when asking "Why study work-trauma in a cross-cultural context?".

There are six stages to the eco-systemic model (tabulated below). Next to each stage are authors whose work broadly or specifically relates to that stage.

TABLE VII: THE ECO-SYSTEMIC MODEL (PETERSON ET AL, 1991)

STAGE	PROCESS	ASSOCIATED AUTHOR
I	<p>THE INITIATION OF A TRAUMATIC EXPERIENCE</p> <p>The first factor to influence traumatic reactions is perception of traumata. Variables include: '...length and intensity of trauma, degree of life threat, bereavement, role of survivor (active versus passive), type of trauma (man-made or natural)...[and] the idiosyncratic specifics of the trauma'.</p>	<p>Chemtob et al, 1988; Collie, 1990; Mazor et al, 1990; Marmar and Freeman, 1988; Donaldson and Gerdner, 1978; Duckworth, 1986; Escobar, 1987; Laufer, 1988.</p>
II	<p>POST-TRAUMATIC COGNITIVE PROCESSING</p> <p>This is psychosocial in nature. It involves processing the trauma within personal coping skills.</p>	<p>Green et al, 1985; Hartman and Burgess, 1978; Paton and Mitchell, 1990c; Coyne and Lazarus, 1980; Newton, 1989; Parkes, 1986; Richard and Krieshok, 1989.</p>
III	<p>ENVIRONMENTAL IMPACT</p> <p>The effects of the trauma also effects others, apart from the victim. E.g., family members and networks of social support.</p>	<p>Figley, 1978a; Argyle, 1986; Baum et al, 1982; Dean and Nan, 1977; Cobb, 1976; House, 1991; McCrae, 1984.</p>
IV	<p>EXTENT OF CLASSICAL CONDITIONING</p> <p>The effects of trauma on individual responses. E.g., increase in avoidance behaviours. Individual differences and cognitive stress processes are an important area for counsellors or peer supporters (Eckenrode, 1984; Eysenck, 1985a, Lazarus, 1966). They need to understand what individual differences influence the stress process (Paton et al, 1992e, 1990a). Factors can include personality, marital status, rank and occupational experience.</p>	<p>Lazarus and Folkman, 1984b; Lee and Hsu, 1985; Parkes, 1986.</p>
V	<p>INDIVIDUAL PERCEPTION OR COGNITIVE APPRAISAL</p> <p>a) Specific appraisals of trauma. b) Specific appraisals of ability to cope and location of trauma in life-experiences. c) Specific effect of trauma on individuals assumptive world.</p>	<p>Janoff-Bulman, 1992, 1989, 1985; Ullman and Brothers, 1983; Epstein, 1989; Hartman and Burgess, 1978.</p>
VI	<p>RESOLUTION TO TRAUMA</p> <p>Based on generalised fear, withdrawal, anger, dissociation and embracing the trauma. 'Non PTSD outcomes, such as major depression, can also occur' at this stage (1992: 103). a) mild, short-lived symptoms. b) return to previous level of functioning. c) personal growth.</p>	<p>Nicholls and Czirr, 1986; Zeiss et al, 1985; Weinberger et al, 1979.</p>

Source: Derived from Peterson et al (1991).

Stage I

Stage I of the eco-systemic model concerns exposure to traumatic stimuli. At this stage, idiosyncrasies or characteristics of the traumatic experience such as the victims involved, the cause of the incident and the warning available are influential. Given the diversity of traumatic possibilities for emergency service personnel, it is important to note that incident features are significant in all stages of the model, including resolution.

Immediately, we see that the cultural values outlined by Hofstede and Trompenaars are important. It is here where we can expect cultural variables in, for example, the predictability or the extent of traumatic stimuli to be influential. The variables 'Ability to control nature' and 'Control over fate' identified by Trompenaars are particularly important (amongst several). Personnel will probably ask: Given the idiosyncrasies of this incident, could I have prevented this? Is it natural?

These idiosyncrasies are particularly salient given the earlier discussed dual role. Personnel in some cultural settings with high individualism may perceive a 'double-emotion' at an incident's occurrence (ie, as a reflection of failures in accident prevention) as well as despair at the consequence of the incident (ie, fatalities as a reflection of failure to perform effectively as and emergency responder). Personnel in cultural settings where there is a high uncertainty avoidance may be more frustrated at their own or their organizations lack of preventative efficacy etc..

The physical role the victim takes during the traumatic event is also important. All 'helpers' (using Paton's term) may perceive an un-taken opportunity to save lives, but will this have equal effect in each culture? It may have potentially more severe implications in cultural settings where, as Hofstede suggests, individualism is a more apparent value. This inevitably impacts 'the crucial subsequent stages of healing' (Peterson et al, 1991: 97). Guilt at personal survival which can also impair adaptation in Stage VI is another cultural factor (individual responsibility).

We should note here that the physical role taken by victims during a traumatic event has often occurred in the literature. It is suggested to have both long-term as well as short-term effects. Longitudinal data on traumatic reactions in ethnic-European cultures by Antonovsky (1971) records a 'concentration-camp syndrome' based on survivor guilt amongst Polish Jews resident in the US. Survivors exposed to the trauma of European concentration camps expressed a guilt at surviving when others had not. Psychological symptoms, including depression and intrusive imagery, were observed twenty-five years after the trauma. Again, this would suggest cultural factors are potentially fundamental.

We should also note that in stage I 'guilt' at performance can have severe implications in highly individualistic cultures where a duality of perceived purpose occurs. MacPherson (1987) records the experience of a US veteran from the Vietnam war where, although the role of the victim was more active (he was forced to 'murder' non-combatants), the result was suicide (1987: 431. See also Huie (1963) for indications of latent effects of guilt in US combatants from WWII). This contradictory experience, and the latency observed by Antonovsky, adds further support to the probability that victims appraisal of their role during the traumatic event is according to certain cultural values. (See Maida et al, 1989; Nicholls and Czirr, 1986; Zeiss et al, 1985; Goodwin, 1987; Leifer, 1988; Herrick, 1992; Laufer et al, 1978. See also Livesay, 1989; McClelland, 1988, 1989 for an example of British cultural pressures in this area.)

Stage II

The same logic in linking cultural differences with the model can be applied in subsequent stages. The initial coping process used by victims of traumatic experiences is covered by Stage II of the ecosystemic model. This stage entails immediate cognitive adaptation to trauma. The victim incorporates the trauma within their existing cognitive schema (Peterson et al, 1991). This is outlined more

closely by the psychosocial model of Green et al (1985), but is inevitably influenced by a number of cultural factors.

This stage is relevant to emergency services in different cultures because it concerns the process of appraising the action taken during a CI, and also the final meaning of the traumatic events with personal schema (Parkes, 1986). The model suggests victims contemplate their action during the traumatic event, by asking questions such as 'Was my performance good enough?', 'Was the event a natural part of life and death?' and 'Could I have done more to save lives?' These questions represent the beginning of the appraisal process and the foundation of adaptation to work-trauma (Leifer, 1988). According to Hofstede et al, in some cultures the questions may carry greater or lesser weight within the schema of the victim.

Considering this stage is particularly relevant for emergency services as appraisal is usually based upon group discussion (Livesay, 1989; Hildebrand, 1984 etc.). Thus, the above questions are often asked by, and responded to, in settings where group norms are enforced and where work colleagues have also been exposed to the same trauma. Hofstede notes the following about anxiety engendered in different cultures, and how it is coped with:

"The more anxious cultures tend to be the more expressive cultures. They are the places where people talk with their hands, where it is socially acceptable to raise one's voice, to show one's emotions, to pound the table. Japan may seem to be an exception in this respect; like other Asians, Japanese generally behave unemotionally in Western eyes. However, in Japan...there is the outlet of getting drunk along with colleagues after working hours. During these parties, men release their pent-up aggression, even towards superiors; but the next day business continues as usual. Such drinking bouts represent one of the major institutionalized places and times for anxiety release" (Hofstede, 1991: 312).¹³

Here, we need to note four key points:

1. The operational conditions in all cultural settings necessitate that emergency service personnel must remain on call if a CI takes place mid-way through a shift.
2. This may influence the appraisal of trauma as group norms of appraisal can result in the immediate post-trauma period. Often, initial appraisal in the group context can be different from initial appraisal in the personal, individual context (Folkman, 1984a, 1984b, Coyne and Lazarus, 1980; Newton, 1989).
3. In all cultural settings emergency service personnel tend to use coping skills based on group norms. This is exemplified by black humour, frequent out-of-work socialisation and communal increases in alcohol use. (See Paviour, 1987 for examples from the British cultural setting, and Nakamura, 1990b for examples from the Japanese cultural setting.)
4. It is during Stage II that early-stage intervention can be effective (Hartman and Burgess, 1978). Victims can be encouraged to appraise the trauma, and their action during the CI, in a positive way (Averill and Rosenn, 1972). This may serve to reduce the incidence of long-term trauma related illness (Unden et al, 1991). Therefore, the use of informal CI debriefing sessions can occur at this stage of the work-trauma experiences (Paton et al, 1992c, 1992d; Duckworth, 1990; Herrick, 1992; Farland, 1985; Ferguson, 1980).¹⁴

Stage III

Stage III concerns the environmental impact of the trauma, and is, again, clearly an area where cultural differences may be influential. The environmental impact of trauma establishes the framework within which resolution is achieved (Maida et al, 1989; McCrae, 1984; Baum, 1982; Figley, 1978a; McGrath, 1970). The environmental impact can

also influence illness levels (Unden et al, 1991) and the efficacy of counselling intervention (Robertson, 1988; Herrick, 1992).

The analysis of environmental impact is analogous to social support. This is because social support represents the environmental mechanism through which resolution in the stress process occurs (House, 1991, Cobb, 1976). Thus, social support represents the situational, rather than personal, framework of coping (McCrae, 1984).

This stage is particularly important to consider for emergency service personnel as their work and non-work support environment is unique in all cultural settings. They are consistently removed from social support outside the work-place such as partners or close friends, due to their shift system. As mentioned, they are also exposed to unique occupational and traumatic stressors which providers of social support outside the work-place do not experience (Paton et al, 1992d; Innes and Clarke, 1983) and can therefore not empathise with, potentially an important variable in the provision of efficacious social support.

These factors suggest unique influences on social support. Given an important aspect of social support is to empathise (House, 1991), providers of social support outside the emergency service environment are less likely to have an empathic understanding of trauma this places an emphasis on appraisal support from individuals within emergency services (Herrick, 1992; Livesay, 1988). This is enforced by cultural variations in the efficacy and style of social support (Argyle, 1986; Lee and Hsu, 1985; Shek and Cheung, 1990) which suggests that the limited experience of providers is a key reason why social support in reducing symptoms falls short of expectations: providers have limited experience (Cutrona, 1990; Dean and Nan, 1977; Falk et al, 1992; Haines et al, 1991).

Stage IV

Stage IV concerns classical conditioning. This stage represents the interaction of the victims existing schema (including any

'psychological vulnerability') with the psychological and emotional sequelae of exposure to trauma. This is an important stage of trauma analysis about which there is much still to be understood but it is at this stage that the background and cultural heritage of the victim is important. (See McClelland (1988b) and Payne et al (1989) for discussion.)

Inevitably at this stage, emergency services believe psychometric data can predict severe reactions. Thus, emergency services wish to assess the classical conditioning of personnel prior to trauma exposure (Roberts, 1985). This is explored more fully in the following chapter. The following table provides an indication of the variety of responses which can be influenced by this stage:

TABLE VIII: COPING STRATEGIES UTILISED BY EMERGENCY SERVICE PERSONNEL

TYPE OF STRATEGY	SYMPTOM OR STRATEGY	%†
On-Site Symptom	Immunity from suffering	37
On-Site Symptom	Shock	30
On-Site Symptom	Pushed to limit	30
On-Site Symptom	Inadequacy	30
On-Site Symptom	Helplessness	22
On-Site Symptom	Dependency on Others	19
On-Site Symptom	Crying Easily	19
On-Site Symptom	Worry About carelessness	19
On-Site Symptom	Pushed to Achieve	19
On-Site Symptom	Fear	12
On-Site Symptom	Feeling 'blocked'	10
On-Return Symptom	Lethargy	39
On-Return Symptom	Depression	37
On-Return Symptom	Anger	33
On-Return Symptom	Nervousness/Tension	33
On-Return Symptom	Altered Sleep Patterns	28
On-Return Symptom	Bad Temper	25
On-Return Symptom	Confused	17
On-Return Symptom	Worrying	14
On-Return Symptom	Bewilderment	14
On-Return Symptom	Hopelessness	11
Alterations in Social Life	Increase in Team Support	40
Alterations in Social Life	Decrease in Family Support	25
Alterations in Social Life	Difficult Social Life	17
Alterations in Social Life	Family Arguments	15
Alterations in Social Life	Marital Problems	14
Alterations in Social Life	Work Arguments	14
Alterations in Social Life	Loneliness	9
Alterations in Social Life	Social Withdrawal	6
Denial Based Strategy	Devotion of self to work	44
Denial Based Strategy	Thinking one event alone	25
Denial Based Strategy	Concentrating on things	23
Denial Based Strategy	Forgetting the episode	19
Social Support Strategy	Talking to Other Helpers	61
Social Support Strategy	Talking to Other People	25
Social Support Strategy	Seeking More Emotional Help	11
Social Support Strategy	Seeking More Instructive Help	11
Social Support Strategy	Talking to Family	11
Social Support Strategy	Talking to Friends	6
Social Support Strategy	Talking to Workmates	3
Feelings of Mastery	Viewing Realistically	58
Feelings of Mastery	Development of a Positive Attitude	50
Feelings of Mastery	Acknowledgement of Feelings	28
Feelings of Mastery	Sorting Out Irrationality	28
Feelings of Mastery	Working on Future Plans	22
Feelings of Mastery	Determining Meaning	22
Feelings of Mastery	Self Enhancement	19
Feelings of Mastery	Professional Enhancement	14
Others	Humour	55
Others	Mindfulness	44

Source: Based upon Paton (1989b).

Note: Based on exposure to disaster work

† % of subjects reporting this variable.

Stage V

Stage V represents the integration of the traumatic experience within the victims ideas, or schema, of themselves and the traumatic event. This stage represents, in essence, the re-building of a new self as the assumptions which underpinned the former self have been 'shattered' (Janoff-Bulman, 1987). At Stage V three areas are relevant:

1. First, specific appraisals about the event occur, such as the degree of life threat, the meaning of death, and the potential for self-injury.
2. Second, specific appraisals about the event's significance for the victim's life occur. This may include values that appraise the trauma in helping understanding life and personal transience. This determines how successful the victim is in adapting the experience of the trauma of 'losing' victims within their own personal and occupational development.
3. Third, specific appraisals are made about the trauma within the victim's coping schema, such as personal ability to appraise traumatic events and incorporate them within existing schema. This outcome has particular implications for emergency services in different cultures because it can result in maladaptive coping processes. A maladaptive coping process may include, for example, going to extreme lengths to avoid sight or sounds that reminded victims of the incident, or of alcohol and substance abuse. An adaptive coping response would be a more integrative approach (where the trauma is viewed as positive and professionally useful), although caution must be taken in this:

"...Another possibility is that the individual's personal theory of reality will accommodate too much. The result is that pathological changes in the personality structure will emerge (eg, resolutions based on embracing the

trauma). It is probable that when a person's basic beliefs are shattered they are more vulnerable to building new belief systems that have been contaminated by the traumatic event." (Peterson et al, 1991: 101 - 102).

The work of Hofstede would suggest cultural dimensions are associated with this resolution, impacting not only the recovery environment but the schema of the victim.

Stage VI

Stage VI of the eco-systemic model represents the ultimate adaptation to traumatic experiences; inevitably important for emergency service personnel in all cultures given their imposed 'performance effectiveness' requirements and need to achieve discernible results, highlighting the importance of adaptation to work-trauma ensures practical steps are developed in this important area (Craine et al, 1992; Lazarus et al, 1985; Arroba and James, 1990). Adaptation to work-trauma must be effective and not impair operational effectiveness (Paton et al, 1992d).

If resolution is maladaptive in individual personnel it will also have potential implications for the immediate work group. Paton et al (1992d) record an instance in a UK cultural setting where one fire-fighter was unable to perform rescue duties during RTAs (road traffic accidents). Although in this instance the work unit ensured the fire-fighter was confined to duties where exposure to body handling was avoided, in other instances this will not always be possible. This example represents a 'maladaptive coping response.'

The cultural differences in what Trompenaars describes as 'Wanting to be left alone at work,' although conceptualized as an occupational condition is a potential determinant of traumatic reactivity. This suggests that whilst Anglo culture have a high need for this experience, in Hong Kong (far Eastern) cultures the need is substantially lower. According to the model adaptation to trauma includes three alternatives:

1. Mild and short-lived symptoms, where the victim does not develop long-term reactions but are temporarily upset by exposure to the phenomena: "...in this type of positive outcome, the degree of disruption is minimal" (1990: 103).

2. An (instant) return to previous level of psychological functioning. Here, the victim is not affected by the traumatic exposure. There may be some residual effects, such as an exaggerated startle response or mild depression, but these are coped with effectively.

3. Utilisation of trauma for personal growth, where the victim integrates the experience of trauma within existing psychological schema to produce a beneficial reaction and adaptation: "...in this event, as a result of working through the trauma, people reach a new level of maturity and functioning" (1990: 103).

SUMMARY

In this chapter we have seen from writers on cultural differences such as Hofstede and Trompenaars that there are potentially several areas, and underlying values, where cultural differences can impact the process of work-trauma, as described by Peterson et al (1992) in the eco-systemic model. Cultural universals may occur, but there is also much cultural diversity. Whilst the eco-systemic model integrates past models/ideas of PTSD, theoretical approaches to traumatic reactions and general literature about work-trauma reactions to produce a 'more integrated understanding of the factors' (Peterson et al, 1991: 96), by applying it to the cultural differences suggested by these authors we see a clear picture of the gaps in the literature.

The eclectic approach of the model is valuable given the exploratory nature of this study. We are attempting to adapt, or meld, concepts of PTSD towards an understanding of how work-related exposure effects individuals in different cultural settings, subject to different cultural values, and to different organisational cultures. The outcomes of work-trauma may not be pathological, but may imply personal and organisational problems, which need to be understood within a cultural framework.

At this exploratory stage, the eco-systemic model illustrates the multi-faceted nature of the phenomena. Particular advantages are that the eco-systemic model incorporates the information processing model (Horowitz et al, 1979), the cognitive-action model (Chemtob et al, 1988), the behavioural learning model (Kean et al, 1985) and the cognitive appraisal model (Janoff-Bulman, 1985; Epstein, 1990). In combination, these represent the primary themes of theoretical analysis in traumatic reactions to date (Peterson et al, 1991: 69).

Of course, a key limitation of the eco-systemic model is that it does not acknowledge the cultural aspect of traumatic reactions. In the following chapter, therefore, we more carefully consider the available information about work-trauma and the legion of organisational and cultural factors which can impact work-trauma in

different cultural settings, and which must necessarily constitute a part of work-trauma understanding in the emergency services.

For the moment, to recap, in this chapter it is suggested that we are at present seeing a research based understanding of PTSD and general traumatic reactions developing which neither acknowledges nor accommodates cultural influences on reaction. In this chapter we outlined eight key reasons why for emergency services this needs to change:

1. Interest in 'performance benefits' by emergency services.
2. Interest in the activities of other emergency services.
3. Interest in the 'fact' of analogous traumata.
4. Interest in academic understanding about traumatic reactions.
5. Interest in changing attitudes towards work-trauma amongst emergency service workers.
6. Increased duality of tasks by emergency service workers.
7. Financial-legal implications of compensation for emergency services.
8. Extensive evidence on cultural differences but no acknowledgment in DSM diagnostic criteria.

ENDNOTES

¹ War studies offer potentially significant background details to work-trauma, particularly in the concept of recovery environments, a key goal of emergency services and an important part of the Peterson et al (1991) eco-systemic model. Post-traumatic stress disorder, for example, comes from research on Vietnam war veterans by Bourne (1979), and is conceptually analogous to work-trauma. War studies and other background from PTSD is fully reviewed in Appendix I.

² Research on work-trauma of fire-fighters, for example, has traditionally remained at low levels outside the US. In 1991, only 17% of UK fire services were 'beginning' to conduct research into fire-fighter stress symptoms & management (McLeod & Cooper, 1992). This compares unfavourably with the US, where approximately 85% of fire services already had stress-management programmes 'of some sort' (Hildebrand, 1986). Even allowing for a further 15% of UK fire services 'considering' implementing stress programmes in 1991, this still leaves the majority of UK fire services ambivalent to stress research.

³ **Absenteeism:** The unscheduled absence from work due to reasons based in work such as working environment and excessive work demands (White, 1979).

⁴ Although research on 'police stress' is certainly more advanced than research on fire-fighters in all cultural settings, it tends to be concentrated on US and UK cultural settings. A key theme in this literature is use of force. Early work tended to look at reactions within police forces to serious wounding/justifiable homicides (eg, Kobler, 1975; Milton, 1977; Kuykendall, 1981; Lester, 1984; Lester & Zunno, 1984 etc.). More contemporary work tends to consider decision-making processes used by police officers when facing the trauma of use of lethal force (eg, Applebaum, 1983; Brown, 1983; Geller, 1985). A part of this trend is different cultural factors affecting the decision-making process.

⁵ The support of the largest trade union in Japan (the Jichiro Municipal Trade Union) and the arrangements made through its offices with the National Association of Fire-fighters in Japan and Nagoya City Fire Department (one of the few Japanese fire services not affiliated to Jichiro) are particularly ground-breaking indications of a changing orientation towards work-trauma in Japan. The participation of Jichiro was particularly significant in presenting a credible research project to Japanese personnel as the literature suggests credibility is often denied to external researchers researching in Japan (Rudovsky, 1965; Vogel, 1979; Gospel & Okayama, 1990; Huffman, 1983; Iwata, 1989; Kamada et al, 1990, etc.).

⁶ Note that one contextual factor common to most emergency services is driving to incidents. This is suggested to be a severe stressor which causes concern to all emergency service personnel (Guilan et al, 1989, 1990; Paton et al, 1992d).

⁷ This is perhaps one reason for the interest of many emergency services with predictive psychometrics, which are often seen as a basis for 'weeding out' potential sufferers at the beginning of their career 'who may suffer unduly' from PTSD (Fire, May 1991: 23; Paton et al, 1993). To some extent, the concerns in emergency services at the 'genuine' prevalence of work-trauma reactions are beginning to be supported by research in the UK cultural setting. These have involved interviews with UK fire-fighters and have found consistent suggestions that exposure to traumata is not perceived as problematic amongst fire-fighters. Instead, occupational stress reactions and the demands of the work-place tend to be perceived as more severe (Paton et al, 1992; McLeod & Cooper, 1992; Livesay, 1989).

⁸ The history of compensation for psychological distress, then termed 'nervous shock', dates to the 1970s (Healy, 1992: 108). Compensation for 'some symptoms of PTSD' has since grown dramatically: from £13,000 per person, the first payment for PTSD in the UK, it has now reached £140,000 per person; a fire-fighter involved in the King's Cross case. Given such a substantial increase over such a short time, higher levels and more frequent compensation for traumatic reactions in the future seem inevitable. This will be exacerbated by a broader reading of traumatic reactions. In a separate incident in the UK, for example, families of victims of a stadium fire argued that 'experiencing' trauma vicariously (ie, by watching it on live TV) constituted an experience of trauma. As a result, they claimed, they should be compensated as if they were victims. (The case was rejected in court.) In Japan, families

traumatized by losing family members to overwork have recently begun to seek compensation from employers (Uehata, 1990). They have claimed the employing organisations were negligent in caring for the well-being of employees and that, as a result, their stress-related disorders - including their own mortality - may be attributed to the organisation. Significantly, they have argued that the level of the compensation for their traumatic experience should be related to corporation profits.

⁹ Flannery's (1990) 'great dearth' is probably the most memorable!; although strictly he was referring to the information of social support and work-trauma. For a review of work on psychological trauma 1970-1989, see Blake et al (1992). Their data suggests over two-thirds of all articles in the period concerned specific populations in mono-cultural settings: War, including the POW experience, 40%; Sexual abuse, including child abuse, 27%; Disasters, 12%. (The remainder is miscellaneous but not attributable to cultural differences.)

¹⁰ Hofstede argues for 'at least' six levels of culture impacting cultural differences:
"a national level according to one's country (or countries for people who migrated during their lifetime);
"a regional and/or ethnic and/or religious and/or linguistic affiliation level, as most nations are composed of culturally different regions and/or ethnic and/or religious and/or language groups;
"a gender level, according to whether a person was born as a girl or a boy;
"a generation level, which separates grandparents from parents from children;
"a social class level, associated with educational opportunities and with a person's occupation or profession;
"for those who are employed, an organisational or corporate level according to the way employees have been socialized by their work organisation." (1991: 10)

¹¹ For example, the sample was composed of IBM-only employees, potentially representing a bias of outlook in respondents. A similar problem comes from this author's professional experience of combining data from respondents in China who are employed in joint ventures and in SOE (state owned enterprises). This is a methodological flaw as each have quite divergent views on cultural norms and management methods etc.. Employees in joint ventures tend to have more 'western' and expressive attitudes. Employees in SOEs tend to be less expressive, and more cautious in statements with political implications for the organization. Hofstede makes tacit admittance of this limitation in both his later work, where he tries to link the survey result with broader cultural data, and his 1991 remark: "The fact that IBM has a strong corporate culture...does limit the usefulness of a questionnaire written for use inside IBM for replications on other populations" (1991: 257).

¹² Sample n=14,993, about 10% of Hofstede's sample although still sizable for most cross-cultural data bases. Note, though, the sample is predominately European (57.3%), with only 7.0% from Asia and 1.8% from Australasia.

¹³ The Hospital Anxiety and Depression Scale, or HAD Scale (14 items), is used in this research to measure anxiety and depression. See Chapter Three, methodology, for details.

¹⁴ A formal 'de-brief' usually occurs 48 hours after the incident. It may be distinguished to a 'fact phase' and a 'thought phase' (Hodgkinson, 1990: 23). In the former phase, the operation is described accurately. In the second phase, a discussion is encouraged upon any effects the incident may have caused. The de-briefing then leads to the 'reaction and symptom phase', the 'normalization phase' and the 're-entry phase' (1990: 23).

CHAPTER TWO

CHAPTER TWO

VARIABLES RELEVANT TO WORK-TRAUMA REACTIONS IN THE EMERGENCY SERVICES

In this chapter, we explore diverse variables which are associated with work-trauma in emergency service workers. The purpose is to begin an assessment of cultural universals that should guide the future of work-trauma understanding. What should we be concerned with in emergency service experiences?

The following table (VIV) summarizes some of these variables and indicates the instrument used for preliminary empirical validation. (Scales used for preliminary measurement are introduced at this stage only to provide an understanding of where the discussion is leading to. This chapter is limited to discussion of the first two columns: cultural differences in variables and emergency service variables). It is necessary to state four other assumptions:

1. When reviewing and understanding emergency service variables, care is needed to differentiate what is suggested and what may be inferred from literature. As noted in the previous chapter, little, if any, literature specifically prompts hypotheses on traumatic reactions in different cultural settings. To make preliminary sense of the paradoxes introduced in Chapter One, therefore, there is an inevitably high need for inference. In the words of Hawley (1968), we need to consider: 'all phenomena that are external to and potentially or actually influence the population under study' (1968: 9). The following review therefore takes a broad look at factors which future researchers should consider.
2. Note also the reason for only basing the review on PTSD research. This is due to a theoretical distinction between this disorder and the more general experience of work-trauma (Paton and Smith, 1992). Although the study of work-trauma can draw many inferences from PTSD research, it still requires specific attention. It is

therefore important that in this exploratory study, a distinction is drawn between a disorder, which has comparatively severe implications for counselling and other non-emergency service intervention, and a reaction, which has different implications for general management initiatives and emergency service prevention of traumatic reactivity.¹ This assumption prompts a focus on underlying organisational and societal issues in this review.

3. The focus of this review is not on dependent variables. The dependent variables which are used in this research - namely the IES-15 (Impact of Event Scale, Horowitz, 1987) for traumatic reactivity, and the HSCL-21 (Hopkins Symptom Check-list, Green et al, 1988) and HAD-14 (Hospital Anxiety and Depression Scale, Zigmond and Snaith, 1987) for general pathology - are not comprehensively explored. This is consistent with the exploratory nature of this study, which is to isolate culturally universal independent (or 'moderator') variables. Later (in Chapter Five), we explore the limitations in this approach, but for now it should be understood the purpose in this chapter is to isolate factors which are culturally universal in predicting or influencing symptomatology. The symptomatology measures are not, per se, reviewed.

4. Finally, underlying this review is an assumption that levels of symptoms associated with work-trauma in different cultures remains, equally in terms of traumatic reactivity as well as depression and other 'non-clinical' symptoms of general pathology, largely ignored (Sartorius et al, 1983; Horowitz et al, 1980; Tanaka, 1987; Payne et al, 1989; Kamada et al, 1990.). In this review, therefore, there is a working assumption that underlying pathology is probably relatively high in the Japanese cultural setting.

This is not to argue this is necessarily the case. Underlying pathology may be higher in Hong Kong, the UK or even at analogous levels in each cultural setting. However, the assumption is made to enhance preliminary analysis. By doing so, it is possible to

'manufacture' a preliminary framework where comparison can be easily made. The assumption is based on two key themes in the literature:

1. The comparatively severe societal and economic stressors endemic in Japanese society
2. The comparatively severe pressures to conform in Japanese organizations, particularly in the public sector.

As will become clear, Japanese emergency service personnel are probably exposed to abnormally high work-loads and psychologically demanding working environments. These entail higher pressure to perform within hierarchical, seniority-based organisations and work environments than seen in most other cultural settings (eg: Anzai, 1990; Gospel and Okayama, 1990; International Labour Office, 1989; Kageyama and Mori, 1991; Mine, 1990, 1987). Japanese emergency service personnel are also exposed to among the highest global levels of fatalities per annum and to the persistent threat of disasters, entailing large scale loss of life, such as earthquakes and typhoons. These stressors are exacerbated by unique characteristics in Japanese urban life, such as confined residential stressors and extensive commuting time. This reduces available sleep hours and the opportunity for leisure and exercise.

TABLE IX: VARIABLES ASSOCIATED WITH WORK-TRAUMA IN EMERGENCY SERVICES

CULTURAL DIFFERENCES IN VARIABLE...	EXPRESSED/EXPERIENCED IN EMERGENCY SERVICES BY...	INSTRUMENT USED...	RESPONSE SCALE...
* Major life events	Length of service (Characteristics of critical incidents; frequency of critical incidents; feasibility of occupational transference; mortality stressors); joining age; age; parenting status	Chronology	Ordinal (derived from joining age and chronological age, years)
* Chronic role strain	Hours worked (Societal stressors; 'economic strain')	Derived from emergency services watch system	Ordinal 8-point scale (past 7 days, hours)
* Work-place leadership stressors/promotion opportunities	Rank (Examination stressors; pressure to perform; exposure to intellectual pressures)	Derived from emergency services rank structure	Ordinal up to 10-point scale (present acting rank)
* Physical illness	Absenteeism (Lack of normative data)	Derived from UK Home Office data	Ordinal (number of days absent, past 90 days)
* Behavioural adaptation and coping measures	Changes in alcohol use; Changes in tobacco use; Change in amount of food consumption (Cultural norms of behaviour)	Derived from Chafetz (1982) and Heath (1982)	Balanced Likert 4-point (degree of change, past 30 days)
* Social support	Level of social support (Social, familial, occupational; working hours)	Derived from Cooper (1983) and House (1988)	Skewed 5-point scale (extent, past 180 days)
* Coping strategies (internalised)	Exercise frequency (Opportunities, effect of watch system)	Derived from qualitative data (Paton et al, 1992d)	Ordinal 3-point (frequency, past 7 days)
* Coping strategies and psychological schema (external)	Contemplation and action over counselling intervention	ibid	Binary (yes/no)

Researchers must acknowledge potentially large variations associated with major life events in different cultural settings. As Ronen and Schenkar indicated, attitudes towards variables such as occupational service, careers, marital status, parenting status as well as exposure to traumatic incidents develop for very diverse reasons in each cultural settings. Tendencies in Arab cultural clusters over parenting motivation (to pass on the male line), for example, may be different from Latin American settings (where having children is more influenced by economic gain).

This section seeks to understand where there may be commonality. It addresses the question: Are major life events having a consistent, universal effect in all emergency services? What can we infer about commonality in emergency services?

Traumatic exposure

Certainly, it is clear all emergency service workers are subject to some analogous, if broad, occupational experiences. Although traumatic experiences may vary between urban and rural areas (Anzai, 1991), and are usually subject to governmental interventions (Hirose, 1989), all emergency service workers, regardless of cultural settings, are exposed to stressors not replicated in other occupational groups. There is the universal potential of exposure to trauma and life-threatening situations in instant and challenging circumstances that are difficult to predict (Paton et al, 1992; Paton, 1989a; Perroni, 1987).

In what specific way will this impact traumatic reactivity? Besides the sight and exposure to mutilation and fatalities how do emergency service personnel react? Below are two key examples of how work-trauma may impact personnel in a culturally consistent way:

1. **Fatalities amongst colleagues.** At most incidents, there is the potential that emergency service workers may themselves be

seriously injured or, indeed, killed. This represents, at a physical level, unique and repetitive threatening circumstances. At a psychological level, it represents a recipe for diverse effects.

Many members of the work-group, for example, usually do not have prior experience of colleague-fatality traumata. Other members may have experiences, but these occurred many years previously. Still others may have had experiences of non work-place fatalities which impact the work-place experience.

Limited, and early, interview data from US and UK fire-fighters suggests symptoms such as anxiety and intrusive imagery tend to increase abnormally in a broad sweep of personnel when colleagues are killed. Not all effected personnel are necessarily colleagues in immediate contact with the individual (Paton et al, 1992d).² The effects of fatalities of colleagues can be diverse, effecting a number of people, and this begins to suggest a commonality between emergency services.

2. **Injuries among colleagues.** Fatalities, though, are one of a number of traumatic experiences which all emergency service personnel face. The danger which is faced by emergency service personnel should not be conceptualized as a fatalities only experience. Incidents where emergency service personnel are not killed but injured can have severe effects too. Not only is perception of danger heightened outside normal experience but severe short-term symptoms such as panic and post-event irrationality occur (Sime, 1980; Keating, 1982; Clisby, 1980; Canter, 1980a, 1980b; Green, 1980; Taylor and Fraser, 1982).

In fact, the psychological and social sequelae of injuries to colleagues, which are probably more frequent than fatalities of colleagues in most cultural settings, can often be long-term in their effect on both the injured individual and the work-group. Hypertrophic scarring is one example of injury where the effects can be long lasting. Although the victim can return - and most emergency services encourage them to return - to the work-place, there is a necessity for visible skin grafting and wearing

pressure garments such as gloves and torso braces over extended periods, often years (MacDonald, 1989: 33). These may convey a sense of vulnerability to others. Besides the demanding adaptation the injured individual needs to make to their personal coping schema, their impact on the work-group can solicit colleagues to question their own experiences. 'Will this happen to me?' 'Did I in some way cause, or fail to prevent, this injury?' etc..

Given the above two factors, a simple questions should be asked here: Do these experiences, or potential experiences, have culturally universal effects in emergency service personnel? Can we infer that this experience, or its potential, impacts all personnel across cultures? Certainly, there are limits in knowing the extent of fatalities in emergency services.³ But other data begins to suggest there is at least a culturally universal potential.

Although there is no data which documents levels of underlying pathology or traumatic symptomatology in emergency service workers in different cultural settings, we may infer that these experiences and emotions impact feelings of fallibility and mortality in others (Bates, 1987; Donnan and Scott, 1987). This is consistent with the Peterson et al (1992) model which sees an environmental impact as one key sequelae of traumatic experiences (1992: 96-97).

We may also infer a commonality by collating scores on the IES-15.⁴ This is based primarily on the work of Wilson et al (1978), who recorded scores for intrusion and avoidance symptoms across diverse samples, from Vietnam veterans to rape victims and family trauma sufferers. Alexander and Wells (1991) recorded 4.81 and 5.02 for a sample of police officers involved in body-handling duties after the Piper Alpha incident. Paton (1990) recorded 2.23 and 1.07 for fire-fighters involved in rescue work at the Armenia earthquake.

Taking all these samples together, Ramsay (1993a) noted differences in scores between subjects who experienced traumatic stressors as part of their occupational commitment and subjects who did not. From seventeen samples, seven were classified as encountering traumatic stressors as part of their work: medical students (Horowitz et al, 1979); police officers (Alexander and

Wells, 1991); Armenian fire-fighter rescue workers (Paton, 1990); nurses in Romania (Paton and Purves, 1991); Japanese fire-fighters (Ramsay, 1992); Scottish fire-fighters (Paton et al, 1992) and Hong Kong fire-fighters (Ramsay, 1993a). Ten samples experienced trauma outside work: the death of a significant other, rape victims, divorcees, serious illness, miscellaneous life threats, family trauma and multiple trauma (Wilson et al, 1978); stress clinic patients (Horowitz et al, 1979); and Armenia Earthquake volunteer rescue workers (Paton, 1990). Mean scores for occupational samples recorded 6.99 (intrusion) and 7.04 (avoidance). This was noticeably lower than 15.68 (intrusion) and 16.15 (avoidance) for non-occupational samples.

This data begins to suggest there may be some commonality in the traumatic reactivity of emergency service personnel. Something may be influencing the way they perceive traumata that transcends cultural settings. Something inherent to their occupational experience, or their underlying disposition and psychological schema, may be influencing observed symptomatology.

It is here we encounter for the first time the crucial factor of the macho ethic. The above data is a significant first step for understanding phenomena endemic to emergency services, particularly the macho ethic and the coping schema personnel tend to use. It suggests there may be a macho ethic transcending all emergency service personnel. We will return to this methodological issue later in this chapter when discussing the macho ethic as a moderator variable, and in the discussion for further research (Chapter Five).

Major life events associated with age

In emergency service personnel, age is an inevitably questioned variable. Questions are always raised on its association with work-trauma. Do personnel become more traumatized as their age and exposure to trauma increases? Does joining age influence subsequent symptomatology? Does parenting age have an influence? Or does age associate with less symptomatology due to the developments of unique coping strategies? In a cross cultural sense, do personnel gradually

assimilate cultural values over time and length of service? Or are these values engendered at an early life stage some time before exposure to trauma?

It is accepted that these questions are inevitable. Given the importance of perception of threat in the stress process (eg, Coyne and Lazarus, 1980; Eysenck, 1985a, 1985b; Hamilton, 1983; Hartman and Burgess, 1978 etc.), and that emergency service personnel in all cultural settings are repetitively exposed to trauma where perception of threat develops and change over time, it is not surprising age and related life events are consistently perceived as potentially important by emergency services (eg, Roberts, 1985). Yet, the reality remains less simple. The following points summarise trends in the literature about the effects of age and are quoted to illustrate the complexity of predicting how age and traumatic reactions in cultural settings interact. (We consider other life events such as marital status in sections on moderator variables.)

1. **Heightened expectations of elders.** Probably some elderly personnel in emergency services may perceive higher expectations than younger personnel to perform effectively within the organisation (eg, Crawford, 1987; Falk et al, 1992; McGoldrick, 1989; Nicholls and Czirr, 1986; Solomon, 1989). These expectations can come from both the public and other work colleagues or superiors (Paton, 1989a). The expectations are inevitably significant in emergency services where elders are subject to legal requirements to perform effectively and save lives. Failure to do so may result in removal from their operational post, transfer to light duties and even, in serious cases, reduction in retirement benefits, not to mention the effects of shame (McGoldrick, 1989; Clisby, 1980; Schwalm, 1981; Perroni, 1987; Carter, 1987; Routley, 1985).

Although this may be culturally universal, though, the effects are less easy to predict. We may infer, for example, there are diverse, culturally-specific differences in operational style and organisational climate which elders experience. For example, the command structures of the immediate work unit; heightened pressure to perform; low respect for some elders in the 'macho' work-place;

the social cohesion of the work-group in and out of the work-place; expectations about the stress inherent in the job; alternative jobs available; norms of seeking and providing social support; organisational attitudes to fatalities and the ability to prevent fatalities; leadership style during incidents with fatalities (Smith et al, 1989), and so on.

2. **Heightened social support expectations from elders.** We may also infer anecdotal evidence about the pressure on elders to provide mature and objective advice on emotions associated with traumatic stressors (Craine et al, 1992; Crawford, 1987; McGoldrick, 1989; Falk et al, 1992; Nichols and Czirr, 1986). Elderly fire-fighters may be perceived by younger fire-fighters, for example, as mature and balanced providers of advice/support when appraising traumatic stressors and managing the symptoms associated with traumata (Paton, 1992d).

But again understanding the effect this has is difficult. Whilst we may infer elders adopt and adapt culturally-specific schema when appraising and explaining stress, it is not known what schema are used. These schema probably involve underlying religious values as well as social morals (Lau, 1989). Although they have inevitable limits in their adaptation in other cultures (Bond and Cheung, 1983; Bond and Yang, 1982) they remain an area for explanation. This is discussed in Chapter Five.

3. **Cultural differences in values between elders and younger personnel.** One key cultural difference about age which may be inferred is that elders in emergency services probably have different cultural values about death versus younger personnel. This is probably a reflection of changing societal values. These involve fundamental changes to the values peoples hold, and is particularly pronounced in Asian cultural settings (Hofstede, 1980a; Lau, 1989; Crawford, 1982; Triandis, 1982; Smith et al, 1978).

How, though, does this impact understanding of work-trauma in elders in different emergency services? In a broad sense, the

impact of cultural values on individual development can be extensive. Lim et al (1987), considering the interaction of physiological stressors and psychological symptoms in Singaporean fire-fighters, suggested 'unique [or cultural] differences' are an explanation of symptomatology. Musk et al (1978) even suggested cultural differences and values held by elders may explain mortality rates.

But again, there is a need for further, more thorough exploration. One avenue may be that acceptance of death symbolism by elders and the belief in death as a normal transitory process may be impacting work-trauma. In Japan, for example, where there are differences in values held by elders and younger people, this may impact some psychological schema.⁵ This would be consistent with data on individual control presented by Trompenaars in Chapter One.

4. **Weak empirical evidence.** Although the above questions are extremely interesting for researchers trying to understand work-trauma more meaningfully, at this stage it has to be acknowledged that linking age with work-trauma symptomatology is not confirmed by data. Available data is at best mixed on the effects of age. Whilst some data supports the increased age/increased symptomatology hypothesis, severity and consistency tend to be questioned. Analysis is often forced to compare different populations with different traumatic experiences.⁶

Conceptually, as indicated above, it is also unclear how age interacts with cultural factors. Does adherence to some cultural values act as a psychological buffer? Do younger personnel interested in other cultural settings (for example, Japanese of America, Chinese of Hong Kong) have their ability to cope in their own cultural setting impacted in consequence?

In short, the majority of empirical or even conceptual evidence about age and symptomatology remains 'ambiguous' (eg, Brooks and McKinlay, 1992; McGoldrick, 1989; Nicholls and Czirr, 1986). At this stage, we note that in practical terms age remains a useful and obvious factor upon which to base work-place interventions,

particularly diagnosis by immediate superiors or senior personnel in charge of work teams (Medd, 1991; Cooper et al, 1989; Hargreaves, 1991; Herrick, 1992). Although little is really known of age and its specific role in mediating either general pathology or specific traumatic reactions, it should not be expunged from work-trauma analysis.

Given that throughout their occupational life emergency service workers are continuously subject to 'frequent life-threatening challenges' and this does conform with part A of the DSM definition of PTSD age will probably remain a curiosity in work-trauma.⁷ But establishing which factors in such repetitive experience can explain or predict symptomatology by age is probably influenced by a vast litany of cultural differences. It deserves serious and continuing attention.

To conclude this section on age, it will be useful to cite a specific cultural example drawn from Japan. Here, researchers may infer a 'unique' Japanese adherence to seniority and respect for age. This is not replicated in Hong Kong, UK or indeed any other cultural setting (Lifton, 1969; Offner and Straelen, 1963; Dale, 1989). This provides support for the Ronen and Schenkar (1985) classification of Japan as an 'independent' culture (see also Lidenthal et al, 1970).

Yet, to understand the impact in Japan of this seniority, researchers would need to acknowledge and understand that elderly Japanese emergency service personnel probably provide social support which is predicated on guidance rather than the advice approach in non-Japanese cultures (Slaughter, 1990; Uehata, 1990; Hyoe and Seidensticker, 1977; Offner and Straelen, 1963). There is not a cultural pressure to offer social support that is 'effective.' Rather, elderly Japanese are able to express their reactions to stressors in the 'context of wisdom' (Offner and Straelen, 1963). This represents a unique opportunity to express emotions and reduce anxieties over the demands raised by traumatic incidents with no questioning of the advice as in other cultures. The guidance will tend to be taken as the final word (Uehata, 1990). How are

researchers to incorporate all these cultural variables to understand the impact of age? An imposing task!

Chronic role strain

Other avenues may be more advisable. One reason why age may associate with at least general pathology lies in strain elders have been repeatedly exposed to during the course of their emergency service career. In this section, we review evidence for commonality in economic and societal stressors. The purpose is to consider if general pathology may be attributable to the long-term effects of chronic role strain.

A first, demanding aspect of chronic role strain that emergency service workers endure is shift patterns. Is there commonality in these? Are the numbers of hours worked per year analogous? Whilst the answer is yes, the picture needs to be understood in a broader context.

1. **There is commonality in shift patterns...** Certainly, most emergency service personnel work a 24 hour shift. Japanese and Hong Kong emergency service workers are typical examples of this long and demanding shift. Some emergency services, including UK fire services, remain on a 12 hour unit but the norm tends to be 24 hour shifts.

Whatever the length of watch, though, such round-the-clock shifts imply certain psychological sequelae. Interrupted sleep patterns, fatigue and removal from society for unique and extensive periods all have psychological after-effects. These may be exacerbated in some cultural contexts by the shift structure. Japanese and some other emergency services, for example, have a shift of '4-4-8' (four days on, four nights on and 8 days off). In others such as Hong Kong and UK it is '2-2-4'.

Researchers understanding emergency services general pathology should also be aware that isolation in some males can lead to increases in fatigue and neurotic symptoms (Kamada et al, 1990;

Tanaka, 1987: 486). This is an important factor when assessing underlying pathology in emergency service personnel. Subjects removed from society for extended periods '...complain of neurotic symptoms and fatigue [are] reported to be much greater...than those in a general occupational setting' (Kamada et al, 1990: 461).

So when understanding, and measuring, general pathology in emergency service workers in different cultural settings, we must be clear that unique working conditions are important, and probably common. They impact not only the social environment for support (House, 1981; Cobb, 1976; Dean and Nan, 1977) but also the psychological state of personnel. As emergency services may in some ways conform with what have been called 'total institutions' (Goffman, 1957; Novaco et al, 1988), work hours are an important background to understanding general pathology. It is for this reason they are included in the preliminary data analysis conducted in the following chapter.

2. ...but no commonality in societal working hours. What, though, about working hours outside the emergency services? What about the working hours that providers of social support have to experience? Is there commonality in these?

Certainly, researchers should be clear there are limits in interpreting the significance, or real level, of cultural differences in working-hours outside the emergency services. They cannot be viewed objectively as a stressor. Societal expectations and norms may render them otherwise, due to underlying cultural differences in concepts of personal strength and feelings of fatigue.⁸

However, as we begin to understand cultural differences and their effect on work-trauma, it is important to look beyond the commonality of emergency service hours and understand how societal norms of work hours impact understanding. Researchers should consider work pressures outside the emergency services and assume that this can impact a diversity of areas, from the provision of social support for emergency service personnel to the willingness of personnel in the emergency services to tolerate comparatively

harsh conditions of employment. (Knowing that the contrary could be even worse.)

Again, an example can be seen in the case of Japan. This cultural setting shows how important understanding work-hours outside emergency services is to the future of work-trauma research in different cultural settings. A unique outcome of Japan's work hours is karoshi, or death from overwork.⁹

This is probably a unique, and therefore unfair example when the purpose is to understand commonality, but it serves the point. Only in Japan is there substantial evidence that significant numbers die from overwork (Uehata, 1990): '...it is believed that workload has been a contributing factor for tens of thousands of fatalities in Japan' (ibid: 7). The prevalence of death from overwork is probably one explanatory factor in the comparatively high rates of job dissatisfaction in Japan (Japan Information Centre, 1991: 2).

The significance of this unique experience is that it suggests time and delivery limitations in social support in Japan. The causes of Karoshi, high and long work hours, imply many individuals may be confined within the work-place for extended periods. This precludes social support being delivered on a regular basis. In addition to availability, excessive work hours also impair the quality of social support as providers and receivers are subject to fatigue and other psychological effects of excessive work hours (Tanaka, 1987).

How may we take this example? Despite its specificity it illustrates how diverse cultural phenomena that seem unrelated to work-trauma can yet impact work-trauma symptomatology. In this case, Karoshi supports an inference that Japanese emergency service personnel may tolerate higher occupational stressors, due to reluctance to leave employment where hours are restricted for employment where hours are, in effect, un-restricted and working conditions less certain. (This is explored more fully in the following section.) They may also received less available and quality social support.

Economic strain

As well as chronic role strain, age may also be associated with repeated economic strain. It is here that we move beyond the individual and family issues which we have alluded to so far, and begin to touch on broader occupational and social environments. How do emergency service personnel react to the wider environment? Does it impact our understanding of work-trauma?

To start with, it should be noted this approach is not often drawn out in emergency service work. Perhaps this is because, simply speaking, the phenomena of 'economic strain' (introduced by Cohen and Edwards, 1985: 265) is so widespread and complex. Yet this is important.

First, we need to understand why it happens. Economic strain may be a consequence of traditional economic conditions that seem beyond psychology. GDP (Gross Domestic Product) data or fluctuations in interest rates seems unrelated to occupational experience, but we need to briefly understand why they happen.

That, though, is the easy part. Second, we need to understand the effects of economic strain. How does it impact anxiety or depression? How does it influence the reality of emergency service personnel's family life?

The following is a preliminary list of key areas where economic strain may be impacting emergency service personnel, and which - therefore - should be incorporated in future developments of work-trauma understanding. Researchers should use the following as a base for understanding.

1. **Quality of life.** Whilst economic strain inevitably causes certain benefits,¹⁰ it also has costs. Usually these are most evident in quality of life, or - another way to conceptualize this - endemic level of stressors. How can endemic level of stressors impact general pathology? One example is the pressure to secure residential facilities.

In this, there are undoubtedly cultural differences that researchers should acknowledge. For example: the purchase price of homes. This can influence anxiety at pressure to purchase and then shoulder a heavy burden of re-payments. The price of an average Japanese home, for example, is 5.7 times the owner's yearly income (8.7 in Tokyo). This is versus around 3.2 in the UK and 3.8 in Hong Kong. And the rewards once housing is secured, and the financial burden managed, are also culturally disparate. The average Japanese house is 5-10m² less spacious than in Europe (Japan Information Centre, 1991: 2; Anzai, 1989).

This is one example of the many an economist could generate. It is significant to our study here because it suggest influences on data sets comparing work-trauma. Whilst in this example, Japanese emergency service personnel may experience comparatively high pressures to secure comparatively less residential accommodation space, emergency service personnel in London may not. Yet, what they may have is extensive commuting times. And we need to understand that! Are they more severe than residential and house purchase pressures? Does commuting impact levels of somatization more than pressure to buy and repayment burdens impact anxiety?

Examples of course can be extensive. In New York, personnel may be at high levels of anxiety because their family has to live in a rough neighbourhood etc etc.. But for a manageable and actionable indication of the broad nature of these factors, future researchers should consider Hofstede's LTO (long-term orientation index (1991). Besides suggesting clear cultural differences (Hong Kong versus Japan (96 and 80 respectively) are quite different from the UK (25).), this provides a preliminary rationale for measurement of some factors associated with quality of life¹¹

2. **Self-comfort.** Economic strain should also be understood as eroding what may be termed self-comfort (Shiobera and Katagiri, 1986). And again this impacts our understanding of how age may associate with general pathology. How can disposition towards, or aversion to, self comfort influence understanding of work-trauma?

Again, Japan provides an example of the relationship. Self comfort can often be societal wide, and associated with historical trends. The success of the Japanese economy is said to depend far more than any other economy on individual mental characteristics (Christopher, 1983; Gospel and Okayama, 1990). These characteristics include individual ability or inclination to place national or group success above personal desires, the 'humanization of work' (Mine, 1990) or personal safety (ibid, 1987). Given also the Japanese predisposition to extreme feats of human endurance in the name of national pride or success (eg, Asahi Shimbun correspondents, 1972; Uehata, 1990) this is a factor when understanding personal coping schema. Researchers need to assess if disposition towards self-comfort impacts general pathology in any way, and also if it impacts traumatic reactivity.

3. **Unionization.** Economic strain can also impact occupational factors; again, this links in with age and personal developments through a work-place with different approaches to 'self-comfort' of personnel. One practical result of the denial of self-comfort is again seen in the Japanese setting. Although union membership in Japan is high, only in western cultures such as the UK is there a history of strike action in the emergency services (International Labour Office, 1992: 56; Hong Kong Government Information Services, 1992: 109).¹² Indeed, the trade unions of Japan are described as timid and reluctant to seek improvements in working conditions (Mine, 1987, 1990). This may be harsh for emergency services as Japan is not alone in precluding hostile (ie, strike) union activity in essential services such as the police, fire brigade etc..

Yet, our understanding of work-trauma should not overlook this. The significance of this timidity lies as much in its effect on perception in emergency service workers as in the reality of occupational change. Even if erroneous, UK and feasibly by extension Hong Kong emergency service workers, perceive an ultimate opportunity to redress occupational stressors (Paton et al, 1992). Japanese personnel, by contrast, do not. Thus, it may

be inferred that tolerance of occupational stressors is comparatively high in Japan, a fact with potential implications for symptoms of work-trauma. This may particularly apply to symptoms related to frustration and lack of influence such as depression and anxiety (Iwata, 1989; Eysenck, 1985b).

4. **Occupational transference.** Ultimately, all of the above suggests that in some cultural settings there are comparatively high tolerance of some or all traumatic and occupational stressors. One way the above may be reflected, and easily measured, is in the perceived feasibility of occupational transference. This is far more limited in cultural settings such as Japan.

In this society, attitudes to job transference are quite unique. Life-time employment within one organisation is traditional and respected, particularly in the public sector. The contrary - signifying disloyalty to the group - is not only disrespected but positively despised in some instances (Gospel and Okayama, 1990).

Even mobility between independent, private organisations is complex and involves almost intolerable loss of seniority, generally negative psychological connotations of belongingness and social stigma (Nakane, 1974; Doi, 1986; Christopher, 1986). By contrast, job transference in other cultural settings such as the UK carries much less stigma and, by inference, less stressors (Gospel and Okayama, 1990) and less susceptibility to endure occupational harshness. Indeed, in Hong Kong the ease of leaving the public sector has quite severe implications for personnel planning (Hong Kong Fire Services [HKFS], 1992).

Pressure to perform

Returning from the broad social and economic conditions that underlie work-trauma, any understanding of the background circumstances to emergency service work cannot avoid the 'general' working environment within which all emergency service personnel must work. The Service!

The Force! The Brigade! A variety of affectionate names capture the love and devotion - and pressure - which emergency services engender in personnel.

Occupational stressors and pressures can include a diversity of experiences (Glass et al, 1973). These are as apparent in the day-to-day, routine and predictable elements of emergency service work as in the exposure to CIs.¹³ They range from, for example, promotion procedures and examinations to the effects of the anti-social work hours system on sleep and social interaction (detailed above), bureaucracy, work-overload or underload, clerical duties, administration, the necessity to perform non-physical but essential tasks (such as community work and equipment maintenance), change of working hours from shift system to routine day-work for senior personnel; or even general changes in management practices (Paton et al, 1992d) etc. etc.. Although these stressors have been referred to as routine and 'boring' (Paton et al, 1992d), they are necessarily endemic to all emergency services across cultural settings (ibid; HKFS, 1990). It seems vital to consider their impact if we can understand work-trauma in different cultural settings.

Within this 'general' working environment of emergency services, one key aspect future researchers should concentrate on is what can be termed this 'pressure to perform'. This is important, if an empirically unsubstantiated term, to use when understanding emergency services. Pressure to perform influences not only the appraisal stage of psychological stress but can also cause severe effects in later years when victims are removed from both potential exposure to the immediate stressor and also the social support network of the working environment. In these circumstances victims come to dwell or ruminate, on past traumatic exposure (eg: Endler and Edwards, 1982; Eysenck, 1985a; Paterson and Neufeld, 1989).

Researchers can find a rationale for isolating 'pressure to perform' in several factors. Inevitably, the bottom line is that all emergency service personnel are pressured to perform because lives are potentially at stake (Hodgkinson, 1990; Glass et al, 1973; French et al, 1982). If there are any failure in duties, this can have

severe consequences (Paton, 1994; Akin, 1977), particularly so when negligence and fatalities can be established as contiguous (Murren and Williams, 1980). Below are some other causes of the pressure to perform which - as with the above example - are argued as culturally universal.

1. **Commonality in traditions.** Pressure to perform is enforced by the traditions of all emergency services. Although these are not identical, researchers can infer there is a close analogy throughout industrialized countries (Bean, 1985; Torbert, 1967). All fire services, for example, are volunteers¹⁴ dedicated to 'save life and property'. All police must 'protect and serve'. All services are 'uniformed' 'disciplined', and (often noble) 'volunteers'.

Traditions are often manifested in working conditions. In all cultural settings, for example, emergency service personnel tend to work over extended periods of time not experienced even by other shift-workers. This makes for a 'special person.' It also, of course, means they are often restricted within stations for long periods, where boredom and inactivity are interspersed with dramatic changes in activity and urgency in conditions that can have unique psychological results (Lim et al, 1987; Kourinka et al, 1981; Douglas et al, 1987).

2. **Repetitive exposure.** Researchers also find a probable rationale for assessing pressure to perform in the recurrence of exposure. This should not be restricted to critical incidents but also include call-outs. Repetitive exposure may not be just traumatic events. Often, these are limited occasions.

It should be noted, though, that work-trauma can be exacerbated by the potential of exposure. Personnel do not have to experience a traumatic stressor for there to be a (perceived) work-trauma stressor. Call-outs, for example, may not consistently influence work-trauma symptoms in personnel exposed to high levels of call-out (Paton et al, 1992d). This is due to individual differences in perception of call-out stressors. Personnel may become used to

frequent call-outs, which will result in a perception that high frequency of call-out is normal, rather than an occupational stressor. Researchers must also be careful to remember that call-outs are variable in frequency and content in urban areas (Douglas et al, 1988).

This brings us to the aspect of traumatic exposure. Again, this can occur throughout the emergency services. City-centre personnel, for example, can often attend over a dozen false-alarms in one shift but, by contrast, one rural station on the same shift may be called to only one major incident such as an RTA (road traffic accident) where several fatalities occur, and where the exposure to trauma is comparatively higher. Interview evidence suggests this 'rural trauma' is exacerbated by the expectations of UK fire-fighters that RTAs in rural areas invariably entail fatalities (Paton et al, 1992d)

Examination stressors

Pressure to perform does not always come on the ground, at critical incidents. Emergency service personnel are actually subject to several other pressures. This section details one which future researchers should consider very closely when assessing cultural differences in work-trauma.

Researchers must start by acknowledging emergency service personnel are exposed to intellectual stressors as well as the above physical stressors. Not all of their occupational experience involves responding to call-outs and dealing with fatalities.

Modern emergency service work, in fact, is far more demanding, and researchers should assess intellectual challenges. All emergency services face increasingly technical demands. These demands, in turn, demand increasingly intricate content and level of technical knowledge and ability in all personnel (eg, Annual Death and Injury Survey, 1983; Canter, 1980a, 1980b; Davis, 1989; HKFS, 1992; Innes and Clarke, 1983).

Broad psychological effects. In psychological terms, research is needed to acknowledge that exam stress may significantly effects levels of anxiety and depression, particularly in some males (Spinks, 1989). The effect of examinations on levels of anxiety and depression is compounded where it is necessary to prepare for examinations whilst still on operational duties, which involve long atypical and irregular work hours so reducing opportunities for adequate study periods (Paton et al, 1992d; 1993). This may entail additional physical pressures (which also influence anxiety and depression levels) and cognitive stressors (such as the necessity to convince oneself of ability and emotional stressors in terms of pressure to perform).

