A Prospective Study of the Relationship Between Stress, Coping and the Onset of Psychosis in a High Risk Group
A Prospective Study of the Relationship Between

Stress, Coping and the Onset of Psychosis

in a High Risk Group

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The experience of stress and associated coping responses are often described as playing an important role in the onset of schizophrenia and other psychotic disorders. Despite widespread acceptance of this model, there is little empirical evidence to support such a relationship. This is partly due to a lack of well-designed prospective studies of the onset of psychotic disorders that incorporate different aspects of the stress and coping process.

The relatively recent development of validated and reliable criteria for identifying young people at ‘ultra’ high-risk (UHR) of developing psychosis has enabled the process of onset of psychotic illnesses to be studied more closely than was previously possible. It has also opened the way to the development and evaluation of preventive interventions.

This longitudinal study aimed to compare the experiences of stress and coping between a UHR cohort (N = 143) and a group of young people without mental health concerns (HC group, N = 32). In addition, the contribution of stress and coping in the development of acute psychosis in a subgroup of the UHR cohort (UHR-P, n = 18) was also investigated.

The UHR group experienced significantly fewer life events over a 12-month period than the HC group, but there was no difference in the experience of minor events or ‘hassles’. However, the UHR group reported feeling significantly more distressed by events, felt they coped more poorly, utilised different coping skills, had fewer social contacts and felt they had lower levels of social support than the HC group. It was concluded that the appraisals made about stressors differentiated the groups and led to differences in coping and distress levels.

Appraisals of stressors also differentiated the members of the UHR group who developed psychosis within 12-months of initial assessment and those
who did not. Specifically, the UHR-P group felt they coped worse with stressful events and had fewer social supports than the UHR participants who did not develop psychosis.

This is the first study to clearly demonstrate an association between experiences of stress and coping and onset of psychosis in a high-risk group. The results indicated that treatment strategies focussing on stress management and enhancing coping skills might be important components of preventive interventions.
DECLARATION

This thesis comprises only my original work, except where due acknowledgement is made in the text to material used.

The thesis is less than 100,000 words in length, exclusive of tables, references and appendices.

____________________________________  __________________________
Lisa J. Phillips    Date
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CHAPTER 1

Introduction and Overview

This study sought to investigate whether stress and coping play a role in the onset of psychotic disorders. The number and types of stressors experienced by young people who were identified as being at ‘ultra’ high risk (UHR) of developing a psychotic disorder were monitored over a 12-month period. The strategies used to cope with those stressors were also monitored. It was hypothesised that those young people in the UHR cohort who developed a psychotic disorder would report higher levels of distress and employ less effective methods of coping than those who did not become unwell. A healthy comparison group was also recruited to determine whether the experiences of stress and coping of the UHR group differed from those of young people without mental health concerns.

The processes underlying the onset and progression of psychotic disorders are poorly understood. Recent advances have been made in the identification of genetic factors that appear to be involved (Bassett, Chow, Weksberg, & Brzustowicz, 2002; Kato et al., 2002; Maier, Zobel, & Rietschel, 2003; McDonald & Murphy, 2003; Owen, Williams, & O'Donovan, 2004), but a complete understanding of the aetiology and onset of these complex disorders is yet to be achieved.

Stress is one factor that has been consistently included in models of the development and maintenance of psychotic illnesses. Previous research suggests that the experience of stressful events that exceed an individual’s coping capacity, and/or the employment of inappropriate or ineffective coping strategies, may promote psychobiological changes that lead to the expression of psychotic symptoms (Myin-Germeys, van Os, Schwartz, Stone, & Delespaul, 2001; Nuechterlein & Dawson, 1984; Nuechterlein et al., 1994;
Furthermore, individuals with poor coping skills or inadequate coping resources might have an underlying vulnerability to the eventual development of psychosis (Fowles, 1992; Hardesty, Falloon, & Shirin, 1985; Lukoff, Snyder, Ventura, & Nuechterlein, 1984; Marsella & Snyder, 1981; Norman & Malla, 1993; Rabkin, 1980).

Whilst the suggestion that stress and coping play a role in precipitating the onset of acute psychosis holds considerable ‘face validity’, evidence to support this notion is slim and largely circumstantial. Earlier studies that have sought to investigate this potential relationship have been hampered by considerable methodological limitations such as retrospective design, small sample sizes and inappropriate comparison groups (Corcoran et al., 2003). A sound exploration of the relationship between the experiences of stress and coping, and the onset of a first episode of psychotic illness in a vulnerable cohort is the central focus of the current study.

Attempts to better understand the process of development and onset of psychotic disorders potentially have practical as well as scientific merit. Increasing emphasis is being placed on providing treatment early to prevent the onset of psychosis or to minimise its impact on the individual. A better understanding of the potential roles that stress and coping play in the onset of disorder might influence the development of effective preventive interventions.

1.1 Stress and Coping

Stress and coping are psychological concepts that have become incorporated into everyday vernacular. Although the experience of stress, its impact on functioning and health, and biological correlates have been the topic of a wealth of research over the past 50 years, there continues to be debate regarding its definition and measurement. Chapter 2 contains an
overview of the stress and coping field. In particular, this chapter provides a rationale for the measures that are used to assess stress and coping in the current study.

1.2 The Onset Phase of Psychotic Disorders

Treatment for psychosis is not normally available until a ‘full blown’ psychotic episode develops. Similarly, descriptions of psychotic disorders have typically focussed on symptoms that occur during the acute and chronic phases of established illness. However, over the past fifteen or so years there has been a shift in emphasis to the early phases of disorder due to the recognition that early intervention can reduce the likelihood of prolonged illness and entrenched disability (Edwards & McGorry, 2002; Heinimaa & Larsen, 2002; McGorry & Killackey, 2002; Shiers & Lester, 2004).

