Extreme Stressors: Technological Catastrophe and Environmental Disaster

	Environmental Disaster	Technological Catastrophe
Cause	Natural activity (e.g. weather; tectonic activity)	Human activity (e.g. chemical or power generation industries)
Location	Restricted to certain areas (e.g. earthquake zones, flood plains, areas near active volcanoes)	Can happen anywhere that the relevant human activities are present.
Duration	Typically short, although the after effects (e.g. famine) may last for some time.	Can be of varying duration.
Predictability, Controllability, avoidability	Some can be predicted to a certain extent, but rarely controlled or avoided.	Typically unpredictable, but because many involve human error, could potentially be avoided.

From time to time, people are exposed to extreme environmental stressors. Whilst there is some variation in the ways people respond to extreme events, it is inevitable that the majority of individuals exposed to such stressors will be affected severely. Environmental psychologists tend to distinguish between those extreme stressors that are the result of natural forces (**environmental disasters**) and those that are the result of human activity (**technological catastrophe**; see table). To a certain extent, this is a false distinction since, as stressors, they are rather similar in being sudden, unexpected and having the potential to cause damage and loss of life on a large scale. In the following section, the term 'disaster' will be used to refer to both types of stressor.

Records of environmental disasters and their impact on human populations stretch back to the beginnings of recorded history and possibly beyond, as some disasters described in ancient legend (e.g. the great floods described in the Bible and the Gilgamesh epic) may be allusions to actual events. Environmental disasters tend to be treated as newsworthy, so that in recent years worldwide attention has been directed to destructive incidents such as the eruption of Mount Soufriere on the West Indian island of Montserrat in 1997. The eruption of the volcano virtually destroyed the island's capital, Plymouth and rendered the southern part of the island uninhabitable, forcing over 8,000 people to move away. Besides the physical destruction and social upheaval, emissions from the volcano have had long-term health effects on the islanders. In particular, quartz particles from the large amount of volcanic ash dropped on Montserrat have led to an increase in lung diseases such as silicosis. Earthquakes frequently cause widespread destruction and death, particularly when they are centred on large conurbations, as has been the case in many parts of the world. In January 2001, a severe earthquake (7.9 on the Richter scale) struck the Gujarat region on India. Over 20,000 people died as a result and damage was caused as far as 300km from the epicentre. Around the epicentre, in Kutch district, damage was particularly severe, with the four major urban areas and 229 outlying villages almost totally destroyed.

The variety of technological catastrophes is potentially as great as the variety of human activity since nearly every industrial or technological process carried out on a large enough scale can have grave consequences if something goes wrong. In 1984, a pesticide factory owned by Union Carbide released poisonous chemicals in Bhopal, India. This resulted in the immediate deaths of around 4,000 people. Many more were blinded and disabled and the long-term effects are still felt today as an abnormally high incidence of birth defects and spontaneous abortion in the vicinity. The full effect of the disaster may never be known, but it is estimated that as many as 15,000 deaths may be directly attributable to the incident, with around 500,000 people affected in some way. A comparable incident in Europe was the explosion at the nuclear power station at Chernobyl, in the Ukraine, during which a large amount of radioactive material was released into the atmosphere as the result of an experiment that went disastrously wrong. Around 30 people present at the time died soon after from acute radiation sickness, and many of those involved in the cleanup operation have since died or contracted various types of cancer. About 70 per cent of the radioactive material eventually fell on Belarus, where there has since been an increase in birth defects and childhood cancers. The effects of the disaster were felt all over Western Europe and the former Soviet Union. As far away as the UK, restrictions on the movement and disposal of livestock were still in force ten years later, because of the take-up of radioactive caesium from contaminated feed.

Acts of war and terrorism have an obvious and terrible human impact. The attack on the World Trade Centre in New York on 11th September 2001 resulted in the deaths of around 2,800 people, including people that worked in the buildings, emergency services workers called to the scene and those on the planes that were flown into the buildings. Wars in the 20th Century accounted for the deaths of as many as 100 million people, combatants and civilians alike. Since the end of World War II, there have been at least 150 wars (resulting in more

than 1000 deaths per year) and many more, smaller conflicts. At least 25 million people have been killed in war since the end of WWII.

The full impact on the survivors of natural disasters, technological catastrophes and war, who may have to cope with bereavement, social upheaval, economic and financial loss and the destruction of their environment, is difficult to comprehend for those who have not been so affected. The following article will consider some of the research into how people are affected by disasters and catastrophes, and consider how psychologists might intervene to lessen an extreme stressor's impact.

Psychological Effects of Disaster and Catastrophe

During a disaster, individuals are typically affected by negative emotions such as fear and shock. It might seem logical that most people will attempt to hide during a disaster, but this is not typically the case. In fact, a range of responses can be seen from numb disbelief (Leach, 1994) through to anti-social behaviour such as looting (Cave, 1998). In the immediate aftermath of a disaster, social cohesion may increase (Bowman, 1964) and there may be evidence of constructive behaviour, such as helping the injured. There is no clear pattern of behaviour common to all disaster situations. However, it is worth stressing that **panic**, defined as flight behaviour that does not take into account the safety needs of others, is actually very rare. Reporting on the behaviour of those caught up in the attacks on the World Trade Centre, Floroiu and Sylves (2002) state that, in common with many disaster situations, the behaviour of most individuals was group-oriented with much evidence of people sharing information and helping those in need.