Behavioural stressors are also placed on examination candidates, entailed by sustained interaction with other fire-fighters over whom promotion will be achieved by passing the examination (Hodgkinson, 1990). Although no comparative data exists concerning the effect of examinations in all personnel, it may be inferred that examination stressors influenced broad levels of anxiety and depression in one study. In addition to one specific occupational stressor (call-outs), '...other [unique] psychological conditions...contributed to [fire-fighter] stress [symptoms]' (Lim et al, 1987: 209).

The changing nature of emergency service recruitment. Underlying examination stressors in emergency services is the changing nature of occupational requirements. Personnel must be more educated, literate and expressive than previous norms. Emergency service work is becoming less of a blue collar and more of a white collar industry. Examinations are one reflection of this.

Researchers must again start by acknowledging that the incidents to which personnel are exposed are becoming a technically more demanding and inherently more risky experience. As a result, all emergency services increasingly face a balancing act: they have to balance requirements for their training and skill-acquisition with the stress involved in their acquisition and the stress inherent in performing their job. In these circumstances, it is natural that

emergency services are interested to know more about the stress process and how it may be managed. And also to know if there usual response of recruiting better educated personnel is viable.

Evidence on the dilemma facing emergency services is particularly seen in contemporary training and education needs. For example, in the UK fire service although increasingly technical requirements influence the criteria for promotion these are also based on the desired 'psychological make-up' of senior personnel who must be more technically literate than their predecessors (Paton et al, 1993). In Hong Kong, where the fire services are analogous to UK norms, examinations are a fundamental stressor on fire-fighters seeking promotion. Subjects can be diverse, ranging from leadership styles to complex chemical formula (HKFS, 1992).

Language strain. Another strain on personnel throughout many cultural settings is the question of language. Exams in Hong Kong, for example, are conducted primarily in English, not the native language of all personnel. The necessity for technical-level knowledge in a second language is supported by the language of the international fire services, English. In many cultures, senior emergency service personnel must utilise journals and attend conferences where English is the language of interaction. This is different to their first language, so placing an additional anxiety.

Changing expectations of personnel. In addition to balancing selection techniques emergency services have to cope, long-term, with differing and what more sensitive attitudes and experience of educated personnel to examination stress. In recruiting more educated personnel, emergency services are also recruiting personnel who tend to be more aware of excessive work demands. They are more likely to express their hostility to those demands and have generally higher expectations of working environments. They are less willing to tolerate organisational stressors (Paton et al, 1992, 1993).

Call-out rates

This needs to be re-visited. It is more complex than the above would suggest. It is an important, and well-known, aspect of emergency service work. How can it help us understand cultural differences?

As mentioned above, call outs are a traditional, and well-known, occupational stressor which all emergency service personnel experience. The effect of call-outs may associate with, for example, pathological stress symptoms such as performance difficulties, general feelings of distress and somatic distress (Douglas et al, 1988; Green et al, 1988). Indeed, besides exposure to traumatic experiences it is call-outs which distinguish emergency service personnel from virtually all other occupational groups bar paramedics: the interspersing of a slow and lethargic work day with periods of high tension and high trauma. One reason why they are colloquially referred to as 'Men in waiting.'

Researchers should be aware of these issues when understanding work-trauma reactions. A starting rationale is the evidence on the physical sequelae of frequent call-outs. Personnel from relatively busier stations or postings are known to have increased cardiac strain when attending incidents (Douglas et al, 1988: 317). The psychological consequences of physical strain associated with frequent call-outs can be particularly serious.

Lim et al (1987) have suggested differences in work-load between Finnish and Singaporean fire-fighters accounts for much of the difference in psychological state (1987: 209, 216). Although caution should be exercised when understanding call-out data (some personnel are consistently stationed in vast, busy urban areas with no feasible rotation to quieter rural areas) the effect on personnel given their persistent and intense exposure can be extensive (see Green et al, 1988; Paton et al, 1992d; Lazarus, 1984a; Hong Kong Government Information Services, 1993; Lothian & Borders Fire Brigade [LBFB], 1992; Scottish Office, 1991).

Alarm stress. Perceived impact of response to alarm bells is an area for future research, particularly with regard to its impact on

anxiety symptomatology. The sounding of alarm bells can increase levels of adrenaline circulation (Jacobs, 1987: 18), heighten mental state (Kuorinika and Korhonen, 1981: 762), increase heart rate, blood pressure, respiration and adrenaline and reduce digestive activity which, in the long-term this has cumulative affects on ulcers, heart disease and colitis (Paterson and Neufield, 1989). This leads to what emergency service workers call 'alarm stress' (Jacobs, 1987).

Given these stimuli are culturally universal and associate with enlarged adrenal glands and other related disorders which are suggested as a factor in mortality rates this is a serious concern for future researchers (Home Office, February, 1990: 20; Donnan and Scott, 1987. Note, though, that empirical validation of mortality rates in emergency service workers remains ambiguous; see Appendix XXIV).

Researchers should note that alarm stress is also exacerbated by the shift patterns of emergency service workers (discussed above). Alarm stress increases heart rate particularly at night when sleep is interrupted (Kuorinika and Korhonen, 1981; Barnard et al, 1973a, 1973b; Barnard and Duncan, 1975: 247). This can have long-term, deleterious effects on heart capacity (Breznitz, 1967). Indeed, physiological stress from alarms at night, which again affects adrenal hormones, is significant as '...almost every system in the body is influenced by the action of adrenal cortical hormones' (Jacobs, 1987: 18).

This would begin to suggest cultural consistency in physiological stressors which may impact a number of work-trauma variables. Researchers should be aware of six factors where research in alarm stress and call-outs may be focused:

1. First, to understand if lower physiological, alarm-stress related stressors tend to occur at quiet or quieter fire stations with less call-outs.
2. Second, if perceived alarm stress is higher or lower amongst elders.
3. Third, if high call-outs still influence symptomatology when there are culturally high levels of call-out anyway (Paton et al, 1992d).

4. Fourth, to explore if personnel in some cultural settings may become used to frequent call-outs, which will result in a perception that high frequency of call-out is normal.
5. Fifth, given that alarm stress is variable in frequency and content in urban areas (Douglas et al, 1988), researchers should explore its impact in rural versus urban settings. City-centre personnel, for example, can often attend over a dozen false-alarms in one shift but, by contrast, one rural station on the same shift may be called to only one major incident such as an RTA (road traffic accident) where several fatalities occur, and where the exposure to trauma is comparatively higher. Interview evidence suggests 'rural trauma' is exacerbated by the expectations of UK fire-fighters that RTAs in rural areas invariably entail fatalities (Paton et al, 1992d).
6. Sixth, researchers may wish to explore if lack of alarm stress (call-outs) may in fact be equally stressful. Lim et al (1987) suggest Singaporean fire-fighters in busy stations find 'non-frequent' call-out shifts are comparatively more stressful than frequent call-outs. Similarly, in a study of UK fire-fighters, a high correlation between stress related ventricular ectopic heart beats and work shifts that involved in-frequent call outs was observed (Douglas et al, 1988). Monotonous watches can also exacerbate the effects of inadequate fitness levels (ibid): LaVerne et al (1978) observed hydrocortisone and norepinephrine levels to reduce during quiet work-days but stress-associated epinephrine levels to increase (1978: 113-114). Anticipation and perception of threat is clearly a key factor of individual differences (Jacobs, 1987).

Physiological stressors

The above is beginning to suggest there are a broad range of occupational and personal characteristics which may be impacting work-trauma in different cultural settings. These can vary from differences in work hours inside and outside the work-place to the diverse impact of economic strain to examination stressors and call outs. To continue the thoroughness of the approach, this next section takes a more physiological approach. It suggests that in truly understanding work-trauma in different cultures, researchers need also to be aware of the physiological impact of emergency service work.

Underlying this approach is evidence that physiological stressors can have quite profound psychological sequelae (Markowitz et al, 1987). These can transcend cultural differences.¹⁵ They are also important because they happen on a repetitive basis.

Again, researchers must start with an appropriate acknowledgement. Here, it is that to begin with there is little understanding of how call-out stress interacts with incident stress in any emergency service workers. All that is known, for example, is that simulated emergency incidents can cause extremely high and altered basal metabolic rates and dramatic and immediate changes in heart rate. Internalised build up of heat, particularly if heavy, insulating clothing and SCBAs (self-contained breathing apparatus) are worn has been observed to cause heat-strain, respiratory-exhaustion and cardiac-strain (Romet and Frim, 1987).¹⁶ Other responses to physiological strain at incidents include: muscle fatigue; hypertension; loss of appetite; miscellaneous respiratory tract problems; insomnia; and headaches (Wong, 1990: 30). Given the high year-round temperatures in some cultures this suggests higher strain in some cultural settings. But is this all?

One way to assess their relationship is to more carefully review the data on incident stress. Here, researchers face a lot of evidence to incorporate. The following is a selection.

Rectal temperature has been recorded as increasing by up to 1.30°C during CIs. HR (heart rate) has been recorded at over 150 beats per minute in simulated search and rescue work (Romet and Frim, 1987), and at 158 beats per minute on vehicles proceeding to an incident (Barnard and Duncan, 1975: 247). This level of HR is the maximum rate endurable without risk of either heart attack or collapse of the cardio-vascular system (Barnard and Duncan, 1975). There is also evidence that high HR during incidents may persist throughout the incident. In one dramatic case, HR at dangerously high levels lasted for ninety minutes (Barnard and Duncan, 1975: 247).

Researchers also need to be aware of chemical dangers which can impact on psychological factors (Markowitz et al, 1987). Exposure to PVC fumes from the combustion of the chloride, for example, leads to increased demoralization, emotional distress and heightened feelings

of threat (ibid). Chemical exposure to PVC (poly-vinyl chloride) also has long-term physical implications: it can also take up to 25 years to cause death, in long-term illnesses (Morinaga et al, 1990). In the long-term, PVC, which releases hydrogen chloride and up to 75 other toxins when burnt, also causes a range of diseases and disorders: specifically, toxins from PVC facilitate birth and genetic defects, leukemia, respiratory diseases and cancer (Epstein et al, 1982).

Another chemical hazard which many emergency service personnel are exposed to is asbestos. Although essentially inflammable asbestos may cause peritoneal mesothelioma as well as asbestosis, a lung disease, when exposed to heat (Selikoff, 1977). The risk personnel face from asbestosis is not lessened by the discontinued use of the material for building.

These effects can be latent. In Japan, asbestos exposure is documented as associating with peritoneal mesothelioma up to 25 years after contact (Morinaga et al, 1990). Exposure to benzene, a material which is still used in building and chemical industries, causes leukemia, carbon monoxide poisoning and increased rates of CAD (coronary-artery disease, Infante and White, 1983; Beck and Sister, 1938; Seppanen, 1979). Again, this is over long periods of time between contact and illness (Infante and White, 1983).

Emergency service workers are also exposed to a range of 'common' chemicals which, after long-term exposure, may be fatal (HKFS, 1992: 3). Carbon monoxide, for example, is commonly found in incidents and causes, after short-term exposure, headaches, fatigue, dizziness and sleepiness. Long-term exposure causes unconsciousness and may be fatal.

Carbon dioxide, also commonly encountered, causes eye-stinging and may lead to hyperventilation. Nitrogen dioxide causes short-term bronchial irritation and may lead to fatal pulmonary edemas. Hydrogen chloride, commonly found in factory and household fires, irritates eyes, skin and mucous membranes; exposure to hydrogen cyanide, commonly found in residential fires involving furniture, leads to confusion, respiratory failure and death. Acrolein, formed when wood, cotton, paper and plastics combust, causes irritation to

the throat, shortness of breath. Inhalation may be fatal (Barnard, 1976) etc. etc..

What does the above mean for researchers? Are physiological stressors impacting work-trauma research in a culturally universal way? How can this be incorporated to understanding of work-trauma?

This will be a difficult question to answer for the study of work-trauma. However, a thorough review needs to acknowledge that physiological stressors are a potentially important area. Researchers must acknowledge that psychological reactions to the above are diverse. Fear and anger are some documented short-term symptoms that result from physiological stressors. These have different effects on blood pressure, for example: subjective fear may result in systolic blood pressure rises; subjective anger may cause diastolic blood pressure increases (Ax, 1953; Ichachter, 1957; Friedman et al, 1985; Averill and Rosenn, 1972; Badia et al, 1967; Breznitz, 1967; Paterson and Neufeld, 1987; Canter, 1980a). But the long-term impact of these stressors on general pathology needs to be carefully assessed.

Social support

Earlier we touched on the impact of social support in understanding work-trauma. This is a crucial area to understand, and deserves closer attention. The following is a review of key issues.

Quantifying differences in social support leads to an understanding of the role social support plays in different cultures, an important area for future research and also the management of professional interventions (Figley, 1985). As social support in different cultural settings can source within the work environment, from colleagues or superiors, or outside the work environment, from partners, families, doctors, or counsellors, social support data must include a comprehensive assessment of all sources of support to calibrate the network available to individuals (Cobb, 1976; House, 1981).

Researchers beginning to understand the relationship of work-trauma and social support tend to find a rationale to look at the

work-place first. The role of providers of social support in the work environment is probably fundamental in understanding the whole framework of social support available to emergency service individuals because they are uniquely able to empathise with individuals (Cobb, 1976). Thus, the work environment represents an immediate, unique opportunity to seek support from individuals who can empathise with perceived problems.

One result of this unique ability to empathise is that providers of social support in the work environment offer 'more tangible' benefits of support than families or other sources outside the work-place (Figley, 1985). Supporters in the work-place environment can provide relevant appraisal advice, which family members are unable to offer, due to their common experience both of the traumata and the organisational environment in which the experience occurs (Figley, 1985; House, 1981; Duckworth, 1990; Payne et al, 1987).

Expecting high support from work colleagues, superiors or other relatives in emergency services is also consistent with the Peterson et al (1992) model of PTSD. This suggests the role of the immediate work environment is fundamental in the process of traumatic reactivity. They see the environment as able to provide positive support, such as expressions of support, or negative support, such as a distancing from the victim (1992: 96). Superiors are the immediate contact which individuals have with the hierarchical organisation (Payne, 1987; Misume, 1989). They also represent the immediate means by which organisations can portray their attitude to victims who are experiencing work-trauma reactions (ibid: 9; Hirose, 1987; Hirose and Ishizuka, 1983). The attitude can be positive, involving expression of support and arrangement for counselling (McLeod and Cooper, 1992), or negative, involving casual concern and hostility to counselling (ibid; Paton et al, 1992d; Gospel and Okayama, 1990).

Similarly, the work colleague or relative has a considerable, although different, ability to influence the psychological state of emergency service personnel (Paton et al, 1992d). This is due to the confined nature of the shift system, where contact with work colleagues is prolonged, and also the operational dependency of

emergency service personnel on colleagues when attending incidents (Lim et al, 1987; Schwalm, 1981). Effective work colleague support minimises panic and facilitates the treatment of post-traumatic reactions due to the factors of shared experience and shared desire to appraise the trauma positively (McEwen, 1988; Murrain and Williams, 1987; Canter, 1989).

What can be inferred from the above? How does this lead to understanding work-trauma? What inferences can be drawn?

Again, the example of Japan is a useful indication of how the above can impact work-trauma studies. The Japanese work environment, for example, is unique in the loyalty it expects from members (McMillan, 1985; Kawasaki, 1969; Japan Institute of Labour, 1989; Misume, 1989; Kageyama and Mori, 1991). This can result in a perceived personal 'inability to act' independently or with initiative (Slaughter, 1990; Gospel and Okayama, 1990; Horsley and Buckley, 1990). As part of this perceived inability held by Japanese workers, the colleague in Japan probably plays a unique role.

The colleague in Japan can, in particular, more effectively assist in the appraisal of 'group information' which is valuable in the provision of support (House, 1981; Dale, 1986). They are also the means by which necessity for loyalty to the organisation is conveyed and also the informational conduit through which the monitoring of that loyalty takes place (Misume, 1989; Christopher, 1983; Kageyama and Mori, 1991). This is a traditional aspect of Japanese organisations which the literature has suggested for some time (eg: Allen, 1972; McMillan, 1985; Nakane, 1973; Reischauer, 1987). A key result of this unusual cultural characteristic is the development of a unique self-concept in Japan in terms of interaction with superiors (Bond and Cheung, 1983; Yum, 1989).

Why is there a suggestion that social support should come from within the workplace? Is it necessarily true that work colleagues in all cultural settings are providers of the more efficacious support?

As detailed earlier, researchers assessing the provision of social support need to look to broad social norms outside the emergency services. They need to note uniquely demanding aspects of the Japanese economy and society entails separation of individuals

from families or friends, providers of social support in the non-work environment, for more extensive periods than UK, Hong Kong or North American cultures (Uehata, 1990; Johnson, 1989; MITI, 1989). The 24-hour shift worked by Japanese fire-fighters exacerbates this factor, removing individual fire-fighters from providers of social support outside the work-place environment for even more extended periods.

Extensive work hours worked in other Japanese occupations also suggest an expectation of reduced opportunities for providing social support, as the providers are themselves limited in the time they can interact with the individual and be supportive. This is due, *inter alia*, to excessive commuting hours, long work hours and the 'informal' necessity for organisational commitment and over-time (eg: House, 1981; Japan Institute of Labour, 1991; Matsumoto, 1984; Matsumoto et al, 1981; Ueda et al, 1989; Uehata, 1990; Ueno et al, 1984).

'Pressures' and norms within the Japanese work environment also imply limitations on the social support that is sought from providers outside the work-place. Japanese workers are encouraged to disguise resentment of superiors (Pascal and Athos, 1982), and to present optimistic views of the organisations performance and environment to outsiders, including family members (Kageyama and Mori, 1991). There is also an encouragement in Japanese organisations to disguise personal problems and thoughts of organisational inadequacies from outsiders (eg: Christopher, 1983; Kawasaki, 1969).

Expectations of low social support from outside the work-place in Japan are also based on the low levels of transference between Japanese organisations. These imply a cultural 'norm' of presenting an image of satisfaction at work (Gospel and Okayama, 1990). This will result in low utilisation of non work-place social support (Cobb, 1976) due to the need for privacy and presentation of optimistic organisation pictures (Pascal and Athos, 1982; Slaughter, 1990). Low social support in Japan is also suggested by unusually long-term confinement within fire stations. This causes fatigue and increases neurotic symptoms. These fracture the normal operation of social support during relaxation periods away from work (eg: Kamada et al, 1990; Matsumoto, 1984; Matsumoto et al, 1981).

Thus, the severe commuting pressures in Japan and unique organisational and cultural norms represent key reasons why Japanese fire-fighters are expected to experience unique forms of social support. Commuting, of course, also represents time pressures on the providers of social support (Tanaka, 1987). As a comparatively high number of wives work in Japan (International Labour Office, 1992), partners, traditionally important providers of social support, are also often separated for long periods from their partners due to long commuting hours (Uehata, 1990; Anzai, 1989). Other providers of support in the non-work environment, such as friends, are also involved in commuting long hours (Uehata, 1990).

Occupational and traumatic stressors can fracture the social support network and buffering effect, particularly the partner/marital relationship. One practical example of social support is its relationship with examination. Although the culturally universal nature of examinations is questionable,¹⁷ when personnel are forced to spend extra hours away from the partner or family whilst revising or preparing the buffering support given by spouses may influence success rate (Fjelstad, 1982). Examination preparation is enervating for wives or partners due to already unusual work hours (Weyer and Hodapp, 1974; Guthrie et al, 1975; Fitts, 1965). This can be one reason why some emergency service workers in the UK tend to experience difficulties in marriage (McEwen, 1988; Paton et al, 1992d; see also Fjelstad, 1978).

The valency of removal from partners assumes, for example, that social support from a partner is culturally of universal importance, a point which the literature does not suggest (Whyte, 1979). Moreover, marital stressors also differ between cultures and it does not follow that the necessity to spend time on examination preparation is automatically a stressor to the marital relationship (ibid). The dynamics of social support, in short, do not suggest that fractured social support from wives or partners necessarily impairs the mediation of work-trauma symptoms. Indeed, it has been argued that less frequent social support may be as valuable as frequent social support (Thoits, 1982).

In this sense, therefore, examination pressures may, in fact, conceivably prove beneficial to some personnel. Partners spend less time together, so removing potential sources of friction. Additionally, cultural norms for divorce are influenced by other, diverse phenomena than excessive work hours, such as personal compatibility and ability to care for children (Fjelstad, 1978; Whyte, 1979). In terms of the effect of examination stressors on levels of anxiety and depression, therefore, although there is evidence to distinguish Japanese exam stressors from UK or Hong Kong stressors their effect may be mediated by the beneficial aspects of examinations on marital relationships.

Stimulant use

Hypothesizing on the interaction of work-trauma symptoms and changes in tobacco and alcohol use is important for two reasons. Firstly, the literature suggests emergency service personnel traditionally make comparatively more extensive use of stimulants than other uniformed populations such as police officers and paramedics (eg: Hildebrand, 1984b; Paton et al, 1992d; Paviour, 1987). Secondly, the literature suggests stimulant use is related to certain or all symptoms associated with traumatic reactions: for example, the diagnosis of PTSD makes an allusion to changes in behaviour related to alcohol (Appendix I); and the use of tobacco and alcohol are suggested as indicative of avoidance symptoms by Horowitz et al (1987) in their diagnosis of PTSD. (See also Wilson, 1978; Alexander and Wells, 1991).

In the literature, however, there is no specific suggestion as to how stimulant use and specific symptoms of either general pathology or specific trauma reactions may be related. There is no comparative data, in particular, on differences in stimulant use in populations exposed to trauma as part of their work versus populations not experiencing work-trauma. It is, therefore, important to consider how changes in stimulant use and all symptoms associated with work-trauma are related in different populations.

The reason for a hypothesis based upon changes rather than levels of stimulant use may be based on understanding about the levels of stimulant use, which are subject to fundamental cultural differences. There are, for example, more Japanese smokers per thousand than in any other country (Anzai, 1990). There are also significant regional differences in other stimulant use within cultures, for example between urban and rural areas (BUPA, 1991; Paviour, 1987; Seppanen, 1979).

The level of stimulants used by populations can also vary over time due to social or personal reasons, for example during vacations or when traveling (Paviour, 1987). The literature suggests, therefore, that changes in stimulant use in response to stressors perceived as 'severe' are a more meaningful indication of the dependency of individuals on that stimulant (ibid). In particular, there is a suggestion that significant changes in stimulant use in response to stressors imply a psychological dependence different from utilisation of stimulants at more constant levels associated with socializing or traditional consumption levels (Seppanen, 1979; Horowitz et al, 1987).

The reason for isolating intrusion, avoidance and depression symptoms lies in interview evidence that these symptoms are perceived by personnel as 'severe'. They are, therefore, more likely to associate with changes in stimulants used to manage their effects (Paton et al, 1992d). Reasons for not anticipating cultural consistency in levels of general pathology lay in the comparatively severe economic and social stressors endemic to Japanese society (see Hypothesis (iii) for details). Contrary to Hong Kong and UK populations Japanese fire-fighters faced severe economic stressors and pressure to conform within the organisation.

There have also been suggestions in the literature that Japanese public sector workers exercised less than in other cultures (eg, Nakamura, 1984a). This would imply stimulants may be used comparatively more in coping behaviours rather than physical exercise. The alternative hypothesis is that changes in stimulant use will not correlate with levels of intrusion, avoidance and depression symptoms associated with work-trauma; and that levels of general

pathology will not correlate with symptoms in the Japanese population.

A variety of sources suggests use of cigarettes, other tobaccos and alcohol is traditionally associated with emergency services in Anglo cultures (Paton et al, 1992d; Paviour, 1987).¹⁸ Another variety of sources suggest the link with ill-health can be far reaching. Researchers have suggested, for example, the relationship between stimulant use and the unusually high mortality and CAD rates within emergency service workers (eg, Barnard and Duncan, 1975; Donnan and Scott, 1982, 1987; Mastromatteo, 1959).

Although level of stimulant use is dependent on individual thresholds of tolerance and cultural norms (McCrae, 1984), the comparative change relative to (unspecified) aspects of work perceived as stressors is important.

It should also be noted there are cultural as well as individual differences affecting the use of stimulants. The use of medication to relieve physiological effects of stress, for example, is higher in Scotland than the UK (11% versus 9%). Stressors 'from relatives' and lack of social interests and sport activities are also higher in Scotland than England (BUFA, 1992).

It is known individual differences can affect some symptoms. For example, a consideration of what was most likely to 'insulate' US fire-fighters from high stress suggests 'assertiveness' and 'self-esteem' (Petrie and Rotheram, 1982: 963). These were observed to inversely correlate with high measures of anxiety, occupational stress, somatic symptoms, positive self description and self-expression (Catell, 1965; Weyer and Hodapp, 1974; Guthrie et al, 1975; Fitts, 1965; Gay et al, 1975).

Thus, these factors could be implicated in moderating PTSD (Petrie and Rotheram, 1982: 966). However, these factors remain ambiguous in their cultural consistency (Bond and Yang, 1982). For example, there are differences between Asian and Western concepts of self which are valued and which influence cognitive appraisal (Ho, 1977, 1986). These differences include assertiveness, ability to cope with stressors and self-reliance (Lazarus, 1966; Lee and Su, 1985; Shek and Cheung, 1990).

These will effect PTSD symptoms in different ways. For example, the emphasis on self-reliance in some cultures will discourage expression of PTSD symptoms. Assertiveness behaviours, such as verbal and physical commands, are less frequent in some Asian cultures (Shek and Cheung, 1990). This will influence the potential for fire-fighters to deal with inter-personal problems arising from expressions of PTSD different from the cultural norm.

One variable which is feasible to compare is the interaction of individual stimulant use with PTSD symptoms. Stimulant use has the advantage of being an easy to measure individual difference. There is also medical evidence that stimulant use is a factor in understanding PTS (Healy, 1992: 128).

Again, little is known about levels or the role of fire-fighters stimulant use in Japan, UK or Hong Kong. Comprehensive data on stimulant use in fire-fighters is only available on US fire-fighters (Hildebrand, 1984a). Amongst this sample, however, over fifty percent of fire-fighters perceived alcohol as a 'small problem' in relation to stress. Twelve percent perceived alcohol as a 'serious problem'. For non-prescribed (ie, illegal) drugs a quarter perceived a 'small problem' (Hildebrand, 1984b: 32).

This would seem to imply fire-fighters in Japan, Hong Kong or the UK (exposed, theoretically, to analogous organisational and traumatic stressors) might also be extensively using stimulants. There is also growing anecdotal evidence of the frequent use of stimulants amongst UK fire-fighters (McLeod and Cooper, 1992; Paton et al, 1992). It has also been suggested, by researchers within UK fire services, that general stimulant use amongst fire-fighters is higher than population norms and a source of organisational concern (Paviour, 1987).

This is an important area as excessive stimulant use can have health repercussions for UK fire-fighters. Douglas et al (1988) suggested alcohol consumption, smoking habits and excessive caffeine consumption (in coffee and tea) relate to increased susceptibility to carbon monoxide poisoning (Douglas et al, 1988: 317-318; Seppanen, 1979). Paton (1989b) has also suggested 'the most consistently observed effects of disaster rescue work for fire-fighters '...were

altered eating habits [and] increased smoking and drinking...The increases in smoking and drinking may be significant in terms of their secondary influence on health' (1989: 317).

Some data is also available on alcohol use and stress in Japan. (Again, not in relation to fire-fighters.) However, Nakamura (1990a) observed 'alcoholic mental disorders' (using the ICD-9, International Classification of Diseases, criteria) to be the second most prevalent psychiatric diagnosis amongst Japanese office-workers in a 25 year longitudinal study (1990a: 339; 1990b: 199).¹⁹ The evidence to link Japanese fire-fighters with the community who do not experience, for example, shift-systems or persistent exposure to trauma is tenuous. This work does, however, suggest alcohol consumption may be at high-levels within Japan. Further, even if the prevalence of alcoholic mental disorders does not refer to fire-fighters it may have implications for the social support fire-fighters seek from others.

Frequency of exercise

Hypothesizing on the interaction of symptoms associated with reactions to trauma inside the work-place and frequency of exercise outside the work-place is founded on anecdotal evidence from UK fire-fighters. This suggests fire-fighters who exercise frequently, in addition to the normal requirements to practice ladder climbs or search-and-rescue drills, tend to 'adapt' more efficaciously to traumatic stressors (ie, experience comparatively lower symptoms). By contrast, fire-fighters who do not exercise frequently exhibit higher symptoms of work-trauma (Paton et al, 1992d; McLeod and Cooper, 1992). This interview data also suggested that the fact of undertaking an activity was the key benefit of exercise; participation per se was not perceived as necessarily enhancing fitness levels.

This was supplemented by evidence on the efficacy of organisation-based exercise initiatives in the prison service. There, exercise programmes had reduced stress symptoms - though not necessarily enhanced fitness levels - over a three month period; the

prison service is comparable to the fire service as both jobs entail confinement within the work-place for abnormally long periods of time and both occupations are characterized by questionable fitness levels amongst personnel. '...High staff morale, improvement in attitudes, increases in confidence, and greater physical fitness which improves resistance to stress' were all reported by staff as direct results of the exercise program (Kiely and Hodgson, 1990: 572). Again, therefore, the literature suggested the importance of understanding the association of frequency of exercise and work-trauma symptoms is not necessarily related to fitness levels.

The hypothesis was also inferred from literature about the changing approach of UK and Hong Kong fire services to fitness levels in all fire service personnel. Historically, little had been done on this topic since Barnard et al's work of the early 1970s, which questioned the functional level of UK fire-fighter fitness. They suggested typical UK fire-fighters had a low cardiovascular capacity. This was in contrast to expectations of a high capacity given the physically demanding nature of the job (Barnard et al, 1973a); the result was an inefficient ischaemic response to sudden stressful exercise (ibid, 1973b). Since Barnard first identified the questionable level of fire-fighter fitness, however, there has been little research on fire-fighter fitness.

However, it appears the work had been taken seriously by UK and Hong Kong fire services. For example, there has been a persistent emphasis to address the issue of fire-fighter fitness and encourage individual (ie, out of work) activities in recent years. Thus, typical fire-fighter fitness, and also exercise frequency, was improving. As part of this trend, fire services in the UK tended to be more active in promoting interested individuals in personal exercise programmes, in conjunction with fire-service wide occupational health schemes (Paton et al, 1992d, 1993). The close organisational links of Hong Kong and UK fire services suggested similar attitudes permeated HKFS; there was, for example, an occupational health scheme in the HKFS.

However, the fact that Japanese fire services did not operate an occupational health scheme was a key difference. This suggested a

unique attitude and ambivalence towards individual exercise in Japanese fire services. Literature from Japan, moreover, suggested individual exercise taken by personnel tended to be higher in the private sector than the public sector (Shoji et al, 1990; Doya et al, 1989).

This was supplemented by primary data from the National Fire-fighters Council which emphasized the independent nature of out-of-work exercise throughout Japanese fire services - ie, that fire-fighters were not specifically encouraged to undertake exercise out-of-work (personal communication, 1991). In the author's subjective judgment the inference in this communication was that fire-fighter fitness was assumed as being at levels which the fire service were satisfied with. There was, therefore, no institutional attempt to encourage exercise out-of-work. This was consistent with data from the Ministry of Health and Welfare (1989) which suggested opportunities for leisure and exercise were low in Japanese society versus other industrialized countries. Thus, the literature suggested a far more active organisational encouragement of UK and Hong Kong fire-fighters fitness levels.

Also underlying the hypothesis was an inference that experience of traumatic situations and other physical stressors inherent to fire-fighting had some association with psychological state in all cultures. Kinston and Rosser (1974), for example, had suggested that the psychological effect of disasters on US individuals could be managed, in part, by physical exercise programmes; Wong (1990) had shown that physical fitness tended to reduce the psychological effects of prolonged wearing of BA sets in Hong Kong; Horowitz et al (1987) had suggested physical fitness could reduce the psychological effects of exposure to chemicals in fires.

The reason for isolating intrusion symptoms lay in the unique characteristics of this symptom; the literature did not suggest this would relate to exercise frequency. Rather, intrusion symptoms were suggested as more closely associated with cognitive schema, and as such were more likely to respond to cognitive management type intervention such as critical incident de-briefing sessions (CIDS) and counselling than exercise programmes. Intrusion symptoms were

also not perceived as reasons for conducting exercise: by contrast, somatic distress or performance difficulties and other levels of general pathology were symptoms which would prompt exercise and which would respond to exercise as they had physical characteristics (Horowitz et al, 1987).

Therefore, it was inferred that UK and Hong Kong fire-fighters with higher exercise frequency would exhibit lower symptoms of general pathology than fire-fighters who did not exercise in all symptoms except intrusion. Given the lower levels of exercise predicted in Japan it was expected that no correlation would exist between exercise frequency and symptoms of both general pathology and specific trauma-reactions. The alternative hypothesis would be that the frequency of exercise would correlate with the level of symptoms associated with work-trauma reactions in Japan but not in UK or Hong Kong; similarly, intrusion symptoms would correlate with exercise frequency in all populations.

Frequency of exercise may relate to stimulant use: the more workers exercise, the more health conscious they are, and the less they use stimulants (Paviour, 1987). Thus, active sport and social interest or both are, essentially (like the use of stimulants), an opportunity to relax and experience mental rewards similar to 'the social act' of smoking and drinking.

It is known how exercise frequency interacts with work-trauma symptoms, interventions, such as in the occupational health scheme, can be more meaningful (Arroba and James, 1987; Kiely and Hodgson, 1990). Information in this area is particularly helpful for emergency services as exercise and fitness are traditional areas of concern and can be easily managed (Paton et al, 1992d). Exercise has beneficial effects on stress, particularly in uniformed organisations (Kiely and Hodgson, 1991). Uniformed personnel often use exercise to manage physical stressors and assuage anger and discontentment (ibid). Several studies on fire services are influenced by the physical characteristics of employment in emergency services, of necessity active, and the frequency with which fire-fighters exercise (Kiely and Hodgson, 1990; Barnard et al, 1973a, 1973b).

Certainly, UK, Japan and Hong Kong fire services are committed to fitness programmes and fire-fighters are subject to regular physical activity and high medical standards on entry (Hargreaves, 1992: 3). Also, the 'healthy worker effect' is clear that the incidence of physiological stress in fire-fighters should reduce, such as ischaemic or rheumatic heart disease, coronary attacks, hypertensive disease, acute myocardial infarction, circulatory problems, respiratory complications and reduced resistance to diseases (Barnard, 1976).

However, care must be taken on exaggerating emergency service fitness in all cultures. Douglas et al (1988) note that 80% or more of heart rate (HR) capacity must be reached for exercise to produce '...a beneficial effect on the cardiovascular system' (1988: 317). They only observed 'some critical incidents' amongst UK fire-fighters where 80% HR capacity was achieved (1988: 317). Japanese fire-fighter fitness has also been questioned, and indeed equated with the fitness levels of a sedentary worker (Kuorinka and Korhonen, 1981: 764).²⁰ Nothing is documented on Hong Kong fire-fighter fitness levels. However, as the 'healthy worker effect' should reduce physical tension, the fact that an '...upset stomach and trouble with sleeping' affects one-third of a sample of US fire-fighters on a regular basis supports a general thesis that global fire-fighter fitness is not at high levels (Hildebrand, 1984b: 32).

Thus, there is potentially universal evidence suggesting fitness levels in fire services is poor. This may serve to confound the relationship as exercise by un-fit individuals does not have the efficient psychological results envisioned by Kiely and Hodgson (1990). There is also a possibility that some emergency service workers perceive they exercise frequently anyway, as part of their job, and do not, therefore, feel the necessity for frequent or demanding individual exercise (Paton et al, 1992d). Similarly, managers within fire services may not feel time is adequate for individual exercise (*ibid*).

There will also be some relationship between age and exercise. In one symptom, somatic distress, age will have a predictable, deleterious influence (Donnan and Scott, 1987). However, the effect

of age on other PTSD symptoms is less clear. Symptoms such as depression or intrusion remain particularly difficult to understand. It is not known, for example, if exercise reduces depression or intrusion symptoms. Alternatively, does exercise frequency indicate high levels of symptoms individuals are seeking to reduce (Kiely and Hodgson, 1990; Barnard et al, 1973a, 1973b; Doya et al, 1989)?

The unknown but potentially important factor of the 'macho ethic'

The macho ethic is an inevitable aspect of emergency services. It is probably best conceptualized as 'endurance' (though for this there is no precedent). How can emergency service workers endure traumata which others would report as having severe consequences (Paton et al, 1992d; McLeod and Cooper, 1992)? Why is it that emergency service workers can silently endure, or at least minimize, the effect of traumatic stressors? Strangely, however, what exactly the macho ethic is remains unclear, although frustratingly its link with work-trauma and particularly the methodological aspect of self-report data and social support is potentially far ranging. What do we know?

1. First, the behavioural manifestations of macho endurance are wide ranging but include black humour, general references which minimize danger and, significantly, notions of performance failure and symptomatology (Akin, 1977; Innes and Clarke, 1983), frequent out-of-work socialisation with other emergency service workers and - probably as part of this - above-average stimulant use rates (Paviour, 1987).
2. Second, black humour is probably the hall-mark of the macho ethic; a coping strategy where the seriousness of the trauma is trivialized as jokes and casual references and serious discussion is avoided (McLeod and Cooper, 1992, again suggesting a link with self-report methodological issues).

3. Third, it can be inferred that fractured social support probably enhances the macho ethic. The existence of providers of support who can empathise with the experience of emergency service workers is anyway more limited than other groups (Flannery, 1990; Cobb, 1976; Dean and Nan, 1987; Figley, 1985)²¹ but as opportunity to interact with providers is further jeopardized by unusual working hours and shifts there is inevitably close bonding between emergency service workers not seen in other occupational groups (Paviour, 1987; Paton et al, 1992d).

4. Fourth, the characteristics of the macho ethic may be so fundamental as to distinguish emergency service culture from the ethnic or national culture.

Yet, beyond this, no formal measurement or even definition of the macho ethic has ever been developed, nor an understanding of what cultural factors may influence it defined. Again, in consequence, there is a need to make inferences when asking, first, if the macho ethic culturally universal and, second, if it impacts work-trauma.

Essentially we can expect some influence from the above because the probable cause of the macho ethic is inevitably culturally universal. Disturbing traumata which involve fatalities, serious mutilation and injury are phenomena which all emergency service workers experience as an inherent part of their job. Body-handling may be a particularly severe stimulus (see, for example, Taylor and Fraser, 1982; Paton et al, 1992d; Mullin and Williams, 1980), though traumata can extend to diverse experiences such as serious injury or the necessity to manage panic in distraught victims. Severe trauma is also compounded when it occurs to emergency service workers themselves.

But effects cannot be assumed as culturally universal. There is some evidence effects may be universal in Anglo emergency services (as seen in Appendix VII), but we know little of how the macho ethic influences the effects of trauma in other cultural settings, although Ramsay's (1993) data on a Hong Kong CI sample suggests potentially large differences. We are forced to speculate on limited data.

Alexander and Wells (1991) probably measured the macho ethic - if unintentionally - when they observed decreased anxiety and depression symptoms amongst UK police officers involved in body-handling following a disaster. (They were engaged in a longitudinal study before a CI occurred.) Anecdotally, after the UK King's Cross fire (1989), for example, the watch commander noted '...I know that I punished many firemen in the course of the decisions I took. I felt this is our function - our first function is to save lives' (The Times); Ballantyne (1916) eulogised London fire-fighting '...His little body and big spirit rejoiced in the whole affair as a magnificent display of fireworks and heroism' (1916: 53).²² This is supported by some academics who note, for example, that fire-fighters must exhibit a '...commitment to face extreme danger for hours on end, as well as risk serious injury and substantial personal and property losses' (McFarlane, 1987: 366).²³ Whilst at an intuitive level all of the above seem plausible in other cultural settings there is no evidence for this.

One way to assess the importance of the macho ethic in different cultures is to take an historical perspective, as emergency service workers are all aware and proud of a unique sense of tradition about 'endurance.' The history can certainly be impressive,²⁴ and there probably is some evidence that this impacts the identity or macho ethic of contemporary emergency service workers. The Samurai influence in modern Japanese emergency service workers is probably a strong example because development of organisation-specific rather than economy-specific skills are emphasized in their emergency services - one reason why fire-fighters in Japan tend to join the fire service earlier than in the UK, where many personnel learn a trade first (Gospel and Okayama, 1990).²⁵ Again, at an intuitive level it seems plausible to expect each emergency services independently develop traditions which nurture pride, a sense of uniqueness within the community, close comradeship and, above all, an ability to endure CIs²⁶ and in effect to under report symptomatology (Paton et al, 1992d; Hodgkinson, 1990; Routley, 1985).²⁷

As well as anecdotal and intuitive evidence we also find some conceptual, if again unintended, evidence that the effects of the macho ethic are culturally universal. Peterson et al (1992) state that experience is a factor in the experience of traumatic stressors:

'...The folklore example of getting back on the horse once a person has fallen off is a good metaphor [in the context of appraising traumata]. The person who gets back on has one set of information (eg, that the horse does not always throw you; the anxiety level is not bad as fantasized, partially due to extinction). The person who does not get on the horse does not have the same information. Furthermore, various cues (eg, thoughts and images) may become conditioned. For instance, the following sequence can occur. The person thinks the thought, 'Perhaps I should try to get back on the horse.' Then the rider becomes anxious. If then the individual does not go through with getting on the horse, the thought may become a conditioned cue' (Peterson et al, 1992: 97).

Thus, it is conceivable that exposure to trauma engenders a learning experience, one result of which is a reduction in reported work-trauma symptoms. This could be occurring in a culturally universal way.

One way we can assess the macho ethic is in attitude towards counselling. Although counselling can be stimulated by a great variety of factors (Robertson, 1988), there is a comparatively new use of counselling outside the US (eg: Hargreaves, 1991; McLeod and Cooper, 1992; Paton et al, 1992d; Ramsay, 1993) and it is probably a culturally universal phenomena in the emergency services.²⁸ As counselling is increasingly used as a means of managing work-trauma reactions, it is important to question if counselling can be applied in the same ways and on the same principles in emergency services outside the US (Herrick, 1992; Medd, 1991; McLeod and Cooper, 1992). Contemplation of counselling is also important as an alternative, pro-active strategy to managing work-trauma reactions and avoiding litigation (Hargreaves, 1991). A hypothesis should address the following: which symptoms stimulate contemplation of counselling?; are the stimulating symptoms culturally universal?; do those contemplating counselling exhibit different symptomatology from fire-fighters not contemplating counselling?

Contemplation of counselling is probably only stimulated by extreme, 'unusual' symptoms such as intrusion and depression (eg: Cooper et al, 1989; Duckworth, 1986, 1990; McLeod and Cooper, 1992), and there is some anecdotal evidence that contemplation of counselling is secretly endemic in personnel who, after being exposed to trauma, experience intrusive imagery and depression at failure to perform effectively (eg: Borus, 1974; Boston Globe, 1984; Duckworth, 1990; Paton et al, 1992d; Piringger, 1982; Robertson, 1988; Smith et al, 1977).

It may also, in fact, be driven by religious values rather than the macho ethic. In Japan, for example, there is a unique 'sense of impermanence' not seen in other Asian or Western cultures (Hyo and Seidensticker, 1977). Death or other trauma involving serious injury tends to be perceived as a normal and a logical development of physical existence (Ibuse, 1989; Morris, 1959; Lifton, 1989; Waley, 1964; Dale, 1989). This would imply that low contemplation or action over counselling may be not be a reflection of the macho ethic but, rather, underlying cultural values.

Emergency service workers may perceive the encountering of bodies and other traumata within a schema suggesting 'normality'. This is consistent with schema theory in emergency services personnel (eg, Paton, 1994) which suggests emergency services personnel adopt, within their occupational roles, unique schema which aid coping with 'the demands of traumatic events' (1994: 2). Thus, for example, in addition to 'normality', the importance of self-reliance and peaceful acceptance of stressors, which is known to be imparted from a young age in Japan (Stephens, 1991), will generate schema that hold both social support and general counselling as relatively unimportant.²⁹

Literature on self-denial in Japan also suggests a cultural tendency to express emotions in personal rather than social ways; ie, without extensive social support. Japanese will express anger and frustration in private rather than in the more open settings of North America (eg: Kamada et al, 1990; Kato, 1969). Social support, therefore, represents a potentially under utilised coping strategy in Japan (House, 1981).

This would begin to suggest that counselling is probably stimulated more by symptoms such as performance difficulties, which are inevitably important 'as a fire-fighter should do'. If performance is impaired over long periods this would constitute an 'unusual' experience and would prompt the seeking of counselling. Emergency service workers experiencing performance difficulties would also be less likely to seek support from superiors when doing so would have implications for promotion opportunities or potentially result in transference to light duties.

SUMMARY

In summarizing the review of variables, several further assumptions should be clarified.

1. The first assumption is that there is a need at this stage to be aware of a **wide-ranging variety of cultural variables** which can associate with work-trauma reactions. This could be due to their proximity either to a formal definition/predictor of acute stress disorder and even PTSD or in their relationship with general psychological stressors, stress reactions and stress moderators.
2. Thus, to develop hypotheses about the association of **several cross-cultural variables** on work-trauma, it is assumed there is a certain interaction between the variables in each culture and certain of the pantheon of work-trauma symptoms. Ultimately, this suggests in data analysis, simple correlation is inadequate; we need to use what Martin called an 'interactional model' (1989: 219-221). Conceptually, though, it suggests in a review we need to consider several diverse cultural variables when understanding the cross-cultural context of work-trauma.
3. Third, we need to fully explore what is implied by what can be measured in the emergency services, particularly length of service, and rank. Thus, for example, if there is a documented tendency for one cultural setting to experience larger numbers of fatalities/critical incidents this we can expect to be reflected in the factor of length of service; be it in numbing or in exacerbated symptomatology. If there is a documented cultural tendency on pressure to perform at work, this may be reflected in the area of rank.
4. Fourth, there is a necessity to avoid placing a too heavy dependence on literature on PTSD. This important point on the conceptual difference of PTSD and work-trauma will be dealt with later in this review.

5. Fifth, we need to assume at this stage that selected cultural variables not only occur in all cultures but also that they have some association with work-trauma in all cultural settings. This will need to be statistically validated at a later stage, but at this stage we must assess the broad areas of potential association. What effect examination stressors have on work-trauma symptomatology, for example, in Japanese versus UK cultural settings is outwith the purpose of this review but what is within the purpose of this review is to justify that examination stressors exist across cultural settings.

The review, therefore, inferred key variables that would define different cultural influences in work trauma. Although in many ways (such as discipline structure, call-out rates, and legal purpose) fire services are analogous organisations which are difficult to distinguish, the literature suggests key differences exist between Japanese, UK and Hong Kong fire-fighters and which will influence work-trauma symptoms. Primary of these is a lower emphasis on examinations amongst Japanese fire-fighters, as a reflection of seniority-based promotion systems; this will potentially reduce anxiety and depression symptoms associated with exam strain. In addition, the unique, urban conditions of Japanese cities causes not only high fire risks and associated fatalities but the demanding and high work hours in Japanese society represent a fracturing of the social support system available to Japanese fire-fighters. This will influence general levels of symptoms.

Balanced against this, however, is evidence that cultural norms in Japanese society prepare Japanese fire-fighters in unique ways for the experience of work-trauma. Death, for example, is portrayed in the literature as uniquely normal and the Japanese are, on a cultural level, suggested to deny individual emotions in favour of perceived national needs such as economic supremacy and the welfare of the group. This will have direct implications for the levels of intrusion and avoidance symptoms due to their close relationship with images of fatalities. Although this holistic view of the Japanese is over-

simplified, it is a key factor in the development of the hypotheses in the following chapter.

Finally, this chapter isolates three individual differences which are potential influences on work-trauma symptoms. They are: age, stimulant use and exercise frequency. Social support, in addition, is suggested as a key determinant of work-trauma symptoms; a unique part of the social support framework is that provided by, outside the workplace, partners or wives and, inside the workplace, by work colleagues and superiors.

ENDNOTES

¹ Organisational initiatives such as improving inadequate facilities, temperature control, noise control and role analysis and its interaction with goal setting are an example of primary prevention (Hennessy, 1990: 50). Secondary prevention is individual oriented, with the relief of symptoms as its purpose; education programmes in cognitive management as well as CI de-briefing may be considered as secondary prevention.

² The point is consistent with evidence from Vietnam veterans which distinguishes the effect of non-combatant fatalities versus the fatalities or serious injury of fellow soldiers (Figley, 1985; Bourne, 1989; Borus, 1984; see also Williamson, 1987; Wilson et al, 1988; MacPherson, 1984). Data about the severe physical and psychological consequences for emergency services also suggests latent reactions from injury to colleagues. A UK fire-fighter who received who 42% burns took three to four years for recovery, for example, but also reported intrusive images up to five years later: '...I still hear the noise of hot air whistling round, getting louder and nearer with the thunder of impending mutilation in my ears' (MacDonald, 1989: 33).

³ In Japan, for example, it is difficult to ascertain specific details of how many die or are injured in the course of emergency service duty. This is a reflection of the comparatively strict government legislation on occupational conditions in Japan's public sector (ILO, 1990; Anzai, 1991). This may explain why projects commissioned by Japanese emergency services in Japan tend to be sparse, and there is a traditional emphasis of stress-related research on the private sector in Japan (Shoji et al, 1990a).

⁴ The Impact of Event Scale is a traditional measure associated with specific traumatic events. It measures intrusion, 7 items, and avoidance, 8 items (Horowitz et al, 1979); see Chapter Three, Methodology, for details.

⁵ Death symbolism is comparatively prevalent in Japan and leads to a unique acceptance of death (Lifton, 1969). See also Campbell (1988), who argues that Eastern religions have developed religious and philosophical taxonomies which are based upon integrating matter and spirit. By contrast, he argues, Christianity, Judaism and Islam hold matter and spirit as dissociated.

⁶ For example, a US survey of under 25 years fire-fighters (Hodgkinson, 1990) estimated that only between '...three and seven percent will suffer profound psychological after-effects following a serious incident' (1990: 23). By contrast, estimates seem to suggest around 25% of elderly trauma victims fail to 'adapt' to traumatic experiences; and for combat veterans over sixty-five, '...between thirty percent and sixty percent [are likely] to show some signs of PTSD' (Nicholls & Czirr, 1986: 421). This may be culturally consistent: some increased symptomatology has been recorded in elderly Japanese subjects (Natsume et al, 1988).

⁷ Note, though, that questions have been raised concerning the necessity for part A in diagnosing PTSD (Paton & Smith, 1992). This would suggest that for emergency service workers engaged in an occupation where work-related trauma is persistent it may not be necessary to isolate stressors in diagnosing PTSD.

⁸ Data on working hours also omits perceived differences or trends. The Japanese government, for example, wants working hours reduced to c.1,800 hours p.a. (MITI Report, 1989) and have called on companies '...to give more freedom of choice to their employees in taking vacations so they can take holidays when they really want to and without feeling guilty about it.' In 1989, the average holiday taken by a Japanese worker was only 3.6 days (MITI, 1989). Yet, the average private-sector worker in Japan still works 300+ hours p.a. more than in Europe. In Hong Kong, average working hours in the private sector are anecdotally suggested as high in the region. In 1990, by contrast, average UK working hours were 1,769 versus 2,143 in Japan, a discrepancy privately estimated at nearer 500 hours (Hong Kong Government Information Services, 1992; International Labour Office, 1992: 101; Uehata, 1990: 9).

⁹ Karoshi: '...a condition in which psychologically unsound work processes are allowed to continue in a way that disrupts the workers normal work and life rhythms, leading to a build up of fatigue in the body and a chronic condition of overwork accompanied by a worsening of

pre-existent high blood pressure and hardening of the arteries and finally resulting in a fatal breakdown..." (Uehata, 1990: 8). Specifically, it is myocardial infarction which causes the sudden deaths: 'recent research...also shows that various types of behavioural stress can cause rapid progress in hardening of coronary arteries accompanied by and leading to angina pectoris or myocardial infarction' (ibid: 10)

¹⁰ Since 1950, Japanese GDP growth has been consistently double the next most profitable country in the world (Allen, 1977: 6-11). Even the 1972-3 oil crisis did not prevent GDP staying at c.10.5% growth per annum since WWII. The results are significant: presently, Japan has a disproportionate share of the world's resources. The Japanese represent only 0.02% of the world's population but own 10.5% of the world's manufacturing capacity, up from less than 2% in 1945 (Kennedy, 1988: 539-40). This probably explains, or is explained by, historically low inflation rates (inflation in Japan tends to be under 2%), population growth (there are 123.60 million Japanese (1989), up from 69.25 millions (1935) and 78.10 millions (1947)) and high social cohesion ('Japan is the most traditional society...with very low rates of divorce and births out of wedlock and the highest proportion of married-couple households although even in Japan, family patterns are changing: sharp drops in fertility have led to much smaller families...' (Japanese Institute of Labour, 1991).)

¹¹ The index describes cultural adherence to economic variables like preferred savings to earnings ratio, perseverance in the face of adversity and thriftiness as well as more 'Confucian' variables like adapting traditions to modernity, respect for elders, and willingness to subordinate oneself. The index correlates with mean economic growth 1965-1987 at .70 ($p < 0.001$).

¹² Unionization in Japan is 26.80%, versus 41.50% in UK and 17.86% in Hong Kong. In Hong Kong only 202 working days were lost to strike action in 1991 (Hong Kong Government Information Services, 1992: 110). In the US, by contrast, 16,996 days were lost to strike action in 1989 (Johnson, 1991: 58).

¹³ Variations are suggested on the categorization of stressors which fire-fighters experience: 'traumatic stressors', 'daily hassles', 'physical stressors' and 'problems unrelated to work', such as marital strain or the illness of partners ('Fire', August 1991: 15). Hong Kong Fire Services have 'high responsibility', 'exposure to life endangering environment', 'prolonged exposure to high tension' and 'sudden arousal in responding to emergency calls' (personal communication, 1992). In a study of stress in a UK uniformed service (the police), stress reactions were categorized as 'physiological symptoms' (eczema, asthma, high blood pressure, digestive problems, coronary heart disease and ulcers), 'psychological symptoms' (nervousness, frustration, restlessness, irritability, dissatisfaction, boredom, hostility, low self-esteem, depression, despair), 'cognitive symptoms' (sensations of un-reality, confusion of names, dates and times, indecision, refusal to accept the obvious, rigid views, anxiety and associated thoughts, susceptibility to rumours and paranoia) and 'ego-defensive symptoms' (denial of reality, fantasy, compensation, projection, repression, displacement, emotional frustration, regression) (Brindley, 1983).

¹⁴ With the curious exception of China, where emergency service personnel are part of the (conscripted) army.

¹⁵ Physiological strain occurs when the muscular-skeleton frame experiences 'bodily strain' and 'hormonal imbalances' due to increased cardio-vascular activity (Barnard & Duncan, 1975). This suggests all emergency service workers potentially experience similar physiological stress. Hormonal imbalances and bodily strain actually associated with incidents have various effects on the stress process, particularly perception of threat and alteration of mood and it is suggested the '...pituitary gland is a much better judge of stress than the intellect' (Cohen & Edwards, 1985: 265).

¹⁶ Physiological stressors inherent in SCBAs remain at the forefront of UK fire service research (Home Office, 1990: 20).

¹⁷ In the Japanese cultural setting, for example, there is a unique emphasis on examinations, different in form not only from UK or Hong Kong public sectors, but also in extent of detail from the US (Gospel & Okayama, 1990). The key - and unique - factor in Japan is that there is less occupational transference: '...Externally validated qualifications

are [therefore] less important except at the point of entry [to an organisation]' (ibid, 1990: 13). The result is the 'infamous' seniority-based promotion in all Japanese organizations (Reischauer, 1993). The unique aspect of Japanese fire service examinations is supported by the nature of UK & Hong Kong fire services exams, which have like many throughout the world become increasingly complex and increasingly significant for individual promotion opportunities (Paton et al, 1993; Ramsay, 1993). Anticipating high levels of anxiety and depression in UK and Hong Kong fire-fighters is supported by the high drop-out rate in HK and UK promotion applicants (Davis, 1990: i; Home Office, 1990: 18). UK examinations are also known to involve ambiguous procedures, further increasing the perception of a stressor (Paton et al, 1993; Home Office Report, 1990: 18).

¹⁸ Two reasons are suggested for the historically high levels of alcohol consumption in UK fire-fighters. First, fire-fighters were once paid by beer in lieu of work done (Torbert, 1967). Second, after the second day watch fire-fighters often drink communally ('Aye Ready', 1936).

¹⁹ International Classification of Diseases, 9th edition classification is also used for diagnosing reactions to trauma, although less prevalently than DSM-III-R.

²⁰ In Japan, there is a suggestion that physical ill-health characterizes a number of occupations where restricted working conditions, such as those experienced by fire-fighters confined in fire stations, exist. Examples include software engineers (Shoji et al, 1990b) and taxi-drivers (Ueda et al, 1989). 'Health consciousness' in Japanese workers is also suggested as low by international standards (Hagihara & Morimoto, 1990: 125).

²¹ Certainly a factor in Japan where implications on 'Japanese identity' and 'inability to cope' are carefully avoided (Dale, 1989; Shoji et al, 1990a, 1990b; Ueda et al, 1989; Bond & Cheung, 1983). As part of this there is an inevitable avoidance of utilising social support or even sharing confidences outside the work-place for problems that relate to the work-place (Ueda et al, 1989).

²² Ballantyne probably alluded to historical traditions. In 1808, for example, UK 'managers' acted for insurance companies to protect property from fire. They observed their 'employees' behaved themselves 'as a fireman should do' (Dickson, 1960: 63). Even in times of growing unemployment and over-population strict criteria have been retained for 'employing' new fire-fighters in the UK, both physical and intellectual. In 1761, the criteria were that they be 'at least 5 feet 7 inches tall' (Dickson, 1960: 66). In 1810, they had to be 'strong and literate', aged 29 or under and to be able to give 'references and security' (Dickson, 1960: 63).

²³ Given this is not required from other workers, may argue it is inconsistent that occupational comparisons are made between fire-fighters and other uniformed services (Williams, 1987).

²⁴ The Great Fire of London (1666) illustrated the necessity for fire-fighters in the UK (Williams, 1927: 6), for example. And in Hong Kong, fire services grew up in colonial times, being associated with service excellence and a prominent position in the community (HKFS, 1994). In Japan, correction of 'fire damage' commenced in 1560. Fire 'watchers', from Samurai ranks, were stationed around the Mikado's palace (Torbert, 1967: 54).

²⁵ Reischauer (1964) captures this well, albeit in reference to the formation of the post-Meiji state in Japan: "In classrooms and army barracks the young Japanese was taught to glory in Japan's military traditions. He came to believe that death on the battlefield for the emperor was the most glorious fate of man, and to believe in the unique virtues of a vaguely defined 'national structure' and an even more vague 'Japanese spirit'". (1964: 130-131).

²⁶ In these demanding situations emergency service workers have to perform effectively and 'with courage' (Petrie and Rotheram, 1982: 963).

²⁷ This potential for under reporting is supported by anecdotal evidence and interview data which suggests the effects of CIs with fatalities does not cause problematic or atypical work-trauma symptoms in UK emergency service personnel (Paton et al, 1992; McLeod & Cooper, 1992; Brooks & McKinlay, 1991). This is not to imply this is culturally unique. In the Hong

Kong cultural setting, there is some evidence that a unique *esprit de corps* and attitude to trauma suggests the possibility of a unique personality amongst Hong Kong fire-fighters versus the community at large (Ko, 1986; also suggested by Paton et al (1994, 1992d) about UK fire-fighters).

²⁸ Counselling tends to be perceived in universal ways, although its purposes can be diverse. For emergency services, one perceived goal is to effect a permanent, beneficial adaptation in victims through discussion and re-appraisal of their symptoms, so bringing their symptoms to normal levels of functioning (Cooper et al, 1990; Smith et al, 1977).

²⁹ Documented results of this education in Japan are placid reactions to stressors in adulthood (eg: Ryinosuke, 1923; Dale, 1989; Uehata, 1990; Riche & Burama, 1980) and a low need for seeking social support (Dale, 1989; Waley, 1964; Kawasaki, 1969; Christopher, 1983).