There is now considerable evidence that the acute phase of a psychotic disorder is often preceded by a ‘prodrome’ or onset phase that is characterised by a decline in functioning from the premorbid level, and the emergence of changes in thought processes, perceptual experiences, emotions and behaviour (Keith & Matthews, 1991; Yung & McGorry, 1996a). Further, it is thought that experiences during this phase can impact significantly on the eventual course and outcome of the illness (Häfner, Maurer et al., 1995; Häfner, Nowotny, Löffler, an der Heiden, & Maurer, 1995). It has been suggested that preventive interventions might be most effective if they are aimed at the prodrome, before the illness has realised its full impact on the individual’s functioning and, possibly, physiology (Mrazek & Haggerty, 1994). In Chapter 3, the literature addressing the prodromal or onset phase of psychotic illness is reviewed.

Although the importance of the prodromal phase on the subsequent course of a psychotic illness is recognised, strategies for accurate identification of
the psychotic prodrome as it occurs have been slower to develop (Yung, Phillips, & McGorry, 2004). An alternative strategy has developed - the identification of individuals who are at heightened risk of developing a psychotic disorder. It is thought that providing preventive interventions to individuals with increased vulnerability will decrease the likelihood that acute illness will develop (Yung, Phillips, & McGorry, 2004). The earliest studies that attempted to identify individuals at heightened risk of developing a psychosis involved the recruitment of children who had at least one parent with a psychotic disorder. These children were then followed up over an extended period of time (usually 10-20 years) to map onset of psychosis and to delineate risk markers for psychosis in those individuals who became unwell (Cannon & Mednick, 1993; Erlenmeyer-Kimling et al., 1995; Fish, Marcus, Hans, Auerbach, & Perdue, 1992). These ‘genetic high-risk’ studies are reviewed in Chapter 4. Unfortunately, this strategy has limited practical application due to the relatively long duration of follow-up and low transition rate to psychosis in the high-risk group. Recently, valid criteria have been developed that identify young people at increased risk of developing a psychotic disorder within a relatively short follow-up period by virtue of recent mental state changes and declining functioning (Yung, Phillips, & McGorry, 2004). The rationale and development of these criteria are also described in Chapter 4. This approach was used to identify the ‘ultra’ high-risk cohort included in the current study.

1.3 Stress-Vulnerability Models of Schizophrenia and Other Psychoses

As indicated earlier, stress and coping have been widely implicated in the development of psychotic disorders. The stress-vulnerability model is one of the most widely accepted paradigms to explain the aetiology of psychotic disorders. The model proposes that individuals who develop a psychotic disorder have an underlying vulnerability towards the development of illness that is either genetically determined or influenced by early trauma such as
obstetric complications (Zubin & Spring, 1977). Environmental stressors are implicated in the conversion of this vulnerability to an episode of acute illness. Many earlier studies have explored the relationship between stress and coping and the course of psychotic disorder. This research is critically reviewed in Chapter 5.

1.4 Hypotheses, Methods, Results and Discussion

The rationale underlying the current study is elaborated in Chapter 6 and the hypotheses are outlined.

The methodology of the current study is described in Chapter 7. This includes a description of the setting for this study (the Personal Assessment and Crisis Evaluation Clinic) and operational criteria for identification of young people at UHR of developing a psychotic disorder. Criteria for identifying transition to psychosis, one of the primary outcome variables of the study, are also outlined. The measures used to assess elements of stress and coping, and the data analysis strategies are also described.

Chapters 8 and 9 contain the results of the study. In Chapter 8, the experiences of stress and coping of the UHR group are compared to a normal comparison group. In Chapter 9, the role of stress and coping in the onset of acute psychosis in the UHR group is examined.

Finally, Chapter 10 contains a detailed discussion of the findings, limitations and implications of the study. This centres on the key question of whether the experience of stressful events, in conjunction with the types of coping strategies employed and coping resources available, influence the development of psychosis in the UHR group.
1.5 Terminology

Throughout this dissertation, reference is made to ‘psychotic disorders’ and ‘psychosis’ rather than employing the more limited term ‘schizophrenia’. Although most literature in the psychosis field usually refers to schizophrenia alone, it is felt that a wider view encompassing the whole range of psychoses is more useful (McGorry, Yung, & Phillips, 2003). This is because, firstly, acute psychosis is a ‘stepping stone’ to a psychotic disorder. The specific diagnosis is determined after consideration of the course and type of symptoms experienced following the onset of acute psychosis.

Second, the diagnostic categories currently employed (most commonly the Diagnostic and Statistical Manual of Mental Disorders (DSM: American Psychiatric Association [APA], 1994) and International Classification of Disorders (ICD: World Health Organisation [WHO], 1992)) reflect the philosophies of those who determined the criteria, at the time of publication. These frequently lag behind the latest developments in knowledge and understanding of psychopathology (Crowe, 2000; Kendell & Jablensky, 2003; Parker, 2000; Spiegel, 2005; Widiger & Clark, 2000). Changes in the definition of schizophrenia over the editions of the DSM illustrate this. Assigning a diagnostic label to an individual’s experiences also has a degree of finality, and often acts as evidence that the individual’s particular situation cannot change beyond that point. This certainly has implications in a clinical sense but also can impact on conclusions drawn through research. It is clear, however, that a diagnosis of a psychotic disorder is not fixed and there is a degree of diagnostic shift and instability, particularly in the early stages of disorder (Fennig et al., 1994; McGorry, 1994). A move away from categorisation and fixed definitions to considering the underlying symptomatology limits this problem.

Terminology is often ambiguous and malleable in the stress and coping field. The word ‘stress’ for example is a noun, a verb and an adjective, has
different meanings whether being used in the context of psychology, physics or phonetics, and can be used to describe a stimulus or a response. Unless stated otherwise, throughout this thesis ‘stress’ or the ‘experience of stress’ is used to indicate those circumstances or events that are appraised or evaluated by an individual as distressing or challenging and elicit a behavioural or biological coping reaction or response.
CHAPTER 2

Stress and Coping: Literature Review

This chapter provides a description of various models of stress and coping, with an emphasis on the evolution of psychological models. Social support is a specific aspect of coping that is highlighted in this review.