Those that are affected by extreme stressors of any sort usually show some evidence of psychological disturbance. Some researchers suggest the existence of an **acute stress disorder** (ASD) whose onset occurs rapidly follows exposure to the stressor. ASD is said to be characterised by severe **dissociative symptoms** including amnesia for the traumatic event, emotional numbness and feelings of derealisation, where the individual loses their sense of the reality of the external world (Barlow and Durand, 1995). Dubouloz and Rerat (1998) describe a range of other psychological symptoms that may accompany exposure to a disaster situation including grief, depression, anxiety and substance (e.g. alcohol) abuse, as well as a variety of social problems including disturbances within the family and at work. Although not all survivors of disaster will experience symptoms severe enough to warrant psychiatric diagnosis, almost all are affected by psychological symptoms to some degree.

The psychological effects of disasters are not necessarily limited to those people directly involved. Others may also be affected by what is sometimes called **secondary traumatisation**. Those most at risk from the indirect effects of disasters include the spouses and loved ones of victims, emergency services and medical workers that are immediately involved in helping the victims and whose job is to treat them following the disaster. Other groups that may be at risk include journalists that cover the disaster and, occasionally, people not involved at all but who feel in some way affected. As an illustration, three months after the attack on the World Trade Centre, the prevalence of depressive symptoms amongst a sample of Manhattan residents was about 10 per cent, compared with an expected prevalence of about 3.5 per cent (Galea, 2002). Similarly, Franklin et al (2002) found that the attacks appeared to be related to an exacerbation of depressive and anxiety symptoms in a sample of American psychiatric patients. The patients most likely to be affected were those who saw themselves as similar to the victims and those who viewed the event as highly personal.

Post Traumatic Stress Disorder

Between 5 and 22 per cent of those directly affected by disaster go on to develop a set of psychological problems now referred to as **post traumatic stress disorder** (PTSD; Green and Lindy, 1994). The main symptoms of PTSD (as described in **DSM – IV**) are:

- Re-experiencing the event. The person may have intrusive and uncontrollable memories of the event, or recurring dreams about it. At times, they may feel as if the event is reoccurring. Additionally, they may react very strongly to cues that resemble aspects of the event.
- Heightened arousal. The person is affected by abnormally high arousal and may have difficulty sleeping and concentrating on things. Additionally, they may become irritable and experience outbursts of anger.
- Avoidance of trauma cues. The person typically avoids thoughts, feelings, conversations and situations that may remind them of the event. They may have partial amnesia for the event. Additionally, their interest in their normal activities and their ability to relate normally to others may be impaired.

Rates of PTSD symptoms in disaster-affected populations increase with the severity of the event. People who suffer injury or significant personal or financial loss tend to have the most symptoms (Green, 1993). Those most at risk of developing PTSD symptoms are people who had some degree of psychological disturbance before the disaster occurred (Smith et al, 1990).

PTSD reflects both the psychological impact of the extreme stressor (flashbacks, abnormal arousal levels) and the person's attempt to deal with this (amnesia and avoidance behaviours). The latter are interesting because they

illustrate people's propensity to use the emotion focused coping strategy of avoidance. The tendency to avoid trauma cues is an adaptive short-term response as it helps the survivor avoid emotionally arousing memories of the original stressor. However, a response that is adaptive in the short term may present problems in the longer term. Many researchers agree that recovery from PTSD can be facilitated by an exploration of the painful traumatic memories (e.g. Hodgkinson & Stewart, 1991). However, the motivation to avoid trauma cues may result in those most affected by a disaster being the least likely to seek psychological assistance.

Reflecting on the usefulness of PTSD as a concept, Cassidy (1997) makes a number of observations. First, the PTSD diagnostic category has highlighted the similarities that exist between the survivors of a wide range of different traumatic events. Second, the existence of an 'official' diagnostic category for traumatic stress symptoms has given legitimacy to the distress of trauma survivors who in the past might have been dismissed as 'weak' or 'over reacting'. The possible consequences of such a view are starkly illustrated by the 306 British and Commonwealth soldiers who were executed by their own commanders for cowardice and desertion during World War I. Many, if not all, of these men would nowadays be recognised as suffering from a reaction to the unimaginable stresses of the WWI battlefield.

However, Cassidy also identifies a number of drawbacks associated with the PTSD diagnosis. First, it encourages professionals to view all those with the diagnosis as very similar when in fact there can be marked differences between them. It could even be questioned whether it is scientifically justifiable to group together under the same diagnostic umbrella such a diverse range of possible symptoms. A second problem is that an official diagnostic category can lead to a lack of flexibility when treating those affected by disasters. A diagnosis of PTSD requires the presentation of a minimum number of symptoms from all three groups (re-experiencing, arousal, avoidance) for at least a month. Those who do not meet these rather arbitrary requirements may not be offered appropriate support because they do not warrant an official diagnosis. However, they may be in no less personal distress than someone who meets the criteria. Alternately, there is the danger that psychological symptoms predating the disaster may be assumed by the diagnosing clinician to be PTSD symptoms. This could lead to inappropriate treatment. A final problem identified by Cassidy is that PTSD represents a psychiatric approach to stress response rather than a psychological one. In other words, the PTSD classification construes traumatic stress reactions as a mental illness or abnormality. It may be more appropriate to view such responses as a normal reaction to an abnormal set or circumstances.