CHAPTER THREE

CHAPTER THREE

METHODOLOGY

Introduction: key research questions arising from Chapters One and Two

This chapter follows in thematic outline the initial stages of the 'research process' (Eiser & van der Plicht, 1988): research questions, research instruments used, sample selection, data collection, sample description. It predominately covers methodological issues raised by the study of work-trauma in different cultural settings. It explores the justification for selecting particular emergency services, and why the use of field studies is preferred over laboratory studies in this study; that is, simply speaking how we have chosen to study the research questions. Differences in sample size and nature are detailed as part of these methodological issues.

This is followed by a description and rationale for questionnaires used: the IES-15 (Impact of Event Scale, 15 items, Horowitz et al, 1979), the HSCL-21 (Hopkins Symptom Check-list, 21 items, Green et al, 1985) and the HAD-14 (Hospital Anxiety and Depression Scale, 14 items, Zigmond and Snaith, 1987). This includes details of the way in which these instruments were administered to certain samples; in short, the way the subject reviewed in the preceding chapter has been empirically studied to reach the conclusions and recommendations made in Chapter Five.

This section, at the outset of the chapter, is the first part of this research process: the research questions. It provides an important summarising link with the preceding literature reviews. This takes the form of, first, the key broad research questions arising from the preceding reviews and, second, the specific research hypotheses addressed in this thesis.

Summarising the central themes of preceding reviews (ie, both Chapters One and Two) is important to do so here. The summary

logically precedes data generation and analysis, and is included here for purposes of linkage and continuity. The intention is to clarify precise issues which the review of literature suggests are appropriate for empirical exploration, both in this study and for future researchers.

A pithy summary of the above chapters is straightforward: it is that there is both an overwhelming litany of cultural differences which can impact traumatic reactivity in emergency services and yet, at the same time, a certain degree of cultural commonality, or what may be referred to as 'cultural universals,' which can also impact traumatic reactivity. Given both potentially impact traumatic reactivity it is therefore paradoxical, and fundamentally limiting, to develop understandings of traumatic reactivity which do not systematically acknowledge cultural 'universals' and cultural 'specifics'. This, in essence, is the message of the preceding chapters.

The preceding chapters show that emergency service factors which researchers need to acknowledge are extremely broad. For example, there is a need to consider and understand not only the traumatic exposure inevitably implied by emergency service work but also other subtleties and elements of emergency service life. These would include but not be limited to examination stressors, rank stressors and a general 'pressure-to-perform' that is associated with all emergency service life.

Addressing these emergency service factors, both conceptually and empirically, is in itself is a challenging task. Yet, the literature reviewed in these chapters also suggests future researchers need to move beyond merely the emergency service environment. They need to consider and understand broader, national, cultural differences. These imply factors such as economic strain or cultural norms in the provision of social support are also important when understanding traumatic reactivity.

In Chapter One a linkage of 'fundamental' cultural factors based on the work of Hofstede and Trompenaars and the eco-systemic model of traumatic reactivity was established. This linkage suggested underlying, fundamental differences in cultural values and

psychological schema (varying from uncertainty avoidance, individual responsibility, individual freedom to perceived control over fate) may potentially impact traumatic reactivity.

This theme was developed in Chapter Two. This suggested the need for specific consideration of the emergency service environment. It was suggested that diverse aspects of the emergency services must be taken into account such that research questions more precisely relate to the work-trauma of one emergency service population or grouping; from fire-fighters to paramedics to police officers etc.. As mentioned above, diverse factors from call-out rates to traumatic exposure to potential for occupational transference are all relevant. And whilst all are specifically related to certain emergency services, that is are 'universal', their effect may be quite 'specific'.

In summarizing the research questions suggested in Chapters One and Two, therefore, it is crucial to note that commonality, or cultural universals, are as much an issue for future researchers as is diversity, or cultural specifics. For example, whilst Ramsay's (1993a) review of data on the IES-15 suggested in all cultures there is a tendency amongst emergency service personnel to under-report symptomatology relative to other populations experiencing trauma such as sexual abuse victims and medical students, call-out rates were also suggested to have potentially diverse effects on emergency service personnel.

Inevitably therefore when summarising the preceding chapters and formulating specific research hypotheses, key questions for future researchers are hinged around questions of cultural universals and cultural specificity. What is the balance between 'cultural universals' and 'cultural specifics'? What can be understood about traumatic reactivity which acknowledges cultural universals or specifics in diagnosis of traumatic reactivity, theoretical understanding and intervention?

Suggested directions for exploring universals and specifics which associate with our understanding of traumatic reactivity are more fully explored in Chapter Five. Future researchers will find in Chapter Five recommendations on data collection methodologies,

sampling frames and attitudes towards counselling which should be considered in future. These constitute a broad direction for the future study of cross-cultural work-trauma within which, inevitably given the overwhelming cultural diversity outlined in Chapters One and Two, there will be a number of sub-issues and concerns.

Indeed, it should be carefully pointed out and understood by future researchers that given the exploratory nature of this study, it is not possible or appropriate to detail every hypothesis that can arise from linking traumatic reactivity with cultural factors. As the field develops future researchers will of course be able to isolate other hypotheses not covered here. This is an important limitation covered in Chapter Five.

In short, the hypotheses summarized below are an exploratory foundation for the field. There will inevitably be gaps. The emergency service focus should not mis-lead researchers that broader cultural factors such as religious values or economic strain are not a future direction for research, for example. And again, note these themes are explored comprehensively in Chapter Five.

1. Exercise frequency will be negatively associated with general pathology and traumatic reactivity in emergency service personnel in all cultural settings; that is the greater the exercise frequency the lower the symptoms of general pathology and traumatic reactivity.
2. Marital status in emergency service personnel will have an associational relationship with symptomatology in all cultural settings.
3. Age will have an associational relationship with symptomatology in emergency service personnel in all cultural settings.
4. Level of social support will be positively associated with general pathology and traumatic reactivity in emergency service personnel in all cultural settings.
5. A high level of social support will be positively associated with general pathology and traumatic reactivity in emergency service personnel in all cultural settings.

6. The extent of social support, that is the 'social network', will be analogous in emergency service personnel in cultural settings.
7. The denial of counselling will be a 'cultural universal'; that is, common to all emergency service personnel in cultural settings.
8. Counselling will be efficacious in all cultural settings; that is, if counselling has been received by emergency service personnel this will associate with symptoms analogous to the emergency service population norm.
9. Parenting will be a culturally universal factor in predicting levels of general pathology and traumatic reactivity in emergency service personnel.
10. There will be an associational relationship between traumatic reactivity and emergency service occupational factors of length of service, rank, and hours worked.

Reasons for the choice of questionnaire instruments

In the above hypotheses a difference between general pathology and traumatic reactivity is evident. This is consistent with the clinical definition of traumatic reactivity seen in Appendix II, which ranges from anxiety and depression (general pathology) to the episodic intrusions associated with traumatic reactivity. It is also consistent with the work of Pearlin (1982), who writes:

"It is not an easy matter to assemble what is known about stressful conditions. One major reason for this difficulty is that the sources of stress extend from the most immediate contexts of people's lives to the outermost boundaries of societies and cultures. A detailed treatment of social stressors touches, at one end, on the micro environments of individuals and, at the other, on large-scale social organization." (1982: 370-371)

It is for these reasons that the three questionnaire instruments were chosen for this study. Specifically, they were

intended to acknowledge that underlying levels of anxiety and depression are as important to understanding cultural differences in work-trauma as well as more specific intrusive experiences. The IES-15 related to the specific elements of trauma outlined in DSM (Appendix II). The HAD-14 and the HSCL-21 also relate to elements of general pathology outlined in the DSM criteria.

The intention in this section is to briefly describe and justify the questionnaire instruments used, specifically their relationship with diagnosis of traumatic reactivity. In the following section, we consider the logistics of questionnaire instrument translation (translated questionnaire instruments in Chinese, Japanese and English versions are in Appendix VIII). That section is a crucial, related part to the methodological use of these questionnaire instruments.

1. First, the Impact of Event Scale was chosen for the study because it is a traditional measure associated with specific traumatic events and experiences. It measures intrusion, 7 items, and avoidance, 8 items (Horowitz et al, 1979). The IES-15 is scored from never (0) to frequently (5) in odd numbered increments (0-1-3-5). A benefit of the instrument was that it had been used with diverse samples. These included, for example, subjects involved in intrusive surgery, disaster rescue work and occupational rescue work (see Appendix VII for details of these symptoms scores).

The IES-15 was also chosen because it closely relates to the definition of PTSD in DSM-III-R, measuring intrusion symptoms - bad dreams and waves of strong feelings - that are consistent with B of the DSM-III-R criteria. Avoidance symptoms indicate denial-based coping strategies and include avoiding discussion of the incident, emotional numbness and an avoidance of events similar to, or evocative of, traumata. This conforms with the dissociational aspect(s) of criteria C in DSM-III-R, and the behavioural adjustment(s) of D5.

2. Second, the Hospital Anxiety and Depression Scale, or HAD Scale (14 items), was chosen for the study because it measures more underlying pathology: anxiety and depression. This scale is based upon psychiatric interviews ratings (Zigmond and Snaith, 1983). The means of scoring are 0-1-2-3. Symptoms of anxiety include tension, irrational fear and restlessness.

The HAD-14 scale was chosen because the above are consistent with criteria D1 in DSM-III-R. Depression symptoms include lethargy, worry and inability to concentrate. These are consistent with criteria C. As anxiety and depression occur in mild forms, the recommended threshold in the HAD-Scale is at 10/11, for each factor. Scores above 10/11 are said to differentiate 'normal' populations from 'caseness' (1980: 365). Caseness indicates the need for professional intervention such as counselling.

3. Third, the HSCL-21 is a list of 21 elements related to general pathology. This is broken down to performance difficulties, 7 items, somatic distress, 7 items, and general feelings of distress, 7 items. Given the physical nature of fire-fighting, indeed all emergency service work, this scale was chosen because two of its sub-factors relate to the physical reactions, or sequelae, implied by the occupational experience of the emergency services.

Experiences such as 'trouble in remembering things' relate to C1 of DSM-III ('Markedly diminished interest in one or more significant activities') and also D4 ('Memory impairment or trouble concentrating'); these are classified as performance difficulties. 'Muscle soreness' and 'a lump in your throat' are indicative of somatic distress and relate to D2 ('sleep disturbance'). General feelings of distress, such as 'feeling blue' and 'feelings being easily hurt' are analogous to depression, thus relating to criteria C in DSM-III-R.

In addition to the above reasons - that the questionnaire instruments sought to measure both traumatic reactivity and general pathology - the questionnaire instruments were also chosen because they had been previously used in similar, emergency service work. The IES-15, as mentioned, is a traditional measure of traumatic reactivity (see Appendix VII for a review of normative data). The HAD-14 had been used in research in police officers exposed to the Piper Alpha disaster (Alexander & Wells, 1991). The HSCL-21 had been used in a certain form with disaster rescue workers (Taylor & Fraser, 1982). Whilst the purpose in this thesis is not to compare with a normative data base, this suggested an element of precedence to the instruments; specifically, they had been used in previous emergency service or closely related research work.

Before moving on to the important question of translating questionnaire instruments, following is a summary of the questionnaire instruments used, their benefits and the sub-scales:

IES-15. Impact of Event Scale, Horowitz et al, 1979.

Key benefits: Widely used in emergency service work, existence of normative data base, relates to DSM-III-R criteria on intrusive imagery

Sub-scale 1: Intrusion. Elements include 'bad dreams related to the event' and 'difficulty in falling asleep because of images or thoughts related to the event'

Sub-scale 2: Avoidance. Elements include 'banishing from memories' and 'avoiding talking about it'

HAD-14. Hospital Anxiety & Depression Scale, Zigmond & Snaith, 1987.

Key benefits: Previously used in some UK emergency service work, relates to DSM-III-R criteria on anxiety and depression

Sub-scale 1: Anxiety. Elements include 'feeling tense' and 'feeling restless'

Sub-scale 2: Depression. Elements include 'losing interest in appearance' and 'ability to laugh'

HSCL-21. Hopkins Symptom Check-list, Green et al, 1988.

Key benefits: Previously used in Australian disaster rescue work, relates to DSM-III-R criteria on depression, acknowledges the physically demanding nature of emergency service work

Sub-scale 1: Performance difficulties. Elements include 'difficulty in speaking' and 'carelessness'

Sub-scale 2: Somatic distress. Elements include 'muscle soreness' and 'hot or cold spells'

Sub-scale 3: General feelings of distress. Elements include 'feelings being easily hurt' and 'feeling lonely' (Note: closely related to 'depression')

The use of audited questionnaire translation

Questionnaire translation is one central issue to cross-cultural research. Collecting self-report data in multi-lingual context (as here in Japanese, Chinese and English) must acknowledge each language has a set of phrases and words which do not, or cannot, translate verbatim (Newmark, 1988). This chapter reviews these and other methodological issues which are important to the future study of work-trauma in different cultural settings. Where possible the approach is prescriptive, although inevitably there is some description of the methods used in this study.

Newmark (1988) notes there is, as yet, no formal translation theory to guide practitioners. The result is a necessity for ad hoc processes and methods (1988: 161). Researchers need to be aware of his suggestions about translation. He argues faults tend to occur at two main levels. A semantic fault occurs when an original word is mis-translated. Thus, for example, 'once' may be translated as 'never' or 'frequently' as 'all the time'. This is usually resolved by a process of re-editing or re-translation. In most instances translators are attentive to such details and faults are unlikely to occur in this area (1988: 158). To this we add that during data analysis abnormal entries can be detected by using tally functions.

An implication fault is more serious and occurs in two ways. The first fault actually lies in psychological implications a respondent takes from the actual fact of the translated material (questionnaire). Thus, for example, Japanese may assume to receive a questionnaire on the symptoms of stress implies they suffer from these symptoms and should, therefore, minimize responses according to the cultural norms of Japanese 'self'. Similarly, emergency service personnel involved in a critical incident may assume that a questionnaire on symptoms of stress implies an opportunity for

maximizing responses to show senior personnel the seriousness of their symptoms and to justify sick-leave. These faults, however, are not a reflection of translation and can occur in all self-report data (Martin, 1989).

A second, more common implication fault occurs when original language colloquial or unusual, culturally-specific terms, such as 'having butterflies' and 'events popping in to minds,' need to be translated. Whilst, for example, it is easy to translate 'memory problems' (HSCL-21) it is difficult to translate 'feeling blue.' Some cultures - including both Japan and Hong Kong - do not conceptualize blue as a colour or term associated with depression. The association of blue and depression is a western, Anglo cultural phenomena.

Are these problems inhibiting for cross cultural research where translated instruments are used? To answer this, it should first be remembered all stress-related questionnaires have an element of inherent ambiguity (Lazarus, 1966). This is particularly true of stress-symptoms requiring responses around their intensity. Despite scales offering verbal indications of a quantitative response (for example, 'Often', 'Frequently', 'All the time' as opposed to 'Once', 'Twice' and so on) these are ultimately an individual, subjective interpretation. What means 'often' to one respondent may mean 'frequently' to another. Likewise, the fact of 'feeling blue' is an ultimately subjective interpretation, regardless of which language the text is in.

Whilst a number of specific issues are raised by this debate, questionnaire translation should not inhibit cross-cultural research. Although feeling blue does not have an equivalent meaning in Japan, for example, there are terms which are analogous. In this case, the concept or term of 'strong sadness' applies.

Future researchers should not undertake translation lightly. One recommended process of translation must be to use a third, specialised party. In this case, a Tokyo-based scientific translation agency and government translators in Hong Kong were used. Ambiguities in meaning should be discussed with these parties, incorporated in the draft and then audited by a fourth party. Here,

a Tokyo academic with experience of cross-cultural research in disasters and questionnaire translation and a medical advisor from a trade union, also with prior translation and research in stress experience, were used. Finally, the questionnaire should also be independently re-translated to the original language - English - to test accuracy.

Researchers should also be aware of cultural differences in standards of translation. There are inevitably cultural differences in translation standards. In Hong Kong, for example, standards of English-based translation are high as the joint official language of Hong Kong is English and there is, therefore, an expertise in translation to and from English. Although several terms in addition to 'feeling blue' could not be translated well from English ('having butterflies' in the HAD-Scale and 'popped into my mind' in the IES-15 for example), experienced translators were able to resolve these in the same way - by using comparable local idioms, which conveyed similar physical experiences and mental changes. In Asian languages there is also a loose potential for symbiosis. The Japanese (final version) questionnaires was made available to the translators who were, therefore, able to utilise the Chinese characters from the Japanese questionnaire.¹

The selection of emergency services

Although the cultural clusters of Ronen and Schenkar imply that a cultural setting is easy to select, actual emergency services to select within the cultural clusters are a different issue. This section justifies the reasons for selection of cultural settings and emergency services and the implications this holds for interpreting results.

Sample selection was based predominately on an ILO (International Labour Organisation, 1990) report on fire-fighting conditions, which suggested organisational similarities and career condition similarities existed between the selected emergency services. This was enhanced by the close historical links of HKFS

and UK Fire Services and the broad similarities between fire services in Japan and the Anglo setting of North America.

Organisational complexity. A key similarity in the organisational environment of the three fire services was their organisational complexity (ILO, 1990). Complexity was defined using two factors: the number of responsibility-levels (ie, ranks) and the number of divisions with autonomous responsibility. This was consistent with Payne (1987). Each of the fire services operated similar rank hierarchies and in each fire service there were five operational-based ranks.

There were also three management-based ranks in each fire service plus a small number of executive posts (in UK and Hong Kong, three, and in Japan, two). The executive posts are analogous to managing director level in the private sector (HKFS, 1990; Paton et al, 1992d). In Hong Kong and UK the executive posts, achieved in identical ways, are designated 'firemaster'. In Japan they are achieved in similar ways and are designated 'fire chief'. The difference in attaining executive level in Japan is that training does not involve attendance at the UK fire-fighting school for senior officers (ILO, 1990).

The three management-level posts in each fire service were responsible for the same duties: namely, the general fire service environment, bureaucratic management and the introduction of new fire-fighting methods. In Hong Kong and UK these ranks also operated on the same title. In Japan, although titles were different the responsibility level was analogous (ibid; Tokyo Fire Services, 1990).

Leadership styles. One methodological significance of similar rank structure and responsibilities concerns leadership styles. Although Japanese leadership styles and norms are unique in the private sector, and are not comparable to Western norms (Misume, 1989), literature suggests that within the public sector Japanese leadership styles are similar to non-Japanese organisations. This minimises the cultural influence of Japanese leadership styles.

Thus, for example, leadership styles during CIs, where fire-fighters must perform effectively and efficiently under command, were inferred to be similar in the three fire services (ILO, 1990).

The organisation of the fire services was also similar in structure, involving three divisions: fire prevention, operational and education divisions. This suggested a comparable range of organisational experience for fire-fighters. In each fire service fire-fighters involved in promotion would need to gain experience in each of the areas (Paton et al, 1993; ILO, 1990).

Historical links. Hong Kong was also selected due to the unique characteristics of the (sole) Hong Kong fire service. These characteristics are broadly similar to UK fire services. For example, the HKFS use fire-fighting methodologies similar to the UK, and adopt an identical approach to rank structure, promotion and pay. Even uniform is identical. This is a reflection of the fact that HKFS were formed and developed on UK fire service norms (HKFS, 1992).

Rank insignia and structures were thus identical in name to UK fire services, and entailed similar responsibilities (ibid). Conditions of service, such as thirty year tenure and recruitment up to age thirty, are also identical to UK fire services. Senior officers also attended advanced training at the UK Fire Services school. Indeed, the only structural difference between the HKFS and UK fire services was the existence of a marine division.

Promotion was also achieved in similar ways to UK fire services (with the exception of a two tier, graduate entry system for some officers). Until 1991, in fact, senior officers in HKFS were British. The HKFS represented, therefore, the opportunity to include data from a fire service with UK fire service norms and traditions but non-UK personnel (Hong Kong Government Information Services, 1993). The inclusion of the HKFS was a logical addition to research which involved a UK fire service. One important factor supporting the close links between Hong Kong and UK organisations was the joint official language of HKFS, English. Indeed, the questionnaire was distributed in English and Chinese versions

Career conditions. A further similarity between HK and UK fire services concerned career conditions, there being identical career conditions in each fire service. As discussed, for Hong Kong this was due to the organisational similarity with UK fire services, but in Japan there was an adherence to international fire service career norms (ILO, 1990) similar to British norms. All fire-fighters in Japan, Hong Kong and UK were also volunteers. Thus, the fire-fighters were not related in career conditions to the armed services as, for example, they are in China, where fire-fighters are conscripted as soldiers on army career conditions (ILO, 1990).

Length of service. Finally, similarities lay in the fact that all fire-fighters in Japan, Hong Kong and UK are limited in their length of service. This was for thirty years from enlistment. Also, fire-fighters could join at similar ages, anywhere from 18-30 years. Requirements for entry to each fire service were also at analogous standards, involving rigorous academic and fitness examinations. These ensured there were fire-fighters who had passed rigorous and analogous entry requirements (Davis, 1990; International Labour Organisation, 1990).

Use of International Labour Organisation (ILO) data.

Given their detailed nature, this deserves particular attention as a methodological tool on which to base sample selection. The report concerned employment and disaster risk conditions in the world's fire services. Thirteen countries were represented, including UK and Japan. The report suggested key similarities between fire services from throughout thirteen participating countries. Similarities included equal promotion opportunities, occupational safety and health conditions and pension rights (1990: 4-8).

The report supported the notion of similarities in the technical level of fire-fighting used in Japan, Hong Kong and UK. The technical similarities were based upon the equipment used by

each fire service, the ability of each fire service to fight multi-storey fires, and the use of turn-table ladders, chemical decontamination units and fire control units. The equipment used by individual fire-fighters was also detailed as similar, involving advanced SCBAs and other equipment carried by two-pump engines (1990: 9). The ILO report also suggested a uniform pressure for all emergency services in industrialized countries:

"...The role of fire services [is] becoming increasingly important and complex [in the developed countries]. Chemical spillages, toxic gas leaks and accidents in nuclear plants were just some of the more spectacular examples of the way in which the demands placed on our fire services had expanded and diversified. These also included the provision of far more advice and the performance of many more inspections than in the past. Highly trained and competent personnel were required if modern fire services were to be able to provide the quality of service upon which human lives and the natural environment depended" (1990: 4).

(This point about duality of tasks - to meet demands at CIs aimed at saving life and to perform inspections aimed at preventing CIs - provides further support for points raised in Chapter One on expectations from emergency service personnel.)

The methodological implications of this were that samples would probably be exposed to similar levels of occupational tasks performed. A further reason for selecting these fire services was the ILO position on international exposure to traumata in industrialized countries:

"...Fire-fighters [from all countries] also had special problems in other areas, such as working hours and health and safety. The obvious risk of death or injury while fighting a fire was only one aspect of the problem, as stress and heart disease were prevalent in the profession...[he stressed] the risk to fire-fighters from non-perceived injuries, particularly those related to stress, and underlined the need for psychological counselling to be readily available...Medical examinations carried out three years [after a CI in Canada]...had revealed PTSD can be very much greater than previously realized." (1990: 13).

The ILO also suggested a similar level of pay and employment conditions existed in Japanese, European and North American fire services. They suggested, contrary to their own expectations, these were analogous throughout fire services including Japan (see also Gospel and Okayama, 1990; Pascale and Athos, 1985; McMillan, 1985). In fact, employment conditions of fire-fighters in Japan were specifically stated as analogous to UK employment conditions (1990: 7). The pay of fire-fighters in Japan was, as for UK and Hong Kong fire-fighters, higher than civil servants at analogous grades: '...the Japanese Government believed that the terms and conditions of fire-fighters in Japan were more than adequate, and this was proved by the high number of applicants for every vacancy' (1990: 11).

This consistency in above-average pay condition was significant because it also occurred in UK and Hong Kong. In these fire services, the pay of fire-fighters is also high versus comparable civil servants (Paton et al, 1992d; Hong Kong Government Information Services, 1993). The methodological implications of this are that all fire-fighters in Japan, Hong Kong and UK are paid at similar rates relative to the societal norm; ie, above average for civil servants.

The selection of samples within emergency services

This section describes how samples were selected from each fire service. In particular, it records how it was necessary to concentrate exclusively on small sub-populations. The methodological implications of this are discussed.

In Japan it was possible to obtain comprehensive data from a large number of personnel (n.688) concentrated in the city centre of Nagoya. In Hong Kong, data was obtained from personnel in an expanded watch in the Kowloon peninsula. In the UK, data was secured from two watches. The result was a discrepancy in sample numbers between Japan (n.688), Hong Kong (n. 68) and the UK (n.70). Selection of samples was made by the fire services.

There are several methodological implications resulting from this sample selection. Questions must be raised on differences between sub-populations and the overall services. There were also different sensitivities towards work-trauma issues. For Hong Kong fire-fighters selected, group counselling and information presentations on PTSD and work-trauma had been implemented prior to questionnaire distribution. (This was the first such use of counselling and work-trauma education in HKFS.) Potentially, this would imply a sensitivity amongst Hong Kong personnel disproportionate to UK and Japanese personnel. It would also imply a unique awareness of the purpose of the research - ie, to document the severity of work-trauma symptoms (Ramsay, 1993a). This awareness will have particularly influenced data on counselling.

The methodological implications of this difference should not be over-stated. A more general sensitivity to work-trauma issues was also in existence in the UK fire service. These were founded in a long-term occupational health scheme (McEwen, 1990), which entailed wide-spread education in stress-related issues, concentrating on post-traumatic stress, as part of initial and on-the-job training (Paton et al, 1992d). Although this training was not conducted immediately prior to questionnaire completion it would also imply sensitivity to issues amongst UK personnel.

The table below shows pertinent data on the three fire services. Key differences can be seen in organisational size and population density. The UK fire service numbers only 9.62% of HKFS strength; Japan only c.20%. Population density is severe in Hong Kong (Kowloon), Edinburgh (city) and Nagoya but moderate in Hong Kong (New Territories) and Edinburgh (Borders).

TABLE X: COMPARATIVE ORGANISATIONAL and CULTURAL DATA

VARIABLES THAT ARE SPECIFIC TO...	HONG KONG	UK	JAPAN
...THE EMERGENCY SERVICE			
Operational Personnel	7,228	751	1,439
Local Fatalities 1991/2	43	7	No data
Local Injuries (Civilian = C; Fire-fighters = FFs)	573 C 32 FFs	86 C 3 FFs	No data No data
Operational Ranks	5	5	5
Management Ranks	3	3	3
...THE COUNTRY/TERRITORY			
Days lost in industrial disputes (1989)†	163	3,702	202
Population Density (per habitable km ²)	5,590*	365§	1,523§
Unionisation rate (%)†	26.8%	46.9%	No data

† Source: Anzai (1990). Includes manufacturing data.

§ Source: National Land Agency, Japan. In Anzai (1990).

* Note: Large discrepancy due to urban status of Hong Kong. City centre population density is 26,450 per km², rural population density is 2,700 per km² (Hong Kong Government Information Services, 1993).

Methodological issues associated with data acquisition

This section details methodological issues associated with acquiring data from the selected samples. A key debate here concerns the merits of field-based studies versus laboratory-based studies. This area must be considered in depth as it is the foundation for using the self report methodology in cross-cultural understanding of work-trauma.

Given that field research takes place closer to the occupational and social environment of subjects, it offers inevitable advantages for studying emergency service workers. It includes case studies, self-report scale distribution, semi-structured interviews, on-site physiological or bio-chemical measurement, study of awareness of issues, subjective measurement of symptoms, behavioural observation, statistical reviews and

environment analysis and assessment. Examples from associated literature are extensive.²

In laboratory studies the opposite occurs and this suggests limits in studying emergency service personnel. Subjects are researched within the laboratory in a controlled environment removed from their occupational and social environment. Thus, laboratories are necessarily removed from the volatile and less predictable occupational and social environment of emergency services (Neufeld, 1989). Laboratory studies may include clinical interviews and the monitoring of physiological responses to psychological stimuli.³

In methodological terms both approaches are of benefit in researching psychological stress. Laboratory study and field study each make '[a] significant contributions to the furtherance of the other' (Martin, 1989: 196). This position is also taken by Laux and Vossel (1982) and Breznitz and Goldberger (1982). They state neither approach is invalid or should be excluded from contributing to an understanding of psychological stress.

Some authors do, however, favour a more polarized position. Prominent advocates of using field studies exclusively are centered on the work of Lazarus (Lazarus et al, 1962; Lazarus and Folkman, 1984; Coyne and Lazarus, 1980 etc). Their view is that the primary merit of field studies rests on the primary de-merit of laboratory findings: the generalisability of findings (Neufeld, 1989: 78). As laboratory experiments are, of necessity, limited to small numbers of subjects, it is difficult to produce research which is based on representative numbers. In contrast, it is possible for field studies to analyze larger numbers of the population, and produce more reliable findings.

Further, they argue the artificiality (or 'restricted ecological validity') of the laboratory precludes inferring findings about non-laboratory situations (Martin, 1989). Laboratory studies are said to fail in creating 'life-likeness' for two reasons. First, ethical constraints imply subjects may leave the laboratory without further complications, something which does not occur in '[the] natural setting and everyday life' (Neufeld, 1989: 78). Second, stressors simulated in the laboratory are not open-ended like

everyday stressors. Rather, they are temporally limited. The laboratory, therefore, is unable to 'examine stress processes over time' (Martin, 1989: 196). Thus, Lazarus et al see the use of field research as a methodology that allows data to be collected which is less subject to some of these restrictions.

However, this is not to say field studies are without methodological problems. Field studies are widely criticized, as summarized by Martin (1989): '...it can be argued that naturalistic field research [compared to laboratory research] is also subject to limitations, including a high vulnerability to threats to internal validity, poor control of extraneous variables, and limited ability to clarify causal relationships between variables' (1989: 196). Although field studies may gather comprehensive data, the methodology precludes the control of variables that can happen in laboratory studies.

Thus, in his review of laboratory methodology, Neufeld claims a move to entirely utilise field investigations 'may be premature' (1989: 78). The move would be one in which the 'substantial heritage' (ibid: 71) of laboratory work was lost. Neufeld notes, for example, that the laboratory has the advantage of allowing manipulation of stressors which are less readily manipulated in field studies. The laboratory also facilitates the study of complex processes, for example molecular psychological processes, which cannot be manipulated by field studies (ibid: 80). Thus, Neufeld means that laboratory-based methodology offers the advantage of supplementary, intricate investigations where variables may be manipulated after field research has generated hypotheses.

The benefit of field studies as preliminary research for laboratory work can be illustrated by investigations in, for example, stress and pain. The laboratory allows pain, such as '...radiant heat, pressure-cuff muscle ischemia [and] hand-immersion into ice water', to be manipulated. This ability to manipulate is in contrast to the manipulation field studies may achieve, where the manipulation of pain in field studies is restricted to duration, chronicity and significance of danger.

Field studies, however, can assess other variables, such as perception and significance of danger, more closely. This is of particular significance when considering CIs. The volatile and severe nature of CIs cannot be replicated in the laboratory. Further, emergency service stressors in general are exceedingly complex to replicate. They include, for example, confinement in stations for extensive periods, rapid changes in activity and exposure to danger in call-outs, persistent needs for socialisation and the exposure to danger which is unique.

There is, Neufeld claims, clearly a theoretical advantage in conducting field and laboratory investigations. Field studies generate hypothesis on relationships of pain and personality and laboratory studies allow for the control of different personalities in response to pain (ibid: 80). The debate on field versus laboratory methodology need not be so polarized, therefore, as the two methodologies may have a certain symbiosis.

Laux and Vossel (1982) see the key difference between field and laboratory studies as their proximity to the natural environment of subjects. This view allows the value of studies to be assessed on criteria of proximity rather than methodological failings. It implies, therefore, the weakness of laboratory studies lie not in the way variables are managed or in the generalisability of its findings. Rather, the fault of laboratory studies are in being removed from the subjects environment. Similarly, the advantage of field studies is their ability to be conducted proximal to the subjects environment.

This view is supported by research which involves utilising traditional laboratory instruments in field research. (See, for example, Douglas, 1985; Lim et al, 1987 and Barnard and Duncan, 1985.) The characteristics of these studies is the use of laboratory instruments in the working environment of fire-fighters. Previously, instruments required for these studies, such as polygraphs, were too bulky for non-laboratory research (Martin, 1990: 211).

The practical benefits of field studies. It is also important, therefore, to consider two practical questions when assessing the

merits of field study versus laboratory study. One concerns the extent of investigation in the subject. The second concerns what practical outcome research is intended to have. If the study does not have a base of literature for researchers to draw upon it is logical for field research to establish what further research may be required. This has implications for this, or any other exploratory, study.

According to Neufeld, therefore, there would be value in generating data on PTSD in fire-fighters from field studies. The results of these could be utilised, if questions were raised, as a basis for subsequent laboratory studies. (Lazarus et al would only see value in field studies. Laux and Vossel would see the value in field studies as efficiently gathering data proximal to the working environment of fire-fighters.)

Secondly, the practical outcome of studies. This research in PTSD is sponsored by organisations seeking practical outcomes that can be applied in the work-place. Thus, there is often little choice for researchers but to pursue field study methodologies concerning large samples.

Finally, it should be recalled that fire services are less enticed, in the short-term, by the prospect of considering traumatic reactions symptoms in the laboratory (Paton et al, 1992d). Rather, they are enticed by the gaining of information on the comparative prevalence and distribution of symptoms within as large a section of their organisation as possible. From this, they can generate credible information for stress-management programmes.

Circumstances of data collection

This section clarifies the circumstances under which data was collected. It explains, to summarise, that the data was collected from each cultural setting using analogous methodologies and for analogous reasons; clearly as part of 'one' specific exploratory project on work-trauma. The purpose of this section is to ensure

that future researchers are clear on the circumstances under which the data was collected.

The initial means of establishing contact with the emergency services was a letter, in Japanese or English as appropriate. (English is the joint official language of Hong Kong, and thus all communications to government departments are usually in English not Chinese.) The letter stated the main research aims, emphasising the lack of data in the area of work-trauma in different cultures and the culture-specific nature of existing research in the UK and US. It was also emphasized in the letter that the project's purpose was to begin to compare work-trauma symptom levels between emergency services rather than to conduct any comprehensive review of the individual emergency services. Thus, the project was presented as emphasizing global concerns and of having no particular implications for individual services.

It was also stated in this introductory letter that participation would not involve financial costs other than internal administration. Translation, for example, was explicitly stated as being arranged independently and thus a cost, or time-input, the emergency services would not need to cover. It was also stated that statistical analysis would be conducted independently (in the UK); again supporting the notion of finite and limited costs for participating emergency services. Emergency services were also made aware that whilst they could be forwarded brief results summaries and related suggestions, these would not be comprehensive.

In the UK, Lothian & Borders Fire Services, which was already participating in research on psychological stress (Paton et al, 1992d), were approached. In Japan three fire services, the National Association of Fire-fighters and an all-Japan municipal trade union were approached. In Hong Kong, the only fire services were approached first by telephone and then by letter. Preliminary selection was made because the Japanese fire services were like Hong Kong and LBFB (Edinburgh) all involved in servicing, or protecting, city-centres: Tokyo, Kyoto and Nagoya.

Support was offered by Nagoya City Fire Department, the Japanese National Fire-fighters Council (based in Tokyo), the all-

Japan municipal trade union and the Hong Kong Fire Services Department. One Japanese fire service expressed interest in further details but subsequently did not reply and one did not respond until after its participation had become inappropriate. Thus, it did not appear difficult to engage organisations in the project in Japan or Hong Kong. Of five organisations approached outside the UK three supported the project.

It should be understood and again emphasized here that the first key circumstance underlying the collection of data in all cultural settings - Japan, Hong Kong and the UK - was its explicit positioning to emergency services as a comparative exercise. Each emergency service was made aware before embarking on the research that predominately comparative data would be the outcome of the project. Whilst the emergency services were aware that symptomatology and absenteeism data could be compared with other emergency services, as organisations, they themselves could expect little direct benefit in terms of suggested management interventions. Whilst the tone of the study and approach was deliberately 'non-threatening' to individual organisations, it also was clear that the research was in an immediate sense 'non-beneficial' for individual organisations and their management of work-trauma.

The comparative rather than comprehensive nature of data collection was also addressed in writing. It was stated in initial contact and on the covers of questionnaires that the research had the support of other emergency services in other countries (ie, cultural settings). This further stressed the theme that the purpose of the research was comparative in nature and not a comprehensive review of the emergency service.

The second underlying circumstance which future researchers should be aware of is that the research was couched in terms of strict confidentiality. Although the emergency services were aware that data collected would be compared academically, they were also made aware and encouraged to develop this message internally that comparative data would not be circulated within the emergency service community. There was no doubt that confidentiality would be

strictly maintained, and thus that the emergency services would not know of 'at risk' individuals or work groups (watches).

Again, this was supported in writing. Confidentiality was clearly stated in writing in the local language (Chinese, Japanese or English as appropriate) on all questionnaires. This was also agreed to in principle by all emergency services (no records were kept of individual submissions). To thoroughly emphasise this theme, on the questionnaires it was also stated results would only be available in summary form. Again, this was in the appropriate local language.

A third circumstance underlying the collection of data was personal contact. Indeed, an essential means of assuring this confidentiality to the emergency services was in personal meetings with the senior personnel of each emergency service. There were extensive preliminary meetings between the author and senior officers where, again, the above themes of comparability and confidentiality were assured and emphasized.

In the case of Japan, preliminary meetings involved members of Fichiro, the largest municipal trade union in Japan, and the National Fire-fighters Association. As both these organizations were based in Tokyo, their presence provided further indications to the emergency services that the data would be collected and analyzed in strict confidentiality. In both Japan and Hong Kong, preliminary meetings were arranged through the training departments; in the case of UK through the Firemasters office (broadly equivalent to CEO in private organisations).

Inevitably, personal contact was particularly extensive with the UK emergency service. The UK emergency service it should be noted were already participating in a wider study on psychological stress at the time the comparative data on personnel exposed to a critical incident was gathered. (As part of this project data from a 'larger' sample of n=395 was gathered; results are in Paton et al (1992d), but are not part of this analysis.) Personal contact was also extensive with Japanese and Hong Kong organisations, however.⁴ In the case of Japan, a three-month stay was arranged in Tokyo and Nagoya where a range of interviews were conducted and arrangements

for questionnaire distribution and collection made. In the case of Hong Kong, repeat visits were made to the emergency service prior to securing participation in the survey.

Notwithstanding this, only as part of personal contact with the UK service were semi-structured and audio-taped interviews conducted with 14% of operational personnel (n=105). This took place over a three month period. Whilst the interviews were used to understand the broad nature of stressors that were experienced in all emergency services, it should be appreciated that a qualitative 'feel' for emergency service work was based on UK emergency service personnel.

Given this broad intention, all interviews both in the UK as well as Japan and Hong Kong were conducted in semi-structured format (Walker, 1985: 5 and 45-71). Clearly for participants, the main objective was to develop insight about the relative role of stressors faced by emergency service personnel in all cultural settings. The interviews were also concerned with exploring the relationship these stressors were generally perceived to have with stress symptoms.

Interviews were not conducted with operational personnel in Hong Kong or Japan (owing to language rather than time limitations). In these emergency services, 2-3 interviews were held with senior personnel (in English), covering the nature of traumatic reactivity in their particular cultural and organisational settings. These interviews were supplemented in the case of Japan by interviews with personnel from outside the specific environment of the emergency services; specifically trade union and academics.

The purpose of all personal contact/emergency service interviews was in effect to seek a 'second-opinion' on the UK qualitative interview data. Ultimately, all the interviews and personal contact provided valuable background information that helped place questionnaire responses from all personnel - British, Japanese and Hong Kong - in perspective. This included interviews with personnel from inside and outside the emergency services.

A clear consensus developed. Indeed, all interviews suggested, above all, that the emergency service environment in all cultural

settings was perceived internally and externally (ie, by emergency service personnel as well as others) as a fundamental aspect or factor in understanding work-trauma symptomatology. The effect of CIs or other traumatic experiences on personnel was universally suggested as comparatively minor (Paton et al, 1992d). There was a clear qualitative message that organisational attitudes and values played a key role in the experience of work-trauma by emergency service personnel.

The nature of samples

Before moving on to the analysis in Chapter Four a review of the nature of samples is fundamentally important. This inevitably concerns issues which future researchers should be aware of when interpreting results and in developing future research frameworks and methodologies. These issues are also comprehensively addressed here in Chapter Five.

First, future researchers must understand that for all samples, and in all cultural settings, questionnaires were collected via the personnel offices of each emergency service. In this way there was fundamental emergency service involvement in the process of data collection. (The implications of this are also discussed in Chapter Five.)

Second, researchers must realise that whilst the nature of samples is comparable in certain respects, the nature of the samples is also subject to certain organisational agendas and values. Although questionnaires were carefully translated according to the principles discussed above (and these were then distributed as 'masters' to the emergency services for copying and distribution), they were distributed to selected personnel; that is, according to choices made by the respective emergency services.

In the case of the Japanese sample, the population to whom the questionnaires were distributed were all personnel operating in city centre stations in Nagoya. In the case of Hong Kong and UK samples, the questionnaires were also distributed to personnel in a city

centre. However, rather than follow a census type approach as used in Japan, these emergency services distributed and collected questionnaires from two watches of personnel operating in a city centre, with each watch coming from the same operating station.

This factor explains the difference in sample numbers. In Japan, total responses were $n=688$. In the UK and Hong Kong, responses were analogous ($n=68$ and $n=60$) but obviously less extensive. (The methodological implications of this are discussed fully in Chapter Five.) It also indicates a key difference in the nature of the samples.

Once the selection of the sample was made, each emergency service distributed the questionnaires. These were collected within a seven day period and bundled together to the HQ office. These were in turn forwarded by mail/traceable courier to the University of St Andrews, Scotland.

As the following table (XI) and related details reveal, the nature of the samples suggests five key differences or characteristics: return rate; rank structure; age, joining age and length of service; working hours; and the employment status of spouses. The following table summarizes the key differences as a percent of respondents. Full data regarding these and other differences which constitute the nature of the samples are in Appendices VI and VIV.

TABLE XI: KEY SAMPLE DIFFERENCES AS % OF RESPONDENTS

VARIABLE	UK	JAPAN	HONG KONG
With above 15 years service	n.23 38.98%	n.361 54.53%	n.25 41.66%
(...mean length of Service; years)	(12.01)	(16.92)	(13.63)
Joined organisation when under 21 years of age	*n.56 81.16%	n.451 67.82%	n.32 53.33%
Joining Age (mean)	23.45	20.36	21.90
Worked overtime on regular shift (past 7 days)	n.2 2.86%	n.100 15.06%	n.3 5.08%
Worked over 50 hours during (past 7 days)	n.4 5.72%	n.164 24.69%	n.16 27.11%
Serving in operational ranks	n.68 100%	n.518 76.43%	n.58 96.67%
Married	n.57 81.43%	n.537 80.63%	n.49 81.67%
(... with wife working)	(n.53) (92.98%)	(n.362) (67.41%)	(n.27) (49.09%)
(...above 40 hrs per week)	(n.4) (7.02%)	(n.50) (9.31%)	(n.12) (24.48%)
With a relative in the organisation	n.9 12.86%	n.58 8.62%	n.5 8.93%
With a relative in other emergency services	n.10 14.49%	n.168 23.95%	n.10 17.24%
Significant/small increase in alcohol use	n.28 70.00%	*n.299 61.13%	n.16 61.53%
Significant/small increase in tobacco use	n.14 70.00%	*n.297 79.26%	n.19 79.16%
Significant/small increase in food use	n.25 55.56%	*n.174 30.12%	n.35 59.32%
Considerable/above average support from partner	n.34 55.73%	n.129 21.63%	n.37 77.08%
Considerable/above average support from colleague	n.11 20.75%	n.104 17.63%	*n.22 64.70%
Considerable/above average support from superior	n.5 10.00%	n.55 9.61%	*n.8 57.14%
Considerable/above average support from counselor	n.1 2.56%	n.4 0.74%	*n.1 12.50%
Exercised more than twice in past 7 days	n.9 12.85%	n.218 33.38%	n.26 44.06%
Contemplation of counselling (ever)	n.1 1.45%	n.22 3.28%	n.11 18.33%
Action on counselling (ever)	n.1 1.45%	n.15 2.18%	n.2 3.33%

Note: * denotes high number of missing values.

Return rate. Questionnaires returned in the UK, Hong Kong and Japan were consistently high, exceeding 9 from 10 in all instances (97.14%, 90.91% and 91.73% respectively).

Rank structure. Contrary to UK and Hong Kong samples, where proportion of responses came from broadly similar ranks, the majority of Japanese respondents were junior-officers; either sub or station-officer level, the third or fourth level of promotion. Differences in ranks were striking: 35.10% of Japanese respondents were sub-officers versus only 9.64% of UK and 11.67% of Hong Kong; 24.93% of Japanese respondents were station-officers versus 7.36% of UK and 5.00% of Hong Kong. Compared to Hong Kong and UK, the Japanese sample had an almost negligible number of fire-fighters - only 12.98% were fire-fighters versus 62.29% of UK and 67.67% of Hong Kong. Although numbers of senior officers were analogous in all three samples, this suggests the Japanese sample tended to be of predominately middle-ranking respondents.

Age, joining age and length of service. The preponderance of junior-ranking officers amongst the Japanese sample was consistent with data on joining age and length of service, which suggested Japanese personnel were longer-serving. Mean service age was at least three years more for Japanese, at 16.92 years, versus Hong Kong, 13.63 years, and UK, 13.01 years. There was also a tendency for Japanese to have joined the organisation at younger years. Mean joining age was youngest for Japanese at 20.36 years, versus Hong Kong, 21.90 years, and UK, 23.41 years; 68% of Japanese had joined the organisation when aged under 21 versus 53% for Hong Kong and 25% for UK. Consistent with this length of service amongst Japanese, mean age was also higher, at 37.23 years, versus Hong Kong, 35.53 years, and UK, 36.42 years.

Working hours (self and spouse). Notably more Japanese worked overtime on the standard watch: 15% versus under 5% for UK and Hong Kong. However, a quarter of Hong Kong respondents worked hours of either 60-70 hours or c.50-60 hours per week (see Appendix VIV): 27% versus 15% for UK and 5% for Japan. Partners in the UK tended to be employed compared to partners in Japan or Hong Kong (Appendices VI and VIV): 76% of UK spouses were employed versus 56% of Japanese and 49% of Hong Kong. This was consistent with the low hours worked by Hong Kong spouses, which tended to be on a part-time basis (ie, under 20 hours per week). The spouses in Japan and UK tended to work around 30 hours per week or more (Appendix VI).

SUMMARY

This chapter started by outlining key research questions derived from Chapters One and Two. It then covered which methods were chosen to study these questions, included as part of which were reviews of the three questionnaire instruments (the IES-15, the HSCL-21, the HAD-14) and a review of the benefits of field versus laboratory studies. These suggested that the future methodological focus of work-trauma should concentrate on field studies about aspects of emergency service experience which could be considered 'cultural universals' and 'cultural specifics'. This is a theme continued with in Chapter Five. Translation methodology was also discussed (and copies of each questionnaire in Chinese, Japanese and English language versions are in Appendix VIII).

Ten specific research hypothesis were generated from the literature review of Chapters One and Two. These covered a diversity of relationships between traumatic reactivity, general pathology and certain features of emergency service life-styles and demographics - from exercise frequency to stimulant use to parenting status - but concentrated upon cultural universals; that is, they intentionally addressed which factors associated closely with emergency service personnel and were potentially universal predictors of traumatic reactivity as well as general pathology.

In addition to certain limitations of data collection (which concentrated on three factors: the comparable nature of the research process, the emphasis of confidentiality, and the extent of personal contact between the researchers and the emergency services), the chapter also covered three key issues which may be construed as methodological limitations in the data analysis presented in the following chapter.

1. First, there is an assumption that translation is reliably capturing the meaning behind scale terms, such as 'feeling blue' and 'events popped into my mind.'

2. Second, an ILO report and other internal documentation suggests there is a close organisational similarity evident between Hong Kong and UK fire services, but probably less so with the Japanese fire services. Whilst this does not imply radical difference it suggests some limitations in understanding the organizational factors at play.
3. Thirdly, there is no evidence that a critical incident occurred in the Japanese sample in the 90 days prior to data collection. Although the literature review earlier would suggest this is possible, there is an absence of empirical evidence to this effect.

(The methodological issues associated with the above limitations, specifically their association with future research direction, are discussed fully in Chapter Five.)

ENDNOTES

¹ The Japanese language uses some characters based on Chinese characters. Although these have been adapted over time, they are broadly analogous in some areas and can be used as guides for meaning in Chinese (Reischauer, 1989).

² Examples include: Natsume et al, 1988, Ueda et al, 1989 (self-report scales); Barnard & Duncan, 1975, Doya et al, 1989, Baum et al, 1983, Seppanen, 1979, Lim et al, 1987, Barnard et al, 1973a, Kurinka & Korhonen, 1981 (on-site physiological measurement); Hagihara & Morimoto, 1990 (awareness of issues); Kamada et al, 1990, Tanaka, 1987 (subjective measurement of symptoms); Matsumoto, 1984; Matsumoto et al, 1981 (behavioural observation); Ramsay, 1993b, Nakamura et al, 1984 (statistical review of data - for example, absenteeism and mortality rates).

³ Examples include McGrath, 1970 (psychological evidence of stress arousal); Prkachin et al, 1983 (facial expression) and Maher, 1966, Hasher & Zacks, 1979 (disruption of motor skills). From Neufeld (1989).

⁴ The three-month stay in Japan was covered in part by a travel grant from the Department of Management, University of St Andrews. Hong Kong is the home of the authors parents, facilitating privately funded visits to the HKFS over an extended period.

CHAPTER FOUR

PRELIMINARY EMPIRICAL UNDERSTANDING

This chapter summarizes some preliminary evidence on how the work-trauma process may be working in different cultural settings. The purpose is to link the subject matter of Chapter Two with conclusions and suggestions for further research, detailed in the following chapter. Given the importance of focusing on the key variables outlined by Chapter Two, we summarise only key findings here. Full data is in Appendix VI following.

Note that in all of the analysis presented here pair-wise deletion is used. Thus, if one item is not completed, scores for that respondent are not shown. Mean substitution was not used. Where tables are introduced in this chapter, they are preceded in small case by a brief explanation of the tables contents and structure. This is not intended as an interpretation of the data in the tables but rather designed to facilitate general ease when consulting tables independently of the text.

Cultural differences in symptomatology

Full results of traumatic reactions and general pathology symptoms are recorded in Table XII, below. This table shows that, contrary to expectations, there were not comparable responses across emergency services in different cultural settings. In fact, there were large differences in symptomatology.

The stressors endemic to Japanese society detailed in Chapter Two and that suggested comparatively high general pathology symptoms (extensive work hours, economic strain, pressure to perform in hierarchical organizations etc.) were only partially supported by the data. Partial in the sense that only compared to the UK, incidence of depression was particularly high (5.61 versus 2.32). All symptoms of general pathology and traumatic reactions were higher in Japan than the UK.

However, an unexpected finding was to see such consistently high profiles in Hong Kong. In all seven symptoms, both general pathology and traumatic reactions, mean scores in Hong Kong were higher than mean level of corresponding symptoms in Japan. Differences were particularly pronounced in the IES-15 scale. Intrusion symptoms in Hong Kong were 11.70 versus 2.67 in Japan and 2.31 in the UK. Avoidance symptoms were 10.90 versus 2.43 (Japan) and 1.73 (UK). This data was unexpected.¹

TABLE XII: CULTURAL DIFFERENCES IN GENERAL PATHOLOGY & TRAUMA REACTIONS

EXPLANATION OF TABLE: This table indicates mean level of the 7 measured symptoms in each cultural setting. For ease of reference, symptoms are grouped by the instrument of which they are a sub-set, and the scale maximum is provided to facilitate understanding the mean score in perspective. Standard deviation is indicated in parenthesis beneath each mean and significant differences are indicated by '#' symbols in the table, with t-values at the bottom of the table. (The explanation for calculating a test of significant differences is in end-note '2'). The bottom of the table also covers details on the symptoms.

SYMPTOMS	UK	JAPAN	HONG KONG
IES-15			
Intrusion symptoms (Impact of Event Scale; scale maximum 35)	a# 2.31 (3.75)	a# 2.67 (5.02)	a# 11.70 (8.35)
Avoidance symptoms (Impact of Event Scale; scale maximum 40)	b# 1.73 (3.39)	b# 2.43 (4.69)	b# 10.90 (8.56)
HAD-14			
Anxiety symptoms (Hospital Anxiety and Depression; 21)	c# 5.13 (4.14)	c# 6.30 (3.61)	c# 8.20 (4.16)
Depression symptoms (Hospital Anxiety and Depression; 21)	d# 2.32 (2.60)	d# 5.61 (3.69)	d# 7.52 (3.15)
HSCL-21			
Performance difficulties symptoms (HSCL-21; scale maximum 28)	e# 10.28 (2.93)	e# 12.27 (3.74)	e# 15.46 (4.54)
General feelings of distress symptoms (HSCL-21; scale maximum 28)	f# 9.7 (3.15)	f# 10.68 (4.30)	f# 14.48 (4.84)
Somatic distress symptoms (HSCL-21; scale maximum 28)	g# 9.33 (3.35)	g# 11.76 (3.56)	g# 17.96 (5.92)

Key: Impact of Event Scale, Intrusion and Avoidance factors; Hospital Anxiety and Depression Scale, Anxiety and Depression factors; Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Tests of significant difference: At a#, b#, c#, d#, e#, f#, g#, there are significant difference between Hong Kong and Japan, Hong Kong and UK, Japan and UK @ $p < 0.0005$ ($t = 3.4602$), using a one-tailed test with degrees of freedom (ν) = 60.

Note: The methodology for calculating significant difference with an example from this table is in the endnotes to this chapter but is based on the simple one-tailed t-distribution (Sprenst, 1977).

Marital status, parenting status and age

Full details on the relationship of marital status with symptoms are contained in Appendices VIV (part B) and X (part B). Appendix XI (parts A-G) details the relationship of all symptoms with all sources of social support, including partners. Appendices XIII and XIV list the correlation of all symptoms with social support. This section summarizes key findings.

In all samples approximately 80% of respondents were married. A cross-tabulation of symptoms by marital status, summarised in Table XIII below, shows clear differences in general pathology and specific traumatic reaction symptoms between single and married subjects. Traumatic symptomatology was uniformly higher in single Japanese personnel versus married personnel. Symptoms of general pathology were higher in married Japanese. Anxiety and depression symptoms were higher in single UK and Hong Kong personnel.

TABLE XIII: CULTURAL DIFFERENCES IN SYMPTOMATOLOGY BY MARITAL STATUS†

EXPLANATION OF TABLE: This table shows how mean level of the 7 measured symptoms in each cultural setting varies according to subjects who are single and married. The table, and all subsequent tables, follows the order UK, Japan, Hong Kong. To ensure that sample differences are understood the table discloses both n. (number) and % (percent) demographics. Significant differences are indicated by '#' symbols in the table. The bottom of the table covers details on the symptoms and types of significant differences.

CULTURE..MARITAL STATUS			SYMPTOM						
	n.	%	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GFD
UK									
Single	6	8.57	1.33 (1.97) a#,b#,c#	3.17 (7.76) a#,b#	5.33 (3.27)	2.67 (3.20) c#	10.27 (3.17) c#	8.78 (2.65) c#	9.83 (3.07) c#
Married §	57	81.43	2.2 (3.67) a#,b#,e	1.30 (2.09) a#,b#,d#,e#	4.88 (4.02) d#,e#	2.14 (2.59) d#,e#	10.25 (3.43) d#,e#	9.42 (3.02) d#,e#	9.75 (3.63) d#,e#
JAPAN									
Single	125	18.77	3.48 (6.41) a#,b#	3.26 (5.93) a#,b#	5.67 (3.40) a#,b#	5.03 (3.80) a#,b#,c#	11.77 (3.29) a#,b#,c#	10.02 (3.28) a#,b#,c#	11.41 (4.20) a#,b#,c#
Married	537	80.83	2.53 (4.68) a#,b#,d#	2.29 (4.41) a#,b#,d#	6.43 (3.64) a#,b#,d#,e#	5.73 (3.63) a#,b#,d#,e#	12.40 (3.85) a#,b#,d#,e#	10.87 (3.64) a#,b#,d#,e#	11.83 (4.32) a#,b#,d#,e#
HONG KONG									
Single	10	16.67	11.50 (7.79) b#	11.20 (6.76) b#	9.70 (3.09) a#,b#	8.70 (3.02) a#,b#	14.50 (2.55) a#,b#	19.44 (5.94) a#,b#	15.50 (4.14) a#,b#
Married	49	81.67	11.94 (8.50) d#	10.96 (8.99) d#	7.90 (4.35) a#,d#	7.27 (3.18) a#,d#	15.64 (4.83) a#,d#	17.83 (5.92) a#,d#	14.27 (5.04) a#,d#

Note:

† See Appendix VIV (part B) for full data on respondents designated 'other'

§ Note that n=5 (7.35%) of UK sample have 'other' marital status.

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Tests of significant difference: All instances in this table marked # are significant @p<0.001, using a one-tailed test with degrees of freedom ('v') = 60; and v=300 for the intra-Japan testing.

- Instances denoted a# are significant differences between single and married respondents within each cultural setting;
- Instances denoted b# are significant differences between single respondents in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted c# are significant differences between single respondents in Japan and UK;
- Instances denoted d# are significant differences between married respondents in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted e# are significant differences between married respondents in Japan and UK.

Full data on the level of symptoms in those with or without children is in Table XIV, below. The table shows that all indices of general pathology were lower in UK and Hong Kong non-parents; that is those without children exhibited higher general pathology symptomatology than those with children. The opposite was observed in Japan where, by contrast, all symptoms of general pathology in Japanese were observed to be higher than non-parents.

Intrusion symptoms in Japanese non-parents were however higher than parents: 3.01 versus 2.53. High symptoms in Japanese non-parents were also seen in avoidance symptoms. This tendency was also seen in Hong Kong and the UK, where non-parents also exhibited higher levels of intrusion and avoidance symptomatology compared to parents. The cultural differences in symptomatology amongst parents is illustrated below:

TABLE XIV: CULTURAL DIFFERENCES IN SYMPTOMATOLOGY BY PARENTING STATUS

EXPLANATION OF TABLE: This table shows how mean level of the 7 measured symptoms in each cultural setting varies according to subjects who have children and do not have children. The table follows the order UK, Japan, Hong Kong. To ensure sample differences are understood both n. (number) and % (percent) demographics are disclosed. Significant differences are indicated by '#' symbols in the table. The bottom of the table covers details on the symptoms and the type of significant differences.

CULTURE...BY PARENTING STATUS			SYMPTOMS						
	n.	%	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GF
UK									
Non-parent	22	31.43%	2.33 (4.51) b#	2.00 (2.30) b#	5.15 (3.22) b#	2.62 (2.38) b#,c#	9.87 (2.29) b#,c#	9.64 (2.21) b#	9.27 (1.60) [a#],b#,c#
Parent	48	68.57%	2.27 (3.40) d#	1.14 (3.78) d#	5.10 (4.52) d#, [e#]	1.68 (2.67) d#,e#	9.73 (3.21) d#,e#	8.73 (3.79) d#,e#	8.23 (3.62) [a#],d#,e#
JAPAN									
Non-parent	187	27.50%	3.01 (5.81) b#	2.31 (5.15) b#	5.55 (3.39) a#,b#	4.97 (3.60) a#,b#,c#	11.66 (3.41) a#,b#,c#	9.89 (2.97) a#,b#	11.20 (4.10) a#,b#,c#
Parent	493	72.50%	2.53 (4.68) d#	2.06 (4.51) d#	6.58 (3.65) a#,d#, [e#]	5.85 (3.70) a#,d#,e#	12.51 (3.83) a#,d#,e#	10.99 (3.72) a#,d#,e#	11.97 (4.36) a#,d#,e#
HONG KONG									
Non-parent	23	38.33%	12.17 (8.98) b#	11.26 (8.79) b#	8.96 (4.41) b#	8.30 (3.27) b#	15.60 (4.99) b#	19.14 (6.09) a#,b#	15.59 (4.59) a#,b#
Parent	37	61.67%	11.41 (7.40) d#	10.68 (8.36) d#	7.72 (3.70) d#	7.03 (2.84) d#	15.39 (3.72) d#	17.21 (5.57) a#,d#	13.81 (4.54) a#,d#

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Tests of significant difference: All instances in this table marked # are significant @p<0.001, using a one-tailed test with degrees of freedom ('v') = 60 for Hong Kong and UK and v=300 for the intra-Japan testing.