In addition to reviewing the concepts of stress, coping and social support, approaches to their measurement are discussed. The aim of this discussion is to provide a background and rationale for the stress, coping and social support measures used in this research study.

2.1 Stress

‘Stress’ is a concept that is incorporated in a range of different fields of study, including engineering, physiology, and psychology. It is also a word employed in everyday language in a number of different contexts: as a noun (to cause stress), a verb (to stress an animal) or an adjective (an animal can exhibit a stress response) (Aldwin, 1994; Toates, 1995). The widespread usage of the term ‘stress’ and the ambiguity surrounding it from a scientific viewpoint led Roskies (1983) to comment “stress has now become a short-hand symbol for explaining much of what ails us in the contemporary world” (p. 542). There have even been suggestions that the term ‘stress’ be excluded from scientific and academic debate as it has become a ‘catch-all’ term almost rendered meaningless due to the lack of consensus surrounding its use (Kasl, 1983; Rushen, 1986). Lazarus and Folkman (1984) suggested that stress is not a unitary variable but a concept that itself encompasses many variables and processes.
The first recorded usage of the word ‘stress’ to indicate suffering was in the 14th century (Lumsden, 1981). Many of the theoretical underpinnings of the concept that remain current today were influenced by the work of engineer Robert Hooke in the late 17th century. Hooke was interested in designing structures such as bridges that could carry heavy loads and withstand natural forces like wind and earthquakes without collapsing (Lazarus, 1999). He wrote about the idea of load - an external force or stimulus exerted on a system. Strain, according to Hooke, is the response of the system to the load and is akin to the stress reaction.

Although Hooke’s formulation of stress was derived ostensibly for engineering purposes, it had wider impact as an explanatory model for pressures on social, psychological and physiological systems and the notion of stress has since been incorporated into physiology, medicine and the social sciences.

2.1.1 Biological / Physiological Conceptualisations of Stress

Biological or physiological definitions of ‘stress’ are alluringly simplistic: “stress refers to the generalised non-specific response of the body to any factor that overwheels, or threatens to overwhelm, the body's compensatory abilities to maintain homeostasis” (Sherwood, 1989, p. 680), with homeostasis being the maintenance of a relatively stable internal environment by physiological systems to ensure the organism’s survival. Thus, in biological terms, a stressor is an agent that generates a response and stress is the reaction to that agent. Stressors that threaten homeostasis can be physical (injuries, heat or cold), chemical (reduced oxygen level, drugs or poisons) and physiological (cancers and allergens).
2.1.1.1 Flight or fight response

Cannon described one of the earliest models of a stress reaction - the flight or fight response (Szabo, 1998). He proposed that physiological processes are activated in response to environmental events of an acute nature, to allow the body to either combat or flee from the stressor. This model is now viewed as overly simplistic, failing to take into account endogenous stressors or long-term threat, or to explain individual responses to stressors. In addition, the model fails to acknowledge that physiological systems can be activated without the actual presence of a stressor. For example, one’s heart rate might rise when recalling a confrontation with a ferocious dog that occurred in the past.

2.1.1.2 General Adaptation Syndrome

Hans Selye described the General Adaptation Syndrome (GAS) - a non-specific, generalised physiological response to stressors that threaten to disrupt regular physiological functioning (Selye, 1956, 1993). He speculated that the GAS was mediated by the hypothalamic-pituitary-adrenal (HPA) axis and that unsuccessful adaptation to stressors led to diseases of adaptation such as hypertension, arthritis, cancer and mental illnesses.

Mason, who wrote at the time of increasing interest into psychological reactions to stress-inducing stimuli, argued that the physiological response to stressors was more complicated than either Cannon or Selye had appreciated. He suggested that a number of physiological systems act in response to a stressor (Mason, 1968). Like Selye, Mason believed that stress had the potential to promote disease but whether it did or not depended on situational and individual psychological factors, not only physiological factors as thought by Selye (Mason, 1971).
2.1.1.3 Physiological responses to stress

More recent research has confirmed Mason’s suspicions: a number of physiological systems provide a coordinated response to stressors and they occur simultaneously (Dubrovsky, 2000). As speculated by Selye, the primary physiological response to a stressor is activation of the HPA-axis (Cotter & Pariante, 2002; Selye, 1993; Sherwood, 1989; Tsigos & Chrousos, 2002). Other physiological systems involved in the stress response include the autonomic nervous system, particularly the sympathetic branch (Sherwood, 1989), and the immune system (Aldwin, 1994; Sherwood, 1989; Toates, 1995).

Areas of the central nervous system also have important roles in the stress response. The limbic system (incorporating parts of the cerebral cortex, basal nuclei, thalamus and hypothalamus) has a central role in regulating aspects of emotion (Sherwood, 1989), including anger and fear. The limbic system also triggers the overt physical responses that accompany those feelings by managing the sympathetic nervous system. Memory and learning are also involved in the response to a stressor, particularly if it has been encountered previously. The relationship between limbic areas and higher cortical areas in managing more complex behavioural and emotional response to stressors is not fully understood. However, the hippocampus is involved in regulating both memory and the HPA-axis and is therefore thought to coordinate many of the different physiological processes that underlie the stress response.

2.1.1.4 Psychosomatic illness

The study of psychosomatic medicine reinforces the notion that there are individual differences in the physiological reaction to psychological stressors. Psychosomatic illnesses are real physical conditions whose aetiology appears to have been influenced, at least in part, by psychological factors (Toates, 1995). Personality type has been cited as one factor that may influence the
development of specific illnesses. Type A personality, for example, is characterised by high levels of hostility, impatience and competitiveness and is thought to be associated with the development of heart disease (Grossarth-Matick & Eysenck, 1990; Schmitz, 1992; Toates, 1995). Physiological mechanisms that account for such specific vulnerabilities have not yet been identified.

