

## Chapter IV

# Individual Reactions and Psychological Impact

### INTRODUCTION

*The possible psychosocial consequences associated with a threat or disaster, as discussed in Chapter III, indicate that people's behaviors and/or reactions can indicate whether they are affected and the degree of impact if affected. If affected, possible reactions can range from common responses, such as fear and anxiety, to fatigue, sadness, depression, and stress disorders. Whereas some people experience significant subjective discomfort, others display conspicuous impairment in their day-to-day functioning, such as sleeplessness; still others indicate clear impairment in one or more functional aspects, such as work productivity or the ability to engage in and enjoy leisure activities.*

*Such disaster/threat-induced reactions may be classified into four categories on the basis of human mental functions (NSW, 2000, p. 28): emotional (e.g., feelings of shock and helplessness, loss of pleasure, sadness), cognitive (e.g., impaired concentration and decision-making ability, disbelief, decreased self-efficacy), physical (e.g., fatigue, exhaustion, startled response, reduced immune response, insomnia, vulnerability to illness), and interpersonal (e.g., social withdrawal, impaired work or school performance, distrust, externalization of vulnerability). If they occur, these effects weaken people's response capabilities during the course of a disaster.*

*In this chapter, we model how people react to an unexpected disaster or threat and thus quantify the possible psychosocial effects a person may experience. For modeling purposes, we make several simplifying assumptions. First, we assume that people are randomly attacked by the disaster event, as either witnesses or direct victims. That is, given the occurrence of a disaster event in a region or area; those who directly encounter the danger or threat are assumed to be random. Second, each affected person will have a different psychological reaction to the disaster event, in accordance with his or her personal experiences, risk perceptions of the disaster event, and self-immune systems. Third, we assume people are risk neutral and engage in rational conduct.*

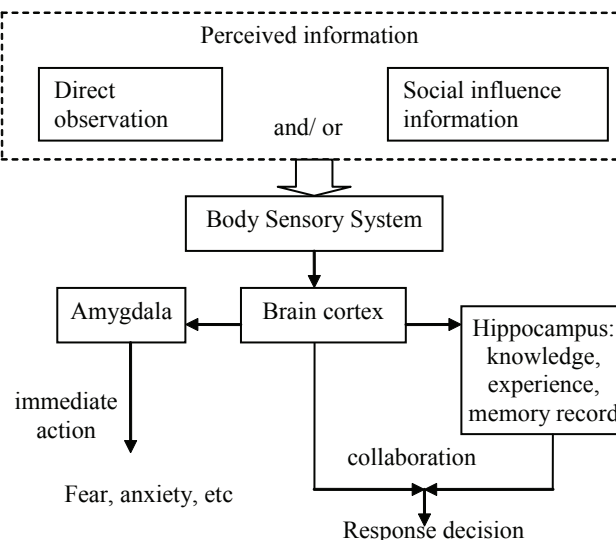
## HOW PEOPLE REACT TO UNEXPECTED THREATS

When determining possible reactions, a person may receive two possible forms of perceived information, in addition to memory information: direct observations about the disaster event and social influence information received at time  $t$ . As we defined in Chapter III, social influence information includes information indicated by other people's behavior or reaction, information from news media, and/or information from word-of-mouth social communications.

When a person faces a threat, the perceived information is transmitted to the amygdala and hippocampus through the brain cortex. In addition to setting off a chain reaction and activating the sympathetic nervous system, the amygdala can prompt an immediate reaction, such as fight or flight. This natural role reflects human instinct (an inborn function), which does not require conscious thought processing. Sometimes people follow or rely on their instincts to make quick decisions. When they encounter danger, the emotional reaction is likely driven by the amygdala, so they display a fear instinct. Meanwhile, the adrenal glands produce adrenaline and, through a different pathway, cortisol. The more adrenaline produced, the more anxious the person is, which increases his or her stress level.

In contrast, the hippocampus receives information from the cortex and combines the encountered threat event, such as the source or context, with separate features of past experiences into an integrated memory picture that helps the person make thoughtful decisions. In collaboration with the brain cortex, the advanced-level nervous system performs a conscious thought process with the aid of the hippocampus. If thoughtful decisions and associated response methods can control or handle the threat situation, the person perceives a signal of decreasing risk, which triggers the amygdala to command the adrenal glands to reduce the secreted amount of adrenaline; then, stress levels decrease, and body functions such as heart rate and blood pressure gradually return to normal. In this case, the coalition forces of the brain cortex and the hippocampus surpass the effect of the amygdala. Thus, some people can keep calm and design dealing strategies when they encounter trouble, danger, or an urgent situation, even if they sense fear initially.

Figure 4.1 Generating a response decision



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