- Instances denoted a# are significant differences between non-parent and parent respondents within each cultural setting; (those instances denoted [a#] are significant @ p<0.01)
- Instances denoted b# are significant differences between non-parent respondents in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted c# are significant differences between non-parent respondents in Japan and UK;
- Instances denoted d# are significant differences between parent respondents in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted e# are significant differences between parent respondents in Japan and UK. (those instances denoted [e#] are significant @ p<0.01)

Full details of the relationship between age and symptoms are in Appendices VIV (part B) and X (part B). Although these show a

tendency in reduction in intrusion symptoms in elders over all cultures (particularly clear in the case of Japan where intrusion symptoms of 3.25 in 18-25 year olds fall to 1.55 in over 50s ($r = -0.06$) and UK, where intrusion symptoms fall from 1.83 to 1.00 ($r = 0.12$), the deleterious pattern of age/symptomatology does not occur for other symptoms. Only anxiety and performance difficulties symptoms correlate with age in Japan ($p < 0.001$); in Hong Kong only somatic distress and depression ($p < 0.01$); and nothing in the UK.

TABLE XV: CULTURAL DIFFERENCES IN SYMPTOMATOLOGY BY AGE

EXPLANATION OF TABLE: This table shows how mean level of the 7 measured symptoms in each cultural setting varies between subjects at five key age groups. The table follows the order UK, Japan, Hong Kong. At the right hand column are correlation values between each symptom and age in each cultural setting. Where r-values are significant at $p < 0.001$ they are indicated by a '*' symbol; where $p < 0.01$ by '+'. Significant differences may be inferred from '+' and '**' symbols in this table. The bottom of the table also indicates covers on the symptoms.

SYMPTOM	MEAN SCORE BY AGE					CORRELATION r =
	18-24	25-29	30-39	40-49	Over 49	
UK						
Intrusion	1.83	1.25	2.69	2.95	1.00	0.12
Avoidance	0.17	1.50	1.50	2.80	0.50	0.15
Anxiety	5.67	4.81	5.00	5.50	4.00	0.01
Depression	2.17	2.50	1.80	3.05	0.50	0.10
Performance difficulties	10.32	10.36	9.80	10.81	11.20	0.08
Somatic distress	9.08	9.61	9.06	9.46	10.40	0.06
General distress	9.78	10.30	9.51	9.68	10.81	0.00
HONG KONG						
Intrusion	10.00	12.81	13.25	9.44	10.33	-0.13
Avoidance	7.60	9.94	13.30	10.81	6.00	-0.03
Anxiety	8.20	9.88	7.74	7.87	4.00	-0.27†
Depression	8.80	8.94	6.95	7.06	4.33	-0.30†
Performance difficulties	16.75	15.80	15.20	15.21	15.00	-0.11
Somatic distress	16.40	19.27	17.10	18.20	20.00	-0.05
General distress	15.60	15.25	14.75	13.31	12.00	-0.19
JAPAN						
Intrusion	3.25	2.46	3.17	2.32	1.55	-0.06
Avoidance	3.09	2.11	2.66	2.42	1.41	-0.03
Anxiety	5.45	5.34	6.52	6.43	7.70	0.17*
Depression	4.36	5.50	5.86	5.58	6.11	0.08
Performance difficulties	11.60	11.65	12.23	12.59	13.32	0.15*
Somatic distress	9.77	9.66	10.85	11.16	11.50	0.18*
General distress	12.14	10.92	11.93	11.80	12.35	0.07

Note: * = $p < 0.001$; † = $p < 0.01$.

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Cultural differences in stimulant use change (tobacco, alcohol & food)

Cultural differences in the use of stimulants were apparent (detailed in Appendices XVI - XIV). The majority in UK and Hong Kong were non-smokers (64% and 60% respectively) whereas the minority in Japan were non-smokers (40%); 20% of the UK sample smoked over 60 cigarettes per day versus only 5% for Japan and 2% for Hong Kong. Medium-level tobacco consumption was also comparatively high in Japan: 24% smoked less than 20 cigarettes, versus 3% for UK and 7% for Hong Kong; 27% smoked just under 50 cigarettes, versus 11% for UK and 25% for Hong Kong. A 'significant increase' of tobacco use (as opposed to an 'increased a little' change) in response to stressors was also comparatively high in Japan (13%) versus Hong Kong (8%) and UK (5%).

For Japan correlation between change in tobacco use with both specific trauma-related and most general pathology symptoms was significant at $p < 0.001$.³ Only anxiety symptoms did not significantly correlate with change in tobacco use above $p < 0.001$; it was $p < 0.05$. Correlation between change in tobacco use was also frequent in the UK. There was significant correlation with all symptoms of the HSCL-21 plus anxiety symptoms ($p < 0.001$). Avoidance symptoms was significant at $p < 0.05$; only intrusion symptoms were not significantly correlated with change in tobacco use. For Hong Kong, avoidance ($p < 0.001$), anxiety ($p < 0.001$) and performance difficulties ($p < 0.001$) were significantly correlated with change in tobacco use.

A similar pattern was evident in alcohol use. Again, correlations for all symptoms by change in use were significant for Japan ($p < 0.001$). In UK only general feelings of distress were not significantly correlated with change in alcohol use ($p < 0.001$). For Hong Kong, three symptoms were significantly correlated with change in alcohol use: anxiety ($p < 0.001$), performance difficulties ($p < 0.001$) and general feelings of distress ($p < 0.001$).

The pattern in food use was less clear. Japan also exhibited a significant correlation between symptoms of general pathology and changes in food use, although the relationship was less frequently observed than for change in alcohol or tobacco use. All correlations were also negative, in contrast to changes in alcohol and tobacco use

where correlations were positive. Intrusion and avoidance symptoms were not significant and anxiety was only significant at $p < 0.10$. The correlation of changes in food use and symptoms was less frequent for UK and Hong Kong. Only depression and change in food use was significantly correlated in UK at $p < 0.001$. In Hong Kong, there was no significant correlation between change in food use and symptoms of either general pathology or specific trauma reactions; the correlation of symptoms and food use also tended to be less consistently negative in Hong Kong.

Cultural differences in exercise frequency and symptomatology

Full details of the relationship between exercise frequency and work-trauma symptoms are in Appendices VIV (part B) and X (part B). These show clear, if unexpected, cultural differences in the frequency of exercise. Although Japanese tended towards lower levels of exercise frequency compared to British, there was no significant difference in observed exercise frequency between Japan and Hong Kong. Exercise taken by British was most frequent: 36% exercised on three or more occasions compared to 13% of Japanese. A large number of Hong Kong personnel (37%) and Japanese (35%) also exercised on no occasion compared to only 18% in UK.

There was a tendency for significant correlations between exercise frequency and all work-trauma symptoms except intrusion in Japan. Five of the six symptoms (which were not anticipated to associate with exercise frequency) were, in fact, significantly correlated: anxiety and performance difficulties symptoms at $p < 0.01$; and depression, somatic distress and general feelings of distress at $p < 0.001$. Only avoidance symptoms did not significantly correlate with exercise frequency in Japan. By contrast, there was no significant correlations between exercise frequency and any symptoms in Britain. For Hong Kong, only anxiety and depression symptoms were correlated with exercise frequency ($p < 0.001$).

Yet, evidence on the efficacious role of exercise frequency on general pathology in all cultures was evident. In all populations

anxiety, depression and general feelings of distress symptoms were exhibited at their highest levels in those not exercising at all. The correlation of frequency of exercise with all symptoms was also negative: for UK fire-fighters, -0.04; for Japanese fire-fighters, -0.11 (significant at $p < 0.005$); and for Hong Kong fire-fighters, -0.14.

The most unexpected finding from the Japan was the way intrusion symptoms correlated with exercise frequency. Although, as anticipated, there was no significant correlation in UK or Hong Kong intrusion symptoms were significantly correlated with exercise frequency in Japan ($p < 0.001$). Moreover, contrary to all other correlations between exercise frequency and symptoms the r-value was positive.

Absenteeism and symptomatology

Full details of the relationship between absenteeism and intrusion and depression symptoms are contained in Appendices VIV (part A) and X (part A). These show intrusion is significantly correlated with absenteeism for UK and Japan but not for Hong Kong. Depression symptoms, however, were only significant for Japan. A surprising finding was that in Japan most symptoms were correlated with absenteeism; the only exception was anxiety and absenteeism, where $r = 0.08$. All other correlations were positive and at $p < 0.001$, except intrusion and avoidance at $p < 0.025$. Suggestions of a close relationship between intrusion symptoms were also in evidence for UK, although the correlation was not significant.

Contemplation and action of counselling

Full details about differences in symptomatology between those contemplating and not contemplating counselling are contained in Table XVI. This hypothesis was supported in the case of intrusion symptoms throughout the samples. As the table shows the mean level of

intrusion symptoms in Japanese and UK personnel contemplating counselling was more than double that of personnel not contemplating counselling, and just less than double in Hong Kong personnel contemplating counselling. For depression symptoms a similar relationship was observed for Japanese and UK personnel, although in Hong Kong levels of depression amongst personnel contemplating counselling were actually less higher than the population norm.

For performance difficulties, however, the hypothesis was not supported for UK personnel contemplating counselling, amongst whom performance difficulties were lower than in personnel not contemplating counselling. By contrast, in Japan and Hong Kong performance difficulties were higher in those contemplating counselling, if by a lesser extent than for intrusion and depression symptoms.

A surprising finding was that in the UK sample other levels of general pathology were not higher in those contemplating counselling. Both somatic distress and general feelings of distress were at analogous levels in fire-fighters contemplating or not contemplating counselling. This was in contrast to Japanese and Hong Kong personnel where symptoms of general pathology were also higher in personnel contemplating counselling compared to personnel not contemplating counselling.

TABLE XVI: CULTURAL DIFFERENCES IN SYMPTOMATOLOGY BY COUNSELLING CONTEMPLATION

EXPLANATION OF TABLE: This table shows how mean level of the 7 measured symptoms in each cultural setting varies between subjects who have and have not contemplated counselling. The table follows the order UK, Japan, Hong Kong. To ensure that sample differences are understood the table discloses both n. (number) and % (percent) demographics. Significant differences in mean scores are indicated by '#' symbols in the table. The bottom of the table covers details on symptoms and type of significance difference.

CULTURAL SETTING	SYMPTOMS								
	n	%	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GFD
UK									
Contemplation of Counselling	2	2.86%	2.50 (3.54) a#,b#, c#	9.50 (13.44) a#,b#, c#	9.00 (0.00) a#	6.00 (4.24) a#,b#, c#	9.83 (2.41) b#,c#	9.08 (1.56) b#,c#	9.33 (3.42) b#,c#
No Contemplation of Counselling	66	97.14%	2.31 (3.78) a#,b#, c#,d#	1.50 (2.70) a#,b#, d#	5.07 (4.15) a#,b#, d#	2.30 (2.58) a#,b#, d#,e#	10.28 (3.38) b#,d#, e#	9.34 (3.06) b#,d#, e#	9.79 (3.55) b#,d#, e#
JAPAN									
Contemplation of Counselling	22	3.19%	6.09 (9.00) a#,b#, c#	7.12 (8.74) a#,b#, c#	9.68 (4.53) a#	8.46 (3.33) a#,c#	15.14 (4.37) a#,b#, c#	12.41 (5.77) a#,b#, c#	16.27 (4.90) a#,c#
No Contemplation of Counselling	622	90.41%	2.54 (4.77) a#,b#, c#,d#	2.26 (4.39) a#,b#, d#	6.20 (3.53) a#,b#, d#	5.53 (3.68) a#,d#, e#	12.30 (3.68) a#,b#, d#,e#	10.65 (3.46) a#,b#, d#,e#	11.63 (4.21) a#,b#, d#,e#
HONG KONG									
Contemplation of Counselling	11	18.33%	17.73 (7.68) a#,b#	14.45 (9.23) a#,b#	10.30 (4.24) a#,b#	8.27 (3.17) b#	18.09 (3.81) a#,b#	21.91 (5.38) a#,b#	17.60 (3.92) a#,b#
No Contemplation of Counselling	49	81.67%	10.35 (7.95) a#,b#, d#	10.10 (8.29) a#,b#, d#	7.78 (4.05) a#,b#, d#	7.35 (4.51) b#,d#	14.82 (4.51) a#,b#, d#	17.00 (5.69) a#,b#, d#	13.84 (4.80) a#,b#, d#

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Tests of significant difference: All instances in this table marked # are significant @p<0.001, using a one-tailed test with degrees of freedom ('v') = 60 for Hong Kong and UK and v=300 for the intra-Japan testing.

- Instances denoted a# are significant differences between those who have undertaken 'Contemplation of Counselling' and those who have undertaken 'No Contemplation of Counselling' within each cultural setting;
- Instances denoted b# are significant differences between those who have undertaken 'Contemplation of Counselling' in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted c# are significant differences between those who have undertaken 'Contemplation of Counselling' in Japan and UK;
- Instances denoted d# are significant differences between those who have undertaken 'No Contemplation of Counselling' in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted e# are significant differences between those who have undertaken 'No Contemplation of Counselling' in Japan and UK.

Intrusion, avoidance, performance difficulties and depression symptoms were all higher in Hong Kong personnel who had received

counselling versus those who had not received counselling. In the case of UK, symptoms were less consistent. The specific trauma-related symptoms of intrusion, avoidance and depression were higher in those who had received counselling. Yet, general levels of pathology were at levels equivalent to those who had not received counselling. Performance difficulties were also considerably lower in those who had received counselling.

Amongst Japanese who had received counselling, intrusion and avoidance symptoms remained at levels higher than for those who had not received counselling (5.07 versus 3.14 for intrusion; 6.25 versus 3.16 for avoidance). As with UK personnel, general pathology symptoms had responded well to counselling intervention. Only anxiety and general feelings of distress symptoms were higher in those who had received counselling. Depression, performance difficulties and somatic distress were at lower levels in UK respondents who had received counselling compared to those who had not received counselling.

TABLE XVII: CULTURAL DIFFERENCES IN SYMPTOMATOLOGY BY COUNSELLING ACTION

EXPLANATION OF TABLE: This table shows how mean level of the 7 measured symptoms in each cultural setting varies between subjects who have acted on counselling and those who have not acted on counselling. The table follows the order UK, Japan, Hong Kong. To ensure that sample differences are understood the table discloses both n. (number) and % (percent) demographics. Significant differences in mean scores are indicated by '#' symbols in the table, with t-values at the bottom of the table. The bottom of the table also indicates details on the symptoms.

CULTURAL SETTING		SYMPTOMS							
	n	%	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GFD
UK									
Action on Counselling	2	2.86†	2.50 (3.54) b#,c#	9.50 (13.44) a#,b#	9.00 (0.00) a#,b#	6.00 (4.24) a#,b#	8.73 (1.56) a#,b#	7.91 (1.37) a#,b#,c	8.46 (1.45) b#,c#
No Action on Counselling	66	97.1	2.31 (3.78) d#	1.50 (2.70) a#,d#	5.07 (4.15) a#,d#	2.30 (2.58) a#,e#	10.32 (3.38) a#,d#	9.83 (3.06) a#,d#	9.36 (3.38) d#,e#
JAPAN									
Action on Counselling	15	2.18	5.07 (8.83) a#,b#	6.25 (8.67) a#,b#	6.93 (4.01) b#,c#	6.20 (4.06) b#	12.00 (3.14) b#,c#	10.37 (2.37) b#,c#	12.33 (4.45) b#,c#
No Action on Counselling	183	26.59	3.14 (5.23) a#,d#	3.16 (5.19) a#,d#	6.76 (3.77) d#,e#	6.36 (3.53) d#,e#	12.86 (4.12) d#,e#	11.37 (4.01) d#,e#	12.27 (4.51) d#,e#
HONG KONG									
Action on Counselling	2	3.33	17.0 (12.73) a#,b	17.0 (18.40) a#,b	13.00 (1.41) a#,b#	9.00 (2.83) a#,b#	18.50 (4.95) a#,b#	26.00 (2.83) a#,b#	17.00 (2.83) a#,b#
No Action on Counselling	58	96.97	11.5 (8.27) a#,d	10.6 (8.28) a#,d	8.04 (4.13) a#,d#	7.47 (3.17) a#	15.35 (4.54) a#,d#	17.67 (5.81) a#,d#	14.39 (4.89) a#,d#

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Tests of significant difference: All instances in this table marked # are significant @p<0.001, using a one-tailed test with degrees of freedom ('v') = 60 for Hong Kong and UK and v=300 for the intra-Japan testing.

- Instances denoted a# are significant differences between those who have undertaken 'Action on Counselling' and those who have undertaken 'No Action on Counselling' within each cultural setting;
- Instances denoted b# are significant differences between those who have undertaken 'Action on Counselling' in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted c# are significant differences between those who have undertaken 'Action on Counselling' in Japan and UK;
- Instances denoted d# are significant differences between those who have undertaken 'No Action on Counselling' in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted e# are significant differences between those who have undertaken 'No Action on Counselling' in Japan and UK.

Social support and symptomatology

There was no significant correlation between all symptoms and all sources of support: 0.04 for UK and Hong Kong fire-fighters and 0.06 for Japanese fire-fighters (Appendix XII). The relationship of symptoms to all sources of support did, however, tend to be positive. Of twenty-one variables (seven symptoms in three samples) only five were negative correlations: depression for UK and Japanese; performance difficulties for UK; somatic distress and general feelings of distress for Hong Kong.

Full details of the levels of social support in each sample are contained in Tables XVIII, XIV and XX below. The first table suggests no comparable fluctuations in social support rankings between cultures. Hong Kong records the highest level of social support from all sources, and Japanese the lowest. The second table considers the cultural differences in high social support and the third table the extent of social network.

The mean value of social support, across 14 sources, was: for Hong Kong 2.82 (56.84% of the scale maximum of 5); for UK fire-fighters 1.76 (35.20%) and for Japan 1.44 (28.80%). Mean levels of social support provided to Hong Kong fire-fighters were nearly double Japanese levels and 21.64% higher than for UK fire-fighters. Providers of social support in the work-place tended to be highly ranked in each culture. Work colleagues were consistently ranked second after partners.

For Hong Kong and Japanese, however, a superior was perceived to provide less support than a close friend. Only for UK fire-fighters was the superior perceived as the third most valuable source of support - above the close friend. For Japanese, close and casual friends were both perceived to offer more valuable support than superiors. For Hong Kong, a close friend, brother and sister were each perceived to offer more valuable support than superiors.

There were no significant variations in ranking for other sources. For example, counselor was ranked either 12th or 13th in all cultures; doctors were ranked 11th or 10th; mothers were ranked 6th or 7th etc. Variations occurred in siblings, which provided higher

support to Hong Kong (3rd and 4th for brother and sister respectively versus 9th and 11th for Japan and 7th and 9th for UK); casual friends, who provided more support for Japanese (4th) than Hong Kong (7th) and UK (8th); and fathers, which provided more support in UK (5th) than in Japan (8th) and Hong Kong (8th).

TABLE XVIII: CULTURAL DIFFERENCES IN GENERAL LEVEL OF SOCIAL SUPPORT

EXPLANATION OF TABLE: This table shows how mean level of support from 14 measured sources of social support varies between each cultural setting. Means of scoring are from 'No support' (1) to 'A little support' (2), 'Average support' (3), 'Above average support' (4) and 'Considerable Support' (5). Significant differences in mean scores are indicated by '#' symbols. Standard deviations are in cursive parenthesis, scale maximum in squared parenthesis ([XX.XX%]); this percent is calculated by letting 'Considerable Support' 5 = 100%. Ranking is in turn beneath these percentages; note this is intra-cultural.

SOURCE OF SOCIAL SUPPORT IN...	UK	JAPAN	HONG KONG	...OVERALL
Partner	a#,b# 3.34 (1.39) [66.80%] 1	a#,b# 2.20 (1.38) [44.00%] 1	a# 4.08 (1.20) [81.60%] 1	3.21 / [64.20%] 1
Mother	a#,b# 1.82 (1.09) [36.40%] 6	a#,b# 1.31 (0.78) [26.20%] 6	a# 3.00 (1.27) [60.00%] 6	2.04 / [40.80%] 6
Father	a#,b# 1.84 (1.18) [36.80%] 5	a#,b# 1.25 (0.73) [25.00%] 7	a# 2.69 (1.35) [53.80%] 8	1.93 / [38.60%] 8
Sister	a# 1.38 (0.83) [27.60%] 9	a#,1.12 (0.51) [22.40%] 10=	a# 3.16 (1.20) [63.20%] 4	1.89 / [37.80%] 9
Brother	a# 1.52 (0.92) [30.40%] 7	a#,1.24 (0.76) [24.80%] 8	a# 3.56 (1.27) [71.20%] 3=	2.11 / [42.20%] 5
Relative	a# 1.37 (0.85) [27.40%] 10	a#,1.32 (0.55) [26.40%] 5	a# 2.65 (1.35) [53.00%] 9	1.78 / [35.60%] 10
Close Friend	a# 2.14 (1.28) [42.80%] 4	a#,1.91 (1.18) [38.20%] 3	a# 3.56 (1.01) [71.20%] 3=	2.54 / [50.80%] 3
Casual Friend	a# 1.51 (0.90) [30.20%] 8	a#,1.64 (1.00) [32.80%] 4=	a# 2.86 (1.39) [57.20%] 7	2.00 / [40.00%] 7
Work Colleague	a#,b# 2.62 (1.33) [52.40%] 2	a#,b# 2.14 (1.24) [42.80%] 2	a# 3.82 (1.19) [76.40%] 2	2.66 / [57.20%] 2
Professional	1.18 (0.64) [23.60%] 13	1.13 (0.51) [22.60%] 9	1.73 (1.00) [34.60%] 11	1.35 / [27.00%] 12
Doctor	a# 1.29 (0.84) [25.80%] 11	a#,1.12 (0.49) [22.40%] 10=	a# 2.09 (1.38) [41.80%] 10	1.50 / [30.00%] 11
Counselor	1.23 (0.74) [24.60%] 12=	1.08 (0.42) [21.60%] 11=	1.63 (1.41) [32.60%] 12	1.31 / [26.20%] 13
Superior	a#,b# 2.22 (1.34) [45.40%] 3	a#,b# 1.63 (1.09) [32.60%] 4=	a# 3.14 (1.56) [62.80%] 5	2.33 / [46.60%] 4
Other	1.23 (0.83) [24.60%] 12=	1.08 (0.47) [21.60%] 11=	1.50 (1.00) [30.00%] 13	1.27 / [25.40%] 14
OVERALL MEAN	1.76 [35.20%] 2	1.44 [28.80%] 3	2.82 [56.84%] 1	2.01 [40.20%] /

Tests of significant difference: All instances in this table marked # are significant @p<0.001, using a one-tailed test with degrees of freedom ('v') = 60.

- Instances denoted a# are significant differences between levels of social support from each source in Hong Kong and Japan and Hong Kong and UK;
- Instances denoted b# are significant differences between levels of social support from each source in Japan and UK.

TABLE XIX: CULTURAL DIFFERENCES IN HIGH LEVELS OF SOCIAL SUPPORT

EXPLANATION OF TABLE: This table shows how high level of support from the 14 measured sources of social support varies between each cultural setting. Means of scoring are from 'No support' (1) to 'A little support' (2), 'Average support' (3), 'Above average support' (4) and 'Considerable Support' (5). 'High' is calculated by combining 'Above average support' and 'Considerable support'. The first number is the frequency of observations, the figure in percentages the amount this represents of the population observed. Thus, for example, whilst 129 subjects received high levels of social support from partners in Japan (that is either 'Above average support' and 'Considerable Support'), this only equals 18.97% of all subjects.

SOURCE OF SOCIAL SUPPORT	TOP-2 BOX# SCORE BY CULTURAL SETTING		
	UK	JAPAN	HONG KONG
Partner	34 (48.57%)	129 (18.97%)	37 (61.67%)
Mother	2 (2.86%)	19 (2.79%)	7 (11.67%)
Father	1 (1.43%)	16 (2.35%)	4 (6.67%)
Sister	1 (1.43%)	5 (0.74%)	37 (61.67%)
Brother	0 (0.00%)	21 (3.09%)	7 (11.67%)
Relative	3 (4.29%)	7 (1.03%)	4 (6.67%)
Close Friend	12 (17.14%)	77 (11.32%)	14 (23.33%)
Casual Friend	2 (2.86%)	43 (6.32%)	5 (8.33%)
Work Colleague	11 (15.71%)	104 (15.29%)	22 (36.67%)
Professional	1 (1.43%)	7 (1.03%)	1 (1.67%)
Doctor	1 (1.43%)	7 (1.03%)	2 (3.33%)
Counselor	1 (1.43%)	4 (0.59%)	1 (1.67%)
Superior	5 (7.14%)	55 8.09%	8 (13.33%)
Other	0 (0.00%)	3 (0.44%)	0 (0.00%)

Key: # Combined 'Above average support' and 'Considerable support'.

TABLE XX: CULTURAL DIFFERENCES IN EXTENT OF SOCIAL SUPPORT NETWORK

EXPLANATION OF TABLE: This table supplements Table XVIV. It shows the extent of high level of support from the 14 measured sources of social support and how this varies between each cultural setting; that is subjects receiving high support from differing numbers of sources. 'High' is again calculated by combining 'Above average support' and 'Considerable support'. The first number in the table is the frequency of observations, the figure in percentages which follows this is the amount this represents of the population observed. Thus, for example, whilst 57 subjects in Japan received high levels of social support from 3-5 sources, this only equals 8.38% of subjects.

HIGH SUPPORT FROM..	...IN THESE CULTURAL SETTINGS		
	UK	JAPAN	HK
0 sources	30 (44.13%)	433 (63.68%)	13 (21.67%)
1-2 sources	32 (47.02%)	183 (26.92%)	24 (40.00%)
3-5 sources	5 (7.35%)	57 (8.38%)	18 (30.00%)
Above 6 sources	1 (1.49%)	7 (1.03%)	5 (8.33%)

Towards a cross-cultural framework using best-subsets regression

In the data of this chapter we see - as expected - certain cultural differences. These are centered around Japan. For example, symptomatology differs between those Japanese with and without children. Whilst there is no effect of having children on either trauma or pathology symptoms in Hong Kong or UK, in Japan there appears to be a clear effect: Japanese parents experience higher trauma symptoms and also higher levels of anxiety/general feelings of distress and somatic distress.

Similarly, whilst there is a questionable relationship between age and any symptom in Hong Kong or UK (only anxiety and depression symptoms correlate significantly with age in Hong Kong ($p < 0.001$)), by contrast anxiety, performance difficulties, and somatic distress are correlated with age in Japan ($p < 0.001$). Absenteeism also has a significant correlation with intrusion symptoms in Japan but no

correlation in either Hong Kong or UK. Counselling appears uniquely efficacious in Japan: in UK and Hong Kong those who had received counselling tend to exhibit symptoms higher than the population norm; yet, there is little to distinguish Japanese who had received counselling from those who had not etc..

However, in this chapter there are also suggestions of certain cultural universals. Sources of social support, for example, are ranked in the same way in all cultures: partner, work colleague, close friend and superior are culturally universal providers of high social support in the emergency services. Both intrusion and avoidance symptoms do not appear to respond to counselling intervention compared to levels of general pathology. These symptoms are consistently higher in all cultures amongst those who have received counseling. Significant changes in tobacco use tend to be significantly correlated with both trauma and pathology symptoms ($p < 0.001$). The correlation of alcohol use with traumatic symptoms is significant across cultures ($p < 0.001$) etc..

In this section, we consider how in an empirical sense all of the above variables, both universal and specific, may interact. The purpose is to make the first step towards a framework which, as detailed in the introduction, links the conceptual material in Chapter Two with the analytical material in the following chapter (Five). The statistical methodology used to develop this framework/link is, first, best subsets regression and, second, multiple regression on to culturally universal predictors suggested by best subsets regression analysis. The conceptual methodology used to develop this framework is to divide predictor variables into three key areas. These are social support (14 sources), daily habits (6 types) and life events (10).

Given that conclusions and discussions in the following chapter are based to a certain extent on this statistical methodology, it is important to note five points which explain the process and results of best subsets regression analysis. Whilst these points are not intended as a statistical guide, they are a conceptual review of the rationale for this statistical methodology.

1. **Best subsets regression analysis value as a statistical filter.**

Best subsets regression is used here - and in other statistical analysis - as, in effect, a statistical filter when a diverse range of predictors are possible. Here, there are totally 30 predictors of traumatic reactivity/general pathology: 14 sources of social support, 6 daily habits, and 10 life events. This is too great a number of predictor variables to produce meaningful regression analysis and R^2 values.

Its purpose and value is therefore '...to select a group of "best subsets" for further analysis' (Minitab, 1991: 83). In other words, best subsets regression is not in itself a basis for a framework of analysis. Rather it is, and is used as, a preliminary means of generating a framework for analysis.⁴

2. **Best subsets regression analysis value as a precedent to conventional multiple regression.** Given the above we can therefore say regression analysis is an inherent result or second stage of best subsets regression analysis. The outcome regression analysis created by using best subsets regression can be seen below in Table XXIV. This table is a conventional 'multiple regression' application of the nine variables which best subsets regression analysis suggests are culturally universal predictors in social support (Table XXI), daily habits (Table XXII) and life events (Table XXIII).

Note that Table XXIV, the conventional multiple regression analysis, is contained in the summary of this chapter as it not only leads to the discussion of Chapter Five but encapsulates the analysis in this chapter.

3. **Examples and explanation of best subsets regression analysis output.** The following three tables (XXI, XXII and XXIII) show the key output of best subsets regression over the three groups of predictors: social support, daily habits and life events. At the bottom of each table, the number and description of variables are listed. For ease of reference, where the c-p value is equal to or

less than the number of variables used in the best subsets regression analysis this is indicated by the symbol '°'. (The statistical significance of this is described below in 5; briefly here we may note this symbol indicates a certain goodness of fit if it is equal to or less than predictor variables in the equation.)

- Thus, for example, Table XXI suggests that there are two culturally universal sources of social support which predict traumatic reactivity/general pathology: a spouse and a close friend. This is from 14 potential sources of support.
- Similarly, Table XXII suggests level of alcohol consumption, change in alcohol consumption, and exercise frequency are 'universal' predictors of traumatic reactivity/general pathology. This is from 6 potential daily habits.
- Table XXIII suggests contemplation of counselling, action on counselling, age, parenting status are universal predictors. This is from 10 life events.

(A universal predictor can be ascertained because it occurs as a 'best' predictor of any one symptom over all three cultural settings at least once.)

4. **Best subsets produces only two predictor variables.** Note that each 'best subsets' regression will usually produce only two predictor variables. As the name suggests these two variables are the 'best' predictors (x) of the variable (y); that is, from the group of x variables selected for analysis best subsets regression analysis suggests which are the two dependent variables that explain most of the variance in the independent variable, y.

- Thus, for example, Table XXII suggests that in Hong Kong the two 'best' daily habits predictors of intrusive imagery are Tobacco Level (that is the amount of tobacco consumed in the preceding seven days; $R^2 = 5.6$, $c-p = 3.1$) and Alcohol Level (the amount of alcohol consumed in the preceding seven days; $R^2 = 4.6$, $c-p = 2.9$).
- Yet in another example from the same table we see that in the UK the 'best' predictors of intrusive imagery are

different. They are in fact Tobacco change (that is, the change in the consumption of tobacco in the preceding seven days; $R^2 = 6.5$, $c-p = 2.6$) and Alcohol change (change in the consumption of alcohol; $R^2 = 4.3$, $c-p = 4.2$).

5. **Best subsets regression analysis has the c-p statistic.** Finally, note that in addition to the R^2 statistic, best subsets regression analysis produces a 'c-p' statistic. Whilst the former statistic is well known as an indication of goodness of fit (that is, the higher the R^2 value, then generally the greater the goodness of fit; Kanji, 1993; Sprent, 1977) the c-p statistic is more unusual in analysis.

It acts as a quality check for this particular regression analysis. The c-p (or 'Marlow's c-p') is, in simple terms, calculated by dividing the sum of squared errors (or 'SSE') of the model by the sum of squared errors in all variables (Kanji, 1993; Minitab, 1991). This can produce a range of values. In the following three tables, for example, c-p varies from 41.3 to 0.5.

A c-p statistic when 'low,' in the sense of being less than the number of predictor variables in the model, provides an indication, first, that there is an appropriate number of parameters in the equation and, second, that the model is precise. (When the word 'precise' is used, this means the model is 'fitting the data well' and would be good at predicting future responses.) A particularly low c-p statistic indicates that x variables could not meaningfully be added to the explanation of the y variable; that is, virtually all of the y variable is explained by the x variables selected.

When the c-p statistic is 'high,' in the sense of being greater than the number of predictor variables, this provides an indication that the model is not a good fit. If the c-p value tends to exceed the number of parameters then this suggests a poorly chosen model. In other words, a high c-p is an indication that other factors are probably at play and are not being captured by the model.⁵

This briefly summarises key conceptual pointers behind the best subsets regression analysis. The following tables summarise the key output from best subsets regression analysis. They follow, in order, sources of social support, daily habits and life events. The following section is the summary of this chapter, and includes the table showing the multiple regression analysis which is based on these three best subsets regression analysis.

TABLE XXI: CULTURAL DIFFERENCES IN SOCIAL SUPPORT: R², BEST SUBSETS

EXPLANATION OF TABLE: This table summarises key statistics from the best subsets regression analysis. The key statistic is the c-p which, as the preceding text describes, acts as a quality check on the appropriateness of the model: the closer the c-p value to the number of parameters (p) the better the goodness of fit. For each symptom, 14 sources of social support are used in the regression model: spouse, mother, father, sister, brother, other relative, close friend, casual friend, work colleague, other professional, doctor, counselor, superior, and other. For ease of reference, a '°' symbol signifies the c-p value is equal to or less than the number of variables (14).

SYMPTOM	CULTURAL DIFFERENCES IN R ² , BEST SUBSETS		
	UK	JAPAN	HONG KONG
Intrusion	Mother, R ² =3.2 (c-p=1.1, s=3.6838)°	Brother, R ² =1.4 (c-p=10.7, s=4.9801)°	Casual friend, R ² =4.3 (c-p=2.5, s=8.2416)°
	Sister, R ² =4.7 (c-p=2.7, s=3.6897)°	Relative, R ² =1.4 (c-p=10.7, s=4.4882)°	Colleague, R ² =2.6 (c-p=3.5, s=8.3114)°
Avoidance	Close friend, R ² =3.2 (c-p=1.0, s=3.3530)°	Relative, R ² =1.0 (c-p=20.2, s=4.6750)	Close friend, R ² =5.2 (c-p=4.7, s=8.4067)°
	Doctor, R ² =2.9 (c-p=1.6, s=3.3675)°	Brother, R ² =0.9 (c-p=21.3, s=4.6773)	Counselor, R ² =2.5 (c-p=4.7, s=8.5265)°
Anxiety	Doctor, R ² =2.5 (c-p=1.0, s=4.1227)°	Close friend, R ² =0.5 (c-p=2.4, s=3.5983)°	Close friend, R ² =11.8 (c-p=6.6, s=3.9405)°
	Sister, R ² =1.6 (c-p=15.4, s=4.1417)	Superior, R ² =0.5 (c-p=2.1, s=3.5590)°	Casual friend, R ² =4.8 (c-p=11.5, s=4.0946)°
Depression	Sister, R ² =4.3 (c-p=0.1, s=2.5611)°	Sister, R ² =0.7 (c-p=0.9, s=3.6799)°	Close friend, R ² =13.2 (c-p=3.7, s=2.9594)°
	Mother, R ² =3.6 (c-p=0.5, s=2.5705)°	Father, R ² =0.4 (c-p=2.9, s=3.6853)°	Casual friend, R ² =6.0 (c-p=0.7, s=3.0793)°
Perf Diff	Sister, R ² =2.3 (c-p=9.3, s=2.9140)°	Others, R ² =0.8 (c-p=2.8, s=3.7230)°	Father, R ² =10.3 (c-p=9.3, s=2.9140)°
	Spouse, R ² =1.5 (c-p=10.0, s=2.9266)°	Close friend, R ² =0.9 (c-p=3.8, s=3.7251)°	Counselor, R ² =12.1 (c-p=3.7, s=4.2967)°
Distress	Others, R ² =5.8 (c-p=0.4, s=3.0827)°	Casual friend, R ² =0.5 (c-p=0.6, s=4.2963)°	Close friend, R ² =7.3 (c-p=0.3, s=4.7037)°
	Doctor, R ² =2.6 (c-p=2.6, s=3.1349)°	Others, R ² =0.4 (c-p=0.2, s=4.2988)°	Counselor, R ² =4.1 (c-p=2.2, s=4.7839)°
Somatics	Spouse, R ² =4.3 (c-p=14.2, s=3.3048)°	Spouse, R ² =1.5 (c-p=1.1, s=3.5852)°	Spouse, R ² =1.5 (c-p=3.8, s=5.9301)°
	Colleague, R ² =1.7 (c-p=16.3, s=3.3493)	Sister, R ² =0.8 (c-p=5.8, s=3.5477)°	Others, R ² =5.7 (c-p=1.5, s=5.8034)°

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

TABLE XXII: CULTURAL DIFFERENCES IN DAILY HABITS: R², BEST SUBSETS

EXPLANATION OF TABLE: This table summarises key statistics from the best subsets regression analysis. Again, the key statistic is the c-p. Each symptom is regressed on 6 daily habits: daily level of tobacco use last month, change in tobacco use in response to stressors last month, level of alcohol consumption last month, change in alcohol consumption last month, change in food consumption last month, frequency of sport/interests participation last week. A '°' indicates c-p value is equal to or less than number of variables (6) and thus goodness of fit.

SYMPTOM	CULTURAL DIFFERENCES IN R ² , BEST SUBSETS		
	UK	JAPAN	HONG KONG
Intrusion	Tobacco change, R ² =6.5 (c-p=2.6, s=3.6539)°	Food change, R ² =0.9 (c-p=2.6, s=4.9867)°	Tobacco level, R ² =5.6 (c-p=3.1, s=8.2868)°
	Alcohol change, R ² =4.3 (c-p=4.2, s=3.6962)°	Alcohol change, R ² =0.7 (c-p=3.6, s=4.9908)°	Alcohol level, R ² =4.6 (c-p=2.9, s=8.2868)°
Avoidance	Tobacco level, R ² =10.9 (c-p=2.7, s=3.2244)°	Alcohol level, R ² =0.6 (c-p=3.2, s=4.5963)°	Tobacco change, R ² =5.2 (c-p=0.6, s=8.4778)°
	Alcohol change, R ² =4.4 (c-p=7.8, s=3.3413)	Food change, R ² =0.6 (c-p=3.6, s=4.5980)°	Sport/interest, R ² =3.3 (c-p=0.5, s=8.5636)°
Anxiety	Tobacco change, R ² =4.7 (c-p=1.7, s=4.0748)°	Food change, R ² =3.1 (c-p=13.1, s=3.5370)	Alcohol level, R ² =10.5 (c-p=4.7, s=3.9691)°
	Alcohol change, R ² =4.0 (c-p=1.2, s=4.0907)°	Alcohol change, R ² =1.0 (c-p=26.2, s=3.5753)	Alcohol change, R ² =10.4 (c-p=4.8, s=3.9708)°
Depression	Alcohol change, R ² =3.2 (c-p=0.5, s=2.5747)°	Sport/interest, R ² =6.0 (c-p=17.6, s=3.6153)	Alcohol level, R ² =1.7 (c-p=1.7, s=2.5607)°
	Alcohol level, R ² =1.4 (c-p=1.7, s=2.5992)°	Food change, R ² =2.4 (c-p=41.2, s=3.6852)	Food change, R ² =0.5 (c-p=1.0, s=3.1687)°
Perf Diff	Alcohol change, R ² =7.7 (c-p=0.4, s=2.8326)°	Food change, R ² =2.2 (c-p=12.7, s=3.6965)	Food change, R ² =5.8 (c-p=2.5, s=4.4473)°
	Tobacco change, R ² =1.0 (c-p=5.1, s=2.9336)°	Sport/interest, R ² =1.4 (c-p=17.8, s=3.7127)	Alcohol change, R ² =4.4 (c-p=3.3, s=4.4810)°
Distress	Sports/interest, R ² =0.9 (c-p=2.1, s=3.1619)°	Food change, R ² =2.9 (c-p=18.4, s=4.2192)	Alcohol change, R ² =5.7 (c-p=0.1, s=4.7435)°
	Tobacco level, R ² =0.9 (c-p=2.1, s=3.1622)°	Sports/interest, R ² =1.8 (c-p=24.9, s=4.2426)	Food change, R ² =2.0 (c-p=2.2, s=4.8365)°
Somatics	Alcohol change, R ² =3.1 (c-p=0.9, s=3.3266)°	Sports/interest, R ² =1.9 (c-p=15.2, s=3.5733)	Alcohol level, R ² =2.4 (c-p=0.7, s=5.9042)°
	Tobacco change, R ² =2.7 (c-p=0.7, s=3.3325)°	Food change, R ² =1.8 (c-p=15.9, s=3.5752)	Alcohol change, R ² =2.3 (c-p=0.6, s=5.9065)°

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

TABLE XXIII: CULTURAL DIFFERENCES IN LIFE EVENTS: R², BEST SUBSETS

EXPLANATION OF TABLE: This table summarises key statistics from the best subsets regression analysis. Again, the key statistic is the c-p. Each symptom is regressed on 10 life events: chronological (age, joining age), mental health (contemplated counselling, acted on counselling); occupational (rank, hours worked, relatives in same organisation, relatives in other emergency service); and personal (marital status, parenting status). A '°' indicates c-p value is equal to or less than number of variables (10) and thus goodness of fit.

SYMPTOM	CULTURAL DIFFERENCES IN R ² , BEST SUBSETS		
	UK	JAPAN	HONG KONG
Intrusion	Relatives in services, R ² =2.8 (c-p=2.0, s=3.7769)° Marital status, R ² =2.0 (c-p=1.4, s=3.7939)°	Received counselling, R ² =1.6 (c-p=1.4, s=5.1469)° Joining age, R ² =1.2 (c-p=0.7, s=5.1570)°	Consider counselling, R ² =11.9 (c-p=0.2, s=7.9060)° Rank, R ² =7.3 (c-p=3.2, s=8.1101)°
Avoidance	Consider counselling, R ² =38.2 (c-p=3.1, s=2.7356)° Relatives services, R ² =2.5 (c-p=41.3, s=3.4362)	Consider counselling, R ² =2.7 (c-p=3.2, s=5.2975)° Acted counselling, R ² =1.8 (c-p=4.8, s=5.3216)°	Consider counselling, R ² =3.9 (c-p=2.0, s=8.4621)° Joining age, R ² =3.8 (c-p=1.9, s=8.4700)°
Anxiety	Relatives in organisation, R ² =4.1 (c-p=1.9, s=4.1178)° Rank, R ² =2.5 (c-p=0.8, s=4.1521)	Consider counselling, R ² =1.7 (c-p=0.3, s=3.7932)° Age, R ² =1.4 (c-p=0.3, s=3.7994)°	Age, R ² =7.1 (c-p=2.0, s=4.0432)° Consider counselling, R ² =3.6 (c-p=0.9, s=4.0838)°
Depression	Consider counselling, R ² =2.9 (c-p=0.1, s=2.6007)° Parenting, R ² =2.9 (c-p=0.1, s=2.6012)°	Consider counselling, R ² =2.0 (c-p=1.1, s=3.5370)° Relatives in service, R ² =1.3 (c-p=2.5, s=3.5502)°	Age, R ² =8.9 (c-p=5.1, s=3.0305)° Parenting, R ² =4.0 (c-p=2.3, s=3.1124)°
Perf Diff	Relatives in organisation, R ² =1.7 (c-p=3.6, s=2.9394)° Hours worked, R ² =1.5 (c-p=3.5, s=2.9432)°	Consider counselling, R ² =1.7 (c-p=1.6, s=4.0153)° Age, R ² =1.1 (c-p=0.5, s=4.0277)°	Consider counselling, R ² =8.3 (c-p=3.3, s=4.3875)° Joining age, R ² =6.2 (c-p=4.6, s=4.4385)°
Distress	Age, R ² =3.1 (c-p=3.0, s=3.1779)° Parenting, R ² =2.3 (c-p=2.5, s=3.1916)°	Consider counselling, R ² =4.4 (c-p=3.5, s=4.3772)° Parenting, R ² =0.6 (c-p=3.5, s=4.4634)°	Consider counselling, R ² =8.6 (c-p=2.7, s=4.6700)° Joining age, R ² =4.9 (c-p=4.9, s=4.7648)°
Somatics	Parenting, R ² =1.6 (c-p=3.8, s=3.4064)° Rank, R ² =1.4 (c-p=3.8, s=3.4089)	Age, R ² =3.9 (c-p=2.8, s=3.9002)° Parenting, R ² =2.0 (c-p=0.7, s=3.9382)°	Consider counselling, R ² =11.0 (c-p=2.1, s=5.6354)° Rank, R ² =9.2 (c-p=3.2, s=5.6945)°

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Summary

Using the above filter, we can see that of the 30 variables entered into the filtering process only nine variables are culturally universal. They are:

1. Level of alcohol consumption
2. Changes in alcohol consumption
3. Frequency of exercise
4. Social support from a spouse
5. Social support from a close friend
6. Contemplation of counselling
7. Action on counselling
8. Age
9. Parenting status

This represents a useful initial step to understanding work-trauma in different cultural settings. The following table indicates that the framework tends to have high R^2 values in UK and Hong Kong cultural settings. By contrast in Japan, the R^2 values are comparatively lower. The methodological implications of using this framework for future research is considered in the following chapter.

TABLE XXIV: CULTURAL DIFFERENCES IN R² FOR A CROSS-CULTURAL MODEL

EXPLANATION OF TABLE: This table is a fundamental summary of this chapter and a link with the following chapter. It shows the regression results of each of seven y variables (denoted 'SYMPTOMS') on to the nine x variables indicated as culturally universal predictors by best subsets regression analysis: from 6 daily habits, level of alcohol consumption, change in alcohol consumption, frequency of exercise; from 14 sources of social support, from a spouse, from a close friend; from life events, contemplation of counselling, action on counseling, age, parenting status. The key statistic is the R² statistic, which indicates the variance explained by the predictor variables. The bottom of the table indicates p values for x variables which are significant; these are useful as indicators of cultural 'specifics'.

SYMPTOM	CULTURAL DIFFERENCES IN R ² , REGRESSION		
	UK	JAPAN	HONG KONG
Intrusion	R ² =10.9 (F = 0.93, p = 0.496)	R ² =7.5 (F = 1.55, p = 0.134)a	R ² =30.0 (F = 1.26, p = 0.268)
Avoidance	R ² =29.1 (F = 3.13, p = 0.005)	R ² =9.4 (F = 1.96, p = 0.047)b	R ² =18.2 (F = 1.21, p = 0.310)
Anxiety	R ² =7.7 (F = 0.62, p = 0.757)	R ² =9.0 (F = 1.88, p = 0.059)c	R ² =45.5% (F = 4.44, p = 0.000)§
Depression	R ² =9.2 (F = 0.76, p = 0.636)	R ² =10.9 (F = 2.30, p = 0.018)d	R ² =27.0 (F = 2.01, p = 0.058)†
Perf Diff	R ² =10.4 (F = 0.87, p=0.557)^	R ² =10.2 (F = 2.13, p = 0.030)e	R ² =30.2 (F = 2.17, p = 0.043)‡
Distress	R ² =6.7 (F = 0.54, p = 0.822)	R ² =10.6 (F = 2.23, p = 0.022)f	R ² =25.6 (F = 1.83, p = 0.086)#
Somatics	R ² =8.9 (F = 0.70, p = 0.690)	R ² =10.7 (F = 2.27, p = 0.020)g	R ² =28.3 (F = 2.02, p = 0.058)##

Key to x variables which are significant:

FOR UK

^ Alcohol change (0.003)

FOR JAPAN

a Contemplation of counselling (0.027)

b Contemplation of counselling (0.01)

c Support from close friend (0.037), parenting status (0.05)

d Sport interest (0.001)

e Contemplation of counselling (0.009), age (0.047)

f Contemplation of counselling (0.003)

g Support from partner (0.034), age (0.019)

FOR HONG KONG

§ Alcohol level (0.014), Alcohol change (p.024) support from close friend (0.01)

† Support from work colleague (0.027)

‡ Contemplation of counselling (0.009), support from close friend (0.016)

Support from close friend (0.05)

Contemplating counselling (0.049)

Details for y variables: Impact of Event Scale, Intrusion and Avoidance factors; Hospital Anxiety and Depression Scale, Anxiety and Depression factors; Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

ENDNOTES

¹ To further understand the magnitude of differences, consider percentages of the scale maximum. Over all seven symptoms, mean level for the UK is 21.60%. For Japan mean level is 27.77%. For Hong Kong mean level is 43.80%. Thus, in broad terms Hong Kong symptomatology in general pathology and specific trauma reactions are, in effect, twice levels in UK, and 16.50% higher than in Japan.

² Calculation of significant difference: The test for significant difference used in this chapter is based on the t-distribution tests described, inter alia, by Sprent (1977) and tabulated, inter alia, in Kmietowicz & Yannoulis (1976), although this test is in common usage throughout the social sciences. In short, tests of difference are calculated by a division of numerator by denominator. This is undertaken such that an arising value (a 't-value') can be compared to the one-tailed tables from which levels of significance can be ascertained at varying degrees of freedom (denoted v and varying from 1 to 300, then infinity). In the t-test for significant difference, the numerator is the difference between the mean values of the variables observed in the populations under investigation. The denominator is the square root of the sum of the squares of the standard deviations divided by the sample n , in both populations.

An example from Table XII follows. To test for difference between UK and Japan intrusion symptoms, the numerator is 2.67 (mean score for Japan) less 2.31 (mean score for UK). This = 0.36. The denominator is the square root of the sum of the following: first, the square of 2.93 (UK standard deviation in intrusion symptoms) divided by 68 (the UK sample number); second, the square of 3.74 (Japan standard deviation in intrusion symptoms) divided by 688 (the Japan sample number). In arithmetic form:

$$\frac{(10.28) - (12.27)}{\sqrt{[(2.93)^2 \div 68] + [(3.74)^2 \div 688]}}$$

This produces a t-value of approximately 5.10. Given this substantially exceeds the critical points at 60 degrees of freedom ($t=3.4602$) this suggests a significant difference between Japan and UK in intrusion symptoms at $p<0.0005$. Critical points at 60 degrees of freedom - which is chosen because it is the most conservative or lowest sample - are as follows: $p<0.01$, $t=2.3901$; $p<0.005$, $t=2.6603$; $p<0.001$, $t=3.2317$; $p<0.0005$, $t=3.4602$ (Kmietowicz & Yannoulis, 1976: 21; further details can be found in most statistical texts such as Kanji (1993); Sprent (1977)).

³ Levels of significance as follows (Kmietowicz & Yannoulis, 1976: 24):

UK: $n=c.70$; $p<0.01$, $r=0.2737$; $p<0.005$, $r=0.3017$; $p<0.001$, $r=0.3583$.

Japan: $n=c.500$; $p<0.01$, $r=0.1038$; $p<0.005$, $r=0.1149$; $p<0.001$, $r=0.1376$.

Hong Kong: $n=c.60$; $p<0.01$, $r=0.2948$; $p<0.005$, $r=0.3248$; $p<0.001$, $r=0.3850$.

⁴ "[Best subsets regression] can be used to select a group of 'best subsets' for further analysis. The general method is to select the smallest subset that fulfills certain statistical criteria. The motivation for variable selection is based on the fact that the subset model may actually estimate the regression coefficients and predict future responses with smaller variance than the full model using all m predictors" (Minitab, 1987: 84)

⁵ "In general, we look for models where C_p [$c-p$] is small and is also close to p . If the model is adequate (i.e., fits the data well), then the expected value of C_p is approximately equal to p , the number of parameters in the model. A small value of C_p indicates that the model is relatively precise (has small variance) in estimating the true regression coefficients and predicting future responses. This precision will not improve much by adding more predictors. Models with considerable lack of fit have values of C_p larger than p ." (Minitab, 1987: 82)

CHAPTER FOUR

CHAPTER FIVE

CHAPTER FIVE

THE FUTURE OF CROSS-CULTURAL WORK-TRAUMA RESEARCH

"Despite the great variety in the details of cultural factors found throughout the world, all cultures, because they must satisfy certain universal needs, have a number of traits in common. This basic anthropological principle, known as cultural universals, can be an important tool...Greater empathy for cultural differences - a necessary if not sufficient condition of increased knowledge - can be attained if we can avoid concentrating solely on the apparent differences between cultures but appreciate their underlying commonalties as well" (Ferraro, 1994: 26)

This final chapter is used to establish and explore directions for further research in cross-cultural work-trauma. Consistent with the position of Ferraro it is argued that the future of cross-cultural work-trauma research should be focused on underlying commonalties. In this way, work-trauma research will reach the 'greater empathy' for cultural differences which it needs.

The means of supporting this argument are to use the imitations in this research as a framework for future developments. Limitations encountered in this data and approach are detailed with a view to suggesting areas which future researchers considering work-trauma should concentrate upon if knowledge is to be increased. The premises underlie the material in this final chapter should be clearly stated because they also underlie the argument of this thesis:

- I. There is a long-term need to isolate specific, common cultural values which relate to work-trauma. As Ferraro indicates, it is the commonality in cultural values, needs and traits which should be the foundation and value of cross-cultural insight. For the moment, the opportunity to validate a comprehensive framework acknowledging the existence and extent of disparate cultural values is some way distant. Future research on work-trauma should be limited to exploration of precise, specific areas of commonality. The framework proposed in this last chapter suggests

there are nine areas for focus on commonality: Level of alcohol consumption; changes in alcohol consumption; frequency of exercise; social support from a spouse; social support from a close friend; contemplation of counselling; action on counselling; age, and parenting status.

II. Second, this approach should neither hide nor disguise the existence and impact of cultural diversity. We should not swing so far in the alternative direction that we (again) approach the study of work-trauma on the implicit assumption of homogenous cultural values, needs and traits. Whilst we can assume, and should focus on, some aspects of the work-trauma process that are 'cultural universals' there remains clear evidence for a diversity of cultural values, responses, and coping strategies and other general influences. These need to be assessed, understood and incorporated in theoretical developments. If researchers uncover commonality, that is helpful but if there is not, we should not attempt to manufacture commonality.

EXPECTED FINDINGS

Before we look to the future of work-trauma research, we need to recap the findings which this research uncovered. In this section we detail expected findings. In the following section, unexpected findings are detailed.

1. **A culturally universal relationship between exercise frequency and general pathology.** Although this data does not suggest exercise frequency is effective in reducing traumatic symptomatology, it does suggest that anxiety/general feelings of distress and depression symptoms tend to be managed effectively by frequent exercise in all cultural settings. The greater the frequency of exercise the lower the level of general pathology.

As exercise frequency is a physical coping skill which most emergency services are well-placed, and enthusiastic, to

encourage, through schemes of occupational health or personalised training schedules, this would suggest in some instances it is legitimate to 'borrow' research and management techniques from other cultural settings. This has beneficial implications for emergency services because it suggests that North American interventions based around using exercise to manage general pathology symptoms may be applicable across cultures. The data presented here suggests that in all cultures anxiety/general feelings of distress and depression symptoms correlate with lack of exercise.

2. **A culturally inconsistent relationship between exercise frequency and traumatic reactions.** However, the evidence for cultural consistency in the relationship between exercise frequency and the management of traumatic reactions is, as expected, less clear. A significant positive correlation between exercise frequency and intrusion symptoms may be occurring in some cultures (Japan). There is no association with exercise frequency in other cultural settings.

As part of a general review of work-trauma management in different cultural settings, future researchers should explore why this is so. They should confirm whether this is culturally unique; ie, restricted to Japan. If this is the case, then there should be further exploration of the unique Japanese dynamics in exercise habits which ameliorate traumatic reactions. Why is this an efficacious coping strategy in Japan? Can understanding of how this impacts psychological schema for dealing with traumatic experiences be derived?

A first start in this research should be to caution emergency services in thinking that exercise frequency is necessarily an efficacious way of managing traumatic reactivity. A useful supporting rationale for this cautioning would be to review studies on exercise programmes such as that by Kiely and Hodgson (1990) and Doya et al (1989) and assess any available evidence on which symptoms exercise programmes are efficacious in managing and which symptoms they are inefficacious at managing. This would

probably be an inferential review as psychological symptoms are not usually quantified in these studies, but it would be a useful starting point.

3. The relationship between absenteeism and traumatic reactions.

Consistent with interview data and anecdotal evidence (eg, Paton et al, 1992d), there is evidence that intrusion symptoms, often conceptualised as the more/most 'severe' in the work-trauma pantheon, do tend to associate with absenteeism in all cultural settings. Levels of intrusion and avoidance symptoms are higher in those absent for more than 3 days in the past 90 days

However, future researchers should appreciate this is a complex area. First, they should question the reliability of this finding. The data presented here, for example, observes that intrusion correlates at $p < 0.001$ with absenteeism in Japan, at $p < 0.01$ in UK, whilst in Hong Kong there is no correlation of intrusion with absenteeism. Given the interest by emergency services in improving 'performance benefits' detailed in Chapter One, future researchers need to consider the relationship. Questions must be asked if the association is causal (ie, abnormal levels of intrusion stimulate personnel to take leave) or associational (ie, personnel experience abnormal intrusion symptoms after being absent where there are increased opportunities to ruminate on work-trauma).

4. The important question of age. Similar to the physical evidence that there is little evidence to suggest cardiac strain is related to age in emergency service or other populations (Douglas et al, 1988: 317; Kuorinka and Korhonen, 1981: 764; Lester and Stanley, 1979; Novaco et al, 1989; Paton, 1990b), the ambiguous psychological evidence about age and work-trauma again emerges in this data. No significant association was found between age and traumatic stress symptoms in any cultural setting. The only finding of significance between age and symptoms is in the area of general pathology: anxiety symptoms were positively correlated with age in Hong Kong ($p < 0.01$) and Japan ($p < 0.001$).

Yet, age is one of the nine variables which were filtered into a framework of traumatic reactions. This would suggest that age is having some bearing on traumatic experiences in all cultural settings. That it is a cultural universal. Exactly what age is revealing is an important area for future concern. Partly, this will be driven by emergency services concerned at any psychological distress in their elders. Partly, this will be driven by a continuing focus on cultural values.

Researchers may question if changing societal values are the reason age is appearing as important. Elders in all cultural settings tend to adhere to more traditional views and expectations of traumatic experience whereas younger personnel tend to adhere to more expressive and open coping strategies (which reflect in higher symptomatology). This issue reflects fundamentally on the underlying cultural factors future researchers should explore. Are emergency services in the words of Kuo (1987), convergent in the coping strategies that younger personnel are utilising?

5. **Cultural differences in stimulant use.** Given that anecdotal evidence suggested 'significant' changes in alcohol and tobacco use associated with abnormally high levels of both trauma and general pathology symptoms, it is not surprising that the data presented here supports this view. Stimulant use, particularly changes in response to work-place stressors are a cultural 'universal.' They are a coping strategy, or behavioural norm, applicable to all cultural settings.

Researchers need to understand particularly alcohol use more closely. This data suggests the association of alcohol and symptomatology is culturally universal. Levels of both trauma and general pathology symptoms are higher in all individuals who make significant changes in their alcohol use when work-place stressors increase. (Stimulant use is discussed more fully later.)

6. **The provision of social support by work colleagues.** As expected, the close and cohesive structure of the emergency services in all cultural settings is reflected in comparatively high levels of

support perceived to be provided by work colleagues. In all cultures work colleagues are second only to partners in the level of support they provide. It is also culturally universal that this exceeds support provided by a superior.

However, whilst this is expected the efficacy of support from work colleagues is questionable in all cultures. In none of these samples was there a significant correlation between support from work colleagues and either traumatic or general pathology symptoms. Indeed, in the cultural framework the culturally universal supporters were outside the work-place: partners and close friends.

Researchers need to explore this more fully. Given this suggests that the working environment of emergency services is generally not meeting some needs for support, questions must be asked why? Even though the literature suggests that the ability to empathise is the driver of efficacious support, why is it that work colleagues, ideally placed to empathise with traumatic experiences, are not being filtered as the more efficacious supporters? As with the question of age, this begins to suggest fundamental questions of the way work-place support is conceptualised in the emergency services. It may be perceived as high, but in all cultural settings it is not necessarily efficacious.