Other models of psychosomatic illness have been developed. Alexander (1950) suggested that the type of illness that develops depends on the type of stressor that is experienced and is influenced by unconscious emotional conflicts that coincide with particular stressful experiences. Similarly, it has been suggested that individuals develop a disorder in the system that is most responsive to stress. For example, an individual who produces excessive stomach acid in response to stressful events might be predisposed to developing stomach ulcers (Darley, Glucksberg, & Kinchla, 1988). The validity and mechanisms underlying these processes require further clarification.

2.1.1.5 Allostasis

Most recently, the concepts of allostasis and allostatic load have been developed to better understand the relationship between stressful experiences and health outcomes (McEwen, 2000, 2003). Allostasis is the physiological response to stress whereby the neuroendocrine, autonomic and immune systems release adrenaline, glucocorticoids and cytokines to act on receptors throughout the body producing short-term adaptive effects in response to stressors. If these mediators are not switched off when they are no longer required, their effect on target cells is prolonged and results in damage. This is allostatic load and refers to the ‘cost’ of adaptation (McEwen, 2003). Allostatic load is reflected in measures of blood pressure, serum cholesterol levels, glucose metabolism, and cortisol excretion (McEwen, 2000) and can lead to impaired immunity, atherosclerosis, obesity,
bone demineralisation and atrophy of nerve cells in the brain (McEwen, 2003). Other factors that influence allostatic load are behaviour, through unhealthy actions such as smoking or excessive alcohol consumption, and genetic background.

As described earlier, the brain has a central role in regulating the physiological response to stressors and is therefore subject to damage if allostatic load is sufficiently high (McEwen, 2003). The amygdala and hippocampus are particularly important in interpreting stressful events and regulating responses. Atrophy of both of these regions of the brain has been reported as a result of chronic stress (McEwen, 2003). The contribution of psychiatric conditions and chronic lifestyle stressors, such as low socio-economic status, to allostatic load is being investigated. There is strong evidence that depressive disorders can lead to allostatic load and harmful changes to the brain and body (McEwen, 2003).

Charney (2004) recently extended the concept of allostasis and developed a psychobiological model of resilience to extreme stress. He suggested that investigation of such a model will enhance understanding of the development of stress-related psychiatric disorders and can also inform the development of prevention and treatment of these disorders.

2.1.2 Sociocultural Conceptualisations of Stress

Discussion thus far has focused on stressors and stress response at an individual physical level. Many events or conditions, such as war, natural disasters, economic depression, or racism, are felt at the societal as well as the individual level. For example, an increased incidence of crime and mental health problems such as substance use and suicidality at times of extreme unemployment in a community is not uncommon (Douglas, 1993; Kasl, Rodriguez, & Lasch, 1998). Of course not everyone will react the same
way to a stressor that is experienced at the social level (Lazarus, 1999). Whilst one individual might respond to high unemployment by no longer seeking employment and resorting to crime, another will consider continuing education or training to assist in finding a job. Social aspects of stress and community reactions are primarily analysed by sociologists and cultural anthropologists. As the current study investigated the stress experience at the individual level, sociocultural aspects of stress will not be considered further here.

2.1.3 Psychological Conceptualisations of Stress

Physiological conceptualisations of stress are limited because they only focus on the impact of stressors at a biological level and cannot fully explain individual responses to stressors. There has been an enormous increase in interest in psychological aspects of the stress concept since the 1940’s that has been attributed to the recognition that soldiers’ involvement in conflict and battle during World Wars I and II often had a huge and devastating psychological impact (Lazarus, 1999). Widespread concerns about the impact of stress on psychological health and well-being have led to the production of an enormous array of self-help and popular psychology texts, and these being widely available and read. In spite of the high degree of interest in the area of stress and health, the concept of psychological stress has proven difficult to define and measure.

2.1.3.1 Stress as a stimulus

Lazarus and Folkman (1984) noted that in psychological terms, stress is usually defined as a stimulus: a stressful event elicits a coping response. Lazarus (1999) suggested that this is an attractive way to think because it externalises the cause of distress, allowing the individual to ignore or
minimise the contribution of their own actions to how they feel (for example, ‘I feel terrible because my boss sacked me’). Obviously this line of reasoning can be problematic.

Three categories of stressful stimuli have been defined (Lazarus & Cohen, 1977). They are i) major changes usually occurring out of the control of any single individual and impacting on a large number of people (such as natural disasters or war); ii) major life events that may or may not be within the control of the individual but which result in a significant level of change to an individual’s life such as the birth of a child, illness of a friend or moving house; and iii) hassles or less dramatic stressful experiences that nevertheless are irritating or may involve some change to routine. Missing the bus, losing one’s house keys or feeling lonely fit this category. Other ways of categorising stressors include whether they are acute or chronic, positive or negative and the degree of impact they have on the individual (Lazarus & Folkman, 1984).

Wheaton (1999) wrote of a continuum, along which he placed the various types or classes of stressors that are most commonly described. Placement along the continuum depends on how continuous or discrete the event is. Consequently ‘sudden trauma’ and ‘chronic stressors’ are at the extreme ends of the scale, and ‘life events’ and ‘daily hassles’ are in the middle. Wheaton also included ‘non-events’ (events that are desired but do not occur) as a source of distress. Although this model is easily understood, there is yet to be a clear consensus about what differentiates major events, minor events, intermittent events and chronic difficulties from each other.