7. **The macho ethic.** Finally, as expected, the data presented here suggests that the macho ethic permeates emergency services in all cultural settings. It is as the literature suggested a cultural universal. In all cultural settings there is something which delineates emergency service personnel in their coping resources, skills and psychological schema.

Researchers will need to more carefully explore the dynamics of this ethic. The data presented here makes an inference on the macho ethic in action on counselling. Using action of counselling as an indication of this ethic, it was observed that action and contemplation were consistently at around 2-3% of the population except in Hong Kong where specific factors may have influenced

data results. (The watch had been exposed to information dissemination on counselling by psychiatrists in the 90 days prior to data collection.)

However, the macho ethic is broader than this limited measurement. It includes, for example, coping resources such as black humour, avoidance of thought, immersion in the job and so on. How each of these elements impact coping schema in each cultural setting will be required to validate the observation. As part of this approach, researchers should gather data from non emergency service populations in the same community. (The methodological necessity for control data is discussed below more fully in the issue of random sampling.)

UNEXPECTED FINDINGS

This section describes findings which the data was not expected to reveal.

1. **Cultural differences are consistent in both general pathology and traumatic reactivity.** The fact that all symptoms, both general pathology and traumatic reactions, were consistently higher in Hong Kong was quite unexpected. Whilst some literature suggested that underlying pathology may be high in some cultural settings, there appeared to be a link with traumatic reactivity. If the latter was high, so was general pathology. If traumatic reactivity was low so was general pathology.

Researchers should question why this is so, and also the conceptualization of what we mean by 'low'. The reading of the literature here, particularly WHO (World Health Organisation) and Japanese government data, suggested that factors endemic to the Japanese organisational and socio-economic environment would influence symptoms of general pathology in a certain way. They would be probably be unusually high relative to other cultural settings. Similarly, reading of the literature suggested unique

elements of the Japanese 'self' would also influence traumatic reactivity in a certain, though different, way.

This data suggests that was erroneous. It was in Hong Kong that highest symptomatology was observed. The Japanese did not exhibit abnormally high levels of either trauma or general pathology symptoms. Moreover, this was consistent across general pathology and traumatic reactions: general pathology was higher in Hong Kong than Japan and UK (that order), and traumatic reactivity was higher in Hong Kong than Japan and the UK (same order).

Researchers should more closely explore the link of general pathology and traumatic reactivity. If there is a link of general pathology and traumatic reactivity that is culturally universal this is potentially significant. It may begin to explain the cultural differences in traumatic reactivity that are being seen are attributable to underlying general pathology.

A rationale that researchers should take is to reconsider the economic and social stressors endemic in each society, and their impact on emergency service personnel. Although the review here suggests that possibly either social and economic stressors in Hong Kong have been under-estimated, or the influence of comparable Japanese stressors has been over-estimated, this is a simplistic analysis. As Chapter Two indicated, there may in fact be a diversity of other cultural factors which are at play, be it in Hong Kong or in any other cultural setting. Uncertainty at political future may be one factor to explain general pathology in Hong Kong, for example. But this would not explain why levels of intrusive imagery were so high in Hong Kong.

2. **Exercise frequency and intrusive imagery.** A second unexpected finding was that although exercise frequency tends to associate with reduced symptomatology (as expected, see above), this may not necessarily apply for some traumatic symptomatology/experiences. In fact, in Japan, the higher the frequency of exercise the higher, not lower, the level of intrusion symptoms. This is contrary to our reading of the literature, which we inferred to suggest there would be no cultural difference in levels of

intrusion or the way it associated with exercise frequency.
(Discussed above in detail.)

3. **The efficacy of counselling.** Contrary to expectations this data also suggests counselling is not always efficacious in all cultures. It was expected that respondents who had received counselling would exhibit symptoms at levels analogous to the population norm; ie, that counselling would have effected a change in work-trauma symptoms. However, the data suggests that intervention is not culturally consistent in efficacy.

A rationale for future research developments is to consider unique aspects of counselling in cultural settings. In Hong Kong and UK, this data suggests symptoms tend to remain abnormally high in those who had received counselling whereas in Japan the opposite occurs: symptoms tend to be at levels equal to the rest of the population in those who have received counselling. Future researchers should question if this is an indication of base-line symptomatology (ie, those who seek counselling in some cultures are usually exhibiting abnormally high symptoms anyway) or a reflection of inefficacious counselling (either by the counselor or due to universal differences between emergency service workers and counsellors).

The necessity for this rationale and approach is supported by a consistent need for counselling. All respondents in all cultural settings who are contemplating counselling tend to exhibit abnormally high level of both general pathology and specific trauma symptoms. This suggests to emergency services that there is a need for counselling in some form. (The exact form is discussed below.)

Researchers should also emphasize that there is an un-met need for counselling. Counselling is not always efficacious in managing either traumatic symptoms or general pathology in emergency service personnel amongst those who have received counselling. Given this is culturally universal this provides a further rationale for exploring the unique aspects of counselling in each cultural setting.

4. **The efficacy of social support.** Although, as expected, work colleagues were prominent providers of social support across cultural settings (see above), an unexpected finding was the low influence this - and other sources of support - had on either traumatic or general pathology symptomatology. Indeed, across all sources of social support there was a negligible correlation with both general pathology and traumatic reactivity.

For future researchers, a rationale for developments is to question the meaning behind the universal tendency for the observed correlations between level of social support and symptoms, both general pathology and traumatic reactivity, to be positive. This may begin to suggest that support tends to be sought when symptoms are high. It is not sought on a daily basis. This is explored more fully below, but is an important question bearing in mind the framework suggests only two sources of support are culturally universal - partner and close friend - and that these are both non work-place providers.

5. **The importance of parenting status.** Reading of the literature did not reveal that the influence of parenting status would be culturally universal, or indeed associated with work-trauma services. Yet, this life event was consistently associated with symptomatology in all cultural settings. Researchers should question why this is so; a new area for exploration.

An underlying rationale for this study will be why this life event tends to be associated with depression, somatic distress and performance difficulties in two of the three cultural settings. Future researchers should consider why this life event is associated with general pathology in some cultural settings. A possible approach is to look more closely at the diverse nature of the tasks which emergency service personnel perform. Given the global propensity for traumatic incidents, it may be that 'special services' are bringing personnel into greater contact with children.¹

6. **Length of service, rank and hours worked.** Finally, it is unexpected to see that occupational characteristics did not appear in the framework. This was unexpected because the literature suggested these may be impacting work-trauma or general pathology symptoms in some way. Evidence of the severe hours worked by all emergency service personnel, for example, was expected to have some influence on underlying pathology such as performance difficulties or anxiety. Similarly, rank with its attendant examination stressors and leadership strain was expected to have some effect on general pathology. Length of service, with its attendant exposure to critical incidents, was expected to have some impact on traumatic reactivity.

This suggests future researchers should include non-occupational circumstances in their understanding of cross-cultural factors which influence work-trauma. Caution should be exercised in eliminating occupational circumstances from all work as this is an important universal to the study. Comparing respondents in similar occupations is valuable at this stage. However, this provides a rationale for expanding the scope of study.

LIMITATIONS

Where do these findings lead us? Given the above expected and unexpected findings what does this suggest for the future study of work-trauma? What should be focused on?

In this section, we consider limitations to this study. The purpose is to supplement the above with other areas of importance to study that were not covered in this study. These may be equally important according to various changing factors in societies and in emergency services.

Ultimately, future researchers developing an understanding of work-trauma should address several limitations in the data and approach taken here. Inevitably, these limitations have implications for the conclusions which may be reached about cultural differences

in work-trauma at this stage, but these limitations should be appreciated in the context of a developing field. As in all fields, there is a necessity for exploratory work which does not comprehensively assess all variables. This section details these limitations with a view to suggesting how future researchers should approach their resolution.

Gender

One issue that must be considered more fully by future researchers is work-trauma and, first, women in emergency services and, second, mixed-gender emergency services. The data and literature review presented here is, similar to most available data, focused almost exclusively on males working in male-only, or at least male-dominated, working environments. This is a limitation for several reasons.

In future, both genders throughout cultural settings will be exposed to work-trauma. This will be as operational, not just support, personnel. UK emergency services are one, of many, examples where emergency services are increasingly bound by equal opportunities legislation to employ and fully utilise female operational personnel.

A rationale for future research in this area may be founded on trends. The trend towards more women in the work-place is, in simple terms, global (eg, Condon, 1985; Tanaka, 1987, Tseng, 1985; Uden et al, 1991). It is an inevitable part of emergency service work in the future.

In Hong Kong, for example, employment of female personnel after 1997 will be influenced by PRC interpretations of the 'Basic' (ie, Civil) Law. On the mainland, employment legislation already emphasises, and encourages, the integration of women in all aspects of the work-place (Redding and Wong, 1986). Already, HKFS have recently recruited their first female fire-fighters. Similarly, although fewer females tend to serve in the Japanese emergency

services, given Japanese adherence to ILO policies on equal opportunities this will probably not remain so for long.

Researchers should be aware that this global trend needs to be mirrored by theoretical understanding. As emergency services change their gender-balance so future researchers must ensure understanding, not just in work-trauma but in other occupational factors and stressors, reflects this reality. This will have particular impact if the framework suggested above, which includes parenting status and alcohol-use change, is to be validated for all emergency service personnel, both women and men. All-male data and all-male analysis will no longer be valid, or meaningful, for emergency services (Hong Kong Government Information Services, 1994; National Fire-fighters Council of Japan, 1992; Paton et al, 1993; Condon, 1985; Uehata, 1990).

In considering the impact of women and mixed-gender emergency services, researchers should be cognizant of evidence that substantial differences can be expected between males and females throughout cultural settings (Rosenthal et al, 1989; Dawes et al, 1989). Pressure to succeed in examinations, an example and experience which increasingly influence promotions in all emergency services, is one area where this literature can be applied to the experience of emergency service situations and organisational climates.

Although examination stress may not be related to work-trauma, researchers should use this as a first focus of study due to its facilitation of sampling populations. Sub-populations in emergency services involved in examinations are easy to identify. And they will involve not only women and men but also mixed-gender watches and, for some time to come, male-only watches.

Researchers should begin from a position that examinations probably have diverse, rather than universal, effects on gender as well as in cultural settings. Examination pressure is suggested to reduce immunoglobulin levels in Hong Kong males more than females, for example. Abnormally high male physiological responses can occur independently of interventions (McLelland et al, 1985; Spinks et al, 1990).² Researchers should use other evidence to support the claim that the examination stress phenomena is meaningful in the context of

emergency services. Data from a Finnish fire service, where the presence of women personnel - operational and support - is more extensive, suggests '...differences in the adaptive resources of men and women' are a key explanation of stress responses and adaptation in the work-place (Kalimo et al, 1980: 186).

Ultimately, the direction of gender research in emergency service should push towards understanding their impact on the macho ethic. Given there are probably several factors which impact the macho ethic in male personnel (discussed below), examinations being just one, an appropriate preliminary methodology for exploring the impact of women in emergency services, and from this developing an instrument to measure the impact, should be derived. One recommended way to assess the impact of women on the macho ethic in different cultural settings is to utilize a case-study approach. By utilising semi-structured interviews with females and males in mixed-gender operational units, this will provide a rich source of background data about this complex, and largely un-known, area.

Moreover, given that in some emergency services the first three ranks constitute approximately two-thirds of personnel, and that women will tend to occur in highest numbers in these more junior ranks as they begin to assimilate to the work-force, this data will be attractive to emergency services as well as theoretically incisive on cultural differences.

Again, it should be repeated that it will also be comparatively easy to gather data as it involves an easily identifiable, and relatively large, sub-populations. Based on understanding reached in this study, preliminary questions on the gender issue should relate to, but not be limited to:

1. How will female personnel impact male avoidance behaviours and psychological schema in examination procedures?
2. How will anxiety symptoms and other symptoms of general pathology be influenced in males concerned at appearing 'weak' in front of females?
3. Will intrusive symptomatology increase as females encourage males to be more sensitive towards these experiences?

4. How will females impact macho behaviour and other traditional coping skills, such as black humour and stimulant use, by preferring and encouraging more open and sensitive discussions of personal expectations and experiences (Coyne and Lazarus, 1980)?
5. Are women more adept at coping with traumatic reactions and/or general pathology symptoms, and if so how will this impact the larger working environment for men?
6. Finally, what are the underlying cultural values which influence male-female relationships?

Researchers will see an element of progression to these issues, moving from the focused study of examination stressors towards understanding of how women impact traumatic reactivity.

Sample size, return rates and random versus census data

As a field of study develops, it inevitably needs to develop a reliable data base; not just for normative findings but also for the credibility of the subject in users perception. An inevitable limitation of this study is that the sample from Hong Kong (n=66) and UK (n=70) are not only significantly smaller than that from Japan (n=688), but based on a sub-population within emergency services. The Japan sample was a broader census of the organisation.

Given sample size discrepancy, the influence of particularly severe, or abnormal, traumatic reactions or underlying pathology in some subjects may have had extensive influence in the UK or Hong Kong data-bases. Given a statistical rule-of-thumb preference for approximately 20 observations for every variable in a framework, this suggests caution must be applied in taking the framework as applicable to all cultural settings. The power of this analysis is weakened by sample size.

As this field of study develops, a reliable - ie, larger - data base will also need to develop. Sample sizes which are analogous and larger will remedy the limitation in this data. An appropriate base for analysis will probably be 250 per emergency service and cultural setting; allowing for up to 12 variables in analysis. Countries which

are logical to highlight should be based on the cultural clusters of Ronen and Schenckar (1985).

Sample size however is perhaps an easy limitation to state and relatively easy to remedy. Future researchers should not though consider this as the main limitation in this data. A more important concern for researchers should be to monitor the actual process of selecting respondents.

Given this analysis compares two sub-population samples (each members of one 'watch' within an emergency service) with a near census survey of a whole emergency service (Japan) this should suggest more fundamental limitations than sample size. Specific experiences or coping skills, for example, may have an abnormal influence in some sub-populations within emergency services. This may not be comparable with a broader census approach, where experiences or coping skills may be more disparate. This methodological point on level of analysis is raised, *inter alia*, by Hofstede et al (1994) and is a useful rationale for future researchers selecting samples of emergency services.

Related to this issue, researchers should beware of issues in exposure to trauma. Often in the literature about trauma reactions, timing of exposure to trauma is discussed as important, although this is often poorly controlled for. Certainly, exposure to trauma as a methodological issue is consistent with the experience of emergency workers.

When exposed to trauma emergency service workers can experience, *inter alia*, intense frustration and anguish (eg, Farland, 1985; Herrick, 1992; Livesay, 1989). But there can be what Martin (1989) calls 'event fall-off' (1989: 200). Under this phenomena, the saliency of experiences as stressors diminish over time. Subjects can recall and measure 'powerful' traumatic experiences in the period immediately prior to data collection (*ibid*: 201) but fail to do so in three, six, nine, even twelve months time. This suggests care must therefore be taken to acknowledge when exposure to unusually demanding incidents occurs. In sub-populations the experience of trauma in specified periods may be quite different than larger census organisations.

But researchers should not lose sight of the more fundamental issue in sample selection. Related to, probably central to, this theme of how to select respondents is rate of return. Although high in all samples in this research, this should also probably be understood as a limitation in the data presented here. In the UK sample, for example, of 70 questionnaires distributed 68 were returned, a return rate of 97.14%. In Japan, of 750 questionnaires distributed 688 were returned, a return rate of 91.73%. In Hong Kong CI sample of 66 questionnaires distributed 60 were returned, a return rate of 90.91%.

Such abnormally high return-rates have implications for the extent of management pressure exerted on respondents. Or, potentially, implications in the agenda of respondents. Whether sub-populations may have sought to emphasise symptomatology, knowing results will be presented to senior management, is an inevitable question and limitation.

This should suggest to future researchers the need to be careful in sampling respondents in all emergency services in all cultural settings. When gathering data in future, researchers should be aware that pressure from emergency services management/command to return questionnaires, or respond to interviews, is at least a possible limitation in all cultural settings. The disciplinary nature of emergency services and, probably a greater factor, the camaraderie and close social relationships which interview data suggests pervades all ranks of emergency services, may have implications for responses which are understood to be 'desired'.

What should the response of researchers be to either emergency service 'ordering' or collective responses? One strategy in managing return rate bias and sub-population bias is to move away from what may be termed the 'census' approach traditionally seen in emergency service work towards a 'random' approach. This should involve random selection of respondents throughout whole emergency services.

To understand the advantages of the random approach, the census approach limitations can be detailed. Usually in the census approach, to gather data, either sub-populations or whole organisations are identified in consultation with the emergency services (with possibly

their own agenda for doing so). Questionnaires are distributed to all subjects in the sub-population or organisation, and analysis presented to the emergency services on the sub-population or organisation. This is probably one reason why high return rates are observed: emergency services are able to 'order' responses easily in identified organisational entities.

This census-type approach is a methodological limitation because it suggest completion may be either rushed - 'a sense of duty' - or manipulated - 'to show the best of the organisation'. A more effective approach to ensure data reliability and absence of 'ordered' or rushed responses should be random selection of respondents throughout the emergency service. Future researchers should, wherever possible, adopt random sampling methodologies. This will ensure not only credible anonymity (randomly selected respondents cannot be identified as easily as personnel within specific sub-populations), but also the mitigation of some emergency services tendency to 'order' or command responses. It is difficult to cajole/command individual respondents scattered widely throughout the emergency services.

Of course, if the random approach is to be truly successful it will need to be carefully supported by an appropriate mechanism of completed questionnaire retrieval. Randomly selected individuals will be much more prone, and able, to non-return. What should the response be to low or non-return by randomly selected respondents?

One often used mechanism of response is by pre-stamped mail. However, experience suggests using mail responses can bring responses down to even lower than observed here; perhaps to 20%, or lower. This would have implications for studying emergency services with populations under 1,250 personnel, the bare minimum of personnel that would be needed to ensure a random sample of 250 on a 20% return rate.

But note that emergency services with less than this number of personnel would preclude a randomly selected sample of 250. There would have to be a de facto census: assuming a 20% return rate by 'random selection,' questionnaires would need to be distributed to probably all the organisation population, thus blurring the

meaningfulness of 'random'. Moreover, many emergency services throughout the world are often of 500, 700 or even 1,000 operational personnel. This would also make it more difficult to survey rural emergency services, which is an important focus for future researchers if we are to understand the impact of urban life on general pathology and on traumatic reactivity.

In these circumstances, one equally appropriate approach to ensure random data future researchers should consider is to reconceptualize understanding of self-completion, such that it excludes self-return. Thus, it may be more appropriate, certainly more efficacious, for randomly selected respondents to be visited whilst on station/in office and asked to complete questionnaire instruments in private. These would then be collected by the researchers.

If appropriate, this questionnaire collection could be combined with a qualitative follow-up, though not preceding, interview. As the field of work-trauma research develops, qualitative interviews conducted by native speakers in each cultural setting will be a valuable supplement to empirical data. Key themes of these interview could be to highlight general trends regarding both awareness of work-trauma and perception of the problem which this causes. The appropriateness of the nine variables identified in this framework should be discussed.

Personnel in control and non-operational duties, such as management personnel in community education or fire prevention who are not directly - but are vicariously - exposed to work-trauma, should also be interviewed. Personnel in urban and rural areas should also be included. When qualitative interviews are conducted at the same occasion, though, respondents would need to be assured that a sealed envelope containing the questionnaire set would only be opened in combination with others.

Whilst the manpower needed to achieve responses on this 'managed random return' basis is inevitably more expensive than a conventional mail - or via emergency service - response, the methodological advantages should be taken as compelling by future researchers. This method would not only ensure response rate was

higher than 20% that mail response could entail. It would also ensure a greater control of emergency service control of results.

At the very least, if future researchers cannot dedicate resources to managed random return, they should be careful to avoid comparing census approach data with random data. If the census approach is to be used, whether of whole organisations or sub-populations such as critical incident groups, it should be used consistently across samples and cultural settings. Although in the random approach it will be appropriate to impose quotas that are consistent with predictors (quotas of parent/non-parent respondents, for example), random samples from emergency services should never be compared with census samples from other emergency services.

Applicability throughout emergency services

Inevitably given the sample selection in this preliminary approach to work-trauma in different cultures, there has been a tendency to concentrate on fire-fighting and the psychological - and also physiological - stressors to which these emergency service workers are exposed in Japanese, Hong Kong and UK cultural settings. Given Ronen and Schenckar propose nine cultural clusters, future researchers will inevitably question if the resulting framework and analysis is appropriate to other emergency service workers in other cultural settings. Police officers, paramedics or disaster relief workers are populations whose occupational experience is documented as uniquely stressful, and the applicability of the framework will be questioned for these populations.

However, it is recommended this concern for reliability should be taken in a broader context. First, researchers should be aware that there is a commonality in potential traumatic exposure between all emergency services. The framework, therefore, is derived from samples with similar experiences to other emergency service personnel.

Second, researches should acknowledge there is commonality in occupational circumstances between the samples used for this

framework and most other emergency services. This extends to quite diverse factors, for example: a predominately male-dominated social support environment; analogous hours and shift systems; exposure to the potential of trauma on a regular, day-to-day basis; similar fitness and academic tests before and during employment; a common occupational purpose and resulting position in the community; analogous pay-levels and spending power; joining and retiring at similar ages; serving a maximum 30 years. Comparable pressures on all emergency services may be inferred from a variety of authors; for example Innes and Clarke, 1983; O'Campo, 1984; Akin, 1977; Hennessey, 1990; Bates, 1987; Docherty, 1989.

A more fruitful ground for future researchers to consider is the applicability of this framework to (randomly selected) populations with different degrees of exposure to threat in emergency services, particularly in rural versus urban settings. Although emergency service personnel face unique risks in urban settings these tend not to be replicated in rural areas. This research did not systematically allow for this variable and this is a limitation which researchers should address.

Future researchers should develop sampling frames which acknowledge personnel operating in rural areas also experience stressors which can be analogous to urban stressors in their perceived, if not actual, intensity but where the process of trauma may be different.³ Indeed, rather than a limitation of applicability throughout emergency services, a limitation in this data is its base of personnel working in urban settings.

One recommended criteria for distinguishing 'rural' from 'urban' should be rate of call-out, although when using this approach, care must be taken to isolate personnel by their service history. Personnel who have returned from urban postings should be eliminated from data about rural personnel, for example, and vice versa for urban personnel recently returning from rural postings.

Assumptions on cultural consistency in self-expression

Researchers will also need to address the methodological weakness underlying the approach here. Several studies on cross-cultural differences have documented quite different cultural norms of expressing symptomatology (eg, Argyle et al, 1986; Bond and Cheung, 1983; Bond and Yang, 1982; Dohrenwend and Dohrenwend, 1974; Dynes, 1989; Grimley, 1974; Ho, 1986, 1977; Meade, 1967; Scott and Scott, 1989; Triandis et al, 1990; Whyte, 1979). The way translation may affect instrument sensitivity is also a common area of concern (eg, Bond and Yang, 1982; Shams and Jackson, 1990), as is an emphasis on social communities within cultures rather than work organisations (eg, Dohrenwend and Dohrenwend, 1974: 446; Leighton, 1963). Besides suggesting areas of interest for future researchers, for this research it suggests a limitation because there is an assumption that there are no cultural differences in expressing symptomatology.

The analysis in this approach to work-trauma in different cultures assumes there is some commonality between the organisations, or organisational entities, observed and that this will equate with analogous expression of symptomatology. Future researchers will need to assess if this is actually so. It is recommended that as part of this they will need to empirically as well as conceptually assess how we understand the whole area of self-expression. This is an important area, and in the following we provide a rationale for future researchers to consider.

Certainly, some literature suggests that low self-expression of symptoms can occur in some cultural settings more than others. Japan is particularly said to exemplify low levels of self-expression (eg: Daly, 1992; Doi, 1989, 1987; Nakane, 1978; Sartorius et al, 1983; see also the World Health Organisation (WHO) study on cross-cultural depression (Sartorius et al, 1983), and Dohrenwend and Dohrenwend (1974) in their study of cultural influences on psychopathology). Draguns et al (1971) noted Japanese patients experienced 'general and diffuse' symptoms compared to more specific and expressive US patients, and Lazarus et al (1966) noted Japanese subjects, unlike American subjects, were not notably more physiologically stressed

(measured by skin conductance) during stressful or benign films. Bond and Cheung (1983) noted the self-concept of Japanese students was less expressive than Hong Kong or US students. Slaughter (1990), in considering Japanese management, noted the Japanese worker is encouraged, and obeys, not to express grievances or other aspects of the 'inner self' etc..⁴

How does this impact the data presented here? TO understand that, future researchers should be aware of literature that suggests the contrary; namely that cultural differences in self-expression should not be over-stated, or mis-understood. This would mean that the data gathered here may be a reliable indication of general pathology and traumatic reactivity. Or it may be subject to cultural norms of under-expression. The position taken is that it is probably reliable but needs further investigation.

Researchers should acknowledge that emotional disclosure, including the sort measured here, occurs in ways. Not all of these can be measured by self-report instruments. Indeed, Lazarus et al (1966) suggest the whole area of Japanese self-expression should be understood in terms of instrument-sensitivity. They question if statements on Japanese self-expression are, in fact, based on misunderstandings of the method of Japanese self-expression:

"...Is concealment of feelings more common in Japan, or does the Western view represent a misconception based on social distance and lack of knowledge of patterns of expression? It is possible that affects are communicated by the Japanese in gestures and expressive aspects of vocalization that even Japanese-speaking Westerners cannot easily interpret. Such differences in the language of affect expression might lead Western observers to a mistaken conclusion about the readiness of the Japanese to express their feelings. Moreover, certain affects may be less readily expressed than others."
(Lazarus et al, 1966: 623).

This is why we make recommendations that future researchers should consider qualitative interviews as a supplement, though not replacement, to empirical validation of cross-cultural frameworks, or models.

But when understanding cultural differences in self expression and the ways to measure these, future researchers need to favour the use of questionnaires. Studies suggesting comparatively low self-expression in some cultures are rarely based on self-report data (Natsume et al, 1988). They tend to use either psychiatric interview methodology or laboratory-based methodologies, which are subject to different influences than self-report based methodologies, particularly interviewer subjectivity. This implies, in particular, a greater reticence in self-expression when faced by an interviewer or in a laboratory setting than occurs when completing questionnaires (Triandis et al, 1990; Prkachin et al, 1983; Neufeld, 1989). The methodological implications of this are that self-report data, where the subject experiences comprehensive anonymity, may associate with less reticence, greater self-expression (Natsume et al, 1990).⁵

Researchers should use this as a rationale for the continued use of self-report data. They should take it as questionable if the observation that expression of psychopathology is low in some cultural settings compared with others (Dohrenwend and Dohrenwend, 1974). Support for the continued use of self-report data is also supported by evidence that questionnaire data on self-expression about stress symptoms from the Japanese Ministry of Health and Welfare (1988). This suggested Japanese, in fact, express unusually high levels of stress symptoms compared to North Americans. Similarly, although the WHO study of Sartorius et al (1983) recorded self-referral for mental illness in Japan at 0.73% of the employed population, low by international standards, this was for a specific form of depression unusual in western societies such as America and Britain (1983: 12). Lazarus et al (1966) also noted Japanese reluctance to express this form of depression over other symptoms such as anxiety (1966: 623). It also seems Sartorius et al concede there figure is unrealistically low due to the discrepancy between true prevalence and apparent prevalence which 'may exist' in depression symptoms of Japanese subjects (Sartorius et al, 1983: 1).

Researchers should also realise there is a traditional argument that cultural norms of self-expression should not be understood as reticence to express symptoms but, rather, as reflections of

instrument sensitivity. Masuda and Holmes (1967), for example, suggested instruments can be sensitive in Japan when properly applied in confidential circumstances. They recorded, on the 'Social Readjustment Rating Scale', a correlation of 0.884 between Japanese and West Europeans, and noted:

"...This is quite remarkable. Western Europeans...have a culture embedded in the democratic ethic, bolstered by internalised Christian moral values for the most part. Japanese eastern culture is embedded in a particularistic hierarchical system which emphasises family-oriented, externally sanctioned rules of ethical conduct. Yet, perception of stressful life events is very similar."

(In Sutherland and Cooper, 1990: 60)

A conceptual rationale for the above observation comes from Doi (1973, 1986). He suggests some cultures can take uniquely duplicitous roles in social, rather than inter-personal, interaction. This role is reflected in binary concepts of self in Japan (called 'tatemae and honne' or 'omote and ura'). These concepts represent the distinction between 'spoken truth' and 'real truth'; although they do not translate to English readily they are comparable to the 'I' and 'Me' of Meade (Markova, 1987: 38; Doi, 1986: 46):

"...[they] overlap with the psychological and sociological concepts of socialisation and self-consciousness. Tatemae is precisely a product of socialisation, and honne is the expression of self consciousness...in the inner recesses of their minds, the Japanese are always aware of the special relationship between them..." (Doi, 1986: 46-47).

This implies that in some cultural settings subjects undertake public expression in the form of 'Me' where, as a result, they express lower symptomatology than the 'I' actually experiences. This theme of duplicity in Japanese is also common to other writers (eg: Mannin, 1960; Mishima, 1989; Nakane, 1973). The duplicitous notions behind tatemae and honne or omote and ura may explain the above studies seeing low self-expression in Japanese subjects when using interview methodologies, and also, for example, the '...often quoted

absence of [expressed] guilt in patients in Japan' (Sartorius et al, 1983: 10). Taking the position of Doi, therefore, future researchers should assume reticence in self-expression is based on interview methodologies and ignores the potentially unique characteristics of self-report (ie, questionnaire) data.

How can future researchers best develop an avenue of study which empirically validates this position? The inevitable, and logistically easiest, way is to gather control data sets at the same time as emergency service personnel are measured. Comparing samples from within and without emergency services is a useful beginning to answering the question of how impactful the emergency service environment is in self expression in differentiating cultural settings. It can also help us understand more of the commonality in emergency services.

A rationale for this comparative approach is that some organisational norms tend to err towards obedient, and away from independent, behavioural traits and self-expression when in a social setting (for a review see Buck et al, 1984). Buck et al suggest the social work environment is comparatively more important for Japanese workers versus North American subjects. They considered self-expression in a sample from two different cultures (America and Japan) living in a third culture (Hawaii), where Japanese and American influence both existed, observing that self-expression changed in Japanese, due to the interaction with the 'more self-expressive' Hawaiian and American social cultures.

This is an interesting study as it suggests that some norms of expression in emergency service personnel may be affected more by the organisation than the larger cultural environment. Thus, an environment where the prevalence of, for example, communication under pressure and the importance of un-ambiguous communication is uniquely high leads to an inference that, as all emergency personnel are exposed to such environments, their self-expression will be universal.

Future researchers wishing to compare emergency service and non-emergency service samples in different cultural settings will also find a rationale for this approach in some of the literature on

the influence of organisation culture (eg, Lazarus et al, 1985: 770-771; Payne, 1987). Given organisational culture is defined as 'The system of information that codes the manners in which the people in an organized group, society or nation interact with their social and physical environment' (Reber, 1985: 170), in this sense, organisational issues are fundamentally important. Emergency services may be '...a common group with common cultural traditions and a sense of identity' (ibid: 251, which on strict logic makes them a trans-cultural ethnicity!)

The analytical grouping of traumatic reactivity and general pathology

As part of the above review of cultural differences in self-expression, researchers will question if they wish to consider traumatic reactivity in isolation, or in conjunction (as here) with general pathology. In this study, traumatic symptomatology is grouped with general pathology in analysis. Future researchers should question if these symptoms are in fact logical to analyze together.

This will best be begun with a more comprehensive review of the constructs of these symptoms in each cultural setting. At a simple level, for example, it is possible there may be cultural disposition to perceive disasters and trauma as in some way part of national identity: for example, 'Fires and conflagrations are so much part of Japan's history that they have become part of its literature and theatre' (Thomas, 1968: 470). This may impact cultural constructs of intrusive imagery.

At a more complex level, underlying cultural values and experiences should be assessed, but derived in initial stages beyond psychology literature. Historians, for example, have implied that 'acceptance' of stress is a comparatively new idea in Japan, only slowly replacing more traditional denial (Uehata, 1990: 3). Researchers may use this as a rationale to explore changes in societal values throughout cultural settings. This is consistent with the cultural framework outlined which sees age as impacting

understanding: elders may be adhering to fundamentally different cultural values than younger personnel.

One approach researchers should pursue is a broad aspect associated with avoidance symptomatology: the 'ability for euphemism'. This has long been said to be endemic in Japanese culture versus European cultures (eg: Russell, 1945: 599) and future researchers will certainly have a rich but extensive source of material to analyze in this subject. Examples of cultural disposition towards denial or euphemism can be diverse. They may range from historical facts or tendencies⁶ to literature which emphasises denial, suppression of individuality and a 'sense of impermanence'.

A second approach should be to explore death symbolism. In Japan a diverse range of material presents death as more normal than any other culture on earth (Hyo and Seidensticker, 1977: 98-103). Given also that 'death symbolism' is endemic in some cultural settings more than others, this may impact not only observed intrusion symptoms but also underlying cultural concepts of the IES-15 measurement.

To provide an example of this approach, the following relates to avoidance symptomatology in Japan. The example is 'The Handkerchief', a philosophical work about Japanese emotions. This concerns the 'hidden and suppressed nature of Japanese [expression] over fatalities (Ryinosuke, 1923).⁷ Other examples which researchers should address are the reactions of Japanese to the trauma of Hiroshima. This is based on denial of any stress reaction and a continuance of 'normal life' not seen in other cultures (Ibuse, 1969; Morris, 1959; Lifton, 1969; see also Appendix I).⁸

Given these are fundamental issues removed from psychology, researchers should also assess religion. This is a complex but important area. One reason for the unique denial reaction in Japanese individuals that future researchers should consider, for example, may be Zen, a prevalent philosophical value system. This emphasises acceptance of death (Offner and Straelen, 1963). The Noh theatre, which is closely based on philosophical ideals of Zen, also illustrates ideas of self-denial and reticence in self-expression in Japan (Waley, 1964). The prevalence of denial in Japan also

exemplifies a philosophical belief in unique psychological stamina and the superiority of the Japanese 'soul', leading to claims by the Japanese, and others, that they have 'a unique identity' (Dale, 1989). This is not to argue similar experiences do not occur in other cultural settings outside Japan. Researchers will find a form of Zen and Confucianism, which also stresses acceptance of death and hardship, is influential in Hong Kong education or in a diversity of settings (Clyde and Beers, 1976).

Where should this avenue of research lead? Whilst this diversification to literature and philosophy should be welcomed to the study of cross-cultural work-trauma, care must be taken to relate its output to psychological constructs and instruments. The 'ability for euphemism' in Japan, for example, is supported by a recent, extensive national survey on stress (n =36,146.) This suggested whilst daily life in Japan is perceived by as much as 50% to be 'stressful' (Health and Welfare Ministry, 1988; this is similar to the 'precipitating stress' assessment by the WHO, which recorded 45.6% positive ratings for endogenous depression and 36.4% for psychogenic depression in a sample of 79 Tokyo residents (Sartorius et al, 1983: 52), the tolerance of stressful daily life was extremely high. Only 10% suggested stress was disruptive to the extent of making daily life 'unbearable' (Health and Welfare Ministry, 1988). Over 70% did not feel that the mood was 'powerful'.⁹

Whatever the source of material, future researchers should orient research towards questions measuring the impact of these cultural values, beliefs and psychological schema to their impact on symptomatology. One approach would be to develop a battery of cultural values which respondents had to indicate their belief in. These could be used as independent variables in analysis of symptomatology. As with all the recommendations in this thesis, a framework for analysis should be the nine variables identified as culturally universal.

Measurement of perceived risk

A further limitation of the data presented here, which should never be repeated as work-trauma research develops, is avoiding measurement of perceived exposure to trauma in personnel. The data presented here did not formally identify either perceived intensity in respondents or the actual number of critical incidents previously attended in a specified period. Whilst some inferences can be made about cultural differences using length of service as a medium or a review of country data on risk, this approach should not be repeated. There are several reasons for this:

1. **Cultural differences in actual traumatic events.** First, the literature clearly suggests that some cultures are exposed to different levels of traumatic events. Japanese emergency service workers operate in unique conditions of *sustained* disaster risk, for example, being exposed to relatively high actual fatalities. (One reason is that urban areas in Japan have comparatively high population densities and compact residences.) The framework proposed here suggests that these factors may not impact understanding of traumatic reactivity as much as non-occupational circumstances such as social support from a partner or close friend. Future researchers need to question if this is so.

One rationale for future research to systematically measure perceived risk is to use geographical factors in measurement and research design. Respondents should be asked to rate living conditions and their perceived stress, for example. (Incredibly, the Japanese inhabit a land space smaller than the UK and yet have double the population.¹⁰ The result is phenomenal, consistent and unprecedented population densities. It is perhaps not surprising residences in Japan have been described as [flammable] rabbit hutches (Nakane, 1976; Shiobara and Katagiri, 1986); or that Tokyo/Yokohama is the largest conurbation in the world.¹¹)

Future researchers should question if perceived risk is one explanation why the Hong Kong level of symptomatology revealed here is so high. Given Hong Kong is the most densely populated

area on earth, and there are a diversity of social and economic stressors, as well as political uncertainty on the future, this may be impacting results. Note that perceived risk should not be limited to traumatic exposure. It should also extend to, as with the 1997 example, perceived political uncertainty. Occupational factors, such as perceived likelihood to achieve promotions, are also variables which should be measured.

2. **Urban and rural differences in risk.** Second, future researchers should assume that geographical factors impact work-trauma in a number of ways. These may be related to urban and rural life. They were not measured in this research.

One rationale for future research is to measure the perceived safety in building practices (Thomas, 1968; Tsuchiya, 1982). Another is the ease of accessibility to incidents in narrow streets etc.. Japanese builders persist in using wood and paper in construction for example (eg, *shoji* sliding doors and *tatami* floor mats). Although traditional reasons for this fragility is the ease of re-building houses after earthquakes, this still suggests excessive fire risks compared to the more geographically spread out cultural settings (ibid).

Researchers should therefore incorporate in research design measurements of the perceived efficacy of government legislation. Questions should be asked about perceived change in risks facing emergency service personnel in both urban and rural settings. It should be noted here that the perception of respondents is more important than the actual frequency of legislation. Although regulations in Japan do encourage non-flammable building materials, for example, this has tended to have influence in only selective circumstances. In Kyoto the number of fires have reduced from 756 (1955) to 230 (1987) despite an increase in population (Kyoto City Fire Service); an accident prevention act for petrochemical complexes (1976) now covers 901 establishments (International Labour Office, 1992: 81); skyscrapers may only be constructed on vast concrete 'rollers', thought to minimise the probability of earthquake related damage.

The UK experienced only 113 fire-related fatalities in 1990 compared to 1,828 in Japan during the same period (Ueda, 1993: 218). Even accounting for discrepancies in population - there being two Japanese for every Briton - this still leaves Japanese per annum fire fatalities significantly higher pro rata. Although Japan is seeking to reduce these figures, much needs to be done to bring Japanese fatalities due to accidents in line with norms in Europe and North America.¹²

3. **Acknowledging the underlying influences of natural disasters.**

Third, future researchers should incorporate underlying geographical factors that impact the potential for natural disaster. Some cultural settings inevitably face more sustained risk from earthquakes than others. Besides entailing dramatic loss of life and severe psychological consequences for helpers (Kingston and Rosser, 1974), earthquakes can involve emergency service personnel in threatening and demanding situations. Considering where some countries are situated is a useful guide. The Japanese archipelago, for example, is on the edge of the Pacific and Great Eurasian plates where earthquakes are a sustained risk and frequent occurrence (Anzai, 1991; Hirose, 1989). Hong Kong is mountainous and subject to frequent typhoons and severe mud slides etc..

Researchers should acknowledge that specific, traumatic characteristics of earthquakes (and other disasters) may have terrific perceived potential even when they occurred some time in the past. The Great Fire of Meireki (1657) and the Great Kanto Earthquake (1923) in Japan provide an indication of scale which can influence this long-term perception. Indeed, the latter has been suggested as still influencing contemporary fire research in Japan (Tsuchiya, 1982).

One way to tap into these underlying historical understandings is to measure perceived extent of lives lost in periods of history. Both the Meireki Fire and the Kanto earthquake each entailed around 100,000 lives lost. This is a significant number, given the Great Fire of London, as a comparable 'national

disaster', cost only six lives and 13,000 residences (Hirose, 1987). The Kanto earthquake also destroyed 366,000 homes, most in fires. Recent disasters in Armenia and America, with fatalities at less than 10% of this number, place the loss of life in the Japanese context truly in context (Huffman, 1983; Mikami and Ikeda, 1985; Mileti, 1983; Shiobera and Katagiri, 1986). Researchers should also include in research design perceived likelihood of recurrence of these disasters.

4. Acknowledging the underlying influences of man-made disasters.

Fourth, even though the Kanto earthquake and others may be recent enough to count as living memory (Okabe and Hirose, 1985), researchers should be careful to also consider contemporary and man-made risk factors in each cultural setting. Exposure to nuclear reactors represent a specific and dangerous source of threat.

Again, researchers should find their rationale for measuring these factors in geography. Partly as a reflection of the above population density (and partly also due to historical concerns at need for power), it is no surprise that Japan has forty-two nuclear reactors in relative proximity to centres of population. This represents sustained risk for large fatalities and toxic contamination where emergency service personnel will be expected to perform rescue duties (Ueda 1993: 153).

Researchers should ask respondents to indicate their responsibilities in the event of nuclear disaster, and again the perceived risk this presents to them. Of course, this research design should not be limited to nuclear reactors. Research design should also measure the perceived likelihood of exposure to other disasters. During the last decade in the UK, for example, there have been significant disasters. These include the Zeebrugge ferry capsized (1987) with 137 fatalities; Kings Cross fire (1987) with 32 fatalities; Piper Alpha oil-rig fire (1988) with 165 fatalities; Clapham rail crash (1988) with 34 fatalities; and the Lockerbie air crash (1988) with 270 fatalities (Paton et al, 1992d).

In short, future researchers must develop and incorporate a scale measurement which quantifies all the above experiences in personnel.

Care should be taken to distinguish this by perceived risk rather than any external measure, for example from government data or emergency service figures. In a comprehensive list of 'major' world fires, for example, one review did not suggest any Scottish or Hong Kong fires were 'major' (International Labour Office, 1992: 79). Although several fires in Japan were described as major (for example, the Sennichi Building, Osaka with 118 fatalities (May, 1972); the Taiho department store in Kumamoto-Shi, near Nagasaki, Kyushu where 100 died (November, 1973); mining disasters in 1963 and 1965 killed 447 and 236 people (the latter of these disasters, near Fukuoka, was so extensive as to have involved overseas rescue workers), major fires in Scotland, whilst perhaps involving comparatively fewer fatalities, also occurred in the period.¹³ They may have been perceived as equally stressful by Scottish or Hong Kong personnel.

Given these sorts of disasters can have very broad cultural implications (for example, the King's Cross underground station is constructed in similar ways to underground stations in Hong Kong and Japan, where underground stations are an essential aspect of urban life (Lo, 1990: 2)), future researchers should incorporate into their research design a nine point scale:

1. Perceived impact of population density on ability to save lives
2. Perceived likelihood of exposure to natural disasters
3. Perceived likelihood of injury in day-to-day CIs
4. Perceived risk of exposure to accidents involving fatalities
5. Perceived risk of exposure to emergency nuclear incidents
6. Perceived level of exposure to adult fatalities
7. Perceived level of exposure to child fatalities
8. Perceived efficacy of accident prevention legislation

We also add that researches should ask information on the number of fatalities directly experienced (child and adult) in a recent specified time period and over the whole career. The variance between these values can indicate the impact of sustained exposure versus recent exposure.

Finally, questions will be inevitably asked as to why cross-cultural work should focus on occupational circumstances when the framework proposed here does not suggest occupational factors are a culturally universal explanation of work-trauma symptomatology. This, however, should be taken in context. Whilst occupational circumstances do not appear at this stage to be driving explanations, the underlying commonality in all emergency services is their exposure to traumatic incidents. In the words of Ferraro quoted at the beginning of this chapter, we will continue to learn of diversity if we 'appreciate their [cultural settings] underlying commonalities as well.'

The social support scale

Given that two sources of social support (partners and close friends) emerged as part of a culturally universal framework, future researchers have a rationale for further exploring this in different cultural settings. In doing so, they should not repeat the scale used here.

Whilst the scale is an eclectic list of sources of support, the response scale has certain limitations. The response scale is from one to five for the value of support provided. Level 1 represents no support and level 5 represents considerable support. The specified time scale is within the last six months.

A weakness of this scale is that it assumes the existence of support. Thus, subjects may only record the degree of support from an individual. There is no potential to record the non-existence of a source of support.

The methodological implications of this are that subjects recording level 1 responses (ie, 'No support') may assume the scale to mean a source does not exist - or that it does exist but that they receive no support from that source. This would apply, for example, to single fire-fighters who recorded level 1 support from partners. In fact, as they had no partners the answer 'no support' is a non sequitur; a non-existent partner cannot give any form of support.

'No supporter available' and 'no support provided' should be clearly differentiated in future research. 'No support provided' from a partner during the adaptation phase, outlined by Peterson et al (1991), may result in maladaptive responses. Thus, instead of work-trauma symptoms being adapted to individual 'assumptive worlds' and re-integrated to previous norms, through discussion and awareness of the incident with the provider, personnel may experience more severe reactions due to the non-support from someone perceived to be a provider of support. They will be less able to accommodate the experience within their 'assumptive world' (Janoff-Bulman, 1987).

A further issue for researchers is to consider why the partner/spouse is a primary source of social support outside the work-place in all cultural settings. Given they have a unique ability and opportunity to act as intimate confidant, the way they influence work-trauma symptoms remains an important area for understanding and basing professional intervention (House, 1981). They represent a key coping resource which can provide, in particular, emotional and appraisal support (ibid; Lee and Hsu, 1979; Dore, 1990; Eckende, 1984; Folkman, 1984a; Paton and Kel, 1991; Paton, 1989a, 1990a). Thus, it is important to consider how partners influence work-trauma symptoms in different populations, and to establish the cross-cultural validity of the role played by partners in mediating reactions to work-trauma.

One rationale for understanding social support may be in the information provided between providers and seekers. Reasons for a universally supportive role from partners in some cultures, for example, may be derived from norms of marital relations and how these condition expected responses in victims.¹⁴

Researchers should question if personnel tend to restrict the information available to their partners for processing information on traumata. They should also question the underlying dynamics of marital relations in some cultural settings. Japanese marital relations, for example, are traditionally characterized as patriarchal (eg: Christopher, 1983; Condon, 1985). The role of women is also seen, in the family, as of less significance than in other Western cultures (ibid, 1985). Japanese marital relations are also

characterized by reduced interaction between partners and the development of separate social lives and coping strategies (Japanese Ministry of Health, 1989).

Ultimately this will lead researchers to question if the partner's contribution to emotional well-being and adjustment may be anticipated as different in cultural settings by essentially efficacious in work-trauma management. Whilst some partners may play a comparatively greater or lesser role in utilizing information, appraising fatigue in occupational stressors (eg: Tanaka, 1987; Whyte, 1979), their efficacy may be analogous. This would begin to question if Western marital relations, which may be more 'relationship-based', represent a more meaningful foundation for appraisal support in response to work-place trauma (see also Fjelstad, 1978).

Finally, in assessing the dynamics of social support researchers are faced by a paradox. In more closely understanding the support provided by partners that is culturally universal, a rationale for development is that specific trauma symptoms are most effectively managed on the basis of empathy (House, 1981). Yet, most partners provide support when their ability to empathise with the specific trauma encountered is necessarily more limited compared to work colleagues or superiors. Why in all cultural settings do partners still tend to influence work-trauma reactions?

THE IMPACT OF THIS DATA ON EMERGENCY SERVICE MANAGEMENT

This section assimilates the data presented above to a more organisational focus. It addresses the question: how can emergency services use this information in managing work-trauma? Although at a conceptual level, the answer to this is also related to the above suggestions for further research, this section look more closely at the resolution of work-trauma in emergency services. It starts with a suggestion that further researchers should re-conceptualize how emergency service personnel are used in the management of work-trauma.

The use of emergency service personnel in work-trauma management

Given evidence that there is cultural consistency in aversion to counselling in emergency services, future researchers will need to question the implications for counseling. Is there still a role for counselling intervention in our understanding of work-trauma? Is there a rationale for continuing to study counseling? In the following section it is argued that counseling should still play a role in our understanding of work-trauma. In this section, it is argued that a supplement to that should be the use of emergency service personnel.

One direction future researchers should pursue is to utilise emergency service personnel in initial diagnosis and management of work-trauma. This raises a number of issues. But is warranted as an avenue of future research by the evidence presented here on reluctance to use counselling. Even though diagnosis of differences in symptomatology is a complex process,¹⁵ there is an empirical rationale for pursuing this approach.

The classic problem which will occur using emergency service personnel (or even clinical diagnosticians) is illustrated by a study of twenty-five veterans from the Vietnam era (Nicholls and Czirr, 1986). Although the soldiers had reported mental confusion and had volunteered for the study, the researchers were able to 'slot' 84% of their reported symptoms into one or another list of mental problems (1986: 421). (Note the methodology used was interviews supplemented by questionnaires; the 'problems' diagnosed were all 'related' to PTSD.) The fact that such a large amount of symptoms can appear in more than one diagnosis even by trained clinicians will be a telling problem for emergency services. How can they be sure symptoms diagnosed by specially selected and trained emergency service personnel are related to work-trauma?

Future researchers should approach this problem by assuming diagnosis of work-trauma reactions, whether by clinicians or emergency service personnel themselves, will remain a blunt science.

They should stress that, in all cultural settings, severity or even existence of symptoms can be influenced by other stressors, such as marital strain or examination stress. In short, that '...individuals differ widely in the clinical picture presented and differential diagnosis can be quite difficult, particularly in elders...PTSD is easily mis-diagnosed' (ibid, 1986: 431).¹⁶

We should begin to change our understanding of what input emergency service personnel can make to work-trauma - in all cultural settings. We should understand that emergency service personnel can, and should, become the primary, initial source of diagnosis. They are often in the best position, being in day-to-day contact, with potential victims. Although, as mentioned in Chapter One, emergency services are traditionally reticent about work-trauma and feel it is properly 'owned' by external experts future researchers should persuade them this is not the only approach. Using emergency service personnel will begin to suggest an internal ability to other personnel, thus beginning to erode the aura which accompanies work-trauma. It will also supplement the organizational macho ethic.

A first step should be to select and educate personnel about the framework developed here. Namely, that a framework of nine probable areas are broadly associated with traumatic reactions in all cultural settings. Care must be taken to state that all variables may apply to a different extent in their emergency service. Examples, from many, could be age. For example, how younger fire-fighters engaged in examination preparation in Singapore will exhibit high anxiety and general feelings of distress symptoms. How elder fire-fighters facing the prospect of retirement in South Africa will exhibit symptoms of avoidance, depression and somatic distress etc..

As part of this acknowledgment of cultural diversity, researchers should emphasize that work-trauma is not necessarily the cause of all psychological symptoms that appear abnormal or disturbing in personnel. Research has already described as 'close' the criteria which are used for the diagnosis of PTSD and for other mental disorders or moods, for example. PTSD may easily be confused with occupational stress, marital or familial stress (Sierles et al, 1983), or even neurosis, psychosis, several personality 'disorders',

and anxiety or depression (Taylor and Fraser, 1982: 5). Indeed, depression and anxiety are two moods which are endemic in all populations (Sartorius et al, 1983).¹⁷

One way to overcome problems of using non-clinicians is semantic. Clarification of terms and language, and then dissemination throughout selected emergency services personnel, is achievable and should be a first goal of future researchers. Occupational stress should be carefully described as contrary to traumatic stress; a reaction to the experience of employment and the organisational environment. It is not indicative of a personal weakness or fault, as 'work-trauma may be' (Hargreaves, 1992). Causes are more likely to lie in a badly designed job than in individual inability to cope (Cox, 1991; Cooper and Baglioni, 1988).

Future researchers should then resolve the confusing number of terms attached to traumatic reactivity. Severe traumatic reactions, for example, have been variously defined as 'caseness' (Brooks and McKinlay, 1991), 'requiring professional intervention' (Paton et al, 1992d), 'likely case/likely serious case' (Duckworth, 1986) and 'sub-clinical' (Baum et al, 1983). DSM-III-R distinguishes between 'Acute PTSD' and 'Chronic, or Delayed, PTSD'. Yet, personnel may not actually, in the words of the Brooks and McKinley study on Lockerbie residents, be worthy of clinical concern even though they may '...exhibit some caseness' (Brooks and McKinley, 1991: 17). Simple and consistent terminology should be developed if programmes are to be credible, and accepted, and interventions in training personnel meaningful and efficacious across cultural settings.

Emergency services should also be provided with clear criteria for diagnosing the severity of traumatic reactions. Two simple criteria should be applied for defining severity: duration and onset. In keeping with DSM-III-R, symptoms which persist for more than six months time should be termed 'chronic'. Symptoms which persist for under six months should be termed 'acute' if they are disturbing to the individual. Should the onset of symptoms be six months or more after the trauma, they should be termed 'delayed'.

A second tactic to enhance the success of emergency service personnel diagnosis is to clarify, very carefully so as to avoid any

stress on themselves, their limitations. Future researchers should develop education programmes that stress distinguishing different forms of psychological reactions, moods and disorders endemic to that culture is a complex process. Given that in ultimately severe cases, personnel may need to understand work-trauma reactions as distinct from, for example, schizophrenia (Walker and Cavenar, 1982) this is an important limitation to emphasize. This is particularly so in cultures like Japan where it is difficult to diagnose schizophrenia in its early form(s) (Nakamura, 1990a), despite its prevalence (1990b: 199).¹⁸

Ultimately, it should be stated that emergency service personnel should never assume any clinical role in diagnosis. This should be clearly emphasized. Rather, as personnel closest to potential victims of work-trauma reactions it is up to them to initiate action, to understand likely problems, likely symptomatology, and to act as providers of first feed-back for professional intervention.

Besides contributing to the removal of the aura of work-trauma, what are the benefits? And why does this framework suggest this approach is important? There are probably a number of answers.

Utilising emergency service personnel in this monitoring capacity should come to represent one of the most valuable bases for organisations seeking to implement intervention strategies (Paton et al, 1993). It will facilitate not only interventions in severe symptomatology but also interventions in other areas where the framework suggests there is an impact: alcoholism, for example, and frequency of exercise. Whilst assessing depression and psychogenic depression, key problems which are endemic to, but vary between, all cultures (Nicholls and Czirr, 1983: 417; Sartorius et al, 1983: 49; Clayton Rivers, 1994) is an important aspect of using emergency service personnel, their value should be understood as what they lead to. Providing a base for interventions in culturally universal variables.

The resolution of work-trauma

This brings us to a crucial aspect of studying work-trauma: the resolution of abnormal symptomatology. As the study of cultural differences in work-trauma develops, and data on commonality as well as diversity is gathered, it will be necessary to ensure this relates closely to the resolution of work-trauma. What should the position of researchers be?

The position should be founded, as mentioned in Chapter One, on the guiding reason that emergency services will continue to have a particular interest in the resolution of work-trauma symptoms. It should also be founded on cultural diversity. Although future researchers should continue to approach work-trauma management programmes on the basis that preventing 'PTSD-related distress' requires multiple, diverse and well managed interventions (McElvoy, 1988; Peronni, 1987; Prentice, 1988a, 1988b; Hogg, 1989), they should also assume severe symptoms are complex cultural phenomena which requires further understanding.

A first step researchers should take is to clearly state their assumptions on treatment of work-trauma. These may be best conceptualised as the 'amelioration' of stress reactions in culturally-specific and limited populations rather than the actual 'ending' of stress reactions in whole organisations across whole cultures (Figley, 1978b: xxiv). There are limits to what may be achieved.

The long-term traditional emphasis on 'pure' stress prevention based around process rather than effects should be avoided: "...We know very little about this process of change, we know far more about the consequences of it" (Hill, 1960: 125). Whilst researchers should also continue to use three crucial principles of cognitive management, counselling, and de-briefing (Scurfield, 1978), they should be aware that these will have differing efficacies in different cultures. In this light, the distinction between cultural variations in 'primary prevention', 'secondary prevention' and relief of severe symptoms is a rationale that should continue to be important (Quick and Quick, 1984).

As part of the attempt to understand cultural differences in counselling action, researchers should be more curious about reasons for cultural consistency in acting on counselling. Generally, this data suggests there is cultural consistency in the extent to which emergency service personnel utilise counselling. Approximately 2-3% of personnel throughout emergency services act on counselling; 2.20% in Japan versus 3.33% (Hong Kong) and 3.08% (UK). This is consistent with the data on social support from counsellors (the lowest in all three cultures - see Table XVIII).

A rationale for approaching this issues is evident. The above data suggests that for approximately every 34 personnel one individual - in all cultures - has received counselling.

Given the size of some watches are often more than this number, and there may be a culturally universal tendency to under record this experience, this has obvious implications for the mental health of all operational personnel throughout cultural settings. Assuming randomness, this would imply in every watch, at least one has undertaken counselling which has been ineffective in 'managing' trauma reactions. For an average-size UK emergency service of approximately 750 operational personnel, this suggests 21 personnel are so effected. In large urban emergency service like Hong Kong with 7,000 personnel this suggests around 210 personnel are affected.

Researchers need to emphasize these numbers when working with emergency services. In doing so, however, a first step will be to assess why it is culturally universal, rather than disparate. Why is symptomatology in all subjects contemplating counselling higher than for others in all cultures?

Again, researchers have data to support their arguments. The difference is an almost identical 13% rise over all the symptoms measured (see Table XXV, below). Although this does not isolate specific, trauma-related symptoms from other general pathology symptoms such as somatic distress and anxiety/general feelings of distress, future researchers thus have preliminary evidence of a culturally universal phenomena.

A related step to understand resolution to work-trauma is to question what actually differentiates those who have received

counselling. This data for example suggest counselling tends to be more efficacious in the area of general pathology but less efficacious in the trauma-related symptoms of intrusion and avoidance. Again, this is culturally universal. In all cultural settings, traumatic symptoms are not responding to counselling intervention. Amongst those who have received counselling, traumatic symptoms remain at levels considerably higher than in those not receiving counselling. This should constitute a key area of concern for emergency services. It is these very severe symptoms which are high in those contemplating counselling; ie, they are an unaddressed sources of distress.

The fact that counselling does not address traumatic symptoms is perhaps not surprising as providers of counselling are not usually recruited on the basis of experience in traumatic stressors (McEwen, 1990; Medd, 1991). Rather, their experience is predominately confined to general pathology in the general population, and they are unable to empathise with the specific experience of trauma. Ultimately, this supports the contention for using emergency service personnel as 'lighthouses' within emergency services.

Although there are cultural consistencies in this area, researchers should also address cultural idiosyncrasies. On an overall basis, in fact, Japanese counselling manages general pathology and traumatic reactions extremely efficiently. This is summarized below:

TABLE XXV: CULTURAL DIFFERENCES IN SYMPTOMATOLOGY BY RECEIVED AND NOT RECEIVED COUNSELLING.

CULTURE	RECEIVED COUNSELLING	NOT RECEIVED COUNSELLING	DIFFERENCE
JAPAN	30.94%	29.76%	+1.18%
UK	40.41%	21.55%	+18.86%
HONG KONG	59.35%	43.26%	+16.09%

Note: Over all intrusion, avoidance, anxiety, depression, performance difficulties, somatic distress and general feelings of distress symptoms. Percentage is derived from the scale maximum.

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress.

Future researchers should consider what aspects of counselling in Japan are working so efficaciously. As part of this, an issue to address is the actual form of Japanese, or other counselling interventions observed to be efficacious. In the UK, counselling is traditionally face-to-face and confidential. However, it may be that the counselling which Japanese personnel experience is, in fact, group counselling, suggesting this may be effective in some cultural settings and some emergency services. If so, the characteristics of why this is so efficacious needs to be explored.¹⁹

As part of this, researchers should explore cultural disposition towards counselling. Japanese, for example, place a unique emphasis on self-reliance (Uehata, 1990; Hyoe and Seidensticker, 1977; Offner and Straelen, 1963). Unique societal and economic stressors of Japanese society also imply a high tolerance for stressors. This evidences itself, for example, in extensive commuting times (Japan Institute of Labour, 1989), cramped living conditions (Japan Information Centre, 1991) and general psychological discomfort in living conditions (Shiobera and Katagiri, 1986; Anzai, 1989). Does this mean it is easier for Japanese counselling to be efficacious? Or are there dynamics in the counselling interaction which are efficacious?

Ultimately, researchers should acknowledge that the value of counselling in work-trauma is crucial, in some form or type, to the whole area of understanding work-trauma resolution. Counselling intervention represents the potential to offer not only institutional level support to work-trauma victims but also to increase a perception of organisational concern (Ramsay, 1993b).

Researchers should also position their future activities as a more effective means of managing work-trauma than financial compensation. The latter, whilst perfunctory and attractive to victims, does not constitute a permanent benefit to victims or organisations (Hargreaves, 1992; Herrick, 1992; Medd, 1991; Cooper et al, 1989; Boston Globe, 1984). The importance of understanding the dynamics of the counselling process makes an understanding of cultural factors vital (Paton, 1989a).

Finally, one required methodological improvement is to avoid the use of binary response scales. Questions which ask 'yes/no,' as used in this research, tend to avoid capturing cultural sensitivities. It is recommended that future researchers should move towards a five point semantic scale. This will allow a more precise calibration of attitudes. Researchers should also quantify when counselling was received. The instrument used here was not time-specific, and this should be understood as a limitation because respondents may have received the counseling several years previously as much as in the past six months.

Cultural attitudes to full-time counsellors

A further issue for future researchers will be to assess how ad hoc counselling is working in emergency services. In the light of the data presented here it is ironic that low sickness levels in UK fire services are claimed as '...due to a policy of rigorous monitoring and counselling' (Home Office/Scottish Home and Health Department Report, 1990). It seems, in fact, that counselling in the UK is only addressing certain symptoms of general pathology rather than the more severe symptoms which influence sickness.

Often, UK fire services and other uniformed organisations opt to utilise counsellors on an ad hoc basis, sharing the expensive resource with other uniformed services. The fire-fighting community, in particular, suggest a preference for occasional counselling (Hargreaves, 1991: 3).

"...The employment of a professional helper on a part-time or consultant basis is recommended. However, professional counselling will not be the most appropriate form of help in all cases and this type of assistance should be part of a wider scheme which is structured so as to incorporate and build on existing facilities within the force..." (Medd, 1991: 6).

In line with a questioning of how partners provide support, researchers should question if a counselor can address the unique traumatic stressors experienced by emergency service personnel. Who can, in fact, be shared between several organisations, each with personnel experiencing unique traumatic reactions (Medd, 1991: 5-8)? A recent survey on a large UK fire service, for example, recommended a 'full time' counselling service should be available for the 'majority of personnel' (McLeod and Cooper, 1991: 58). They suggested this is necessary due to a shortfall in '...the options for helping self or colleagues to deal with stress' (1991: 59).

Although a full-time counselor can be perceived as expensive and under-utilised (Paton et al, 1992d), this is not always the case during large CIs. After the Bradford fire, for example, 61% of officers at the incident made a positive decision for counselling (Hodgkinson, 1990: 23). The earlier experiment/orientation has been repeated by other fire services (Herrick, 1992: 10 and 12) and full-time counsellors have been used to 'prevent' stress in the Post Office (Allinson, Cooper and Reynolds (1989), Sadu, Cooper and Allison (1989)).

The true value of any counselor, though, lies in their ability to address the symptoms which this data suggests are going unaddressed across cultural settings. The methodology of successful counselling interventions is usually based on individual

confidentiality and on sharing life events. Yet, researchers should question if this approach is constructive.

Meyer (1951), for example, suggested life events associated with stress reactions and cognitive appraisals (the 'life chart model'). He calibrated life events with the Schedule of Recent Experience (Holmes and Rahe, 1967). Many criticisms have been generated about this approach (eg, Jenkins et al, 1979). The life-events approach suggests the theory looks to the past to explain present experience and cognition. It does not allow for development and change in the individual. Thus, it is suggested to be an invalid basis for counselling (Martin, 1989). The methodology of life events is also subject to the '...distortions and biases of self report and recall of subjects' (1989: 204). Yet, given that counsellors may try to use past life events as a basis for re-appraising stressors (thus, there is an element of similarity between the counselling and the cognitive management approach), this suggests a link with the cross cultural framework which holds age and parenting status are having a large impact on symptomatology.

Whatever the counseling methodology chosen, future researchers should acknowledge that results produced by counsellors are not universal. In the above research, for example, the full time counselor, appointed within the post office's occupational health service, appeared to reduce absence 'events' by 42% and sickness absences by 50%. However, as job satisfaction fell by 2% and organisational commitment by 4% it was concluded that:

"...It is difficult to know whether an in-house counselling service is better, worse or just different from the more common employee assistance program [ie, part-time counselling]..." (Sadu et al, 1989: 45).

It seems paradoxical, therefore, that counselling is recommended for all emergency service personnel without some form of conjunction with emergency service personnel themselves.

One suggested compromise to counselling for emergency service personnel is the introduction of 'peer support programmes' (Paton et al, 1992d; McEwen, 1988). The programmes have occurred in Australian

fire services, and have been associated with a reduction in the incidence of avoidance symptoms. Whilst social support must be voluntary and empathic otherwise it may exacerbate stress (Lieberman, 1982) this may be a future direction for counselling-type interventions.

Stimulant use management in different cultures

Given the suggestions that both level and change in alcohol use are culturally universal explanations it is appropriate to quote Heath (1987):

"Despite the significant increase in societies among which drinking beliefs have been described, there is no reason to revise some of the most significant generalizations that derive from cross-cultural study of the subject:

1. In most societies, drinking is essentially a social act and, as such, it is embedded in a context of values, attitudes and other norms.
2. These values, attitudes, and other norms constitute important socio-cultural factors that influence the effects of drinking, regardless of how important biochemical, physiological, and pharmacokinetic factors may also be in that respect.
3. The drinking of alcoholic beverages tends to be hedged about with rules concerning who may and may not drink how much of what, in what contexts, in the company of whom, and so forth. Often such rules are the focus of exceptionally strong emotions and sanctions.
4. The value of alcohol for promoting relaxation and sociability is emphasized in many populations.
5. The association of drinking with any kind of specifically associated problems - physical, economic, psychological, social relational, or other - is rare among cultures throughout both history and the contemporary world.
6. When alcohol-related problems do occur, they are clearly linked with modalities of drinking, and

usually also with values, attitudes, and norms about drinking.

7. Attempts at prohibition have never been successful except when couched in terms of sacred or supernatural terms." (1987: 45-46; quoted in Clayton Rivers, 1994.)

Finally, given the suggestion that alcohol changes in consumption are impacting work-trauma in all cultural settings, interventions based around changes in stimulant use are a key area where future research programmes should concentrate. This data implies that in Japan there is a consistent correlation between both levels of general pathology, specific trauma-symptoms and changes in alcohol, tobacco and food use. Although the correlation is not as consistent for Hong Kong or the UK the correlation tends to be high in these samples also. This suggests changes in stimulant use are a strong predictor of work-trauma symptoms in all cultures.

One effective rationale for future researchers is to utilise this knowledge in educating senior officers and personnel about the close relationship of these phenomena with work-trauma symptoms. Personnel who are making a significant change in alcohol consumption are a particularly logical group to target within emergency services. Note that self-diagnosis in the area of abnormal stimulant use is ineffective in some cultural settings (Paviour, 1987). Thus, it is necessary that other personnel who have extensive contact hours be informed of the significance of changes in alcohol, tobacco and stimulant use. This approach is also valuable as it can cater for cultural differences in levels of stimulant use.

THE PAST AND THE FUTURE OF WORK-TRAUMA STUDIES

Underlying all of the above recommendations and discussion in this thesis is that 'work-trauma research' has tended to be a limited and at best organisation-specific task. There has never been a formal consideration or theoretical assessment across cultural differences, despite the fact all emergency service personnel are potentially exposed to trauma 'on a daily basis' (a recurrent turn of phrase: in Paton et al, 1992d; Akin, 1977; Livesay, 1989; MacDonald, 1989; Hargreaves (1992); Canter, 1980b). Usually, individual emergency services have researched and focused on their (individual) experiences with 'trauma.' Admittedly, in these works there has been some commonality, for example in the application of PTSD language and some concepts and in agreement about the potential (if not actual) severity of 'the trauma problem.' Early work outside the US by Paton et al (1992), McLeod and Cooper (1992), and Livesay (1991), and in Hong Kong by Ko (1987) and Ramsay (1992) are all indicative of this organisation-specific approach.

Yet, the clear majority of the individual efforts to study work-trauma still remain almost exclusive to the North American cultural setting. Outwith this restricted slice of 'culture', little work in the remainder of the Anglo cultural cluster, or the Far Eastern culture (Hong Kong) or the so-called 'independent cultures' (Japan), which Ronen and Shenkar felt unable to categorise, has been achieved.

In some cultural settings finding this paucity of literature on work-trauma is, perhaps, not surprising. In Japan, for example, until recently there was little literature on general psychological stress amongst any Japanese populations anyway.²⁰ The first really comprehensive (and non-laboratory) study of psychological stress in Japan dates as recently as Natsume et al (1988). Certainly, since then several other studies have focused on the anecdotally severe occupational stressors endemic in Japanese society, concentrating particularly on work overload (eg: Doya et al, 1989; Hagihara, 1990; Iwata, 1989; Kageyama and Mori, 1991; Kumagi, 1990; Kumagi et al, 1990; Masuko et al, 1989; etc.), and one can see there is now a

relatively entrenched theme about work stress in contemporary psychology literature emerging from Japan. But none have considered, or to the authors knowledge are considering, either work-trauma or specific cultural variables in Japan or other cultural settings which influence the work-trauma process. The focus is more, perhaps inevitably given the chronology, on data collection using US instruments.

In the Hong Kong ('Far Eastern') cultural setting, with its attendant British affiliation and exposure to Western management practices and interests (eg, Coates, 1946, 1966; England and Rear, 1981; Goodstadt and Li, 1974; Hong Kong Government, 1995, 1991, 1970), the paucity of literature on work-trauma is perhaps more surprising. This is particularly so when one looks to literature on general psychological stress in Hong Kong, which is notably more advanced and diverse than in Japan, and certainly at levels and a focus analogous to the UK. Examples include, but are not limited to: methodological - particularly translation - issues (Bond and Yang, 1982; Ma and Leung, 1990; Yum, 1989); life events (Chan, 1989; Chan et al, 1989; Chan and Chan, 1983); coping behaviour (Lee, 1985; Lee and Hsu, 1979); work stressors (Lam et al, 1987; Wong et al, 1984); examination stressors (Spinks et al, 1990); as well as more general views of ethnic Hong Kong Chinese psychopathology (Cheung, 1986) and general cultural ideas of 'the Chinese self' (Wong, 1990; Bond, 1986; Bond and Cheung, 1983).

Despite such a well developed body of literature about stress in Hong Kong, admirably unique by Far Eastern standards, one again sees only limited, organisation-specific efforts to study work-trauma. Of the only two relevant studies one is by a fire-fighter (Ko, 1987), and one concerns a limited sample of respondents exposed to a critical incident (Ramsay, 1992). In many cases, the emergency services are still relying on material written by, and based on data from, the Anglo cultures (in this case, UK). In a city state, one cannot expect a broad sweep of concern about cultural differences in work-trauma. Indeed, there is in Hong Kong no apparent shared study or concern about work-trauma between, for example, the police, fire services (which in Hong Kong include paramedics) and the seven other

uniformed services active in the territory (Hong Kong government, 1993).

But this all begins to suggest that an important management and psychological topic has not developed at anywhere near the same rate as sophisticated psychological research in any cultural settings. Indeed, although literature about work-trauma in Hong Kong is weak and in Japan essentially non-existent, these should not be considered exclusively primitive. Although UK emergency services exemplify a more established tradition of research on psychological stress and awareness of work-trauma, the first studies of work-trauma as mentioned date only to 1989. Like Hong Kong, they are organisation-specific works.

In comparison to the Anglo (US) cultural setting it could be argued more or less all research on work-trauma is primitive. Inevitably and in the light of this absence of incisive literature, temptation might point to literature from the Anglo (US) cultural setting to suggest hypotheses valid in other cultural settings. But this, unfortunately, is a wasteful temptation. Certainly, literature on PTSD and general work-trauma is extensive in the US, dating at least to Laughlin (1980) and his study of Oklahoma fire-fighters. Since then, a diversity of work-trauma literature has emerged from theoreticians and US emergency services, and the US is undoubtedly the most advanced cultural setting for exploration of work-trauma.

Unfortunately, though, most of this research is too diverse to drive a cross-cultural model of work-trauma.²¹ And, as with the Hong Kong and UK literature, it remains organisation-specific. Most tellingly, it has tended to avoid the use of consistent indices, favouring instead a more 'customised' approach consistent with the other organisation-specific nature of many work-trauma studies. Rare exceptions are the Maslach Burnout Inventory and the IES-15, but although these have been consistently applied they have tended to be applied to diverse occupational populations, not just the emergency services, and invariably as part of research in the more severe PTSD.

Thus, although literature loosely related to work-trauma in the North American cultural setting may seem more advanced than in the UK, Hong Kong or certainly Japanese cultural settings, it is not

literature which has systematically contrasted different cultural settings within the US (say, for example, between the urban north-east and the rural south etc.) or sought to develop a framework which assesses the impact of cultural variables on work-trauma. In terms of driving a model or understanding of work-trauma in non-US cultures, therefore, the valency of US work-trauma literature is in fact minimal and, worse, a potentially wasteful temptation.

In concluding this thesis, it should be clear this approach should never be repeated. Future researchers have a number of issues to address in an interesting, and managerially important, topic. The framework of nine culturally universal variables will provide the framework for future developments.

/END/

ENDNOTES

¹ The possibility that special services now bring personnel into greater contact with children may be inferred from the following definition: '...[special services] include the rescue and release of persons at transport accidents, collapsed structures due to explosion, storm or earth tremor and the mitigation of damage to property caused by flooding and high winds, as well as numerous other services where specialist skills, equipment and training may be used to protect lives, mitigate damage and provide humane assistance' (Civil Protection, 1990: 7). The potential for injury, death & burning of children is increasing the world over due to the nature of fires & modern living conditions. It is suggested, for example, '...the fires of the future may well utilise energy at something approaching the efficiency which we find in the sun' (Barclay, 1976: 235). In the UK 40% of all call-outs are now 'special services,' up from less than 10% a decade previously (Civil Protection, 1990: 7).

² The exact process of immuno-suppression during examinations is that the central nervous system (CNS) stimulates the adrenal medullary. This stimulates an increase in catecholamines (epinephrine and norepinephrine) which filter to the urine and the blood. Filtering occurs through the endocrinic or the exocrinic glands. Endocrinic glands (which secrete hormones into the blood system) are the pituitary, pineal, thyroid, parathyroid and adrenal glands, the testes or ovaries and the pancreatic islets of Langerhans; exocrinic glands secrete hormones in tissues (eg, the skin, lips, saliva, sweat etc.). They are also referred to as 'the epithelic tract' (McLelland et al, 1985).

³ Paton et al (1992d) have reported that rural areas where motorways run often experience horrific RTAs. Plane-crashes such as Lockerbie illustrate how rural personnel face the potential for unique traumata (Mitchell, 1990). Given that stage I of the eco-systemic model concerns the initiation of a traumatic experience, this would suggest that personnel stationed in rural areas may not be anticipating severe CIs and this may heighten the influence of the experience on traumatic reactions and general pathology.

⁴ Note in the WHO study Japanese subjects also scored low in self-assessment of 'stressful life events in childhood' compared to non-Japanese subjects (Sartorius et al, 1983: 32); Similarly, Kim (1986) suggested lower levels of expressed anxiety in younger Japanese versus younger Korean women (1986).

⁵ Nakamura (1990a, 1990b) also suggests diagnosis by psychiatric interview excessively influences results in Japanese subjects. He quotes the case in 1957 when forty-one cases of patients were diagnosed mentally-ill but, different interviewers using identical criteria, 21 cases were re-diagnosed in 1986 (1990b: 337; 1990a: 195). A study using interview methodology to compare psycho-pathology in Canada & Nigeria also concluded results were 'to an unknown degree under the influence of differences in the procedures employed in the two studies' (Leighton, 1963: 124).

⁶ Japanese tendency to euphemism, for example, includes the Korean (ie, racially impure) influence in Japanese society which is traditionally denied (Kennedy, 1987: 774). The 'rape of Nanking' is referred to as the 'so-called' massacre (Brackman, 1987: 84). There was 'boasting' at mis-deeds by 'war criminals' at the 1946-7 Tokyo trials (ibid: 84). At the end of WWII, the Emperor suggested '...the war has developed not necessarily to Japan's advantage' (Horsley & Buckley, 1990: 7), erroneously referred to as a 'surrender' by US translators (Harries & Harries, 1987: xvi). These denials & euphemism arouse much mistrust. The '...wartime myth that all Japanese are monsters' has been slow to fade (Brackman, 1987: 161). It is of little surprise, therefore, that Japan causes 'grave concerns [in] its Asian neighbours' (the South Korean Deputy Foreign Minister, 1991). There is a latent, 'nervous' belief of 'the potential in the culture...a certain dynamic in the culture...[in their]...obsession with perfection' (Singapore Prime Minister Lee Kwan Yeu, 1992).

⁷ A mother seems composed and unaffected by her sons death: '...She had no tears in her eyes. Her voice was natural. Besides, a smile played about the corners of her mouth. So, if anyone had simply seen her outward appearance without hearing her words, he would surely have thought nothing but that she was talking about ordinary everyday affairs. To

the professor this was surprising...probably due to her endeavour to suppress the agitation of her emotions [a handkerchief was ripped in two]...a bright smile beamed from her unclouded face, as before..." (1964: 106).

⁸ Historically, there have been two main Asian influences in Japanese culture and philosophy: Zen Buddhism and Confucianism (Mannin, 1960; Hyoe & Seidensticker, 1977). The former developed in the 13th to 14th Centuries, the latter in the 17th Century (Hyoe & Seidensticker, 1977: 69-74). The introduction of Western missionaries in Nagasaki in the 16th Century and the arrival of the US in 1853-4 are significant dates in the Western influences (Hyoe & Seidensticker, 1977: 74-80; Kennedy, 1988: 265). Yet, feudalism in Japan was officially ended only in 1889 by Emperor Mutsuhito, very recent compared to the UK (Kennedy, 1988: 266). These may be one explanation of why religious behaviour in contemporary Japan has been equated with mental 'status' (Lidenthal et al, 1970); and a diversity of religions in Japan which affects the appraisal of stress (Offner & Straelen, 1963).

⁹ Of those men who said they were bothered by stress the greatest perceived stressor was 'work' (45%). For women it was 'relationships' (44%). Age may have influenced results, however: the greatest age for susceptibility to the definition used for stress was in the years 25-54. This was particularly so for women in all ages (54.4%, compared to 49.2% of men). Over 20% of 12-14 year olds felt the pressure of 'examination hell' as significant in their lives; over 45% of the same age group said they worried about the 'meaning of life and their future'. Non-government research has also suggested work overload is endemic in Japan (Ueda et al, 1989; Kumagi et al, 1990; Matsumoto et al, 1981; Matsumoto, 1984; Gospel & Okayama, 1990).

¹⁰ In the Japanese archipelago (378,000 km²), only 4.2% is residential (Anzai, 1991: 6); 66.50% remains forested (i.e., uninhabited) compared to only 9.5% forested (uninhabited) in the UK. This can result in severe urban concentrations: the 8.5 million inhabitants of Tokyo swell to 12 million per day with commuters. The fact that so much of Japan is uninhabited has implications for emergency services: whilst technically Hong Kong has population density greater than Edinburgh or Nagoya, emergency services can work in the city-centre or the rural New Territories (HKFS, 1992). Similarly, Edinburgh fire-fighters can also work in city-centres or rural areas (Paton et al, 1992d). Average population density in Japan is 326 per km²; in the UK 233 per km² (Anzai, 1991: 6); in Hong Kong 14,218 per square mile (Johnson, 1989: 282). Population density for Nagoya is 36th largest (1989) in the world, preceded by Hong Kong (30th). Edinburgh is not recorded. Note that ratio of land-space to number of inhabitants is said to predict psychological symptoms (Dohrenwend & Dohrenwend, 1974).

¹¹ For researchers assessing how geographical location and factors have facilitated the cultural development of Japan, the following factors provide a rationale. Japan is 110 miles from the nearest mainland point in Korea. It is several hundred (treacherous) miles from the main centres of population on the Chinese eastern seaboard. This distance has been described as 'disproportionately great' in the development of island societies (Kennedy, 1988: 67), allowing Japan to absorb 'outside influences at its own pace' (Allen, 1972: 9). Researchers should consider if these factors have nurtured unique cultural approaches to psychological reactions. This should be supplemented with a consideration of the necessity for crowded living conditions (Anzai, 1990).

¹² Fire-related fatalities in the UK have risen from 39 (1950) to 113 (1990), a rise of 189%. In Japan, by contrast, fatalities rose from 780 (1960) to 1,828 (1990), a rise of 134% (Ueda, 1993: 218). Note also that Japan has a uniquely high rate of traffic accidents, which fire-fighters are involved in resolving. These result in severe injury or death - 614,000 in 1988, the second highest level of accidents, next to America which has double the Japanese population, in the world (Japan Information Centre, 1991: 2). In Hong Kong the total number of 'accident' fatalities was 894 (1990), reduced to 797 by 1992. Although this is a comparatively high figure given the size of the territory as equal to that of Greater London (ie, approximately 7 million residents) this includes occupational accidents. Of these, only seven were attributed to fire and forty-five to RTAs (Hong Kong Government Information Services, 1993).

¹³ For example; Kilburnie (1972), when 7 fire-fighters lost their lives; thirteen were killed at Argyle Street in Glasgow (1949); nineteen died at Cheapside Street, Glasgow (1960); twenty-two died in James Watt Street, Glasgow (1968) etc..

¹⁴ This relates closely to the Peterson et al position: "...An integrated model of PTSD cannot ignore the influences of classical and respondent conditioning. There is a level of nonconscious, nonvolitional response to stimuli and cues that have been conditioned that is essentially automatic. These responses as well as the negatively reinforced avoidance responses influence the intrusion-avoidance gradient... For instance, the degree of avoidance behaviour in which an individual engages will influence the nature of the information available for processing..." (1992: 97).

¹⁵ In the use of the HSCL-58, for example, debate has arisen on what is to be a threshold to signify severity of symptoms (Taylor & Fraser, 1982: 8-9). The tactic pursued by these authors was to set an arbitrary level of severity based on subjective interpretations of the scale and then use these consistently over time as data on work-trauma grows. The establishment of severity was established by Taylor & Fraser thus: "...But first a pragmatic decision was made to set the HSCL stress discriminator level...at a somewhat conservative score of 11. The prior test information suggested that a baseline score of about five would apply to a general population, and that of about 10 to neurotic groups but when the present test distribution of scores gave a bi-modal distribution about the score of 121, that number was adopted as a discriminator..." (Taylor & Fraser, 1982: 8).

¹⁶ Also, non-empirical accuracy of diagnosis even amongst clinicians remains dubious. It is suggested, for example, that only 10% of all psycho-pathological diagnosis may be categorized according to formal criteria. Highly skilled, subjective interpretation of symptoms is required for accurate diagnosis (Dohrenwend & Dohrenwend, 1974: 424).

¹⁷ Figley interprets the DSM-III criteria to '...suggest that symptoms of depression and anxiety are common and may be severe enough to deserve additional diagnosis' (Figley, 1978b: xxi). An indication of the number of symptoms reported as sequelae in the stress process illustrates this dilemma. The symptoms are certainly extensive. The following list of symptoms were each thought to be indicative of traumatic stress reactions (and were used in a scale): 'Feeling out of control, feelings of inadequacy, feelings of unreality, thinking that things can't get worse, spending 'more time' alone, believing that the world is 'against you,' having the urge to cry or run away and hide, an inability to concentrate, irritability, impulsive behaviour, being easily startled, an inability to sit still, heaviness in arms or legs, weakness in body parts, feeling light headed, any faintness and dizziness, muscle soreness, numbness or tingling in the body, tenseness in muscles, shortness of breath, hot or cold spells, diarrhoea or indigestion, tight stomach, nausea or upset stomach, stuttering or speech problems, loss of (or excessive) appetite, having headaches, cold or warm hands, insomnia, a lump in the throat, a pain in the neck, having nightmares, inability to concentrate, teeth grinding habits, body trembling or nervous tics, dryness in the throat and mouth, smoking, backache, frequent need to urinate, accident proneness, sweating, sweaty hands, pains in the heart or chest, itching, a racing heart, using illegal drugs, using alcohol and using Prescription drugs.' These symptoms are physical, cognitive, emotional and some are related to psychiatric notions of depression and anxiety.

¹⁸ In the severe example it is feasible to instruct managers that episodic intrusions, or 'flashbacks', in traumatic reactions are related to events in reality whereas in schizophrenia a near similar experience, hallucinations, is not based on any experienced reality. The voices which schizophrenics report they 'hear' will probably come from internal imaginations. Work-trauma 'voices' are related to experience at the time of the trauma (Nicholls and Czirr, 1986: 422-423).

¹⁹ A key reason for inferring a neutral effect of Japanese counsellors, may be the attitude towards counselling and face-to-face contact in Japan. This has been described as a 'non-Japanese' act implying weakness and a disloyalty to the Japanese race (Dale, 1989). Given that interview methodologies tend to record low self-expression and cultural reticence in emotional disclosure, this suggests a low efficacy of counselling in Japan as emotional disclosure would be limited (Sartorius et al, 1987; Dohrenwend & Dohrenwend, 1974; Nakamura, 1990a, 1990b). Ultimately, the face-to-face contact implied in counselling represents a unique challenge to 'the Japanese self' (Doi, 1986; 1973). As the Japanese

utilise a unique part of personality when dealing face-to-face with other Japanese (ibid, 1973), this will result in low levels of expression compared to emotional self-disclosure utilising non face-to-face interactions such as questionnaires (ibid, 1973; Sartorius et al, 1983).

²⁰ 'Classic' assessments of Japanese culture & society have also tended to ignore issues of psychological stress in the Japanese and Japan. For example: Nakane, 1974; Christopher, 1983; Rudovsky, 1965; Vogel, 1971; Pascal & Athos, 1981; Doi, 1973, 1986; Taylor, 1983.

²¹ The focus of US-based literature has often tended to be about the experience of small sub-populations exposed to CIs or organisational responses to work trauma, such as peer support groups and counselling intervention, or to mortality rates versus the community (e.g.: Hildebrand, 1984a, 1984b; Piringner, 1982; Perroni, 1987; Mastromatteo, 1959; Bates, 1987).

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APPENDIX I

A: A REVIEW OF KEY ISSUES IN THE DEVELOPEMNT OF PTSD RESEARCH

This appendix briefly details background details to traumatic reactions, concentrating on the plausibility of PTSD as an autonomous disorder, and the debate around diagnosis. It is included in the appendices as the material does not directly relate to the argument in the main text. However, what is contained below is relevant to an appreciation of issues in the study of traumatic reactions, and thus to work-trauma.

Historical examples of reactions to trauma

The name 'post-traumatic stress disorder', with which all trauma reactions are commonly associated, dates to Bourne (1980) and his work on Vietnam veterans. The DSM definition of PTSD (Appendix II) is widely used (e.g., Lindy, 1989; McClelland, 1988), and is based on four areas of diagnosis: first, exposure to a traumatic stressor that is unusual in human experience; second, a psychological re-experiencing of the trauma; third, an emotional numbing; fourth, an increase in symptoms.

Historically, there have been legion variations in definition and terms for reactions to trauma: 'Counter Disaster Syndrome' (Raphael, 1986); 'nervous shock', 'Combat Fatigue', 'Combat Exhaustion', 'Effort Syndrome', 'Acute Situational Reaction', 'Operational Fatigue', 'Recurrent Battle Dreams' are some examples (see Trimble, 1978 for a review). The symptoms of trauma reactions defined in DSM-III have been specifically compared to the definitions 'gross stress reaction' in 1958 and 'transient situational disturbances' in 1968 (Parson, 1978: 322). As the symptoms of trauma also include involuntary recollections of certain events, altered sleep and response patterns, PTSD has been summarized as a '...psychological disorder associated with serious traumatic events [leading to] re-experiencing the trauma in dreams, recurrent images

and thoughts, a general sense of numbness and feelings of lack of involvement with the real world, guilt...sleep disturbances and an exaggerated startled response' (Reber, 1985: 561). In addition to different terms for reactions to trauma there have also been differing symptom check-lists: for example, the 'Delayed Stress Reaction Checklist' (Hickman, 1987: 193-207) and the International Classification of Diseases, 9th Edition (the ICD-9 (1980)), by the World Health Organisation (used, for example, by Nakamura, 1990a, 1990b).

Thus, although a relatively new and post-Vietnam classification within the DSM pantheon, PTSD does not necessarily concern symptoms exclusively observed in Vietnam veterans. Indeed, the literature is clear that severe reactions to traumata of the type PTSD alludes to are not an exclusively contemporary emotion, nor an emotion dating from the 1960s, as some have argued, or indeed an emotion exclusive to industrialism (Dohrenwend & Dohrenwend, 1974; Paterson & Neufield, 1989; Goldhamer & Marshall, 1953; Trimble, 1978).

In fact, it is suggested characters in the plays of Shakespeare, written 16th, exhibited some PTSD symptoms (Rivers, 1918; Trimble, 1978: 6-7). Samuel Pepys was suggested to have exhibited intrusive imagery six months after the Great Fire in 1666 - he was '...terrified in the night nowadays with dreams of fire and falling down of houses'. According to DSM-III-R and DSM-IV criteria, this indicates chronic levels of PTSD (Daly, 1983: 66; Appendix II). Charles Dickens also complained of being '...not quite right within' after witnessing a railway accident (Trimble, 1978: 7). Even Lucretius (1st BC) described how 'a more than usual strain [came to] occupy and mock the minds of men'. Of these historical examples, those taken from Shakespeare and Lucretius are most interesting:

*O, my good lord, why are you thus alone?
For what offence have I this fortnight been
A banish'd woman from my Harry's bed?
Tell me, sweet lord, what is't that takes from thee
Thy stomach, pleasure and thy golden sleep?
Why dost thou bend thine eyes upon the earth,
And start so often when thou sit'st alone?
Why hast thou lost the fresh blood in thy cheeks;
And given my treasures and my rights of thee*

To thick-eyed musing and cursd melancholy?
In thy faint slumbers, I by thee have watch'd,
And heard thee murmur tales of iron wars:
Speak terms of manage to thy bounding steed,
Cry, 'Courage! To the field!' And then hast talk'd
Of sallies and retires; of trenches, tents;
Of palisades, frontiers, parapets,
Of basilisks, of cannon, culverin,
Of prisoners' ransom and of soldiers slain,
And all the currents of a heady fight.
Thy spirit within thee hath been so at war
And thus hath so bestirr'd thee in thy sleep,
That beads of sweat have stood upon thy brow
Like bubbles in a late-disturbed stream;
And in thy face strange motions have appear'd,
Such as we see when men restrain their breath
On some great sudden hest. O, what portents are these?
Some heavy business hath my lord in hand,
And I must know it, else he loves me not.

Source: Lady Percy, Henry IV, Part I, Act II, Sc. III.

'And generally, to whatever pursuit a man is closely tied down and strongly attached, on whatever subject we have previously much dwelt, the mind having been put to a more than usual strain on it; during sleep we for the most part fancy that we are engaged in the same; lawyers think that they plead causes and even draw up covenants of sale, generals that they fight and engage in battle, sailors that they wage and carry on war with the winds.... So all other arts and pursuits are seen for the most part during sleep to occupy and mock the minds of men.'

Source: Lucretius (c.95-55 B.C.), De Rerum Naturae.

The stimulus of war to studies of work-trauma

Contemporary interest in the psychological sequelae of trauma is undoubtedly a reflection of three key wars of the twentieth century: the Great War (1914-1918), the Second World War (1939-1945) and the second Vietnamese Civil War (1954-1975). Throughout these wars themes in trauma research have emerged: for example, an emphasis on effects over causes; coping strategies used during and after; cognitive mechanisms of appraisal over time; and questions of prediction and individual vulnerability (Novaco et al, 1988; Wolfsohn, 1918; Lewis, 1918).

Inevitably, much early interest in traumatic reactions stemmed from the writers, novelists & poets who wrote extensively about the trauma of the trenches and their alienating & horrific effects 'on emotions and concerns' (e.g., Brooke, 1920: cxxiii-clix, 1940: 143-150; Sasson, 1917, 1918, 1930, 1936; Owen, 1931; Friedrich, 1924). A literary tradition was soon superseded by a scientific one. By the end of the Second War, the trauma of war was described more scientifically as 'a laboratory that manufactures psychological dysfunction' (Swank, 1949: 476). Kardiner (1941) suggested there was a 'physioneurosis' in traumatized soldiers, involving an irrevocably changed personality. Grinker & Spiegel (1945) suggested a residual stress model that was linked to the extent and characteristics of exposure. By the time Vietnam arrived, or more specifically US soldiers arrived back in the US cultural setting from the brief but traumatic stretches in the war, war was said to have as a 'ubiquitous phenomena' transference in the individual psyche from the battlefield to peacetime (Lindy, 1989).

Although these wars stimulated awareness of trauma, however, we should note the interest of clinicians has not always been sympathetic. This is perhaps based on the reality of combat, which more rarely than the popular media has it brings out the most heroic in humans. Probably, it was also based on symptoms of traumatic reactions viewed by non-clinicians. During the Great War, for example, although Rivers (1918) suggested '...it is natural to thrust aside painful memories just as it is natural to avoid dangerous or horrible scenes in actuality' (1918: 173) the observation contradicted many beliefs of officers that men unable to be 'courageous' in response to trauma 'lacked moral fibre':

"...in the majority of instances [of shell-shock] a pre-existing emotivity was present. The dreams of soldiers...exhibit in a striking manner how an incident of war associated with emotional shock is graven on the mind, for it continually recurs in a vivid and terrifying manner in their dreams, half-waking state, and in some few cases even in the waking state, constituting hallucinations. Forgetting this painful experience is a natural defensive reaction" (Mott, 1918: 169).

(This observation was rather ironic as more officers than other ranks tended to experience shell-shock most in the trenches (Healy, 1992: 92).)

In respect of hallucinations Mott was exaggerating as hallucinations are more a reflection of schizophrenia than PTSD (Nicholls and Czirr, 1983). Intrusive imagery ('it continually recurs in a vivid...') and avoidance or denial based coping strategies ('Forgetting this painful experience'), however, remain contemporary research concerns and part of the PTSD diagnosis. The 'lacking moral fibre' aspect of PTSD is also still often raised in fire services today (Paton et al, 1992).

The link between Vietnam and emergency service work

PTSD has also developed as applicable to a quite diverse number of populations. For example: family violence and sexual assault victims (Williams, 1987: 239 & 253 following; Wilson, 1978: 142-172; Donaldson & Gardner, 1978; Agosta & McHugh, 1987); crime victims (Kilpatrick et al, 1978); combat veterans in Israel (Solomon, 1989); paramedics (Kalimo et al, 1980); terrorist bomb survivors; communities which experienced disasters (Griffin, 1987; Brooks & MacKinley, 1991; Baum et al, 1982, 1983); rescue workers (Taylor & Fraser, 1987; Paton, 1990); and in children in response to the political turmoil in South Africa (Dawes et al, 1989).

Vietnam, however, is the key war which influences contemporary understanding of PTSD. This is perhaps not surprising given the duration of the war, which lasted, in various guises, for ten thousand days (MacLean, 1981). It is also a reflection of the significant numbers of soldiers that were effected by war and exhibited a range of symptoms now grouped under 'PTSD'.

Vietnam also, undoubtedly, provided a stimulus to understanding PTSD in emergency service personnel such as fire-fighters. For example, Laughlin (1980), the first author to consider fire-fighters after the identification of PTSD, said fire-fighting was like an enduring Vietnam. Yet, the association of Vietnam, with its unique

stressors, with fire-fighters, exposed to different stressors, is not necessarily close.

Certainly, the stressors of fire-fighting and war are both outside the realm of most 'normal' human experience, meeting, therefore, criteria A in DSM-III-R. Both occupations were/are exposed to potential traumata, such as body handling, for which there is often little opportunity to prepare. Fire-fighting and war are also characterized by other incidents and disasters where training and experience cannot provide comprehensive or even partial means of preparation (Paton, 1992).

In most respects, however, the stressors of fire-fighting are quite different from the stressors inherent in Vietnam. For example, the war involved, on the American side, predominately conscripted and young individuals not experiencing pressures to pass examinations or marital strain (MacPherson, 1987: 103-118); they were not generally older volunteers, as fire-fighters are; the soldiers were also from a greater variety of social and geographical backgrounds than fire-fighters (1987: 103-118); they were organized in rapid and brief periods of time - basic training last 6 weeks, advanced another four - compared to fire-fighting basic training which is over 24 weeks and regularly up-dated; they received less training than fire-fighters on stress reactions; they were asked to commit, or performed of their own volition, tasks quite different from fire-fighting (1987: 182-197), which is, throughout the world, 'to save life and property'. In short, the whole of motivation & intention distinguishes a fire-fighter from a US-Vietnam soldier.

The suggestion that fire-fighting should be compared to the sequelae of combat in Vietnam, however, persists. This must be due, particularly, to the enduring fact the two 'samples' have encountered mutilation and fatalities. Yet, this seems a spurious comparison.

A key difference is that exposure to fatalities & mutilation by fire-fighters is a risk transcending thirty years or more; considerably longer than the 365 days for most Vietnam veterans. This raises a question over whether critical incidents are, in fact, less traumatic for fire-fighters as they become, due to such persistent exposure, 'normal'. In the Vietnam war, by contrast, exposure to

trauma was temporally limited and also comparatively more severe (Laufer, 1988). Thus, both duration and intensity of the stressors were different for Vietnam veterans compared to fire-fighters; the trauma of war was certainly not normal in the sense of occurring over three decades. Moreover, fire-fighters are also exposed to fatalities in situations where they have no causative role (see Figley, 1978a).

Supplementing this observation is empirical evidence on PTSD in soldiers and fire-fighters. Estimates of the number of Vietnam veterans who exhibit 'some symptoms' of PTSD are as high as 700,000. This equals c.25% of the 2.75 million veterans of the war (MacPherson, 1985: 207-230). Yet, the number of fire-fighters 'affected' by PTSD has been placed, with some exceptions, at levels somewhere below 10% of operational personnel (e.g., Hildebrand, 1984b).

Although the links of fire-fighting and Vietnam should not be taken too far, however, the study of PTSD in fire-fighters has certainly gained from Vietnam-based studies. For example, Vietnam stimulated a sensitization towards PTSD in all individuals exposed to trauma. Secondly, Vietnam facilitated a systematic cataloguing of symptoms associated with PTSD. Cataloguing has signified a shift of interest away from ignoring '...sporadic and unpredictable explosions of aggressive behaviour' (DSM-III) towards an interest in explaining why specific symptoms of PTSD 'happened', and how to cope with each symptom (MacPherson, 1985: 209). Thirdly, Vietnam has led to practical experience and understanding of counselling; stress management; debriefing procedures; and concerns for the partners of fire-fighters (McLeod & Cooper, 1991; Williams, 1987; Paton & Kel, 1991).

Ultimately, Vietnam has shown how sensitive researchers must be to the latency of reactions. Thus, understanding of PTSD in fire-fighter or other populations is aided by an emphasis on gathering more information: as more data emerges and more longitudinal studies mature so appreciation grows. Hence, it is claimed there is '...good reason to believe that the effects of stressors must be examined over long periods of time if we are to understand their impact fully' (Landy, 1985: 538-9).

Contemporary views of traumatic reactions are more sympathetic than that taken by officers in the Great War. They accept, for

example, that although 'prior circumstances' are inherent in individuals this does not necessarily predict 'combat fatigue', 'shell-shock' or PTSD. Rather, it is accepted that exposure to traumata are sufficient conditions for PTSD reactions; this is stated in part A of the DSM-III-R diagnosis concerning exposure to a recognizable stressor that would cause reactions in almost anybody (see Appendix II).

In fairness, this idea was also suggested after WWII by, inter alia, Stouffer (1949), Kardinger & Spiegel (1947) and Swank (1949). However, these writers were never given due prominence. Swank's position was also mis-interpreted: he argued that reactions were related to the length of exposure to trauma. This was the basis for rotation of Vietnam soldiers for 365 days. Actually, he observed that of 2,630 combat survivors the majority had a 'better than average stability' because they had endured training (1949: 477; Goodwin, 1987: 4). He never argued that duration of stressors could exclusively explain PTSD symptoms. Swank had alluded to this in his statement that 'in combination with 65% of casualties' reactions could be explained. The real point he made was about the characteristics of the stressor, which remains a popular theme: '...event undesirability is a more effective predictor of later dysfunction than change per se' (Paterson & Neufield, 1989: 25).

Questions over the autonomous diagnosis of PTSD

Although contemporary attitudes to traumatic reactions are more sympathetic than eighty or less years ago, however, a persistent theme of contemporary literature questions the justification and measurement of traumatic reactions using the DSM-III-R as a diagnostic guide. The most prominent aspect of this theme is the autonomous nature of PTSD diagnosis. This holds that trauma has non-specific sequelae; in other words PTSD will occur to all individuals exposed to trauma (Healy, 1992), be they Vietnam veterans or fire-fighters attending a CI.

How feasible or realistic this assumption is remains ambiguous (ibid). There are suggestions, for example, that sympathy for victims

exhibiting traumatic reactions has become excessive & impractical. The diagnosis of PTSD, in fact, is the only diagnosis in DSM-III-R exclusively explained by exposure to traumata rather than the disposition or circumstances of the victim. There is no aspect of adaptation in PTSD and there are, therefore, logical difficulties in defining what constitutes a trauma 'outside the realm of normal human experience'.

As a result, claims over PTSD have become absurd: can victims experience trauma vicariously by watching disasters on TV? This has been described as trauma occurring after 'less than overwhelming adversity' (Healy, 1992: 107). Healy also notes: '...not since Freud in 1895 had psychological problems been described in this way' (1992: 106). The implications of a reaction which can be attributed exclusively to trauma exposure has significant financial-legal implications underlying all debate on work-trauma in fire-fighters or any other population (see Chapter 1).

It is, therefore, surprising the debate over stressor characteristics versus personal characteristics has not remained more central to a PTSD diagnosis. Why a diagnosis of PTSD exclusively ignores these issues is complex. One reason may be related to the contemporary agenda of patients & lawyers, as postulated by Healy:

"The significance of [court decisions] is twofold. One is that [PTS] is diagnosed on the basis of the self-reports of those affected. The other is the fact that for the first time the courts recognized that an autonomous psychological disorder can be precipitated entirely by environmental factors - hence my contention that {PTS} has become 'real'..." (1992: 109).

A second reason is related to the needs of healers. The importance of ease of event-characteristics in diagnosing PTSD has tended to receive support among psychiatrists, often with limited time resources, who are predisposed to using chemical interventions in easily-identifiable problems. Similarly, counsellors, committed to a process of group therapy, have benefited from an assumption that exposure to trauma must cause PTSD symptoms which require counseling intervention. It is also often argued that many DSM criteria are historically disposed to the requirements of the US pharmaceutical and

insurance industries (Healy, 1992: 232). The more exact the criteria the greater the necessity for and use of drugs and the greater the likelihood of litigation.

A third reason why PTSD should not be exclusively diagnosed in terms of a stressor may be related to the profundity of reactions to battle, particularly the effects of Vietnam on US soldiers. The numbers of those affected by the trauma of Vietnam were so extensive (as high as 700,000 by some estimates) it seemed hard to conclude that the stressor of war had other than a common reaction. These proportions were similar to the Great War where, it is estimated, c.250,000 of British soldiers were affected (Healy, 1992: 104). This would seem to suggest the stimulus of trauma was so profound as to have non-specific sequelae.

After Vietnam theoreticians were particularly perplexed at the unusual frequency of symptoms and other evidence of distress and 'psychological epidemiology' amongst so many veterans with no apparent association (Goodwin, 1987: 2). This suggested initially, in keeping with the arguments of Swank et al (1949), that the characteristics of combat stressors explained PTSD symptoms in all individuals. The importance of stressor or personal characteristics, therefore, did not seem a logical or necessary part of the diagnosis of PTSD.

This orientation in PTSD diagnosis is not, however, uniformly supported. Not all research from Vietnam implies trauma has non-specific results. An extensive study of 1,342 Vietnam veterans, for example, was unable to infer association between severity of PTSD and characteristics of combat. This, they suggested, implied 'pre-existing emotivity' (the term first used by Wolfsohn in 1918) rather than exposure to trauma was a more influential factor in understanding PTSD (Laufer et al, 1978). Other studies mentioned earlier also suggested pre-existing emotivity was a factor in understanding PTSD symptoms (e.g.: Slater & Slater, 1944; Dohrenwend, 1973; Antonovsky, 1971).

The continuing emphasis on using one trauma-stimulus in diagnosing PTSD is not, however, exclusively inaccurate. Trauma is, after all, the essential factor in stimulating abnormal symptoms associated with the PTSD diagnosis. Nonetheless, a more comprehensive diagnosis which utilizes consideration of the above factors is a

necessary development. The role of culture in explaining PTSD symptoms is also not considered by DSM-III-R (Paton & Leigh, 1993).

In fact, questions about the autonomous nature of traumatic reactions have long been raised. Slater and Slater (1944), for example, dissented from explaining traumatic reactions in terms purely of stressor duration or intensity. Their study, based on subjects affected physically by a blitz air-raid in London, considered latency of reactions as a further way to diagnose PTSD.

They suggested those who were affected in a physically, and thus cognitively, traumatic way (i.e., being buried for some time in rubble) exhibited, in initial stages, 'traditional' symptoms of trauma. These symptoms, however, were not observed to be constant over time. Thus, they concluded, trauma was a process which affected individuals differently in the long-term despite stimulating short-term, non-specific, reactions.

They speculated that past mental disorders were a better predictor of the extent & existence of the long-term traumatic reactions. Trauma would not produce a non-specific reaction or be related to the length of the original trauma. Their position has also been supported by more contemporary writers. For example, in a recent review of personality and stress reactions it is suggested '...evidence indicates strongly that heredity plays an important [role]' (Eysenck, 1985a: 138; Wilson et al, 1978: 142).

The latency of traumatic reactions

There are suggestions that latency of reactions to trauma indicate pre-existing emotivity, and therefore influence PTSD experiences and diagnosis. This position was supported by other studies concerning WWII populations. For example, Dohrenwend (1973) also suggested there were non-specific traumatic reactions in initial stages and specific reactions in later stages. She considered the experience of another war trauma, imprisonment in concentration camps, and suggested prior disposition to mental instability (or 'vulnerability') was a 'necessary' condition for long-term stress reactions.

The effects of trauma in concentration camps were also considered by Antonovsky (1971). He conducted a long-term study of camp survivors, amongst some of whom he identified a 'concentration camp syndrome'. Symptoms included expressing a desire for death as a means to assuage the guilt at having survived at the 'expense' of others. He also argued pre-existing characteristics influenced long-term trauma reactions.

Thus, in understanding a balance between personal & stressor characteristics one area that may be important is considering the latency or chronicity of PTSD. It is known, for example, that intrusive memories or survivor guilt may last for decades (e.g.: Antonovsky, 1971; Slater & Slater, 1944; Neuhäusler, 1973; Nicholls and Czirr, 1985; Huie, 1963; Dohrenwend, 1979). It is therefore feasible to use the latency of trauma in diagnosis.

Latency may be of particular benefit as there is some evidence that short-term reactions to trauma, i.e. under one year, are universal and transcend culture. They can be quite different from long-term reactions (Taylor & Fraser, 1982). The question is how long a short-term reaction is normal.

The literature offers an ambiguous answer. After a US disaster 'severe' symptoms have been suggested to persist for over one year (Baum et al, 1983); UK rescue workers exhibit severe 'performance guilt' after four months (Paton, 1989a). Yet, physiological stressors from fires have been suggested to cause predominately short-term symptoms for under 90 days (Markowitz et al, 1987: 90); following an earthquake in Athens, 1981, there was, in the following 30 days, even an increase in heart attacks (Mervyn, 1987: 19). Other reactions to stress have resulted in transient 'three day psychoses' (Stress and Mental Disorder, 1979: 3).

One indication assisting diagnosis is that severe, long-term reactions tend to affect fewer individuals. Diagnosis is therefore facilitated because the experience of PTSD is at a more profound level when it lasts long-term. Practitioners managing intervention, however, need to be cautious in appreciating the characteristics of latent reactions, some of which can be exceedingly distressing to victims

If the reaction is persistent, for example, stress reactions may lead to suicide long after the original trauma is experienced. Often, therefore, suicide follows periods of minimal evidence of PTSD symptoms that were abnormally high in the short-term but appeared to have reduced to normal levels for that population. A Vietnam veteran, for example, ended his life fifteen years after a brief, traumatic episode. He wrote before his suicide:

"...When I was in Vietnam, we came across a North Vietnamese soldier with a man, a woman and a three-or-four-year-old girl. We had to shoot them all. I can't get the little girl's face out of my mind..." (MacPherson, 1984: 217-218).

However, diagnosing PTSD in terms of a long-term experience may also have the advantage of supplementing the characteristics, mentioned earlier, of duration & intensity of stressor. It has been suggested, for example, the duration of stress should be assumed as proportionately related to the latency of symptoms (Selye, 1976; Solomon, 1989). There is also a suggested relationship between the intensity of the stressor and the length of the stress reaction: 'if stress has been particularly intense or prolonged, remission of symptoms can be long delayed' (Maida et al, 1989; *Mental Disorders*, E.B., 1985: 962).

In short, the importance of duration and intensity in understanding the latency of PTSD has been addressed by some researchers. Some have suggested a close association but, in general, a clear theoretical understanding has still to develop. One solution may lie in an arbitrary allocation of severity. This has been used in the past. In considering 'combat fatigue', for example, WWII psychiatrists used three month time units to assess the latency of stress reactions (Stouffer, 1949): 'under three months' of combat experience was shown to have the least percentage of critical scores on a psychosomatic symptoms index; 'over nine months' of combat experience was observed to have the highest percentage on the same index (Stouffer, 1949: 451-2). Thus, the duration of the stressor was shown to relate to psychosomatic symptoms.

McFarlane (1989, 1988, 1987a, 1987b), by contrast, could not establish a clear association between latency and stressor characteristics. He considered individual fire-fighter responses to the stress of a bush-fire. His intention was to establish an existent pre-disposing vulnerability that would affect perception of intensity of trauma in Australian fire-fighters. However, after two longitudinal studies, he concluded '...a number of other unexamined factors must be playing a major causative role' (McFarlane, 1987: 227).

However, even if duration of stressors does explain PTSD, it may not be possible to divide the experience of subjects fire-fighters in autonomous time units. As mentioned above, un-like soldiers fire-fighters are exposed to trauma over sustained periods of time. Fire-fighters are also exposed to stressors where intensity would seem to outweigh duration. The following example, taken from an interview transcript, describes the after effects of a propane gas explosion in Birmingham:

"...his corpse was lying on the floor, the clothes burned off. Inside the house the smell of charred wood mingled with that of roasted flesh.../'Do fire-fighters ever get used to dealing with this?/'When you're wearing a uniform it's a job,' said Rossiter. 'You're completely isolated in your brain - until you go home. But then the tears pour down...we all cry...there's no shame in that..." (The Independent, 'Men in Waiting', September, 1990).

Fire-fighting also involves frequent contacts with death and injury to fire-fighters themselves. In the US, during 1980-1982, 374 fire-fighters lost their lives in the course of their duties; in Hong Kong 42 fire-fighters were injured in 1991-2; in 1980-1981, over 200,000 US fire-fighters were injured and 6,505 civilians lost their lives in fire/accident and emergency related deaths. Thus, a cognitive appraisal of potential risk of life to which there may have been no preventative options must be assumed in fire-fighters (Hildebrand, 1984b: 32).

Such stressors have latent reactions, but they trend to reduce in the majority of populations. It has been suggested that the stress of body-handling may be exhibited in symptoms twenty months after the incident (Taylor & Fraser, 1982: 4). However, the Taylor & Fraser

study also observed a long-term reduction of symptoms. Evidence from research in police involved in the Hillsborough disaster also observed a reduction of symptoms over a five month period (Duckworth, 1986). Taylor & Fraser recorded reduction of symptoms from an original level of 82% to 57% after 3 months & 37% after 20 months. Duckworth (1986), using the GHQ-60, recorded a fall from 18.28 to 1.41 after five months.

However, there is evidence that symptoms can last much longer and remain intense for some victims. Chodoff (1963) also suggested the importance of duration in understanding the latency of stress reactions: after fifteen years of liberation from concentration camps certain symptoms remained evident in some (though not all) survivors. Included in a detailed list of symptoms were a phobia of being alone or an obsessive dwelling (a 'rumination') on the events of camp life.

Also, hyper-alertness was observed to exist in soldiers who were not in concentration camps but on the basis of a similar time lapse: fifteen years between the trauma of combat in Europe and intrusive symptoms (Archibald et al, 1962). Soldiers and doctors who worked in the horrific circumstances of the 'New Order' camps in Germany also reported on the effects of managing (if not instigating) such horror in the 1960s: clearing bodies from 'monoxide vans' was 'a great ordeal'. (It was in these vans that victims in hermetically sealed vehicles were asphyxiated by the engine vapours.) It led to '...immense psychological injuries...damage to health...[and headaches which]...appeared after each unloading' (Shirer, 1973: 960; Neuhäusler, 1973).

The question of age and traumatic reactions

Thus, there seems a necessity to consider questions over the latency of PTSD reactions rather than to assume that exposure to trauma is sufficient condition for a diagnosis of PTSD: 'The relationship between situation and emotion is not the complete story' (Leventhal and Nerenz, 1983: 9). One explanation of the latency of stress reactions may lie in age.

In a US survey of young fire-fighters it was estimated that only between '...three and seven percent will suffer profound psychological after-effects following a serious incident' (Hodgkinson, 1990: 23). By contrast, estimates seem to suggest around 25% of elderly trauma victims fail to 'adapt' to traumatic experiences. This data suggests that PTSD in elders is a source of concern.

It has also been suggested that of elderly combat veterans over sixty-five '...between thirty percent and sixty percent [are likely] to show some signs of PTS' (Nicholls and Czirr, 1986: 421). This would imply that, independently of either the duration or the intensity of the stressor, the latency of PTS develops with age. This is also suggested to apply in Japanese subjects (Natsume et al, 1988).

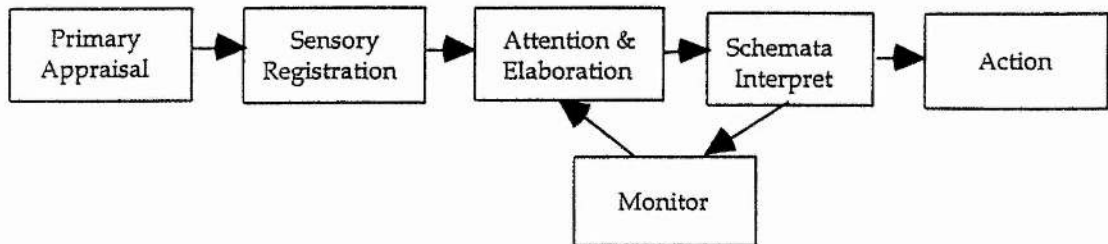
This has led to a conclusion that levels of PTSD symptoms stress need to be appraised in a different way than that proposed by DSM-IIIR. One suggestion is the 'person-environment' fit suggested by Mechanic (1978) (Hamilton, 1983). This approach is said to have significant implications for considering management practices and other organisational issues in fire services.

It is also for this reason that counselling, which can adapt to individual situations, is suggested as a significant stress management strategy. Also, coping methods based on the use of videos have been shown to reduce stress during military training. High attrition rates have been shown to concentrate by training group (Novaco et al, 1988). 'Drill instructors', it is suggested, can cause the '...negative incentive training' used for induction courses to increase the number of 'attriters'. This occurs independently of any psychometric properties, including age.

Thus, the training of emergency personnel has also been suggested as an explanation of PTSD symptoms: '...training directs them to focus upon their external performance, and to deny and suppress their feelings' (Taylor, 1983: 6). Sergejuk & Zakharova (1986) differentiate between experienced and inexperienced fire-fighters in explaining mental tension. 'Individual susceptibility' may be a reflection not of the individual but of the individuals superiors and work environment.

B: THE STRESS PROCESS

An equally useful model to that included in the text (the eco-systemic model) is the Cognitive Appraisal Process (CAP) (Folkman, 1984b). This is described in this appendix as a background to psychological stress. It is excluded from the main body of the text because it is not central to understanding cultural difference. However, it is an important framework for understanding.



Source: Leventhal & Nerenz (1983).

This illustrates the cognition of stress involves sequential steps (Vaernes et al, 1982; Lazarus et al, 1985). Firstly, there is an initial binary evaluation of the existence of the stressor. This involves 'risk perception' (Eiser and van der Plicht, 1988: 172), occurs on-site (Paton, 1989a), is based on an 'implicit internal model' (Fisher, 1986) and is referred to as 'primary appraisal'. It is suggested that this develops in victims with respect to their occupational tasks and the risks inherent in a situation (Lim et al, 1987: 215). This may include a behavioural as well as cognitive approach (Scurfield, 1978) and also involve 'neuro-linguistic programming' (Hartman & Burgess, 1978). Lazarus has distinguished between primary appraisal of 'threat', 'impact' and 'post-impact' (Paterson & Neufield, 1989).

Secondly, an appraisal of the extent of threat posed, or, alternatively, the fear caused by the stressor. This involves 'perceived importance of cost and benefits' (Eiser and van der Plicht, 1988: 172) and may be described as 'secondary appraisal'. The 'threat' in a situation may be focused on either objective features or emotional reactions (Lazarus, 1985). As appraising a stressor is a subjective and

not an objective experience, it is important '...to avoid whole-whole relationships, where the independent and dependent variables are mutually and totally inclusive' (Lazarus et al, 1985: 776). Appraisal is subject to 'a wide range of personal beliefs' (Folkman, 1984b).

Coping with (or 'preventing') stress is thus a subjective and adaptive process. It involves a stimulus, an appraisal and a response. It is suggested this response, or outcome, may be a perception of a threat, of harm, of a challenge or of neutrality (Lazarus (1966), Folkman (1984)). The stress process is subject to environmental demands that are made upon individuals and how that individual appraises their ability to react to the stressor (Lazarus (1985: 338), Dore (1990), Eiser and van der Plight (1988), Novaco et al (1988)). For example, patients may tackle either symptom features or elicited emotions (Leventhal & Nerenz, 1983).

One particular strategy in preventing stress is to encourage re-appraisals of cognitive norms. Prevention is taken to involve a development of appraisal of the stress process (Lazarus, 1969: 338). or of the alteration of schema (Leventhal & Nerenz, 1983). Cognitive management suggests that stress prevention involves a learning, or re-learning, process. It is thus based on self-management (Leventhal & Nerenz, 1983). Cognition is a broad term which refers to thinking, conceiving and reasoning, categorized as 'mental behaviours' (Reber, 1985: 129).

Janis and Mann (1977) suggest coping patterns include 'defensive avoidance', and 'hypervigilance'. 'Feelings of 'mastery' and 'ascertainment of meaning' have also been suggested ways of appraising, reducing and ultimately preventing post-traumatic stress reactions, in this case associated with a couplet of disasters (McCammon et al, 1988). It is suggested, however, that feelings of mastery are difficult to nurture (Parson, 1978: 333). Emotion focused coping is suggested as efficacious in coping with disasters (Baum et al (1982, 1983), Kobasa (1979), Durham et al (1985) and Horowitz et al (1980)).

Re-appraising a stressor with cognition's such as this has been shown to be a subjective process. There is, therefore, an inference it can be managed. This is what is implied by cognitive management. McFarlane (1989), for example, has concluded that '...people's perceptions of the threat and losses sustained in a disaster often can have little to

do with their actual experience [of the stressor]' (1989: 227). If cognitive interpretations of the stressors may be managed then there is also an implication that individual differences are of significance. The literature suggests that anxiety in individuals is different and this may relate to performance effectiveness, the 'performance difficulties' of the HSCL-21 scale.