The main problem with defining stress simply as a stimulus is that it assumes that all individuals will respond in the same way to a given stressor. This is similar to the GAS. As shown below, this underestimates the relationship between the individual and stressful events.
2.1.3.2 Stress as a response

Within a psychological framework, stress has also been viewed as a response to events and an individual can describe feeling ‘stressed’ or ‘distressed’. Just as this definition of stress is inadequate within the physiological sciences, it is inadequate in a psychological context. Although it is often important to identify when an individual feels upset or distraught, focusing solely on a response renders it difficult to identify what will elicit this response and what will not (Lazarus & Folkman, 1984). Equally importantly, a ‘stress response’ may occur in reaction to events that are not normally themselves stress provoking. For example, an individual may react to a piece of beautiful music with tears, behaviour that in other circumstances indicates distress (Lazarus, 1999). Lazarus and Folkman (1984) wrote: “The response cannot be reliably judged as a psychological stress reaction without reference to the stressor” (p. 15).

Stimulus and response definitions of stress are inherently circular - a stressful stimulus is defined primarily by the fact that there is a stress response and there cannot be a stress response without a stressful stimulus (Lazarus, 1999; Lazarus & Folkman, 1984). These models fail to indicate what characteristics of the stressor induce the response or what characteristics of the response indicate the impact of a particular stressor. To paraphrase Lazarus and Folkman (1984), it is the stimulus-response relationship that defines stress, not one of these components in isolation.

2.1.3.3 Stimulus- Organism- Response models

Recognition of the role that individual characteristics play in determining the response to stressful stimuli led to the development of the Stimulus-Organism-Response (SOR) model of stress (Lazarus, 1993). Factors such as personality type were thought to influence an individual’s response to a given
situation (Frydenberg, 1997; Lazarus, 1993). The example of Type A personality was described earlier.

Although this model recognises the important role individual differences play in the relationship between stressors and response, it is a static model, which does not explain why an individual responds differently to similar stressful situations at different times (Lazarus, 1999). Clearly there are other factors that contribute to an individual’s response to a stressful event.

2.1.3.4 Transactional model of stress

The study of human responses to extreme events such as war and natural disasters, and even to more common (but often no less devastating) events such as loss of a loved one, can lead to the false impression that the stress response is primarily environmentally controlled, as most individuals will have a marked reaction to such events. The study of milder events such as moving house, experiencing a minor injury or failing an exam provides an insight into the wide variability of responses that are possible between individuals. Whilst one person may respond to being cut off in traffic by another driver with anger and thoughts of revenge, another will be less concerned and more capable of dismissing the event as trivial. In fact, an individual’s response to the same event can differ over time. This suggests that psychological stress cannot be defined only at the environmental level but must take into account characteristics of the person involved. Thus, a transactional model of stress has been developed (Lazarus & Folkman, 1984; Lazarus, 1999) (Figure 2.1).
Lazarus and Folkman (1984) defined psychological stress as “a particular relationship between the person and the environment that is appraised by the person as taxing and exceeding his or her resources and endangering his or her well-being” (p. 19). According to this model, psychological stress influences the intensity, duration and type of psychological and physiological responses to experiences or events (DeLongis, Folkman, & Lazarus, 1988). This model emphasises that a “stressful encounter should be viewed as a dynamic, unfolding process, not as a static, unitary event” (Folkman & Lazarus, 1985, p. 150).

Evaluation of the meaning and potential impact of events is implicit in this model and influences the response. Lazarus and colleagues referred to this process as cognitive appraisal (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Lazarus & Folkman, 1984). As seen in Figure 2.1, the way in which an individual attempts to manage the demands of a situation and the environment, coping, is central to the transactional model of psychological stress.
2.1.3.5 Cognitive appraisal

Two types of cognitive appraisal have been defined - primary and secondary. The labels ‘primary’ and ‘secondary’ do not refer to degree of importance or timing but merely distinguish the two types. Primary appraisal is the process of determining if an event or experience has a personal impact - is it relevant to the individual’s values, goals and self-esteem? (Folkman, Lazarus, Gruen, & DeLongis, 1986; Lazarus & Folkman, 1984; Lazarus, 1991, 1999). Secondary appraisal is the evaluation of what can be done to minimise potential negative consequences of the event (Folkman, Lazarus, Gruen et al., 1986). This is an assessment of what options are available to counter the event. As indicated earlier, an event is considered stressful if there are insufficient resources available to manage it successfully. Although this assessment may underlie coping, it is not in itself the coping response (Lazarus, 1999).

Primary and secondary appraisals are interdependent (Lazarus, 1999) and an individual’s appraisal of a particular event is not fixed but can change over time as environmental and individual circumstances change (Lazarus, 1991). Factors such as the novelty or familiarity of a stressor, its predictability or otherwise, and its timing and duration can influence appraisal (Lazarus, 1999). Thus, appraisal is a process. However, Lazarus (1991) also stated that individuals tend to develop relatively stable appraisal styles and evaluate different situations with a degree of consistency. An individual’s general appraisal style is influenced by personality traits or cognitive disposition. One example of an appraisal style is optimism or pessimism (Scheier & Carver, 1987).
2.1.3.6 Primary appraisal

Lazarus and Folkman (1984) outlined three potential outcomes of the primary appraisal process. If an event does not have the potential to impact on an individual’s welfare or goal attainment, it is irrelevant. Benign-positive appraisals result if the event is perceived to enhance or preserve happiness. Appraisal of an event as stressful suggests that the event is perceived to potentially impact negatively on an individual’s well-being or goal attainment.

Appraisal of an event as stressful can occur for three reasons (Lazarus, 1999; Lazarus & Folkman, 1984). A harm or loss appraisal indicates that a negative outcome, such as death of a family member, or recognition of damage to self-esteem, has already occurred. Identifying an event as threatening, on the other hand, refers to the potential for future negative outcomes associated with the event and is commonly accompanied by feelings of anxiety and anger. Threat allows the individual to anticipate coping strategies and implies that loss or harm is not inevitable. Finally, challenge also refers to the possible outcome of an event, but focuses on growth or gains that may result. Challenge is therefore marked by emotions such as eagerness and excitement in addition to nervousness and trepidation. Threat and challenge are not necessarily mutually exclusive: moving house, for example, may be associated with feelings of excitement about a new environment but also anxiety about getting along with neighbours.