In laboratory experiments, cognitive 'repressors' are suggested to have higher stress responses than 'low-anxious subjects' (Weinberger et al, 1979: 369). Byrne (1964) suggests that low-anxiety samples repress threatening stimuli and high-anxiety samples sensitize the same stimuli. 'Repressors' are individuals who use coping strategies equitable with low anxiety but high defensiveness. 'Low-anxious' subjects tend to report low anxiety and low defensiveness. It is thus suggested that '...repressors as well as high-anxious persons tend to cope ineffectively with psychosocial stress relative to truly low anxious persons' (Weinberger et al, 1979: 379). Laboratory experiments consistently reveal that hi-anxiety samples attach more attention cognition's to threats than low-anxious subjects do (Cohen & Edwards, 1985). High anxious individuals seem to expel more capacity on solving problems but produce the same results as low anxious subjects. It is suggested, therefore, that performance effectiveness often camouflages the adverse effects of anxiety on processing efficiency' (Cohen & Edwards, 1985).

The debate on anxiety has included field studies. Novaco et al (1988), for example, suggest that 'externals' gain most from intervention compared to 'internals'; Dornic (1980, 1977) suggested hi-anxious individuals reported greater effort on tasks compared to low anxious individuals.

Denial-based coping strategies may involve the avoidance of information, the shifting of responsibility and selective information processing (Janis and Mann, 1977). For example, high tobacco or alcohol users may avoid or denigrate information on health-risks (Eiser and van der Plicht, 1988). The reduction of the 'gap' between expectations surrounding disaster relief and the reality which bureaucratic, physical and media pressures and other limitations impose on this may also serve to reduce stress by managing cognition's in the stress process (Paton, 1989a). This is a suggested explanation in the discrepancy between IES-A

symptoms of volunteers (4.3) and fire-fighters (9.2) involved in the Armenian earthquake rescue work (Paton, 1990b). Coping strategies have been divided between denial, social support and mastery (see Appendix), and problem focused, appraisal focused and emotion focused (Folkman (1984b), Cohen & Edwards (1985)).

There are indications of the necessity for cognitive management. In a sample of American fire-fighters, it has been reported that 70% felt that they had not been cognitively 'prepared' for the stress of the job (Hildebrand, 1984). More than sixty percent indicated this resulted in 'trouble with tension' (Hildebrand, 1984b: 32). This research has several methodological problems. For example, the sample was small (120 fire-fighters). It did not distinguish responses by age or rank. It did not quantify or categorise over five hundred '...personally upsetting...' situations listed by respondents. However, it suggests the consequences if cognitive orientation in fire-fighters is not managed.

However, there are also indications that cognitive management is subject to limitations. It has been noted, for example, in the police service, individuals may be negative towards stress management (Brindley, 1983). ('...They [police officers 'under stress'] adopt defensive positions and there is little doubt these men and women are currently suffering stress because they cannot, or will not, adapt...' (Brindley, 1983: 77).) The prevention of stress is suggested to lie in the constructive adaptation of cognition by individuals and individuals within organisations and not in the 'transference' or denial of stress reactions (Lindy, 1989). 'Denial' is a common coping strategy amongst the members of professions where a 'macho' ethos may be strong. To admit to 'mental problems' is perceived as a sign of weakness or personal inadequacy (Herrick, 1992: 10). However, there are suggestions that denial based coping strategies may be considered as deviation based coping strategies, which re-direct thoughts and behaviour to a different stressor (Cohen & Edwards, 1985).

Selye (1976) suggested that 'stress experience' was a physically degenerative process. Although cognitive coping or defence mechanisms became more elaborate during life events, the energy with which to implement them becomes less and less copious. Laboratory experiments on the effect of heat and cold on performance implied credibility to this

idea. Namely, that stressors can utilise and then impair attention and cognitive capacity during work (Landy, 1985: 528). As appraisal of either traumatic or occupational stress occurs it is subject to the influence of the other process of appraisal and prevention. This is particularly so over time. This amounts to the 'part-whole relationship' (Lazarus, 1985: 776). However, at least one researcher has disagreed with this thesis (Lefcourt, 1976). He suggests that control persists over time (Goodwin, 1987: 14).

Some research has also implied that coping is related to the experience of the trauma independent of the person exposed to the stressor (Stouffer, 1949). More recently, it has been argued that orientation towards trauma may be a stable experience (Coll, 1985). Thus, the management of traumatic stress reactions are not necessarily receptive to cognitive management.

APPENDIX II

CLINICAL DEFINITIONS OF PTSD AND ACUTE STRESS DISORDER

DSM-III DIAGNOSTIC CRITERIA FOR POST-TRAUMATIC STRESS DISORDER (PTSD)

- A. Existence of a recognisable stressor that would evoke significant symptoms of distress in almost everyone.
- B. Re-experiencing of the trauma as evidenced by at least one of the following:
 1. Recurrent and intrusive recollections of the event;
 2. Recurrent dreams of the event;
 3. Sudden acting or feeling as if the traumatic event were re-occurring, because of an association with an environmental or ideational stimulus.
- C. Numbing of responsiveness to or reduced involvement with the external world, beginning after the trauma, as shown by at least one of the following:
 1. Markedly diminished interest in one or more significant activities;
 2. Feeling of detachment or estrangement from others;
 3. Constricted affect.
- D. At least two of the following symptoms, not present before the trauma:
 1. Hyper-alertness or exaggerated startle response;
 2. Sleep disturbance;
 3. Guilt about surviving when others have not, or about behaviour required for survival;
 4. Memory impairment or trouble concentrating;
 5. Avoidance of activities that arouse recollections of the traumatic event;
 6. Intensification of symptoms by exposure to events that symbolise or resemble the traumatic event.

Source: Diagnostic and Statistical Manual of Mental Disorders (1983), American Psychiatric Association, Washington DC.

DSM-IV DIAGNOSTIC CRITERIA FOR POST-TRAUMATIC STRESS DISORDER (PTSD)

- A. The person has been exposed to a traumatic event in which both of the following are present:
1. The person has experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others;
 2. The person's response involved intense fear, helplessness, or horror. Note: in children it may be expressed instead by disorganized or agitated behaviour.
- B. The traumatic event is persistently re-experienced in at least one of the following ways:
1. Recurrent and intrusive recollections of the event, including images, thoughts, or perceptions. Note: in young children, repetitive play may occur in which themes or aspects of the trauma are expressed;
 2. Recurrent distressing dreams of the event. Note: in young children, there may be frightening dreams without recognisable content;
 3. Acting and feeling as if the traumatic event were re-occurring (including a sense of reliving the experience, illusions, hallucinations and dissociative flashback episodes, including those that can occur upon awakening or when intoxicated). Note: in young children, trauma-specific reenactment may occur.
 4. Intense psychological distress at exposure to internal or external cues that symbolise or resemble an aspect of the trauma;
 5. Physiologic reactivity upon exposure to internal or external cues that symbolise or resemble an aspect of the trauma.
- C. Persistent avoidance of the stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by at least three of the following:
1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma;
 2. Efforts to avoid activities, places, or people that arouse recollections of the trauma;
 3. Inability to recall an important aspect of the trauma;
 4. Markedly diminished interest or participation in significant activities;
 5. Feeling of detachment or estrangement from others;
 6. Restricted range of affect (eg, unable to have loving feelings);
 7. Sense of foreshortened future (eg, does not expect to have a career, marriage, children, or a normal lifespan).
- D. Persistent symptoms of increased arousal (not present before the trauma) as indicated by at least two of the following:
1. Difficulty falling or staying asleep;
 2. Irritability or outbursts of anger;
 3. Difficulty concentrating;
 4. Hypervigilance;
 5. Exaggerated startle response.

E. Duration of the disturbance (symptoms B, C, and D) is more than one month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Note: Specify as follows:

ACUTE, if duration is less than three months

CHRONIC, if duration of symptoms is three months or more

DELAYED ONSET, if symptoms occur at least six months after exposure to the stressor.

Source: Diagnostic and Statistical Manual of Mental Disorders (1994) American Psychiatric Association, Washington DC.

DSM-IV DIAGNOSTIC CRITERIA FOR ACUTE STRESS DISORDER

- A. The person has been exposed to a traumatic event in which both of the following are present:
1. The person has experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others;
 2. The person's response involved intense fear, helplessness, or horror.
- B. Either while experiencing, or immediately after experiencing, the distressing event, the person has at least three of the following dissociative symptoms:
1. Subjective sense of numbing, detachment or absence of emotional responsiveness;
 2. A reduction in awareness of one's surroundings (eg, being in a daze);
 3. Derealization;
 4. Depersonalisation;
 5. Dissociative amnesia (ie, inability to recall an important aspect of the trauma).
- C. The traumatic event is persistently re-experienced in at least one of the following ways: recurrent images, thoughts, dreams, illusions, flashback, episodes; or a sense of reliving the experience; or distress upon exposure to reminders of the traumatic event.
- D. Marked avoidance of stimuli that arouse recollections of the trauma (eg, thoughts, feelings, conversations, activities, places or people).
- E. Marked symptoms of anxiety or increased arousal (eg, difficulty sleeping, irritability, poor concentration, hypervigilance, exaggerated startle response, and restlessness).
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning, or the individual is prevented from pursuing some necessary task, such as obtaining medical or legal assistance or mobilizing personal resources by telling family members about the traumatic experience.
- G. The symptoms last for a minimum of two days and a maximum of four weeks and occur within four weeks of the traumatic event.
- H. Not due to direct effects of a substance (eg, drugs of abuse, medication) or a general medical condition, and is not merely an exacerbation of a preexisting disorder.

Source: Diagnostic and Statistical Manual of Mental Disorders (1994) American Psychiatric Association, Washington DC.

APPENDIX III

SYMPTOMS OF THE DELAYED STRESS REACTION CHECKLIST

1. Depression;
2. Memory Impairment;
3. Sleep Disturbances;
4. Anger;
5. Survivor Guilt;
6. Anxiety;
7. Psychic or emotional numbing;
8. Hypersensitivity to justice;
9. Emotional constriction;
10. Problems with intimate relationships;
11. Loss of interest in work and activities;
12. Difficulty with authority figures;
13. Alienation;
14. Negative self-image;
15. Hyperalertness;
16. Flashbacks to Vietnam;
17. Fantasies of retaliation;
18. Fantasies of destruction;
19. Concern with humanistic values overlaid by hedonism;
20. Suicidal feelings and thoughts;
21. Avoidance of activities that arouse memories of traumas in war zone;
22. Tendency to react under stress with survival tactics;
23. Cynicism and distrust of government and authority;
24. Emotional distance from children, spouse and others;
25. Self-deceiving and self-punishing patterns of behaviour such as an inability to talk about war experiences, fear of losing others, and a tendency to fits of rage.

Note: Symptoms not in order of frequency or intensity

Source: Hickman (1987). In Williams (Ed., 198).

APPENDIX IV

CULTURAL DIFFERENCES IN LIFE EXPECTANCY BY AGE AND GENDER

COUNTRY	GENDER	BIRTH	AGE 1	AGE 10	AGE 20	AGE 40	AGE 60
Japan*	Male	75.61	75.01	66.25	56.50	37.35	19.94
(1987)	Female	81.39	80.76	71.94	62.05	42.54	24.00
UK (Scotland)*	Male	70.05	69.76	60.97	51.27	32.26	15.68
(1985)	Female	75.83	75.49	66.71	56.86	37.45	19.90
Hong Kong†	Male	75.10	*	*	*	*	*
(1992)	Female	80.70	*	*	*	*	*
Australia*	Male	72.77	72.50	63.74	54.13	35.39	18.10
(1986)	Female	79.13	78.84	69.94	60.13	40.71	22.54

Note: * No data

Source: * UN Demographics Yearbook (1988); † Hong Kong Government (1993)

APPENDIX V

LEVEL OF SICKNESS/ABSENTEEISM IN EMERGENCY SERVICES

It is known absenteeism may have damaging effects on intrusion and depression symptoms when personnel have greater opportunity for contemplation of incidents (Docherty, 1989; Laughlin, 1980; Arkin, 1977; Bates, 1987). Causes of absenteeism in some emergency services are particularly well known. In nurses, for example, the literature suggests absenteeism is usually influenced by traumatic stressors rather than levels of general pathology. Taylor & Cangemi (1988), for example, suggested nurse illness was caused by severe work-place stressors, a point supported by Haines et al (1991). Lam et al (1987) suggested that in Hong Kong carers mental health or psychological state influenced absenteeism. Landstergis (1988), Hisashige et al (1989) and Allanche (1988) also suggested that stressful incidents would be reflected in absenteeism.

Yet, some emergency services tend to be reluctant to collect - or at least reveal - systematic data on absenteeism/sickness. Data in Scottish fire services is not methodically collected, for example. In Hong Kong and Japan, data is unavailable in the literature or on request from emergency service or government sources (see Appendix V for details).

In Japan, it is particularly surprising to see the Japan Industrial Safety & Health Association excludes specific emergency service workers from its annual reviews (1990: 4). This is surprising, and disappointing, because some evidence suggests absenteeism/sickness in these emergency service workers may be high, and by inference there may be a link with work-trauma symptomatology.

Methodologically, (Horwitz et al, 1987) imply a link with at least intrusion and avoidance symptoms, which can appear in periods of inactivity associated with absenteeism or sick leave. UK fire-fighters are suggested to be probably absent/sick at 'apparently excessive' levels (6.25% of scheduled work days) compared to operational workers (4.75%; Home Office/Scottish Home and Health Department, 1990; Paton et al, 1992d). Data from Finland records sickness levels of operational personnel at 10% of available shifts

(Kurinka & Korhonen, 1981: 762). There is also evidence for abnormally high ill-health retirements in UK fire services: in 1989 seventy-four did (Home Office, 1990: 3). Below are three sets of available data on absenteeism in the UK:

A: OPERATIONAL VERSUS CONTROL PERSONNEL (1989-1991)

SICKNESS TYPE	1989		1990		1991		% CHANGE	
	Oper.'1	Control	Oper.'1	Control	Oper.'1	Control	Oper.'1	Control
Certified Sickness	4.02%	2.02%	4.65%	1.50%	4.40%	1.71%	+0.48%	-0.31%
Self-certified Sickness	1.28%	1.50%	1.22%	2.69%	1.33%	2.50%	-0.05%	+1.00%
Industrial Injury	0.61%	0.00%	0.92%	0.00%	0.52%	0.05%	+0.09%	+0.05%
Total	5.91%	3.52%	6.79%	4.19%	6.25%	4.26%	+0.34%	+0.74%

B: BY OCCUPATIONAL GROUPING (1991)

OCCUPATIONAL GROUP	TOTAL	(...OF WHICH SELF-CERTIFIED)
Civilian	4.75%	(1.59%)
Control	4.26%	(2.50%)
Uniformed	6.25%	(1.33%)

C: LOCAL & NATIONAL COMPARISONS (1991)

CATEGORY	NATIONAL AVERAGE	REGIONAL AVERAGE	EMERGENCY SERVICE
Manual	4.70%	6.75%	6.06%
Non-Manual	2.50%	4.29%	3.45%

D. THE COLLECTION OF SICKNESS/ABSENTEEISM DATA

Note that sickness levels in UK fire services are not methodically collected, and official policy is ambiguous towards this collection. The Home Office has implied the lack of data is acceptable (1990: 23), for example, but also that 'this position should continue to be [annually] reviewed (Home Office report, February, 1990: 3).

Partly, this may be attributable to difficulties in measurement and definition. In 1989, levels of sickness in fire services collected 'voluntarily' oscillated between 2.8% and 13% (Home Office/Scottish Home and Health Department Report, 1990), a dramatic variance. The data was silent on how sickness levels were attributable to personnel on 'long-term sick leave' (Home Office/Scottish Home and Health Department Report, 1990).

Partly, there is probably confusion on how to use even reliable data. Although there is a suggestion that fire services with high absenteeism 'should consider' occupational health schemes (Home Office/Scottish Home and Health Department Report, 1990), these are often couched in fundamental terms. Some absentee's monitoring may be related to retention of staff by avoiding 'premature' retirements through ill-health (Home Office report, February, 1990: 3); one fire service in the UK has even proposed 'welfare visits' (Home Office/Scottish Home and Health Department Report, 1990).

The only consistent theme in the proposed interventions in the UK appears to avoid attributing absenteeism to lack of fitness. This may be ironic as in other cultural settings '...control of body weight has been one of the major issues in corporate fitness programs' aimed at reducing absenteeism due to ill-health (Doya et al, 1989: 3). Whilst future researchers may wish to establish a longitudinal data-base of self-report data from emergency service personnel returning from sick leave, such projects would probably need to be confined to limited periods to ensure completion rates were high. This could never be as comprehensive as a formal, longitudinal and thorough organisational initiative.

APPENDIX VI

SUMMARY QUESTIONNAIRE DATA

Variable	Responses & means		
	UK	Japan	Hong Kong
No. of Variables	124	154*	124
Distribution	70	750	66
No. Returned	68	688	60
% Returned	97.14%	91.73%	90.91%
Method of collection	via fire service	via fire service	via fire service
Rank	1.66	1.99	1.70
Length of Service	12.01	16.92	13.63
Hours worked last week	4.04	4.01	2.49
Joining Age	23.45	20.36	21.90
Absenteeism in last 3 months	1.47	1.43	1.52
Age	35.59	37.23	35.53
Educational level	2.32	2.38	2.76
Marital Status	2.01	1.82	1.85
Exercise frequency last week	2.61	2.12	2.28
Work status of partner	2.07	1.85	1.82
Hours worked by partner	4.91	4.50	1.57
Fire Service Relatives	1.87	1.92	1.92
Uniformed Service Relatives	1.86	1.76	1.83

Notes: Rank (8 responses, 1 = fire-fighter, 2 = Leading fire-fighter); Length of Service (continuous response); hours worked (8 responses, 2 = standard watch without overtime, 3 = 35-40 hours, 4 = 40-45 hours, 5 = 45-50 hours); joining age (continuous response); absenteeism (4 responses, 1 = no days, 2 = 1-3 days); age (free response); educational level (5 comparable responses, 2 = completed to age 16, 3 = further education); marital status (3 responses, 1 = single, 2 = married); exercise frequency in last week (4 responses, 2 = once, 3 = twice); work status of partner (3 responses, 2 = No, 3 = not applicable); hours worked by partner per week (8 responses, 1 = < 10 hours, 2 = 10-20 hours, 4 = 25-30 hours, 5 = 30-35 hours); fire service relatives (2 responses, 1 = yes, 2 = no); uniformed service relatives (2 responses, 1 = yes, 2 = no).

Key: * There are a larger amount of variables in the Japanese questionnaire due to the inclusion of a 30-item scale on working environment. This was not used in this research due to a lack of comparative data in UK and Hong Kong.

APPENDIX VII

LEVEL OF INTRUSION & AVOIDANCE SYMPTOMS IN POPULATIONS EXPOSED TO TRAUMA

SAMPLE	n.	AUTHOR(S) & YEAR	INTRUSION	AVOIDANCE
Vietnam veterans	74	Wilson et al (1978)	20.32	20.42
Death of sig. other	96	Wilson et al (1978)	15.31	16.93
Rape Victim	9	Wilson et al (1978)	20.00	20.78
Divorce	13	Wilson et al (1978)	19.31	19.92
Serious Illness	19	Wilson et al (1978)	14.79	15.58
Life Threat	62	Wilson et al (1978)	11.58	12.87
Family Trauma	16	Wilson et al (1978)	14.88	17.75
Multiple Trauma	27	Wilson et al (1978)	17.11	18.78
<i>Medical Dissection</i>	110	<i>Horowitz et al (1979)</i>	4.30	5.50
Stress Clinic Patients	66	Horowitz et al (1979)	21.30	17.35
<i>Piper Alpha Fire (P)</i>	71	<i>Alexander & Wells (1990)</i>	4.81	5.02
<i>Armenia Rescue (FF)</i>	16	<i>Paton (1990)</i>	5.75	5.20
<i>Armenia Rescue (Vol)</i>	13	<i>Paton (1990)</i>	2.23	1.07
<i>Romania Carers/Nurses</i>	18	<i>Paton & Purves (1991)</i>	17.39	18.50
<i>Japanese Fire-fighters</i>	668	<i>Ramsay (1992)</i>	2.67	2.43
<i>Scottish Fire-fighters</i>	70	<i>Paton et al (1992)</i>	2.31	1.73
<i>Hong Kong Fire-fighters</i>	60	<i>Ramsay (1993)</i>	11.70	10.90

Note:

- Samples italicized experienced traumatic stressors as part of occupational life. Mean scores for this sub-group are Intrusion 6.99 & Avoidance 7.04
- Scores for the remaining samples, not experiencing trauma as part of occupational life, are Intrusion 15.68 & Avoidance 16.15.

APPENDIX VIII

COPIES OF QUESTIONNAIRE INSTRUMENTS

The following pages contain copies of the original questionnaire instruments used in each cultural setting. The original questionnaires are un-marked but the following order is used throughout this appendix:

1. English language version
2. Japanese language version
3. Chinese language version

For readers unfamiliar to these languages, Japanese can be recognized as a combination of kanji (Chinese ideograms) and two syllabries. These are the angular kata-kana and the cursive hira-gana. Chinese is composed entirely of ideograms.

A second way to recognize questionnaires is that the Chinese language version transcribes the English version verbatim first. This is because English is presently the joint official language of Hong Kong. Thus, the fact that Chinese translations visibly follow, not proceed, the English in these questionnaire instruments should be understood as because this is mandated by government policy. It is not because respondents are bi-linguals or English-speaking only.

Note also that for the Chinese language versions, the dialect used in translation is Cantonese. Future researchers using this scale in Mandarin-speaking areas of China and Taiwan are advised to consult local translation experts for the subtle changes this dialect involves. The importance of auditing translation is discussed in Chapter Three.

The questionnaire instruments are, in order, the IES-15 (Impact of Event Scale; Horowitz et al, 1979), the HAD-15 (Hospital and Anxiety Depression Scale; Zigmond & Snaith, 1987), and the HSCL-21 (Hopkins symptom check-list; Green et al, 1988). These are designated throughout this appendix with a cover page.

Demographic, daily habits and confidants questionnaires follow, again in the same order of language.

THE IMPACT OF EVENT SCALE

1. English language version
2. Japanese language version
3. Chinese language version

THE LONG-TERM EFFECTS OF THE INCIDENT

This is a list of the way events have affected people some time after their involvement in traumatic incidents.

For each of the following statements list how many times you have experienced them in the last four weeks. If they do not apply to you, please circle Number 1 (Never).

Please use the following scale:

- 1 - Never
- 2 - Rarely (once or twice)
- 3 - Occasionally (three or four times)
- 4 - Frequently (more than five times)

I had waves of strong feelings about the event.	1	2	3	4
Things I saw or heard suddenly reminded me of the event.	1	2	3	4
I thought about it when I did not mean to.	1	2	3	4
Images related to the event popped into my mind.	1	2	3	4
Any reminder brought back emotions related to the event.	1	2	3	4
I have difficulty falling asleep because of images or thoughts related to the event.	1	2	3	4
I had bad dreams related to the event.	1	2	3	4
I knew that a lot of unresolved feelings were still there, but I kept these under wraps.	1	2	3	4
I avoided letting myself get emotional when I thought about, or was reminded of, the event.	1	2	3	4
I wished to banish it from my store of memories.	1	2	3	4
I made an effort to avoid talking about it.	1	2	3	4
I felt unrealistic about it, as if the event had not happened or as if it was not real.	1	2	3	4
I stayed away from things and situations that might remind me of the event.	1	2	3	4
My emotions related to the experience were kind of numb.	1	2	3	4
I didn't let myself have thoughts about it.	1	2	3	4

精神的ショックによる長期的影響

以下は、大きな精神的ショックを与える出来事（以下、事件と称す）に遭遇した人々が以後その事件によりどのような影響を受けたかをまとめたものです。それぞれの項目について、あなたが過去4週間にそれらの状況をどのくらい経験したか、該当する番号を下の表から選んでそれぞれ右欄の番号を○で囲んで下さい。

番号表

- 「まったく経験しなかった」ならば・・・1
- 「1、2回経験した」ならば・・・2
- 「3、4回経験した」ならば・・・3
- 「5回以上経験した」ならば・・・4

急に事件の衝撃がよみがえった	1	2	3	4
何かを見たり聞いたりした拍子に事件を思い出した	1	2	3	4
思い出すつもりはないのに				
事件のことを思い出してしまった	1	2	3	4
事件の情景が急に頭に浮かんだ	1	2	3	4
何かにつけ、事件のときの感情がよみがえった	1	2	3	4
事件の情景や衝撃が原因でよく眠れなかった	1	2	3	4
事件が原因で悪い夢にうなされた	1	2	3	4
事件が原因で精神的に不安定になっているが、				
それを表に出さないようにしている	1	2	3	4
事件のことを思い出しても				
感情的にならないようにした	1	2	3	4
事件のことを忘れたと思った	1	2	3	4
事件について話さないようにした	1	2	3	4
そのような事件など実際には				
起こらなかったかのように感じた	1	2	3	4
事件を思い出させることには				
近づかないようにした	1	2	3	4
事件に関しては感覚がマヒしてしまったようだった	1	2	3	4
事件のことは考えないようにした	1	2	3	4

事件對你造成的長期影響

This is a list of the way events have affected people some time after their involvement in traumatic incidents.

下表列出救援人員在處理傷亡事件一段時間之後所受的影響。

For each of the following statements list how many times you have experienced them in the last four weeks. If they do not apply to you, please circle Number 1 (Never).

請回答你在過去四星期內經歷下文所述感受的次數。如你沒有所述感受，請選擇「1」（絕無）。

Please use the following scale :

請根據以下分表作答：

1 - Never

絕無

2 - Rarely (once or twice)

甚少（一、兩次）

3 - Occasionally (three or four times)

間中（三、四次）

4 - Frequently (more than five times)

經常（超過五次）

I had waves of strong feelings about the event. 1 2 3 4

對事件的情緒久久不能平伏。

Things I saw or heard suddenly reminded me of the event. 1 2 3 4

某些物件或聲音突然勾起對那事的回憶。

I thought about it when I did not mean to. 1 2 3 4

無緣無故想起那事。

Images related to the event popped into my mind. 1 2 3 4

腦海中湧現處理那事時的情景。

Any reminder brought back emotions related to the event. 1 2 3 4

任何與那事有關的事物都令處理事件時的情緒再次出現。

Your mind occasionally going blank.

1 2 3 4

腦中腦海一片空白

Either a numbness or tingling in your body.

1 2 3 4

身體麻痺或刺痛

A lump in your throat.

1 2 3 4

喉嚨疼痛

Trouble in concentrating.

1 2 3 4

難以集中精神

Feelings of weakness in parts of your body.

1 2 3 4

身體某些部分疲弱

Occasionally 'heavy' feelings in your arms and legs.

1 2 3 4

腦中手脚「沉重」

THE HOSPITAL ANXIETY AND DEPRESSION SCALE

1. English language version
2. Japanese language version
3. Chinese language version

HAD Scale

Please read each item and tick the box opposite the reply which comes closest to how you have been feeling *in the past week*. Don't take too long over your replies: your immediate reaction to each item will probably be more accurate than a long thought-out response.

Tick only one box in each section

I feel tense or 'wound up':

- Most of the time
- A lot of the time
- Time to time, Occasionally
- Not at all

<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

I feel as if I am slowed down:

- Nearly all the time
- Very often
- Sometimes
- Not at all

<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

I still enjoy the things I used to enjoy:

- Definitely as much
- Not quite so much
- Only a little
- Hardly at all

<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

I get a sort of frightened feeling like 'butterflies' in the stomach:

- Not at all
- Occasionally
- Quite often
- Very often

<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

I get a sort of frightened feeling as if something awful is about to happen:

- Very definitely and quite badly
- Yes, but not too badly
- A little, but it doesn't worry me
- Not at all

<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

I have lost interest in my appearance:

- Definitely
- I don't take so much care as I should.....
- I may not take quite as much care
- I take just as much care as ever

<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

I can laugh and see the funny side of things:

- As much as I always could
- Not quite so much now
- Definitely not so much now
- Not at all

<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

I feel restless as if I have to be on the move:

- Very much indeed
- Quite a lot
- Not very much
- Not at all

<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

Worrying thoughts go through my mind:

- A great deal of the time
- A lot of the time
- From time to time but not too often
- Only occasionally

<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

I look forward with enjoyment to things:

- As much as ever I did
- Rather less than I used to
- Definitely less than I used to
- Hardly at all

<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

I feel cheerful:

- Not at all
- Not often
- Sometimes
- Most of the time

<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

I get sudden feelings of panic:

- Very often indeed
- Quite often
- Not very often
- Not at all

<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

I can sit at ease and feel relaxed:

- Definitely
- Usually
- Not often
- Not at all

<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

I can enjoy a good book or radio or TV programme:

- Often
- Sometimes
- Not often
- Very seldom

<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

過去7日間について

それぞれの文章を読み、過去7日間のあなたの私生活および職場での精神状態についてもっともよくあてはまると思われるものを選んで下さい。回答に際してはあまり時間をかけずに、あてはまると瞬間的に思われるものを一つだけ選んで枠内に○印をつけて下さい。

緊張感や不安感を感じましたか？

いつも感じた _____
よく感じた _____
ときどき感じた _____
まったく感じなかった _____

趣味や好きな事を以前と同様に楽しめましたか？

以前と同様に楽しんだ _____
以前ほどは楽しめなかった _____
少ししか楽しめなかった _____
まったく楽しめなかった _____

今にもわずらわしい事が起こりそうな感じがしましたか？

非常に強く感じた _____
それほどではないがかなり感じた _____
多少は感じるが気がかりにはならなかった _____
まったく感じなかった _____

おもしろい事を素直に笑うことができましたか？

以前と同様にできた _____
以前ほどはできなかった _____
以前と比べてほとんどできなかった _____
以前と比べてまったくできなかった _____

この7日間で不安を感じたことがありましたか？

いつも感じた _____
よく感じた _____
ときどき感じた _____
ごくたまにしか感じなかった _____

この7日間を楽しく過ごせましたか？

まったく楽しくなかった _____
ごくたまにしか楽しく過ごせなかった _____
ときどき楽しく過ごせた _____
だいたい楽しく過ごせた _____

リラックスした気分になれましたか？

いつもなれた _____
たいていなれた _____
ときどきならなれた _____
まったくなれなかった _____

無気力を感じましたか？

いつも感じた _____
よく感じた _____
ときどき感じた _____
まったく感じなかった _____

胃がむかむかするような恐ろしい事がありましたか？

まったくなかった _____
ときどきあった _____
よくあった _____
いつもそうだった _____

自分の身なりに気をつかわなくなりましたか？

まったく気をつかわなくなった _____
あまり気をつかわなくなった _____
以前ほど気をつかわなくなった _____
以前と同様に気をつかった _____

あせりを感じて落ち騒かないことがありましたか？

非常にあった _____
かなりあった _____
あまりなかった _____
まったくなかった _____

楽しみにする事がありましたか？

以前と同様にあった _____
以前ほどなかった _____
以前と比べてほとんどなかった _____
まったくなかった _____

突然恐怖感を感じる事がありましたか？

非常によくあった _____
よくあった _____
あまりなかった _____
まったくなかった _____

読書やラジオ、テレビを楽しむことができましたか？

よく楽しんだ _____
ときどき楽しんだ _____
あまり楽しめなかった _____
ほとんど楽しめなかった _____

Please read each item and tick the box opposite the reply which comes closest to how you have been feeling in the past week. Don't take too long over your replies: your immediate reaction to each item will probably be more accurate than a long thought-out response.

請閱讀下文各項，並在最能形容你在過往一星期內的情緒的格子中加上「✓」號。切勿考慮過久，對每項問題的即時反應會較長時間考慮後的答案更為準確。

Tick only one box in each

每題只可選擇一個答案

I feel tense or 'wound up' :

情緒緊張

Most of the time
經常

A lot of the time
時常

Time to time, Occasionally
偶然

Not at all
絕無

I feel as if I am slowed down :

自覺幹勁減退

Nearly all the time
經常

Very often
時常

Sometimes
有時

Not at all
絕無

I still enjoy the things I used to enjoy :

對於向來喜歡的事物

Definitely as much
興趣不減

Not quite so much
興趣略減

Only a little
興趣大減

Hardly at all
毫無興趣

I get a sort of frightened feeling like 'butterflies' in the stomach:

恐懼顫抖

Not at all
絕無

Occasionally
偶然

Quite often
時常

Very often
經常

I get a sort of frightened feeling as if something awful is about to happen :

驚怕大禍臨頭

Very definitely and quite badly

非常恐懼
Yes, but not too badly

頗有此感
A little, but it doesn't worry me

略有此感
Not at all

無此感覺

I have lost interest in my appearance :

對於修飾儀容

Definitely

提不起勁
I don't take so much care as I should

興趣大減
I may not take quite as much care

興趣略減
I take just as much care as ever

興趣不減

I can laugh and see the funny side of things :

樂天幽默

As much as I always could

一如以往
Not quite so much now

不及以往
Definitely not so much now

大不如前
Not at all

絕無此感

I feel restless as if I have to be on the move :

坐立不安

Very much indeed

極度不安
Quite a lot

頗有此感
Not very much

略有此感
Not at all

無此感覺

Worrying thoughts go through my mind :

焦慮擔憂

A great deal of time

經常
A lot of the time

時常
From time to time but not too often

間中
Only occasionally

偶然

I look forward with enjoyment to things :

對未來充滿憧憬

As much as ever I did

一如以往
Rather less than I used to

不及以往
Definitely less than I used to

大不如前
Hardly at all

絕無此感

I feel cheerful :

心情愉快

Not at all

绝不

Not often

甚少

Sometimes

有時

Most of the time

經常

I get sudden feelings of panic :

突然感到心慌意亂

Very often indeed

經常

Quite often

時常

Not very often

偶然

Not at all

絕無

I can sit at ease and feel relaxed :

心緒安寧

Definitely

肯定

Usually

通常

Not often

甚少

Not at all

绝不

I can enjoy a good book or radio or TV programme :

能從閱讀、收聽電台及收看電視節目中得到樂趣

Often

經常

Sometimes

有時

Not often

偶然

Very seldom

絕少

THE HOPKINS SYMPTOM CHECK LIST SCALE

1. English language version
2. Japanese language version
3. Chinese language version

THE LAST SEVEN DAYS

This is a summary of reactions that have been reported by some people who have been involved in disasters and other infrequent, but dangerous and occasionally fatal, situations. Many of the reactions may be something you have never experienced, or perhaps something that you have experienced when you were younger, but that don't affect you any more.

If this is the case, please *don't* say so.

Instead, decide how much each of the points may have applied to you **during the past seven days: only describe what you may have felt like in the last week.** Use this scale, which is virtually the opposite of the last one, for your answers:

<i>Not at all</i>	1
<i>A little bit</i>	2
<i>Quite a bit</i>	3
<i>Extremely</i>	4

How much did each of the following apply to you in the last seven days..?

- | | | | | |
|--|---|---|---|---|
| • Difficulty in speaking at times of excitement | 1 | 2 | 3 | 4 |
| • Trouble in remembering things | 1 | 2 | 3 | 4 |
| • Concerns about sloppiness or carelessness. | 1 | 2 | 3 | 4 |
| • Blaming yourself for things. | 1 | 2 | 3 | 4 |
| • Pains in the lower part of your back. | 1 | 2 | 3 | 4 |
| • Feeling lonely. | 1 | 2 | 3 | 4 |
| • Feeling 'blue' | 1 | 2 | 3 | 4 |
| • Your feelings being easily hurt. | 1 | 2 | 3 | 4 |
| • Feeling that others do not understand you, or are unsympathetic. | 1 | 2 | 3 | 4 |
| • Feeling that people are unfriendly, or dislike you. | 1 | 2 | 3 | 4 |
| • Having to do things very slowly, to ensure that you are doing them properly. | 1 | 2 | 3 | 4 |
| • Feeling inferior to others. | 1 | 2 | 3 | 4 |
| • Muscle soreness. | 1 | 2 | 3 | 4 |
| • Having to check and double-check what you do. | 1 | 2 | 3 | 4 |
| • Occasional hot or cold spells. | 1 | 2 | 3 | 4 |
| • Your mind occasionally going blank. | 1 | 2 | 3 | 4 |
| • Either a numbness or tingling in your body. | 1 | 2 | 3 | 4 |
| • A lump in your throat. | 1 | 2 | 3 | 4 |
| • Trouble in concentrating. | 1 | 2 | 3 | 4 |
| • Feelings of weakness in parts of your body. | 1 | 2 | 3 | 4 |
| • Occasional 'heavy' feelings in your arms and legs. | 1 | 2 | 3 | 4 |

ストレスの兆候

以下は、事故およびその他の人命にかかわる危険な状況に立ち会った警官・救急隊員等がその事故の影響としてあげた精神状態をまとめたものです。それぞれの項目が過去7日間の自分にどの程度当てはまるか、該当する番号を下の表から選んでそれぞれ右欄の番号を○で囲んで下さい。これらの項目の多くは、あなたが一度も経験したことがないことかもしれませんし、あるいは過去において経験したことはあるが現在はもう何の影響も及ぼさないものであるかもしれません。

いずれにせよ、過去7日間の自分の精神状態をふりかえり、それぞれの項目がどれほど当てはまるか、を答えて下さい。

番号表

- 「まったく当てはまらない」ならば・・・1
- 「少し当てはまる」ならば・・・・・・2
- 「かなり当てはまる」ならば・・・・・・3
- 「非常に当てはまる」ならば・・・・・・4

興奮すると話せなくなる	1	2	3	4
記憶力が落ちた	1	2	3	4
仕事が雑で注意深さに欠ける	1	2	3	4
自責の念にかられる	1	2	3	4
腰痛がある	1	2	3	4
孤独感を感じる	1	2	3	4
憂うつになる	1	2	3	4
物事に傷つきやすい	1	2	3	4
周囲の人々が自分を理解してくれないと感じる	1	2	3	4
周囲の人々がよそよそしく、 自分を嫌っているように感じる	1	2	3	4
仕事を正確にやろうとすると 動作が非常にのろくなる	1	2	3	4
他人に対して劣等感を感じる	1	2	3	4
筋肉痛がある	1	2	3	4
自分のした仕事を何度もチェック しないと気がすまない	1	2	3	4
ときどき急に暑くなったり寒くなったりする	1	2	3	4
ときどき何も考えられなくなる	1	2	3	4
身体の一部が無感覚になったり ヒリヒリ麻んだりする	1	2	3	4
喉に何かつかかえているような気がする	1	2	3	4
集中力が低下した	1	2	3	4
身体の一部に力が入らない	1	2	3	4
ときどき手足が重く、だるく感じる	1	2	3	4

How much do each of the following apply to you in the last seven days..?
 在過去七天裏，你曾否有以下的感覺？

Difficulty in speaking at times of excitement. 情緒緊張時說話困難	1 2 3 4
Trouble in remembering things. 記憶力衰退	1 2 3 4
Concerns about sloppiness or carelessness. 擔心自己散漫或疏忽	1 2 3 4
Blaming yourself for things. 自責	1 2 3 4
Pains in the lower part of your back. 腰背疼痛	1 2 3 4
Feeling lonely. 孤獨	1 2 3 4
Feeling 'blue'. 情緒低落	1 2 3 4
Your feelings being easily hurt. 感情脆弱	1 2 3 4
Feeling that others do not understand you, or are unsympathetic. 不獲瞭解或同情	1 2 3 4
Feeling that people are unfriendly, or dislike you. 別人態度不友善或厭惡	1 2 3 4
Having to do things very slowly, to ensure that you are doing them properly. 因要確保事情辦得妥當而效率極低	1 2 3 4
Feeling inferior to others. 自卑	1 2 3 4
Muscle soreness. 肌肉疼痛	1 2 3 4
Having to check and double-check what you do. 須反覆核對自己有否做錯	1 2 3 4
Occasional hot or cold spells. 間中發熱或發冷	1 2 3 4

I have difficulty falling asleep because of images or thoughts related to the event.

1 2 3 4

因想起那事或其中情景而難以入睡。

I had bad dreams related to the event.

1 2 3 4

事件在噩夢中出現。

I knew that a lot of unresolved feelings were still there, but I kept these under wraps.

1 2 3 4

自知心緒不寧，但不願在人前顯露。

I avoided letting myself get emotional when I thought about, or was reminded of, the event.

1 2 3 4

想起那事時壓抑自己的情緒。

I wished to banish it from my store of memories.

1 2 3 4

希望事件從記憶中消失。

I made an effort to avoid talking about it.

1 2 3 4

竭力迴避談及那事。

I felt unrealistic about it, as if the event had not happened or as if it was not real.

1 2 3 4

覺得事件虛假，好像從沒發生，或並非真實。

I stayed away from things and situations that might remind me of the event.

1 2 3 4

遠離可能勾起對事件的回憶的事物和環境。

My emotions related to the experience were kind of numb.

1 2 3 4

對那事的經過感覺麻木。

I didn't let myself have thoughts about it.

1 2 3 4

避免回想起那事。

EMPLOYMENT AND PERSONAL BACKGROUND

1. English language version
2. Japanese language version
3. Chinese language version

EMPLOYMENT AND PERSONAL BACKGROUND

- RANK/POST
- SEX
- AGE
- AGE WHEN JOINED BRIGADE
- YEARS IN EACH RANK

or

Firefighter	Station(s)
Leading FF.....	.....
Sub Officer .....	.....
Station Officer .....	.....
A.D.O. ....	.....
D.O. ....	.....
S.D.O. ....	.....
Asst. F.M. ....	.....
Dep. F.M. ....	.....
F.M. ....	.....

- YEARS IN EACH POST:

First	Station(s)
Second .....	.....
Third .....	.....
Fourth .....	.....
Fifth .....	.....
Sixth .....	.....
Seventh .....	.....
Others .....	.....

- EDUCATION (Tick all levels of held qualifications):

Secondary 'O'	
Secondary 'A'	
Trade	Type
Further	
Higher	

- HOURS WORKED IN THE LAST SEVEN DAYS (including time on call):

Part time, less than ten hours.....
Standard watch, without overtime
Standard watch, with overtime
35-40 hours
40-45 hours
45-50 hours
Under 60 hours
Under 70 hours
Other (please state)

職務および個人に関するデータ

階級

性別

満年齢

何歳のときに消防士として勤務し始めましたか？

これまでに経た階級とそれぞれの勤務年数

1. 消防総監 _____
2. 消防司監 _____
3. 消防正監・消防長 _____
4. 消防監・消防次長 _____
5. 消防司令長・署長 _____
6. 消防司令・分(副)署長 _____
7. 消防司令補・中隊長 _____
8. 消防士長・小隊長または分隊長 _____
9. 消防副士長 _____
10. 消防士 _____

最終学歴

1. 中卒 _____
2. 高卒 _____
3. 短大・専修学校卒 _____
4. 四年制大卒 _____

過去7日間に何時間勤務しましたか？(自宅待機中も含む)

1. パートタイムで十時間未満 _____
2. 標準シフト 残業なし _____
3. 標準シフト 残業あり _____
4. 35-40時間 _____
5. 40-45時間 _____
6. 60時間未満 _____
7. 70時間未満 _____
8. その他(具体的に明記して下さい) _____

EMPLOYMENT AND PERSONAL BACKGROUND

受聘紀錄及個人背景資料

RANK/POST

職級 / 職位

SEX.....

性別

AGE.....

年齡

AGE WHEN JOINED THE SERVICES.....

入職年齡

YEARS IN EACH RANK

擔任下列職級的年數：

Fireman.....	Station(s)	.....	年
消防員	消防局		
Senior Fireman.....	消防局	.....	年
消防隊目	消防局		
Principle Fireman.....	消防局	.....	年
消防總隊目	消防局		
Station Officer.....	消防局	.....	年
消防隊長	消防局		
Senior Station Officer.....	消防局	.....	年
高級消防隊長	消防局		
A.D.O.	消防局	.....	年
助理消防區長	消防局		
D.O.	消防局	.....	年
消防區長	消防局		
S.D.O.	消防局	.....	年
高級消防區長	消防局		
D.C.F.O.	消防局	.....	年
副消防總長	消防局		
C.F.O.	消防局	.....	年
消防總長	消防局		

YEARS IN EACH POST :

駐守不同崗位的年數：

First 第一個崗位	..... Station(s) 消防局	..... 年
Second 第二個崗位	..... 消防局	..... 年
Third 第三個崗位	..... 消防局	..... 年
Fourth 第四個崗位	..... 消防局	..... 年
Fifth 第五個崗位	..... 消防局	..... 年
Sixth 第六個崗位	..... 消防局	..... 年
Seventh 第七個崗位	..... 消防局	..... 年
Others 其他崗位	..... 消防局	..... 年

EDUCATION (Tick all levels of held qualifications) :
教育程度：

Completing F.3	完成中三課程
Completing F.5	完成中五課程
Secondary	會考五科合格
Higher Level	高等程度考試合格
Advanced Level	高級程度考試合格
Post Secondary	專上學院畢業
University Graduate	大學畢業
Others	其他

HOURS WORKED IN THE LAST SEVEN DAYS (including time on call) :

過去七天的工作時數 (包括候命時間) :

Standard watch, without overtime
一般當班時間 (無超時工作)

Standard watch, with overtime
一般當班時間 (有超時工作)

35-40 hours
35至40小時

40-45 hours
40至45小時

45-50 hours
45至50小時

Under 60 hours
60小時以下

Under 70 hours
70小時以下

Other (please state)
其他 (請註明)

FAMILY

1. English language version
2. Japanese language version
3. Chinese language version

FAMILY

□ MARRIAGE.

Unmarried.....
Married
Other

If applicable, how long has your current marriage been for?

.....

□ AGE OF CHILDREN:

First Child
Second Child
Third Child

□ FAMILY JOBS:

Are any of your *immediate* relatives current or past employees of the Brigade?

Yes
No

Are any of your *immediate* relatives employed in other uniformed services?

Yes
No

Does your wife, husband or partner work?

Not applicable
Yes
No

If so, for how many hours did they work last week?

Part time, less than 10 hours
10-20 hours per week
20-25 hours per week
25-30 hours per week
30-35 hours per week
35-40 hours per week
Over 40 hours per week
Over 50 hours per week

家族について

結婚していますか？

1. 独身 _____
2. 既婚 _____
3. その他 _____

既婚の場合、結婚してからどのくらいになりますか？

() 年 () 月

子供は何歳ですか？

1. 第一子 満 () 歳
2. 第二子 満 () 歳
3. 第三子 満 () 歳

家族の就業状況：

家族の中で現在または過去において消防署勤務の経験をもつ人がいますか？

1. はい _____
2. いいえ _____

家族の中で警察・軍隊等での勤務経験をもつ人がいますか？

1. はい _____
2. いいえ _____

あなたの配偶者または働いていますか？

1. はい _____
2. いいえ _____
3. 該当せず _____

「はい」の場合、この一週間間に何時間くらい働きましたか？

- パートで10時間未満 _____
- イ. 10 - 20 時間 _____
 - ロ. 20 - 25 時間 _____
 - ハ. 25 - 30 時間 _____
 - ニ. 30 - 35 時間 _____
 - ホ. 35 - 40 時間 _____
 - ヘ. 40 時間以上 _____
 - ト. 50 時間以上 _____

FAMILY
家庭狀況

MARRIAGE

婚姻狀況：

Unmarried

未已婚

Married

未婚

Other

其他

If applicable, how long has your current marriage been for?

已婚者請填寫結婚年數：

..... 年

AGE OF CHILDREN :

子女年齡：

First Child

第一名子女 歲

Second Child

第二名子女 歲

Third Child

第三名子女 歲

FAMILY JOBS :

家庭成員的職業：

Are any of your immediate relatives current or past employees of the service?

現時或以往是否有近親受僱於本處？

Yes

是

No

否

Are any of your immediate relatives employed in other uniformed services?

是否有近親受僱於其他紀律部隊？

Yes

是

No

否

Does your wife work?

妻子是否在外工作？

Yes
是

No
否

Not applicable
不適用

If so, for how many hours did she work last week?

妻子如在外工作，上星期共工作多少小時？

Part time, less than 10 hours

非全職工作（不足10小時）

10-20 hours per week

10至20小時

20-25 hours per week

20至25小時

25-30 hours per week

25至30小時

30-35 hours per week

30至35小時

35-40 hours per week

35至40小時

Over 40 hours per week

超過40小時

Over 50 hours per week

超過50小時

DAILY HABITS

1. English language version
2. Japanese language version
3. Chinese language version

DAILY HABITS

The following questions refer to current habits, the exercise you take and so on. Please tick only one line for each question.

How many cigarettes on an average day did you smoke in the last month?
(consider one cigar or pipe the equivalent of a cigarette)

- None
- Under 5
- 5-10
- Under 20
- Under 50
- Over 60

How did your smoking change when events at work during this month were more demanding than on average?

- Fell Significantly
- Fell a little
- Increased a little
- Increased significantly

How many drinks of alcohol, on an average day, did you have in the last month?
(consider a 'glass' as a pint of beer, a single measure of spirits or a glass of wine)

- None
- 2-3 drinks
- Under 5 drinks
- 5-7 drinks
- Under 10 drinks
- Over 15 drinks

How did your drinking change when events at work during the last month were more demanding than on average? (Again, there is no line for 'stayed the same')

- Fell Significantly
- Fell a little
- Increased a little
- Increased significantly

How did the amount of food you eat change when events at work during the last month were more demanding than on average?

- Fell Significantly
- Fell a little
- Increased a little
- Increased significantly

Did you actively pursue an interest or play some sport last week (excluding social or drinking events)?

- Not at all
- Once
- Twice
- Three or more times.....

How many days in the last three months have you been absent from work, owing to illness?

- None
- 1-3 days
- 3-6 days
- Over 7 days

日常習慣

以下は、日常習慣に関するアンケートです。それぞれの質問に対し、当てはまるものを一つだけ選んで○をつけて下さい。

この一ヶ月の間で、一日平均何本位タバコを吸いましたか？

- イ. 0本 _____
- ロ. 5本未満 _____
- ハ. 5 - 10本 _____
- ニ. 20本未満 _____
- ホ. 50本未満 _____
- ヘ. 60本以上 _____

この一ヶ月の間で、仕事上処理しなければならない事が増えたとき、あなたのタバコの本数はどのように変わりましたか？

- 1. 著しく減少した _____
- 2. やや減少した _____
- 3. やや増加した _____
- 4. 著しく増加した _____

この一ヶ月の間で、一日平均どのくらいのアルコールを飲みましたか？

- イ. 0 _____
- ロ. 2 - 3杯 _____
- ハ. 5杯未満 _____
- ニ. 5 - 7杯 _____
- ホ. 10杯未満 _____
- ヘ. 15杯以上 _____

この一ヶ月の間で、仕事上処理しなければならない事が増えたとき、あなたの飲酒量はどのように変化しましたか？

- 1. 著しく減少した _____
- 2. やや減少した _____
- 3. やや増加した _____
- 4. 著しく増加した _____

この一ヶ月の間で、仕事上処理しなければならない事が増えたとき、あなたの食事量はどのように変化しましたか？

- 1. 著しく減少した _____
- 2. やや減少した _____
- 3. やや増加した _____
- 4. 著しく増加した _____

この一週間の中に、趣味やスポーツをはじめとする諸活動（ただしパーティーおよび宴会等を除く）を積極的にしましたか？

- 1. まったくしなかった _____
- 2. 一度した _____
- 3. 二度した _____
- 4. 三度以上した _____

過去三ヶ月の間で、何日間仕事を病欠しましたか？

- イ. 0日 _____
- ロ. 1 - 3日 _____
- ハ. 3 - 6日 _____
- ニ. 7日以上 _____

DAILY HABITS

生活習慣

The following questions refer to current habits, the exercise you take and so on. Please tick only one line for each question.

下列問題與你現時的習慣及運動等方面有關。每題只可選擇一個答案。

How many cigarettes on an average day did you smoke in the last month?
(consider one cigar or pipe the equivalent of a cigarette)

本月內平均每日吸煙多少支？
(每支雪茄或煙斗均作一支香煙計算)

None

沒有抽煙

Under 5

5支以下

5-10

5至10支

Under 20

20支以下

Under 50

50支以下

Over 60

60支以上

How did your smoking change when events at work during this month were more demanding than on average?

本月內工作較平日繁重時，你抽煙的數量有何改變？

Fell significantly

大減

Fell a little

略減

Increased a little

略增

Increased significantly

大增

How many drinks of alcohol, on an average day, did you have in the last month?

本月內平均每天喝酒多少杯？

None

沒有喝酒

2-3 drinks

2至3杯

Under 5 drinks

5杯以下

5-7 drinks

5至7杯

Under 10 drinks

10杯以下

Over 15 drinks

15杯以上

How did your drinking change when events at work during the last month were more demanding than on average? (Again, there is no line for 'stayed the same')

本月內工作較平日繁重時，你喝酒的份量有何改變？（一如上題，不得選答「無改變」。）

Fell significantly

大減

Fell a little

略減

Increased a little

略增

Increased significantly ...

大增

How did the amount of food you eat change when events at work during the last month were more demanding than on average?

本月內工作較平日繁重時，你飲食的份量有何改變？

Fell significantly

大減

Fell a little

略減

Increased a little

略增

Increased significantly ...

大增

Did you actively pursue an interest or play some sport last week (excluding social or drinking events)?

上星期內你有否積極投入平日愛好的活動或運動（社交應酬或飲酒不計算在內）？

Not at all

沒有

Once

一次

Twice

兩次

Three or more times

三次或以上

How many days in the last three months have you been absent from work, owing to illness?

過往三個月內，你因病缺勤共多少天？

None

沒有缺勤

1-3 days

1至3天

3-6 days

3至6天

Over 7 days

7天以上

CONFIDANTS

1. English language version
2. Japanese language version
3. Chinese language version

CONFIDANTS

Within the last six months, when something at work has been particularly demanding who have you approached to talk about, or seek advice about, the situation?

Use a score between #1 (*No support*) and #5 (*Considerable support*).

<i>No support</i>	1
<i>A little support</i>	2
<i>Average support</i>	3
<i>Above average support</i>	4
<i>Considerable support</i>	5

- | | |
|---|-----------|
| <input type="checkbox"/> Wife, husband or partner | 1 2 3 4 5 |
| <input type="checkbox"/> Mother | 1 2 3 4 5 |
| <input type="checkbox"/> Father | 1 2 3 4 5 |
| <input type="checkbox"/> Sister | 1 2 3 4 5 |
| <input type="checkbox"/> Brother | 1 2 3 4 5 |
| <input type="checkbox"/> Other relative | 1 2 3 4 5 |
| <input type="checkbox"/> Close friend | 1 2 3 4 5 |
| <input type="checkbox"/> Casual friend | 1 2 3 4 5 |
| <input type="checkbox"/> Work colleague | 1 2 3 4 5 |
| <input type="checkbox"/> Other professional (eg. policeman) | 1 2 3 4 5 |
| <input type="checkbox"/> Doctor | 1 2 3 4 5 |
| <input type="checkbox"/> Counsellor (eg. occupational health) | 1 2 3 4 5 |
| <input type="checkbox"/> Your immediate superior at work | 1 2 3 4 5 |
| <input type="checkbox"/> Other (please specify) | 1 2 3 4 5 |

Have you ever considered approaching an external professional (such as a counsellor or doctor) for advice concerning situations at work?

Yes

No

Have you actually received some form of professional advice in this respect?

Yes

No

悩みを打ち明けられる人間関係

この6カ月の間で仕事上のストレスが増したとき、誰に相談しましたか？
 下記のそれぞれについて、該当する番号を下の表から選んでそれぞれ右欄
 の番号を○で囲んで下さい。

番号表

「相談しなかった」あるいは

「まったく助けにならなかった」ならば・・・1

「若干助けになった」ならば・・・・・・・・・・2

「まあまあ助けになった」ならば・・・・・・・・・・3

「かなり助けになった」ならば・・・・・・・・・・4

「非常に助けになった」ならば・・・・・・・・・・5

配偶者または配偶者に相当する人	1	2	3	4	5
母親	1	2	3	4	5
父親	1	2	3	4	5
姉妹	1	2	3	4	5
兄弟	1	2	3	4	5
上記以外の親戚	1	2	3	4	5
親しい友人	1	2	3	4	5
友人・知人	1	2	3	4	5
同僚	1	2	3	4	5
警官等他の同業者	1	2	3	4	5
医師	1	2	3	4	5
カウンセラー	1	2	3	4	5
職場での直属の上司	1	2	3	4	5
その他（明記して下さい）	1	2	3	4	5

仕事上の悩みについてカウンセラーや医師等に相談しようと思った
 ことがありますか？

1. はい _____

2. いいえ _____

その際、助けとなるアドバイスを受けることができましたか？

1. はい _____

2. いいえ _____

CONFIDANTS
傾訴對象

Within the last six months, when something at work has been particularly demanding who have you approached to talk about, or seek advice about, the situation?

過去六個月內，遇上工作特別繁重時，你曾向誰傾訴或徵詢意見？

Use a score between #1 (No support) and #5 (Considerable support).
請選擇1分（不予支持）至5分（十分支持）。

No support 不予支持	1
A little support 少許支持	2
Average support 普通支持	3
Above average support 頗為支持	4
Considerable support 十分支持	5

- | | | | | | |
|---|---|---|---|---|---|
| <input type="checkbox"/> Wife or partner
妻子或伴侶 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Mother
母親 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Father
父親 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Sister
姐妹 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Brother
兄弟 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Other relative
其他親戚 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Close friend
好友 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Casual friend
普通朋友 | 1 | 2 | 3 | 4 | 5 |
| <input type="checkbox"/> Work colleague
同事 | 1 | 2 | 3 | 4 | 5 |

- Other professional (eg. policeman) 1 2 3 4 5
其他職業的人士（如警務人員）
- Doctor 1 2 3 4 5
醫生
- Counsellor (eg. occupational health) 1 2 3 4 5
心理輔導員（如職業健康）
- Your immediate superior at work 1 2 3 4 5
直屬上司
- Other (please specify)..... 1 2 3 4 5
其他（請註明）

Have you ever considered approaching an external professional (such as a counsellor or doctor) for advice concerning situations at work?

有否考慮約見外間的專業人士（如心理輔導員或醫生），徵詢他們對你工作情況的意見？

Yes

有

No

無

Have you actually received some form of professional advice in this respect?