A number of studies have indicated that how an event is appraised is associated with the development of certain mental health disorders. For example, the development of depression has been associated with appraising events as being associated with severe long-term threat and loss, and anxiety disorders are associated with the experience of events judged as being associated with a high degree of danger (Harris, 1991).
Three other contributors to the primary appraisal process have been defined (Lazarus, 1991). Goal relevance refers to the extent to which an event impacts on personal goals or aims. If an event is perceived as having little or no goal relevance, it may not be perceived as stressful. Goal congruence refers to the extent to which an event is consistent with an individual’s goals. An event that impedes the achievement of an ambition or desire is considered goal incongruent and may be associated with negative emotions consistent with feeling distressed. Finally, the type of ego-involvement associated with an event influences the emotional outcome of that event. For example, an event that results in damage to one’s self-esteem commonly results in anger.

2.1.3.7 Secondary appraisal

When an event is perceived as a threat or a challenge, an evaluation of how that event can best be managed to prevent a negative outcome becomes important. This is secondary appraisal. Three components of the secondary appraisal process have been outlined (Lazarus, 1991). Blame or credit refers to a determination of who is at fault or responsible for a situation; coping potential refers to whether or not an individual has the resources to manage the demands of a situation; and future expectancy refers to whether the situation is predicted to change for better or worse in the future.

2.1.3.8 Other moderating factors

Other psychological factors that contribute to individual differences in response to stressors or to moderate the appraisal of stressors have been described. For example, individuals who score highly on measures of hardiness appraise potentially stressful situations more favourably and use
more effective coping strategies than those who score lower (Frydenberg, 

Similarly, locus of control is the notion that the outcome of an event can 
either be influenced by the individual (internal control) or is a result of 
factors external to the individual such as fate, chance or the role of others 
(external control) (Rotter, 1966). In most situations, the perception of having 
control may be more important than the amount of control an individual 
actually has: believing that something can be done to either alter the 
situation or to help accommodate it has a positive effect on the ability to 
cope with stressful events. In keeping with this ‘externalisers’ typically 
display strong positive relationships between the experience of life events and 
physical and psychological symptomatology, whilst ‘internalisers’ generally 
experience less distress and better mental and physical health outcomes 
(Klonowicz, 2001; Parkes, 1984; Peterson & Seligman, 1987). However, this is 
not always the case. Research has also shown that individuals with strong 
internal control expectations adjust poorly when outcomes are in fact 
uncontrollable (Fournier, de Ridder, & Bensing, 2002; Shapiro, Schwartz, & 
Astin, 1996; Tennen & Affleck, 1987). For example, Taylor (1979) reported 
that people with high perceptions of internal locus of control adjust poorly to 
hospitalisation, often resisting treatment recommendations. Therefore, in 
some situations it appears that relinquishing control might be associated with 
better physical and emotional health outcomes than the maintenance of 
inappropriate beliefs of control (Peterson & Seligman, 1987; Tennen & 
Affleck, 1987).

Self-efficacy refers to the belief an individual has about his or her ability to 
deal effectively with a given situation (Bandura, 1977a, 1977b, 1984). 
Individuals with high levels of self-efficacy judge themselves as being able to 
handle situations that might be perceived as intimidating or overwhelming by 
others. This suggests that successful coping not only requires particular 
situation-specific skills but also the belief that one has those skills and can
employ them appropriately. Self-efficacy is obviously closely aligned with locus of control and secondary appraisal (Shelley & Pakenham, 2004).

An optimistic outlook, high self-esteem and a sense of purpose and goal direction have also been described as key mediators in the psychological stress process (Taylor & Aspinwall, 1996). This list of potential mediating factors highlights that an individual’s response to stress is complicated, involving many psychological processes.

2.1.4 Measurement of Stress - Physiological Perspective

The measurement of physiological responses to stress is fairly readily achieved. At the most basic level, changes in heart rate, perspiration, and respiration rate in response to an event or stimulus are easily quantified. More sophisticated analysis can measure the response to a stressor at the level of HPA-axis functioning (for example, by measuring salivary or plasma cortisol levels both prior to and after exposure to a potential stress-inducing stimulus) or the sympathetic nervous system (by monitoring adrenaline levels or heart rate). The Dexamethasone Suppression Test has been considered as the best indicator of HPA-axis functioning for many years and has been utilised in many studies of mental illnesses (Arana, Baldessarini, & Ornsteene, 1985; Berger, Krieg, Bossert, Schreiber, & von Zerssen, 1988). In this test a synthetic substance that mimics the action of cortisol - dexamethasone - is ingested and the subsequent HPA-axis response is measured (Arana et al., 1985). Stimuli that evoke a physiological stress reaction can also be quantified, such as the level of an environmental contaminant that provokes an allergic reaction or distance from feared animal that results in raised heartbeat.

As noted earlier, one problem with assessing the response to stressful events purely on a physiological level is that the physiological indicators of a
stress response do not only occur in conjunction with a stress-inducing stimulus. Physical activity, extremes in weather, and pleasurable events can also elicit these responses. Examination of the cognitive processes accompanying the physical response to a stimulus enables discrimination between a stressful response and otherwise.

2.1.5 Measurement of Stress - Psychological Perspective

It is possible to assess stimuli that induce a stress response and to measure the reaction to stress-inducing stimuli from a psychological perspective. Both approaches are useful within therapy settings. For example, when treating an individual with a specific phobia, an exposure-response prevention technique might be used (Butler, 1989). The graded hierarchy of stressful situations that is central to this technique is informed by both the physiological reaction to different potential stressors as well as the cognitive response. Progress through the hierarchy is managed by monitoring the response to each successive step - when the patient develops the ability to cope with a certain stimulus (indicated by reduced physiological and cognitive responses to the stimulus, mediated by newly acquired coping skills), the next situation up the list is then addressed.

2.1.5.1 Life events

For many years, the standard approach to assessing the level of stress experienced by an individual has been to count the number of major life events that have occurred within a defined time period. This approach developed from the observation by Holmes and Rahe (1967) that major life changes such as the death of a loved one, purchasing a house, or getting married result in a degree of readjustment and an increased risk of physical illness. They developed the Social Readjustment Rating Scale (SRRS). Each
item in this list of common life events is weighted according to the degree of
'readjustment' to everyday life is required to accommodate it. It was
assumed that the more life events experienced over a given length of time,
the greater the psychological impact and the degree of readjustment required
by the individual. A number of similar scales have been developed based on
the SRRS, such as the Psychiatric Epidemiology Research Interview
(Dohrenwend, Krasnoff, Askensky, & Dohrenwend, 1978). Many of the later
scales do not assign a weighting to individual event types, but simply assume
that the greater the number of events experienced within a given time frame,
the greater the psychological impact.

Although it makes sense that an accumulation of life events can impact on
health status, the influence of mediating factors, including the desirability,
predictability, and level of control associated with events is ignored using this
approach. The life events model also fails to incorporate a role for the
appraisal processes described above and is developed from the static models
of stress that view stress as something that simply impacts on the individual.

Additionally, major life event checklists are invariably incomplete, do not
take into consideration cultural or social factors such as age or ethnicity on
the impact of events (DeLongis, Coyne, Dakof, Folkman, & Lazarus 1982;
Kanner, Coyne, Scharfer, & Lazarus, 1981; Lazarus, 1999) and tell very little
about day-to-day living, as events included on such lists occur relatively
infrequently by definition. Further, little consideration has been given to the
point at which events that happen more than once stop being viewed as major
life events and become classified as ongoing stressors (for example, abuse
that occurs regularly within a relationship). Despite these shortcomings, the
life events approach has, unfortunately, remained dominant in the
psychological literature due to the paucity of other approaches.

The Life Event and Difficulty Schedule (LEDS) developed by Harris (1991)
was an attempt to address many of the shortcomings of the basic life event
checklists. An interview is conducted with the subject to determine what incidents or events have occurred during a specified period of time. Detailed questioning then enables the interviewer to rate various aspects of the quality of each event such as degree of long-term threat or unpleasantness, loss, danger, and goal congruence.

Although the LEDS enables important information about the nature of stressful events to be determined, its author acknowledges that its use has some distinct disadvantages. First, administration of the LEDS takes considerably longer than the checklist approach (an interview covering a 12-month period is estimated to take 1 hour 45 minutes and rating the responses takes an additional 2 hours 45 minutes) (Harris, 1991). People wishing to use the LEDS are required to undergo intensive training with an accredited trainer. Despite these shortcomings, the additional information gained through this more intensive interview-based approach is extremely valuable when investigating the relationship between stressful life events and disorder. A number of interviews have been developed based on the LEDS including the Life Events Interview Schedule (LEIS) that is used in the current study.

2.1.5.2 Hassles

A number of researchers have investigated whether relatively minor events or ‘hassles’ that occur more frequently than major life events have an impact on health outcomes. Kanner and colleagues (1981) defined hassles as “the irritating, frustrating, distressing demands that to some degree characterize everyday transactions with the environment” (p. 3). Hassles include practical difficulties such as losing one’s keys, chance events such as poor weather, and ongoing concerns and worries such as caring for children.

Like life events, hassles are thought to be cumulative and impact on physical and psychological health (Kanner, Feldman, Weinberger & Ford,
although Dohrenwend and Shrout (1985) disagreed. Hassles are more likely to be influenced by an individual’s characteristics and lifestyle than major life events. Although the relationship between hassles and life events has not been fully explored, some researchers have suggested that minor stressors do not always occur independently of major life events, and they might moderate the expression of symptomatology (Monroe, 1983; Pillow, Zautra, & Sandler, 1996).

Scales have been developed to assess the regularity and impact of hassles as well as attempting to capture the individual’s perception of the severity of hassles that are experienced. The Hassles Scale (Kanner et al., 1987) is the most widely used scale of this type and it measures both the quantity and severity of hassles that are experienced. The inclusion of severity ratings has been criticised by some for contaminating measurement of exposure to hassles with psychopathology and distress, which are often predicted by the number of hassles experienced. DeLongis and colleagues (1982) questioned whether the Hassles Scale is merely an inventory of what has taken place in the respondent’s life or is weighted by the meaning or subjective impact (appraisal) of the events and therefore is coloured by beliefs and expectations. They also noted that demographic factors could influence the significance of a hassle. For example, younger people are more likely to endorse hassles such as having a poor night’s sleep or experiencing pain more often than older people because they occur less frequently to younger people in general. More recently, the experience of positive minor events has been recognised and they have been incorporated into scales as ‘uplifts’.

2.1.6 Summary - Stress

The characterisation and assessment of stress has undergone considerable refinement over the past twenty years, and attention is now being paid to better understanding the stress response and the dynamic relationships
between stressors and the individual. However, some outstanding issues remain. How do stressors integrate? Is the relationship a simple additive one or more complex depending upon the different qualities of stressors experienced? How does the impact of an ongoing chronic minor stressor or hassle compare with the experience of a single major life event? Does genetics play a role in the experience of particular stressors or the number of stressors experienced? Further, whose perspective should be taken when rating the impact of a particular stressor - the affected individual or an independent observer? There is obviously much more work to be done in this field.

Contemporary psychological models of stress, particularly the transactional model, suggest that measures used to assess the experience of stress should be multi-faceted. Whilst most measures continue to quantify the number of stressful events confronted by an individual, the subjective experience of those events is also assessed. Additionally, measures do not only focus on the experience of major life events, but also on the experience of minor events or hassles.