你是否已經就上述問題徵詢某類的專業意見？

Yes

是

No

否

APPENDIX VIV

CULTURAL DIFFERENCES IN SYMPTOMATOLOGY

A: BY OCCUPATIONAL FACTORS

RANK	Pop.	%	IRS-I	IRS-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GFD
Fire-fighter	UK	62.29%	1.91	1.48	4.76	2.44	10.13	9.34	9.75
	Japan	12.98%	1.84	1.14	6.31	5.29	12.24	10.64	12.32
	HK	67.67%	13.27	11.38	9.06	16.14	16.14	19.27	15.11
Leading fire-fighter	UK	14.97%	4.58	2.75	4.50	1.50	10.68	10.50	9.58
	Japan	3.39%	1.94	2.66	5.47	5.08	11.34	10.39	11.00
	HK	18.33%	10.09	9.71	6.82	5.46	14.10	16.73	14.27
Sub-Officer	UK	9.64%	1.75	1.75	7.50	3.50	11.07	9.03	10.06
	Japan	35.10%	0.71	0.13	5.18	4.77	11.71	11.35	10.53
	HK	11.67%	10.00	10.00	6.29	6.71	15.13	16.17	12.00
Station Officer	UK	7.36%	1.50	1.50	5.83	1.50	10.00	8.22	9.78
	Japan	24.93%	2.86	2.21	5.93	4.55	11.75	11.11	11.48
	HK	5.00%	9.67	16.33	10.33	8.33	15.67	15.67	14.67
Divisional Officer up	UK	5.33%	*	*	*	*	9.78	7.78	9.00
	Japan	6.34%	2.11	3.17	8.67	5.78	14.87	12.76	14.56
	HK	3.33%	3.50	3.50	4.00	8.00	10.50	11.50	11.00
LENGTH OF SERVICE									
Under 5 years	UK	23.41%	*	*	4.00	*	10.16	9.16	9.60
	Japan	2.11%	3.36	1.63	7.07	4.71	10.93	8.86	10.14
	HK	23.34%	11.54	10.46	8.25	8.62	16.82	16.50	15.77
6-10 years	UK	10.94%	1.42	1.17	4.67	1.67	10.82	10.35	11.53
	Japan	3.02%	4.05	4.46	6.42	4.20	11.25	10.10	11.53
	HK	26.67%	13.69	13.25	9.88	8.38	16.06	19.88	15.88
11-15 years	UK	24.43%	3.07	1.47	4.93	2.87	9.93	8.76	9.45
	Japan	12.54%	2.59	1.89	5.47	5.34	11.77	10.07	11.81
	HK	10.00%	8.33	11.67	9.17	7.67	16.00	19.60	13.67
16-20 years	UK	23.66%	1.75	1.17	5.91	2.87	10.06	9.29	9.12
	Japan	24.47%	2.77	2.39	5.28	5.33	11.83	10.12	11.48
	HK	13.33%	14.87	10.38	9.00	6.37	13.75	15.62	13.12
21-25 years	UK	9.67%	2.38	2.71	5.09	2.27	10.12	9.49	9.79
	Japan	21.18%	3.36	3.19	7.09	6.09	12.35	10.96	12.00
	HK	16.67%	8.30	7.10	6.20	5.40	13.67	16.20	13.33
Over 26 years	UK	7.89%	1.50	1.75	5.50	2.88	11.82	9.89	10.48
	Japan	26.71%	2.04	2.00	6.72	5.71	12.71	11.31	11.90
	HK	11.67%	11.57	11.71	7.71	7.71	15.83	17.00	12.59
HOURS WORKED									
Standard Match	UK	83.08%	2.50	1.35	4.85	2.30	10.17	9.27	9.71
	Japan	63.40%	2.32	2.35	6.12	5.55	12.28	10.66	11.55
	HK	59.32%	11.77	11.65	8.28	7.58	15.29	17.76	14.55
Standard Match + overtime	UK	1.79%	1.88	1.56	4.08	1.88	10.29	10.43	8.71
	Japan	30.87%	3.25	2.60	6.91	5.85	12.42	10.76	12.32
	HK	5.08%	9.67	3.67	5.33	7.67	13.33	16.00	11.67
Under 60 hours	UK	1.79%	1.33	0.33	8.33	5.00	10.00	9.80	10.80
	Japan	3.77%	3.00	1.57	5.88	5.00	12.56	11.36	12.20
	HK	18.64%	13.00	10.27	8.09	6.45	16.60	18.20	14.60
Under 70 hours	UK	13.33%	3.25	4.38	8.25	2.75	10.96	9.45	10.06
	Japan	1.96%	3.15	2.11	4.62	5.39	11.69	9.93	11.00
	HK	8.47%	11.40	11.80	9.60	9.20	15.80	21.60	15.40
JOINING AGE									
18 years	UK	9.41%	3.75	3.50	7.25	1.00	9.34	9.06	9.44
	Japan	37.59%	2.61	2.44	5.85	5.43	11.95	10.41	11.41
	HK	11.87%	13.86	8.86	7.43	7.57	12.86	15.57	11.71
19 years	UK	7.63%	3.00	1.67	7.67	4.00	10.11	9.18	9.82
	Japan	12.18%	3.45	3.03	6.73	5.70	12.68	11.13	12.14
	HK	15.00%	12.33	9.11	7.67	7.11	15.13	19.00	14.78
20 years	UK	8.65%	0.50	*	4.50	2.00	10.87	10.03	9.65
	Japan	12.03%	2.12	2.18	6.74	6.06	12.96	11.70	12.42
	HK	18.33%	15.55	10.64	11.18	9.00	16.27	18.91	14.91
21-25 years	UK	44.27%	2.03	1.53	5.35	2.21	10.27	9.09	9.53
	Japan	32.93%	2.31	1.95	6.28	5.37	12.06	10.41	11.65
	HK	40.00%	8.37	11.17	7.79	7.33	15.05	17.09	14.25
26-30 years	UK	30.03%	1.22	2.44	4.06	2.83	10.47	9.57	10.21
	Japan	5.26%	4.76	4.36	7.49	6.77	13.12	11.35	12.55
	HK	15.00%	13.56	13.89	6.63	6.56	18.13	20.29	16.63
ABSENTEEISM									
No days	UK	72.86%	1.84	1.28	4.36	1.92	9.60	8.88	8.41
	Japan	65.24%	2.27	2.03	6.17	5.46	11.97	10.36	11.36
	HK	60.00%	10.39	9.14	7.54	6.72	14.63	16.97	13.31
1-3 days	UK	14.29%	2.70	4.10	7.40	3.80	10.11	10.67	11.44
	Japan	28.18%	1.51	3.11	6.43	5.65	13.02	11.25	12.53
	HK	30.00%	13.33	13.56	9.22	8.94	16.82	20.47	15.72
3-6 days	UK	5.71%	1.75	1.00	6.25	3.25	12.00	13.33	11.00
	Japan	5.05%	3.00	4.25	6.64	7.46	12.91	11.61	12.76
	HK	8.33%	16.00	15.80	9.40	8.20	19.00	18.20	16.60
Over 7 days	UK	7.14%	6.80	2.20	7.40	2.60	9.80	9.0	8.20
	Japan	1.53%	5.50	3.09	8.70	7.50	13.30	12.20	14.50
	HK	1.67%	8.00	2.00	7.00	7.00	11.00	7.00	8.00

B: BY PERSONAL FACTORS

	Pop.	%	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GFD
MARITAL STATUS									
Single	UK	12.47%	1.33	3.17	5.33	2.67	10.27	8.78	9.83
	Japan	18.77%	3.48	3.26	5.67	5.03	11.77	10.02	11.41
	HK	16.67%	11.50	11.20	9.70	8.70	14.50	19.44	15.50
Married	UK	80.15%	2.25	1.30	4.88	2.14	10.25	9.42	9.75
	Japan	80.63%	2.53	2.29	6.43	5.73	12.40	10.87	11.83
	HK	81.67%	11.94	10.96	7.90	7.27	15.64	17.83	14.27
Other	UK	7.38%	3.71	4.00	7.00	3.43	10.72	9.33	9.87
	Japan	0.60%	1.25	0.00	8.00	8.25	12.75	10.25	12.50
	HK	1.67%	2.00	5.00	8.00	8.00	*	11.00	14.00
AGE									
Less than 40 years	UK	67.52%	2.00	1.30	5.14	2.23	9.81	9.09	8.55
	Japan	62.16%	2.99	2.24	5.92	5.41	11.93	10.32	11.59
	HK	68.33%	12.77	11.33	8.65	8.00	15.78	15.26	18.16
41-50 years	UK	26.90%	2.95	2.80	5.50	3.05	10.81	9.46	9.68
	Japan	29.53%	2.32	2.42	6.43	5.58	12.59	11.16	11.80
	HK	26.67%	9.44	10.81	7.87	7.06	15.21	18.20	13.31
Over 50 years	UK	5.58%	1.00	0.50	4.00	0.50	11.20	10.40	10.81
	Japan	8.31%	1.55	1.41	7.70	6.11	13.32	11.50	12.35
	HK	5.00%	10.33	6.00	4.00	4.33	15.00	20.00	12.00
EDUCATION									
To age 16	UK	65.65%	1.69	1.44	5.94	2.44	10.01	9.33	9.50
	Japan	2.21%	3.13	2.29	6.60	5.13	13.21	11.29	13.57
	HK	42.37%	13.60	10.76	9.72	7.88	16.23	20.05	14.92
To age 18	UK	27.66%	1.95	1.16	4.17	1.11	10.71	9.78	10.43
	Japan	79.50%	2.56	2.43	6.24	5.67	12.33	10.83	11.77
	HK	32.20%	10.27	12.00	7.48	7.00	15.76	17.24	14.68
Higher Education	UK	6.69%	3.43	2.29	6.29	2.29	9.95	9.33	9.50
	Japan	18.29%	3.11	2.45	6.25	5.46	11.92	10.01	11.54
	HK	3.39%	3.50	3.50	4.00	8.00	10.50	11.50	11.00
Education ('Other')	HK	16.95%	12.10	10.70	6.70	7.00	13.90	16.00	13.10
EXERCISE FREQUENCY									
No exercise	UK	18.27%	4.13	2.13	6.47	2.73	10.42	9.42	9.94
	Japan	34.61%	2.86	2.67	6.72	6.89	12.67	11.17	12.59
	HK	37.29%	12.27	12.91	10.29	8.96	17.05	18.86	16.36
Once	UK	21.83%	1.12	0.18	3.41	1.82	9.76	9.16	9.69
	Japan	32.01%	2.94	2.64	6.31	5.29	12.57	10.8	11.66
	HK	18.64%	7.36	10.64	9.56	6.82	13.00	15.60	11.91
Twice	UK	24.37%	2.11	1.89	5.22	2.65	10.21	9.37	9.68
	Japan	20.67%	2.02	1.73	6.02	5.49	12.17	10.61	11.51
	HK	22.03%	8.54	9.31	6.69	7.31	14.50	16.33	13.08
Thrice or more	UK	35.53%	2.15	2.60	5.53	2.15	10.55	9.34	9.78
	Japan	12.71%	2.88	2.69	5.68	3.50	11.31	9.45	10.80
	HK	22.03%	17.31	9.23	6.92	5.92	15.31	19.92	14.75

C: BY FAMILIAL FACTORS

EMPLOYMENT STATUS OF SPOUSE	Pop.	V	IES-I	IES-A	HAD-A	HAD-D	HSCL- PD	HSCL-SD	HSCL- GFD
Not employed	UK	9.51†	1.33	3.17	5.33	2.67	10.81	9.29	10.32
	Japan	29.39†	2.57	2.06	6.55	6.04	12.42	10.93	12.17
	HK	34.55†	13.89	11.95	9.16	8.11	15.26	18.47	15.11
Employed	UK	76.35†	2.25	1.30	4.88	2.14	10.39	9.54	9.97
	Japan	56.30†	2.46	2.39	6.36	5.58	12.34	10.78	11.62
	HK	49.09†	9.81	10.22	7.12	6.74	15.04	16.28	13.26
No spouse	UK	14.14†	3.71	4.00	7.00	3.43	9.58	8.83	8.52
	Japan	14.31†	3.34	3.10	5.87	5.19	11.88	10.10	11.46
	HK	16.36†	11.39	9.56	8.22	7.33	16.13	20.43	14.75
HOURS WORKED BY SPOUSE									
Under 40 hours	UK	86.10	2.26	1.71	5.58	2.35	10.31	9.56	10.08
	Japan	19.71†	2.65	2.22	6.67	5.97	12.49	10.94	12.27
	HK	42.86†	13.78	10.00	9.33	8.56	13.50	19.33	14.44
Over 40 hours	UK	13.90†	3.00	1.47	4.57	2.33	10.57	9.30	10.16
	Japan	21.78†	1.94	1.34	6.33	6.25	12.19	10.81	11.80
	HK	57.14†	13.92	15.17	9.00	7.67	17.91	17.83	16.00
NUMBER OF CHILDREN									
With a first child	UK	71.57†	2.33	2.00	1.00	2.62	10.22	9.36	9.56
	Japan	71.91†	2.53	2.35	6.56	5.86	12.55	10.99	11.99
	HK	61.67†	11.41	10.68	7.72	7.03	15.39	17.21	15.59
With a second child	UK	56.85†	2.14	1.94	1.00	2.74	10.26	9.45	9.56
	Japan	59.56†	2.37	2.23	6.12	5.99	12.49	11.09	11.96
	HK	41.67†	9.44	10.20	7.96	6.88	14.67	17.09	13.20
With a third child	UK	12.69†	1.00	0.75	1.00	2.58	10.31	9.43	9.89
	Japan	13.97†	2.50	2.69	6.60	5.67	12.76	11.21	12.24
	HK	8.33†	12.40	11.80	7.60	6.80	15.00	15.25	13.00
FIRE SERVICE RELATIVES									
Yes	UK	15.78†	1.78	1.89	1.00	3.22	10.79	10.12	10.66
	Japan	8.62†	3.00	2.63	5.67	4.91	11.53	10.84	11.39
	HK	8.93†	13.80	6.50	10.80	7.60	6.60	14.20	15.25
No	UK	84.22†	2.39	1.71	1.00	2.18	10.19	9.18	9.60
	Japan	91.38†	2.67	2.43	6.35	5.67	12.34	10.68	11.79
	HK	91.07†	11.90	11.29	8.76	6.60	15.55	14.50	14.66
UNIFORMED SERVICES RELATIVES									
Yes	UK	16.37†	0.90	0.50	1.00	1.40	10.42	9.42	9.90
	Japan	23.95†	3.08	2.81	6.57	5.38	12.25	10.52	11.47
	HK	17.24†	9.00	10.60	7.20	6.70	13.44	18.11	13.00
No	UK	83.63†	2.59	1.95	1.00	2.52	10.27	9.32	9.75
	Japan	74.05†	2.53	2.34	6.23	5.71	12.31	10.77	11.91
	HK	82.76†	12.50	11.31	8.43	7.71	15.98	17.94	14.98

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress (* - No data).

APPENDIX X

CULTURAL DIFFERENCES IN CHANGES IN STIMULANT USE BY DEMOGRAPHICS

A: UK

	SIGNIFICANT FALL ALCOHOL	SIGNIFICANT FALL TOBACCO	SIGNIFICANT INCREASE ALCOHOL	SIGNIFICANT INCREASE TOBACCO	SAMPLE MEAN
Age	34.48	37.38	35.43	38.12	35.59
Marital	1.85	2.00	2.00	2.00	2.01
Service	10.70	12.31	11.00	13.73	12.01
Rank	1.55	1.69	2.00	2.88	1.66
Hours	4.07	3.54	4.57	6.38	4.04

B: JAPAN

	SIGNIFICANT FALL ALCOHOL	SIGNIFICANT FALL TOBACCO	SIGNIFICANT INCREASE ALCOHOL	SIGNIFICANT INCREASE TOBACCO	SAMPLE MEAN
Age	35.41	35.80	38.12	38.21	37.23
Marital	1.70	1.60	1.67	1.87	1.82
Service	15.60	15.40	16.94	17.10	16.92
Rank	2.96	3.10	3.19	3.45	3.08
Hours	4.04	3.90	3.94	3.69	4.00

C: HONG KONG

	SIGNIFICANT FALL ALCOHOL	SIGNIFICANT FALL TOBACCO	SIGNIFICANT INCREASE ALCOHOL	SIGNIFICANT INCREASE TOBACCO	SAMPLE MEAN
Age	53.00	36.75	30.00	49.50	35.53
Marital	2.00	2.00	2.00	2.00	1.85
Service	23.00	12.50	6.67	28.50	13.63
Rank	3.00	1.50	1.00	3.00	1.70
Hours	6.00	4.67	2.67	1.00	2.49

APPENDIX XI

CULTURAL DIFFERENCES IN SYMPTOMATOLOGY BY LEVEL SOCIAL SUPPORT

A: INTRUSION SYMPTOMS

SOURCE	POP.	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	CORR.
Partner	UK	1.11	2.89	2.00	3.15	2.73	0.12
	Japan	1.99	2.83	3.01	3.62	3.07	0.10
	HK	12.67	4.00	11.40	10.69	13.17	0.09
Mother	UK	1.67	3.40	1.22	No data	No data	-0.14
	Japan	2.35	3.33	4.94	3.33	5.00	0.13
	HK	7.00	6.25	12.71	12.25	22.33	0.52
Father	UK	1.74	2.00	2.71	No data	No data	0.04
	Japan	2.36	3.17	6.00	2.70	3.00	0.11
	HK	9.75	5.00	12.80	5.50	29.90	0.46
Sister	UK	1.94	No data	No data	No data	No data	-0.31
	Japan	2.27	4.30	5.72	3.67	No data	0.11
	HK	12.67	4.00	11.40	10.69	13.17	0.15
Brother	UK	1.61	1.60	2.67	No data	No data	0.12
	Japan	2.20	2.80	6.05	3.38	No data	0.07
	HK	7.00	6.25	12.71	12.25	22.33	0.52
Relative	UK	1.70	1.50	No data	No data	No data	0.07
	Japan	2.41	2.57	2.75	2.00	4.00	-0.03
	HK	9.75	5.00	12.80	5.50	29.00	0.46
Close Friend	UK	1.71	3.25	1.08	3.12	4.00	0.17
	Japan	1.87	3.27	3.96	3.38	1.43	0.17
	HK	11.00	11.00	6.60	10.33	21.00	0.43
Casual Friend	UK	1.61	2.33	2.50	0.50	No data	0.05
	Japan	2.06	3.56	3.44	4.03	1.29	0.12
	HK	6.00	12.00	12.44	15.00	21.75	0.60
Work Colleague	UK	1.43	2.11	3.37	1.00	2.80	0.10
	Japan	2.05	3.04	2.47	2.68	3.79	0.07
	HK	13.67	12.00	8.00	17.42	10.15	0.16
Professional	UK	1.72	No data	2.00	No data	No data	-0.05
	Japan	2.36	4.44	2.86	4.60	No data	0.05
	HK	12.67	14.00	16.00	6.00	No data	-0.11
Doctor	UK	1.56	No data	4.50	No data	No data	0.72
	Japan	2.38	2.75	5.00	2.50	15.00	0.05
	HK	12.60	10.33	16.00	29.00	1.00	0.01
Counselor	UK	1.56	4.50	No data	No data	No data	0.70
	Japan	2.40	3.58	3.56	1.50	13.00	0.01
	HK	13.33	8.00	No data	No data	No data	-0.56
Superior	UK	2.32	0.50	4.08	No data	5.00	0.15
	Japan	2.27	3.16	2.40	3.14	4.29	0.08
	HK	15.33	8.00	No data	13.60	13.67	0.04

B: AVOIDANCE SYMPTOMS

SOURCE	POP.	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	CORR.
Partner	UK	2.67	1.89	1.89	2.50	1.58	-0.08
	Japan	1.89	2.58	2.88	3.18	2.56	0.08
	HK	11.33	4.00	11.60	11.23	12.17	0.13
Mother	UK	1.89	1.40	2.00	No data	No data	-0.07
	Japan	2.14	2.89	4.24	5.71	4.57	0.14
	HK	5.33	9.50	14.00	8.25	8.33	0.07
Father	UK	1.93	0.71	5.16	No data	No data	0.04
	Japan	2.14	2.88	3.57	4.46	No data	0.13
	HK	5.00	10.33	14.40	11.50	5.00	0.12
Sister	UK	1.80	3.00	No data	No data	No data	-0.13
	Japan	2.08	4.91	6.67	3.05	No data	0.13
	HK	11.33	4.00	11.60	11.23	12.17	0.13
Brother	UK	1.75	0.60	3.67	No data	No data	0.07
	Japan	1.89	3.09	5.54	5.36	0.43	0.12
	HK	5.33	9.50	14.00	8.25	8.33	0.07
Relative	UK	1.64	1.75	3.00	No data	1.50	-0.01
	Japan	2.20	1.71	2.36	5.71	No data	-0.02
	HK	5.00	10.33	14.40	11.50	5.00	0.12
Close Friend	UK	1.71	0.25	0.42	4.87	2.00	0.15
	Japan	1.64	3.03	3.62	3.39	1.03	0.11
	HK	8.00	16.00	10.90	8.00	5.80	-0.29
Casual Friend	UK	1.58	No data	2.33	1.50	No data	0.03
	Japan	1.74	3.24	3.18	5.42	0.98	0.16
Work Colleague	UK	2.29	0.67	2.05	1.83	0.60	-0.08
	Japan	1.79	2.63	2.76	2.58	2.24	0.06
Professional	UK	9.00	15.78	7.80	10.33	10.88	-0.11
	UK	1.69	No data	0.75	No data	No data	-0.11
	Japan	2.08	4.36	4.33	3.20	No data	0.07
Doctor	HK	5.33	15.00	14.00	8.00	No data	0.46
	UK	1.72	No data	No data	No data	14.00	0.34
	Japan	2.11	3.29	5.54	2.29	No data	0.08
Counselor	HK	6.40	11.33	14.00	15.00	4.00	0.20
	UK	1.72	No data	No data	No data	3.00	0.02
	Japan	2.16	5.24	2.41	1.71	No data	0.02
Superior	HK	33	20.00	No data	No data	4.00	-0.05
	UK	2.40	0.50	1.92	3.00	1.00	-0.07
	Japan	1.95	3.25	1.91	3.46	4.24	0.09
	HK	0.33	6.00	No data	12.20	9.00	0.42

C: ANXIETY SYMPTOMS

SOURCE	POP.	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	CORR.
Partner	UK	3.33	5.56	4.56	8.37	4.92	0.12
	Japan	5.97	7.26	6.38	6.85	6.08	0.05
	HK	10.67	5.00	9.40	8.00	7.83	-0.07
Mother	UK	4.70	4.40	6.22	4.50	5.39	0.10
	Japan	6.27	7.25	5.31	7.00	7.43	0.02
	HK	3.33	7.75	9.86	6.50	6.67	0.14
Father	UK	4.56	6.71	6.71	4.00	4.93	0.17
	Japan	6.15	6.63	6.59	7.50	7.67	0.07
	HK	5.25	7.33	9.60	7.50	4.50	0.05
Sister	UK	5.00	4.00	2.00	4.00	5.75	-0.21
	Japan	6.23	7.00	8.11	10.33	2.50	0.08
	HK	10.67	5.00	9.40	8.00	7.83	-0.07
Brother	UK	4.43	4.80	9.00	No data	No data	0.32
	Japan	6.12	7.50	6.75	8.85	6.12	0.10
	HK	3.33	7.75	9.86	6.50	6.67	0.14
Relative	UK	4.67	7.50	3.50	4.00	5.50	0.05
	Japan	6.24	6.00	9.38	6.50	5.80	0.08
	HK	5.25	7.33	9.60	7.50	4.50	0.05
Close Friend	UK	4.71	6.50	5.50	7.75	3.50	0.11
	Japan	5.93	6.88	6.73	6.75	7.71	0.12
	HK	7.00	9.50	8.50	5.33	6.00	-0.27
Casual	UK	4.87	3.67	8.17	5.00	No data	0.18
Friend	Japan	5.97	7.28	6.37	7.64	5.14	0.10
	HK	5.00	10.00	8.89	8.00	4.75	-0.02
Work	UK	4.43	4.22	7.79	4.83	4.00	0.09
Colleague	Japan	5.87	7.30	6.51	6.46	6.25	0.06
	HK	8.67	8.44	7.00	8.25	8.25	-0.04
Professional	UK	4.86	No data	9.14	4.00	No data	0.04
	Japan	6.22	8.00	5.75	5.40	5.00	0.08
	HK	6.33	11.67	8.00	9.00	No data	0.27
Doctor	UK	4.94	No data	7.00	No data	15.00	0.39
	Japan	6.19	7.69	9.00	6.67	6.00	0.10
	HK	6.60	10.00	8.00	16.00	3.00	0.13
Counselor	UK	4.94	7.00	No data	No data	10.00	0.24
	Japan	6.24	8.67	8.78	7.00	5.00	0.08
	HK	6.50	15.00	No data	No data	3.00	-0.20
Superior	UK	5.20	5.63	5.50	4.00	6.00	0.24
	Japan	6.31	6.61	6.00	7.54	5.72	0.03
	HK	5.67	6.00	No data	11.00	4.67	-0.20

D: DEPRESSION SYMPTOMS

SOURCE	POP.	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	CORR.
Partner	UK	1.78	2.56	2.75	4.25	1.89	-0.01
	Japan	5.57	6.53	5.46	5.57	4.57	-0.06
	HK	6.33	6.00	7.40	8.08	7.13	0.07
Mother	UK	2.46	1.00	1.67	No data	2.82	-0.25
	Japan	5.77	5.23	4.14	5.83	7.57	-0.04
	HK	2.67	6.75	7.71	8.50	6.00	0.33
Father	UK	2.42	2.00	1.71	No data	No data	-0.17
	Japan	5.74	5.27	4.63	6.10	8.17	0.00
	HK	4.00	7.00	6.80	8.00	7.50	0.37
Sister	UK	2.15	0.50	0.67	No data	No data	-0.25
	Japan	5.72	6.10	5.89	9.33	5.50	0.04
	HK	6.33	6.00	7.40	8.08	7.13	0.07
Brother	UK	2.15	1.80	1.67	No data	No data	-0.07
	Japan	5.62	6.05	5.20	5.92	7.00	0.03
	HK	2.67	6.75	7.71	8.50	6.00	0.33
Relative	UK	2.09	3.00	1.50	No data	0.50	-0.16
	Japan	5.65	5.67	7.56	1.50	6.80	0.05
	HK	4.00	7.00	6.80	8.00	7.50	0.37
Close Friend	UK	2.35	3.75	2.67	1.75	2.75	-0.02
	Japan	5.67	6.22	5.57	4.95	5.43	-0.04
	HK	1.00	9.00	8.10	4.78	6.60	-0.12
Casual Friend	UK	2.10	0.33	4.33	No data	No data	0.07
	Japan	5.59	6.39	5.23	6.28	3.86	0.01
	HK	5.20	8.00	7.11	5.00	6.25	0.08
Work Colleague	UK	1.92	2.67	3.11	1.50	1.80	-0.01
	Japan	5.73	6.25	5.51	5.38	4.36	-0.07
	HK	4.00	7.44	7.30	7.17	8.19	0.21
Professional	UK	2.17	No data	1.50	No data	No data	-0.15
	Japan	5.65	7.00	6.14	4.80	6.50	0.03
	HK	6.17	7.33	7.00	8.00	No data	0.23
Doctor	UK	1.91	No data	4.50	No data	5.00	0.29
	Japan	5.61	7.06	7.85	4.83	5.00	0.06
	HK	6.60	7.67	7.00	7.00	4.00	-0.18
Counselor	UK	1.91	4.50	No data	No data	8.00	0.42
	Japan	5.64	7.83	7.00	6.00	6.50	0.07
	HK	6.67	8.00	No data	No data	4.00	-0.27
Superior	UK	1.83	3.25	2.75	0.50	3.67	0.15
	Japan	5.73	6.33	5.22	5.97	3.72	-0.05
	HK	8.00	6.33	No data	8.40	3.67	-0.29

E: PERFORMANCE DIFFICULTIES SYMPTOMS

SOURCE	POP.	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	CORR.
Partner	UK	10.63	10.07	10.17	10.02	10.06	-0.04
	Japan	11.70	12.74	12.64	13.08	12.91	0.14
	HK	19.00	10.67	17.40	14.62	15.26	-0.07
Mother	UK	10.24	10.84	10.32	10.60	10.50	0.03
	Japan	12.19	13.20	12.64	12.08	13.17	0.04
	HK	1.33	15.00	15.86	13.25	14.50	0.11
Father	UK	10.18	10.03	9.84	12.00	10.11	0.05
	Japan	12.18	13.97	12.48	11.70	12.60	0.03
	HK	12.25	13.67	16.80	11.00	10.50	-0.08
Sister	UK	10.46	9.50	9.83	12.00	7.00	-0.02
	Japan	12.16	14.30	13.89	19.00	8.00	0.10
	HK	9.00	10.67	17.40	14.62	15.26	-0.07
Brother	UK	10.36	10.26	9.46	10.88	7.50	-0.06
	Japan	12.69	13.60	12.33	15.15	11.71	0.09
	HK	11.33	15.00	15.86	13.25	14.50	0.11
Relative	UK	10.34	9.10	10.33	11.14	11.00	0.02
	Japan	12.20	12.33	14.44	15.00	11.00	0.06
	HK	12.25	13.67	16.80	11.00	10.50	-0.08
Close Friend	UK	10.48	9.41	9.87	11.43	11.50	0.07
	Japan	12.00	12.72	12.73	12.63	13.85	0.10
	HK	5.00	22.00	15.67	12.13	13.80	-0.30
Casual Friend	UK	10.24	9.05	11.60	10.80	8.00	0.06
	Japan	11.88	12.49	13.47	13.97	11.67	0.16
	HK	11.60	15.50	17.13	13.00	13.50	0.14
Work Colleague	UK	10.30	10.68	10.09	10.28	9.65	-0.04
	Japan	12.09	12.28	12.77	12.44	12.24	0.05
	HK	13.00	No data	17.00	15.70	14.33	-0.03
Professional	UK	10.23	7.75	8.67	11.33	14.00	-0.01
	Japan	12.13	15.31	14.00	12.20	9.00	0.09
	HK	11.00	15.67	18.00	16.00	No data	0.50
Doctor	UK	10.24	10.00	8.50	10.00	10.67	-0.04
	Japan	12.13	15.56	13.00	13.50	No data	0.10
	HK	12.00	15.00	18.00	17.00	7.00	-0.01
Counselor	UK	10.26	7.33	9.38	11.00	12.00	0.00
	Japan	12.17	15.17	13.78	14.00	9.00	0.08
	HK	50	20.00	No data	No data	7.00	-0.25
Superior	UK	10.32	10.67	10.33	11.57	9.56	0.01
	Japan	12.20	12.94	11.89	13.35	11.94	0.03
	HK	9.67	10.67	No data	18.20	15.00	0.68

F: SOMATIC DISTRESS SYMPTOMS

SOURCE	POP.	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	CORR.
Partner	UK	8.63	9.53	9.81	9.46	9.29	0.04
	Japan	10.25	10.79	11.36	11.51	11.46	0.14
	HK	22.33	13.33	20.00	18.00	17.05	-0.12
Mother	UK	9.16	9.13	9.03	9.30	9.50	0.01
	Japan	10.71	11.13	11.09	10.08	9.86	-0.01
	HK	16.33	20.67	18.43	18.00	16.67	-0.04
Father	UK	9.11	8.17	10.09	9.60	9.50	0.08
	Japan	10.62	12.33	11.15	10.80	9.67	0.03
	HK	18.25	17.67	21.75	13.50	13.00	-0.28
Sister	UK	9.14	8.29	9.33	10.17	7.00	0.01
	Japan	10.65	11.40	13.78	19.33	9.00	0.18
	HK	22.33	13.33	20.00	17.05	19.09	-0.12
Brother	UK	9.10	8.79	9.54	9.25	7.50	-0.01
	Japan	10.59	12.05	11.35	13.15	9.00	0.06
	HK	16.33	20.67	18.43	18.00	16.67	-0.04
Relative	UK	9.07	8.67	9.33	10.50	15.00	0.14
	Japan	10.64	11.93	12.75	8.50	10.20	0.05
	HK	18.25	17.67	21.75	13.50	13.00	-0.28
Close Friend	UK	9.23	8.74	9.25	9.48	9.91	0.05
	Japan	10.43	11.05	11.30	11.02	10.29	0.06
	HK	24.00	20.00	19.44	15.13	17.50	-0.32
Casual Friend	UK	9.16	8.80	9.55	9.71	8.00	0.03
	Japan	10.45	11.20	11.79	11.33	8.57	0.09
	HK	15.80	21.00	20.67	9.00	15.33	-0.06
Work Colleague	UK	8.99	9.78	9.18	8.72	9.15	-0.03
	Japan	10.54	11.11	10.98	10.74	9.96	0.01
	HK	19.33	No data	19.13	17.56	18.18	-0.08
Professional	UK	9.02	7.75	8.00	10.33	15.00	0.07
	Japan	10.63	13.62	12.29	10.00	9.00	0.06
	HK	17.67	22.33	19.00	18.00	No data	-0.11
Doctor	UK	9.08	7.00	7.67	9.00	9.00	-0.06
	Japan	10.59	13.12	12.62	12.17	7.00	0.10
	HK	18.60	21.33	19.00	27.00	7.00	-0.23
Counselor	UK	9.06	9.00	8.13	9.67	8.00	-0.05
	Japan	10.64	12.92	13.11	13.50	9.00	0.09
	HK	19.50	22.00	No data	No data	7.00	-0.70
Superior	UK	9.17	8.36	9.48	9.29	9.12	0.02
	Japan	10.71	11.12	10.53	11.14	9.40	-0.02
	HK	17.00	16.33	No data	19.00	20.00	0.24

G: GENERAL FEELINGS OF DISTRESS SYMPTOMS

SOURCE	POP.	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	CORR.
Partner	UK	9.48	9.45	10.49	9.84	9.38	-0.02
	Japan	11.17	12.37	12.19	12.45	11.89	0.09
	HK	17.33	11.33	15.20	14.62	13.96	-0.08
Mother	UK	9.90	10.03	10.34	9.20	9.50	-0.01
	Japan	11.62	12.75	12.21	12.67	13.33	0.07
	HK	14.00	12.00	15.43	15.50	9.33	-0.11
Father	UK	9.96	9.20	10.10	9.50	9.60	-0.03
	Japan	11.62	12.83	12.89	10.10	14.60	0.06
	HK	13.00	12.67	15.60	11.00	11.50	-0.07
Sister	UK	9.93	9.57	10.08	10.50	7.00	-0.01
	Japan	11.67	12.50	14.24	16.67	8.00	0.09
	HK	17.33	11.33	15.20	14.62	13.96	-0.07
Brother	UK	9.28	9.89	10.31	10.88	7.00	0.03
	Japan	11.59	12.00	13.40	13.69	10.14	0.06
	HK	14.00	12.00	15.43	15.50	9.33	-0.11
Relative	UK	9.84	9.50	9.83	10.86	8.00	0.02
	Japan	11.75	10.93	14.40	12.50	9.00	0.02
	HK	13.00	12.67	15.60	11.00	11.50	-0.07
Close Friend	UK	9.97	9.65	9.24	10.38	11.70	0.05
	Japan	11.21	12.41	12.53	12.76	12.05	0.13
	HK	19.00	16.50	15.40	11.00	12.25	-0.42
Casual Friend	UK	9.77	9.05	10.55	10.50	9.00	0.05
	Japan	11.23	12.48	12.62	14.26	10.17	0.17
	HK	11.80	12.50	16.22	12.00	13.00	-0.14
Work	UK	9.91	10.25	9.37	9.89	9.65	-0.03
	Japan	11.39	12.23	11.96	12.10	11.40	0.05
Colleague	HK	15.33	No data	15.44	13.90	13.45	-0.14
Professional	UK	9.78	8.25	8.83	11.00	13.00	0.02
	Japan	11.70	14.00	12.43	10.60	9.00	0.02
	HK	12.17	15.67	12.00	15.00	No data	0.19
Doctor	UK	9.72	9.00	9.17	8.60	12.67	0.03
	Japan	11.67	13.69	13.23	12.67	No data	0.08
	HK	14.20	12.33	12.00	20.00	7.00	0.17
Counselor	UK	9.82	7.33	8.75	11.33	15.50	0.09
	Japan	11.73	13.08	11.89	17.00	9.00	0.04
	HK	12.17	20.00	No data	No data	7.00	-0.29
Superior	UK	9.86	9.32	10.26	11.40	9.33	0.05
	Japan	11.70	11.97	11.57	12.47	11.78	0.03
	HK	12.33	8.00	No data	15.40	11.00	0.42

APPENDIX XII

CULTURAL DIFFERENCES IN CORRELATION OF SYMPTOMS WITH MEAN SOCIAL SUPPORT

SYMPTOMS	UK	JAPAN	HONG KONG
Intrusion	0.15	0.07	0.14
Avoidance	0.00	0.08	0.17
Anxiety	0.13	0.05	0.08
Depression	-0.01	-0.01	0.12
Performance difficulties	-0.02	0.07	0.01
General feelings of distress	0.01	0.07	-0.02
Somatic distress	0.01	0.06	-0.19
Mean	0.04	0.06	0.04

APPENDIX XIII

CROSS CULTURAL DIFFERENCES IN CORRELATION OF LEVEL OF SOCIAL SUPPORT WITH SYMPTOMATOLOGY

SOURCE	NEGATIVE			POSITIVE		
	UK	Japan	HK	UK	Japan	HK
Partner	4	1	4	3	6	3
Mother	3	2	2	4	5	5
Father	2	-	3	5	7	4
Sister	6	-	4	1	7	3
Brother	3	-	1	3	6	5
Relative	2	2	3	5	5	4
Close Friend	1	1	6	6	6	1
Casual Friend	-	-	3	7	7	4
Work Colleague	5	1	5	2	6	2
Professional	4	-	2	3	7	5
Doctor	2	-	3	5	7	4
Counselor	1	-	7	6	7	-
Superior	1	2	1	6	5	6
Total:	36	10	52	65	94	52
Per source	2.57	0.71	3.64	4.64	6.60	3.71

APPENDIX XIV

CULTURAL DIFFERENCES IN POSITIVE & NEGATIVE CORRELATION OF WORK-TRAUMA SYMPTOMATOLOGY

	NEGATIVE			POSITIVE		
	UK	JAPAN	HK	UK	JAPAN	HK
Partner	Avoidance Depression Perf. Diff. GPD	Depression	Anxiety Perf. Diff. Somatics GPD	Intrusion Anxiety Somatics	Intrusion Avoidance Anxiety Perf. Diff. Somatics GPD	Intrusion Avoidance Depression
Mother	Intrusion Avoidance GPD	Depression Somatics	Somatics GPD	Anxiety Depression Perf. Diff. Somatics	Intrusion Avoidance Anxiety Perf. Diff. GPD	Intrusion Avoidance Anxiety Perf. Diff. Depression
Father	Depression GPD		Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Perf. Diff. Somatics	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Depression
Sister	Intrusion Avoidance Anxiety Depression Perf. Diff. GPD		Anxiety Perf. Diff. Somatics GPD	Somatics	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Depression
Brother	Depression Perf. Diff. Somatics		Somatics GPD	Intrusion Avoidance Anxiety GPD	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Depression Perf. Diff.
Relative	Avoidance Depression	Intrusion Avoidance	Perf. Diff. Somatics GPD	Intrusion Anxiety Perf. Diff. Somatics GPD	Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Depression
Close Friend	Depression	Depression	Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Perf. Diff. Somatics GPD	Intrusion
Casual Friend			Anxiety Somatics GPD	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Depression Perf. Diff.
Work Colleague	Avoidance Depression Perf. Diff. Somatics GPD	Depression	Avoidance Anxiety Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety	Intrusion Avoidance Anxiety Perf. Diff. Somatics GPD	Intrusion Depression
Professional	Intrusion Avoidance Depression Perf. Diff.		Intrusion Somatics	Anxiety Somatics GPD	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Avoidance Anxiety Depression Perf. Diff. GPD
Doctor	Perf. Diff. Somatics		Depression Perf. Diff. Somatics	Intrusion Avoidance Anxiety Depression GPD	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety GPD
Counselor	(Perf. Diff.)		Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Depression (Perf. Diff.) Somatics GPD	Intrusion Avoidance Anxiety Depression Perf. Diff. Somatics GPD	
Superior	Avoidance	Depression Somatics	Depression	Intrusion Anxiety Depression Perf. Diff. Somatics GPD	Intrusion Avoidance Anxiety Perf. Diff. GPD	Intrusion Avoidance Anxiety Perf. Diff. Somatics GPD

APPENDIX XV

CORRELATION BETWEEN WORK-TRAUMA SYMPTOMATOLOGY IN DIFFERENT CULTURES

UK Japan HK	PD	SD	GFD	HAD-A	HAD-D	IES-I	IES-A
PD	*	*	*	*	*	*	*
	*	*	*	*	*	*	*
	*	*	*	*	*	*	*
SD	0.50	*	*	*	*	*	*
	0.63	*	*	*	*	*	*
	0.69	*	*	*	*	*	*
GFD	0.66	0.45	*	*	*	*	*
	0.73	0.57	*	*	*	*	*
	0.80	0.68	*	*	*	*	*
HAD-A	0.70	0.73	0.56	*	*	*	*
	0.47	0.41	0.54	*	*	*	*
	0.58	0.59	0.57	*	*	*	*
HAD-D	0.72	0.65	0.47	0.63	*	*	*
	0.35	0.30	0.39	0.53	*	*	*
	0.33	0.32	0.34	0.70	*	*	*
IES-I	0.25	0.29	0.02	0.34	0.23	*	*
	0.25	0.25	0.33	0.31	0.18	*	*
	0.54	0.48	0.50	0.46	0.23	*	*
IES-A	0.28	0.32	0.16	0.40	0.24	0.61	*
	0.30	0.30	0.36	0.31	0.21	0.80	*
	0.59	0.48	0.67	0.64	0.37	0.41	*

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties (PD), Somatic Distress (SD) and General Feelings of Distress (GFD).

APPENDIX XVI

CULTURAL DIFFERENCES IN SYMPTOMOLOGY BY CHANGE OF STIMULANT USE

A: UK

Change in Stimulant Use	n	t	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GPD
Tobacco: Significant Fall	*	*	*	*	*	*	*	*	*
Tobacco: Non-Significant Fall	5	10.00†	2.33	1.50	4.17	2.83	3.32	9.22	8.55
Tobacco: Non-Significant Increase	11	55.00†	4.15	2.54	6.46	2.62	10.25	8.73	9.10
Tobacco: Significant Increase	1	5.00†	5.00	9.00	14.00	4.00	10.81	9.33	10.00
Alcohol: Significant Fall	6	3.54†	2.70	1.50	2.50	1.50	10.52	9.90	10.85
Alcohol: Non-Significant Fall	19	27.36†	0.71	0.14	1.41	0.36	9.31	9.20	11.57
Alcohol: Non-Significant Increase	25	37.05†	2.72	1.80	5.54	2.33	10.54	9.90	12.24
Alcohol: Significant Increase	12	1.95†	8.00	9.00	11.33	4.57	10.29	9.36	16.40
Food: Significant Fall	2	1.23†	*	*	*	5.00	10.31	9.73	9.18
Food: Non-Significant Fall	25	37.47†	4.00	2.95	5.47	1.22	10.40	9.44	9.92
Food: Non-Significant Increase	27	40.43†	1.52	1.20	5.68	1.92	10.41	9.46	9.97
Food: Significant Increase	12	1.89†	*	*	*	*	8.19	8.43	10.14

B: JAPAN

Change in Stimulant Use	n	t	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GPD
Tobacco: Significant Fall	10	2.52†	1.44	1.90	5.30	5.40	12.90	12.10	11.10
Tobacco: Non-Significant Fall	75	18.39†	2.15	1.55	5.31	5.24	11.27	9.69	10.51
Tobacco: Non-Significant Increase	259	55.24†	2.20	2.14	5.83	5.59	12.05	10.56	11.46
Tobacco: Significant Increase	53	13.18†	5.17	4.92	7.39	7.19	14.35	12.26	14.47
Alcohol: Significant Fall	27	5.51†	1.74	2.07	5.22	4.04	11.85	10.22	10.35
Alcohol: Non-Significant Fall	154	33.47†	2.26	2.23	5.20	5.31	12.39	10.48	11.57
Alcohol: Non-Significant Increase	283	57.75†	2.30	2.58	5.49	5.90	12.53	11.04	12.23
Alcohol: Significant Increase	15	3.27†	10.50	10.54	10.94	7.94	17.07	14.53	15.40
Food: Significant Fall	3	1.17†	1.62	2.29	5.53	4.52	14.13	12.37	13.00
Food: Non-Significant Fall	404	68.94†	1.05	2.37	6.89	5.17	12.39	11.15	12.51
Food: Non-Significant Increase	170	29.01†	2.09	1.86	5.50	4.30	11.89	10.15	11.03
Food: Significant Increase	4	0.68†	10.00	9.43	7.75	5.25	12.50	10.25	13.75

C: HONG KONG

Change in Stimulant Use	n	t	IES-I	IES-A	HAD-A	HAD-D	HSCL-PD	HSCL-SD	HSCL-GPD
Tobacco: Significant Fall	4	16.67†	9.00	5.50	5.75	5.25	14.67	18.50	13.57
Tobacco: Non-Significant Fall	1	4.17†	25.00	5.00	5.00	12.00	7.00	16.00	14.00
Tobacco: Non-Significant Increase	17	70.83†	15.18	12.94	9.25	5.77	16.06	19.06	15.53
Tobacco: Significant Increase	2	8.33†	10.50	13.50	11.00	11.00	18.50	18.50	13.50
Alcohol: Significant Fall	1	1.85†	14.00	3.00	1.00	1.00	15.00	20.00	*
Alcohol: Non-Significant Fall	9	14.52†	11.22	10.67	7.56	8.22	12.97	17.11	12.11
Alcohol: Non-Significant Increase	11	50.00†	14.38	13.23	9.29	6.92	15.83	19.54	15.85
Alcohol: Significant Increase	1	11.54†	9.33	14.00	13.00	10.00	18.00	20.57	16.13
Food: Significant Fall	5	10.17†	19.33	17.67	10.50	6.50	15.67	19.50	16.67
Food: Non-Significant Fall	18	30.51†	9.33	9.94	7.94	7.94	13.47	16.24	12.13
Food: Non-Significant Increase	29	49.15†	10.72	8.93	7.21	7.07	15.73	17.73	14.12
Food: Significant Increase	5	10.17†	14.50	15.00	11.40†	8.83	18.57	21.00	18.00

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress; * - No data

APPENDIX XVII

CORRELATION BETWEEN CHANGES IN STIMULANT USE WITH MEAN WORK-TRAUMA SYMPTOMATOLOGY (7 SYMPTOMS)

	UK	JAPAN	HONG KONG
Change in tobacco use	0.20	0.17	0.20
Change in alcohol use	0.20	0.15	0.28
Change in food use	-0.11	-0.11	0.04

APPENDIX XVIII

CORRELATION OF SYMPTOMATOLOGY BY INDIVIDUAL DIFFERENCES

A: OCCUPATIONAL FACTORS

UK Japan HK	Rank	Service	Hours	Joining Age	Ab.	IES-I	IES-A	HAD-A	HAD-D	PD	SD	GPD
Rank	*	*	*	*	*	*	*	*	*	*	*	*
Service	0.51	*	*	*	*	*	*	*	*	*	*	*
	-0.24	*	*	*	*	*	*	*	*	*	*	*
	0.31	*	*	*	*	*	*	*	*	*	*	*
Hours	0.75	0.12	*	*	*	*	*	*	*	*	*	*
	0.34	0.39	*	*	*	*	*	*	*	*	*	*
	-0.32	0.04	*	*	*	*	*	*	*	*	*	*
Join	-0.15	-0.39	-0.07	*	*	*	*	*	*	*	*	*
	-0.31	-0.13	-0.35	*	*	*	*	*	*	*	*	*
	0.13	-0.13	-0.12	*	*	*	*	*	*	*	*	*
Ab.	0.05	-0.04	0.24	-0.19	*	*	*	*	*	*	*	*
	0.38	0.31	-0.31	-0.05	*	*	*	*	*	*	*	*
	0.31	-0.04	0.11	0.01	*	*	*	*	*	*	*	*
IES-I	0.19	0.39	-0.33	0.38	0.29	*	*	*	*	*	*	*
	0.07	-0.06	-0.03	0.04	0.12	*	*	*	*	*	*	*
	-0.37	-0.09	0.34	-0.06	0.17	*	*	*	*	*	*	*
IES-A	0.12	0.11	0.15	0.13	0.12	0.51	*	*	*	*	*	*
	0.36	-0.33	-0.06	0.33	0.11	0.30	*	*	*	*	*	*
	-0.37	-0.10	-0.03	0.19	0.19	0.41	*	*	*	*	*	*
HAD-A	0.26	0.07	0.16	-0.15	0.26	0.14	0.40	*	*	*	*	*
	-0.02	0.15	0.30	0.39	0.38	0.31	0.31	*	*	*	*	*
	-0.22	-0.21	0.05	-0.15	0.15	0.45	0.54	*	*	*	*	*
HAD-D	0.17	0.38	0.37	0.07	0.17	0.21	0.24	0.63	*	*	*	*
	0.34	0.37	0.01	0.06	0.11	0.13	0.21	0.35	*	*	*	*
	-0.12	-0.28	-0.02	-0.12	0.23	0.50	0.57	0.70	*	*	*	*
PD	0.05	0.10	0.11	0.07	0.11	0.25	0.28	0.70	0.72	*	*	*
	-0.01	0.14	0.34	0.04	0.12	0.25	0.30	0.47	0.15	*	*	*
	-0.19	-0.19	0.13	0.35	0.28	0.54	0.59	0.58	0.31	*	*	*
SD	0.33	0.38	0.01	0.36	0.14	0.29	0.32	0.73	0.55	0.50	*	*
	-0.06	0.17	0.10	0.33	0.13	0.25	0.30	0.41	0.30	0.51	*	*
	-0.30	-0.34	0.14	0.06	0.05	0.48	0.48	0.59	0.32	0.59	*	*
GPD	-0.32	0.05	0.11	0.06	0.16	0.22	0.16	0.56	0.47	0.56	0.45	*
	-0.34	0.06	-0.31	0.34	0.15	0.33	0.36	0.54	0.39	0.73	0.57	*
	-0.19	-0.26	0.04	0.22	0.12	0.50	0.57	0.57	0.34	0.58	0.30	*

B: BY PERSONAL FACTORS

	Age	Educ.	Marital	Exercise	IES-I	IES-A	HAD-A	HAD-D	PD	SD	GFD	Ab.
UK												
Japan												
HK												
Age	*	*	*	*	*	*	*	*	*	*	*	*
Educ.	-0.08	*	*	*	*	*	*	*	*	*	*	*
Marital	0.30	-0.07	*	*	*	*	*	*	*	*	*	*
Exercise	-0.01	0.01	-0.11	*	*	*	*	*	*	*	*	*
IES-I	0.12	0.13	0.14	-0.13	*	*	*	*	*	*	*	*
IES-A	0.15	0.07	0.07	0.12	0.61	*	*	*	*	*	*	*
HAD-A	0.01	-0.02	0.10	-0.01	0.34	0.40	*	*	*	*	*	*
HAD-D	0.10	0.05	0.07	-0.04	0.23	0.24	0.63	*	*	*	*	*
PD	0.08	0.02	0.02	-0.01	0.25	0.28	0.70	0.72	*	*	*	*
SD	0.06	0.03	0.05	-0.05	0.29	0.32	0.73	0.65	0.50	*	*	*
GFD	0.07	-0.04	0.04	-0.14	0.33	0.36	0.54	0.39	0.73	0.57	*	*
Ab.	-0.01	-0.05	-0.01	-0.15	0.12	0.11	0.08	0.11	0.12	0.13	0.15	*

C: BY FAMILIAL FACTORS

UK	Wk. 1	Wk 2	Ch. 1	Ch. 2	Ch. 3	Fam.1	Fam.2	ISS-I	ISS-A	Anx.	Dep.	PD	SD	GFD	Ab.
Japan															
HK															
Wk 1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wk 2	0.11	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	-0.04	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	-0.05	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Ch.1	-0.23	0.16	*	*	*	*	*	*	*	*	*	*	*	*	*
	-0.15	0.03	*	*	*	*	*	*	*	*	*	*	*	*	*
	0.17	-0.20	*	*	*	*	*	*	*	*	*	*	*	*	*
Ch.2	-0.25	0.16	0.94	*	*	*	*	*	*	*	*	*	*	*	*
	-0.17	0.04	0.97	*	*	*	*	*	*	*	*	*	*	*	*
	-0.08	0.22	0.96	*	*	*	*	*	*	*	*	*	*	*	*
Ch.3	-0.20	0.27	0.91	0.94	*	*	*	*	*	*	*	*	*	*	*
	-0.24	0.11	0.86	0.88	*	*	*	*	*	*	*	*	*	*	*
	-0.24	*	0.93	0.89	*	*	*	*	*	*	*	*	*	*	*
Fam.1	0.03	-0.11	0.17	0.13	0.25	*	*	*	*	*	*	*	*	*	*
	-0.01	-0.06	-0.06	-0.05	0.10	*	*	*	*	*	*	*	*	*	*
	0.01	-0.19	0.01	0.02	0.28	*	*	*	*	*	*	*	*	*	*
Fam.2	-0.02	-0.11	0.17	0.13	0.25	0.08	*	*	*	*	*	*	*	*	*
	0.02	0.02	-0.06	-0.06	-0.06	0.18	*	*	*	*	*	*	*	*	*
	-0.07	0.20	-0.34	-0.24	0.09	0.41	*	*	*	*	*	*	*	*	*
ISS-I	0.04	0.17	0.09	0.08	0.15	0.06	0.16	*	*	*	*	*	*	*	*
	-0.04	-0.10	-0.06	-0.10	-0.06	-0.02	-0.05	*	*	*	*	*	*	*	*
	-0.13	0.01	-0.25	0.11	0.45	-0.06	0.16	*	*	*	*	*	*	*	*
ISS-A	-0.11	0.05	0.11	-0.01	0.26	-0.02	0.15	0.61	*	*	*	*	*	*	*
	0.06	-0.12	-0.03	-0.07	-0.12	-0.01	-0.04	0.30	*	*	*	*	*	*	*
	-0.10	0.25	-0.12	0.12	0.68	0.02	0.03	0.41	*	*	*	*	*	*	*
Anx.	-0.11	-0.14	-0.05	-0.03	0.20	-0.21	0.01	0.34	0.40	*	*	*	*	*	*
	-0.06	-0.06	0.14	0.10	-0.05	-0.05	-0.04	0.31	0.31	*	*	*	*	*	*
	-0.13	-0.05	-0.14	-0.17	0.54	0.05	0.12	0.46	0.64	*	*	*	*	*	*
Dep.	0.05	-0.12	-0.03	-0.13	-0.15	-0.14	-0.15	0.23	0.24	0.63	*	*	*	*	*
	-0.07	-0.04	-0.01	-0.04	-0.01	0.06	0.04	0.18	0.21	0.53	*	*	*	*	*
	-0.13	-0.17	-0.17	-0.14	0.62	0.09	0.12	0.23	0.37	0.70	*	*	*	*	*
PD	-0.10	-0.07	0.19	0.20	0.21	-0.01	0.02	0.25	0.28	0.70	0.72	*	*	*	*
	-0.04	-0.14	0.10	0.05	-0.03	0.06	0.01	0.25	0.30	0.47	0.35	*	*	*	*
	0.00	0.44	-0.18	-0.09	0.93	0.02	0.21	0.54	0.59	0.58	0.33	*	*	*	*
SD	-0.05	-0.08	0.13	0.15	0.03	-0.11	-0.01	0.25	0.32	0.40	0.24	0.50	*	*	*
	-0.07	-0.08	0.10	0.05	0.02	-0.01	0.03	0.54	0.30	0.31	0.21	0.63	*	*	*
	0.02	-0.12	-0.06	-0.04	0.69	-0.01	-0.01	0.48	0.48	0.59	0.32	0.59	*	*	*
GFD	-0.14	-0.06	0.11	0.10	0.08	-0.11	-0.01	0.02	0.16	0.56	0.47	0.66	0.45	*	*
	-0.06	-0.13	0.04	-0.01	0.08	0.03	0.04	0.33	0.36	0.54	0.39	0.73	0.57	*	*
	-0.08	0.17	-0.20	0.06	0.35	0.03	0.16	2.50	0.57	0.57	0.34	0.80	0.58	*	*
Ab.	-0.14	-0.01	-0.05	-0.10	-0.03	-0.13	0.13	0.29	0.12	0.26	0.17	0.11	0.14	0.16	*
	0.02	-0.09	-0.11	-0.11	-0.05	-0.03	0.01	0.12	0.11	0.08	0.11	0.12	0.13	0.15	*
	-0.16	-0.02	0.13	0.19	0.58	-0.02	0.15	0.17	0.19	0.15	0.23	0.18	0.05	0.12	*

Key: IES - Impact of Event Scale, Intrusion and Avoidance factors; HAD - Hospital Anxiety and Depression Scale, Anxiety and Depression factors; HSCL - Hopkins Symptom Check List, Performance Difficulties, Somatic Distress and General Feelings of Distress; Wk1 - Employment Status of Spouse; Wk2 - Hours Worked by Spouse; Ch.1,2,3 - Children; Fam.1 - Relatives in Fire Service; Fam.2 - Relatives in Uniformed Services; Anx. - Anxiety; Dep. - Depression; Ab. - Absenteeism; * - No data.

APPENNDIX XVIIV

THE QUESTION OF MORTALITY IN EMERGENCY SERVICE WORKERS

There are certainly anecdotal belief about a link of mortality and emergency service work. The stress of fire-fighting, for example, can be a 'life threatening challenge' (Petrie & Rotheram, 1982; Smith et al, 1977); in the US between 1980 and 1982 '...stress was the primary cause of fire-fighter deaths' (Hildebrand, 1984b: 32); '...the number one killer of fire-fighters [in 1990] in the United States was stress' (Hodgkinson, 1990: 22); '...when out of control, the reaction to severe stress [in fire-fighters] proceeds from alarm and internal defence mobilization through temporary neurotic and psychotic reactions to total mental exhaustion and death' (Laughlin, 1980: 25); stress is as '...big a killer as AIDS' (Spicer, 1989); abnormally high cerebrovascular diseases in some populations need to be managed by disease control programmes (Nakamura et al, 1984: 304) etc..

There is little evidence, however, which would empirically suggest a consistent link. Partly, this is a limitation of data. Specific data on mortality, in fact, tends to concern small cohorts in European and American cultural settings, and there is only one long-term on-going study of mortality (in UK fire-fighters). Partly, though, this is a limitation of directions for research.

For example, in a study of US fire-fighter deaths from 1921-1953 higher rates of heart-related diseases and associated causes of death were observed compared to the population norm (Mastromatteo, 1959). Bates (1987) supported this view. He suggested fire-fighters aged between 45 and 54, with six or more years of service, had a higher probability of suffering coronary artery disease (CAD) compared to the population at large.

Musk et al (1978), however, observed no 'strong' association between fire-fighters and cardio-vascular, respiratory or malignant diseases, using data from 1915-1975. Although they did suggest 'possible sub-groups [or] individual differences' may influence the association (1978: 198) they were unable to conclude that fire-fighters experienced dis-proportionately high mortality rates.

Longitudinal studies of UK fire-fighters (Donnan & Scott, 1982; forthcoming) and Japanese 'protective service workers' (Nakamura et al, 1982; forthcoming) have also documented similar ambiguity. ('Protective service workers' include fire-fighters as well as other occupational groups exposed to work-trauma like police officers and paramedics.)

Thus, although it is known that in some cultural settings longevity exceeds others (see Appendix IV), this data does not profile emergency services. It also, and this is a concern for most emergency services, does not compare specific cities. Discrepancies in sub-groups can be extensive, making the use of such data inaccurate or mis-leading (Musk et al, 1978).

How does this mixed empirical-anecdotal evidence impact emergency services? In one sense, it spurs them towards exercise. It could be inferred some emergency service workers tend to be more healthy than the population norm, and that they will in fact experience less stress symptoms and, therefore, reduced incidence of premature death. There is empirical support for this in the work of Nakamura et al (1984), who observed in a five year period that frequently exercising protective service workers in Japan recorded the least mortality amongst five occupational groups (1984: 310). Although Japanese protective service workers also have a higher documented rate of cerebrovascular diseases, particularly cerebral haemorrhage, these diseases are a common cause of death in Japan and are not attributed to specific occupational conditions or lack of exercise (Nakamura et al, 1984: 303). Similarly, in America although related cardiovascular renal diseases are a common cause of death in fire-fighters they are also endemic to un-fit urban populations in North America (Mastromatteo, 1959: 232).

In another sense, though, it is frustrating as no action plans can be devised. Whilst it is theoretically possible, for example, that retired fire-fighters mortality (should it be proven as higher than population norms) is attributable to a sudden lack of stressors rather than the deleterious effects of service, there is no evidence. Although this would be in keeping with work which suggests lack of call-outs can lead to physiological stress in fire-fighters (Lim et

al, 1987; Douglas et al, 1988; LaVerne et al, 1988), it is difficult to conclude.

Overall, the data on mortality remains unadvanced. There is no empirically reliable evidence that emergency service workers experience increased mortality compared to the community from which they are drawn. Although it is important to remain aware of issues in mortality, as in future researchers will produce more comprehensive pictures of mortality amongst fire-fighters from different fire services (e.g., Donnan & Scott, forthcoming; Nakamura et al, forthcoming), it remains to be seen if data can show that, ultimately, emergency service workers do experience increased mortality rates.

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ABBREVIATIONS USED IN THE TEXT†

4-4-8 shift	Four days on, four night on, eight days off
2-2-4 shift	Two days on, two nights on, four days off
C	Civilians
CAD	Coronary-artery disease
CI	Critical incident
CNS	Central Nervous System
DSM (III/IV)	Diagnostic & Statistical Manual of Mental Disorders
FFs	Fire-fighters
GDP	Gross Domestic Product
GHQ	General Health Questionnaire
HAD	Hospital Anxiety and Depression Scale
HK	Hong Kong
HKFS	Hong Kong Fire Services
HR	Heart rate
HSCL	Hopkins symptom check-list
ICD (9)	International Classification of Diseases
IES	Impact of Event scale
ILO	International Labour Organisation
LBFB	Lothian & Borders Fire Brigade
LTO	Long-term orientation index
PVC	Poly-vinyl chloride
PTSD	Post-traumatic stress disorder
RTA	Road traffic accident
SCBA	Self-contained breathing apparatus
UK	United Kingdom of Great Britain & Northern Ireland
US	United States of America
WHO	World Health Organisation

† Written in full at the first text occurrence only.

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