### 2.2 Coping

Coping is a multifaceted concept. A broad definition is that coping is an individual’s “cognitive and behavioral efforts to manage (reduce, minimise, master or tolerate) the internal and external demands of the person-environmental transaction that is appraised as taxing or exceeding the person’s resources” (Folkman, Lazarus, Gruen et al., 1986, p. 572). All thoughts and behaviours in response to a stressor are considered to be coping responses, whether they assist in managing the situation or not. An individual may not always be aware of the strategies they employ to cope with a stressor, for example working overtime to avoid a stressful home environment, although this might be obvious to others.
2.2.1 Traditional Models of Coping

Initially coping models were derived from animal research and psychoanalytic literature (Lazarus & Folkman, 1984). The animal model defines coping as behavioural responses that lower psychophysiological arousal thereby reducing the impact of noxious stimuli (i.e. the ‘flight or fight’ concept). An example of this is hibernation in colder months by bears or a zebra running away from a lion to avoid potentially being eaten. This model of coping is clearly inadequate for many human (and indeed possibly animal) situations because it does not incorporate a cognitive or emotional element.

Within a psychodynamic framework, coping can refer to psychological defence mechanisms that are used to deal with psychological conflict deriving from internal or external events. These defence mechanisms alter one’s perception of events in order to reduce distress (Suls, David, & Harvey, 1996). In other words, the role of defence mechanisms is to “fend off, distort or disguise unacceptable ideas or feelings” (Parker & Endler, 1996, p. 8) that threaten ego stability. A vast number of defence mechanisms, such as repression, dissociation, denial and intellectualisation, have been described by theorists from Freud onwards (Parker & Endler, 1996; Suls et al., 1996). Anna Freud suggested that particular defence styles are associated with particular psychological problems (Sandler & Freud, 1983). For example, hysterical neuroses were associated with repression whilst paranoid neuroses were linked with projection (Parker & Endler, 1996). She also suggested that some defences are more pathological than others (Parker & Endler, 1996). Vaillant (1971) created a hierarchy of defence mechanisms from immature to sophisticated and adaptive. This model suggests that those who primarily employ adaptive defences have better mental health than those who do not, although this has not been clearly illustrated.
The ego defence approach to defining coping is not dominant today for a number of reasons. Differences in nomenclature of the various defence mechanisms have led to confusion (Suls et al., 1996). More importantly, there is a lack of empirical evidence supporting the validity of the ego defence approach. Most of the literature in this field consists of case studies, which do not stand up to the scrutiny modern psychology demands (Vaillant, 1994). There is an unproven assumption implicit in this model that some defence styles are always adaptive whilst others are always maladaptive and the context within which they apply is irrelevant. The description of ego defences also ignores the role of conscious and behavioural coping strategies (Folkman & Lazarus, 1980).

According to Lazarus and Folkman (1984), another central problem with the psychodynamic definition of coping is its emphasis on coping style or trait, which has subsequently been found to have little value in predicting actual coping behaviour. A study of the coping style of surgery patients and the actual strategies used to cope with their surgery revealed no significant correlation between trait and process measures of coping, with the process measure being a better predictor of recovery (Cohen & Lazarus, 1973). This study suggested that trait measures of coping underestimate the complexity of coping strategies as most trait measures evaluate coping on a single dimension (such as repression-sensitisation). It should be noted, however, that recent research has suggested that some coping styles are trait-like. One example is reappraisal or suppression in emotion regulation (Gross & John, 2003).

Coping is a complex process with many different levels of stimuli to be attended to and changing demands over time (Lazarus & Folkman, 1984). A study of college students before, during and after an exam found that coping strategies employed differed at the three stages of the stressful event (Folkman & Lazarus, 1985). This is not to say that individuals do not have preferred modes of coping in certain situations, but traditional models of
coping have tended to view coping responses as relatively stable and inflexible.

2.2.2 Process Models of Coping

In the 1960’s, research began to highlight coping as a process. Lazarus and colleagues called attention to the importance of coping behaviour (in contrast with unconscious defences) and the cognitive and situational determinants of a coping response. Exchanges between the person and the environment (appraisal) and the ongoing state of action and reaction are as important in coping as they are in the stress process (Frydenberg, 1997). The primary and secondary appraisal process influence the coping strategies enacted at a given time. Importantly, Lazarus (1999) stated that no universally effective or ineffective coping strategies exist.

In a landmark study, 85 married couples were interviewed once a month for six months about the most stressful event they had encountered over the previous week and the strategies they used to cope with that event (Folkman, Lazarus, Dunkel-Schetter et al., 1986; Folkman, Lazarus, Gruen et al., 1986). A factor analysis of the results revealed eight distinct coping strategies shown in Table 2.1. The first three strategies are problem-oriented, the next four are emotion-oriented and the final strategy is avoidance. Other studies have revealed similar groupings of strategies (Dunkel-Schetter, Feinstein, Taylor, & Falke, 1992; Pearlin & Schooler, 1978).
<table>
<thead>
<tr>
<th>Problem-oriented strategies</th>
<th>Coping strategy</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Confrontative coping - aggressive efforts to change</td>
<td>“I stood my ground and fought for what I wanted”</td>
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<tr>
<td></td>
<td>situation</td>
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<tr>
<td></td>
<td>Seeking social support - obtaining information and</td>
<td>“I talked to someone to find out what my options might be”</td>
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<tr>
<td></td>
<td>emotional support from others</td>
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<td></td>
<td>Planful problem solving - deliberate problem-oriented</td>
<td>“I brainstormed possible responses, chose one and followed it”</td>
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<tr>
<td></td>
<td>efforts</td>
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<tr>
<td>Emotion-oriented strategies</td>
<td>Self-control - efforts to regulate emotions</td>
<td>“I told myself not to get angry”</td>
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<td></td>
<td>Distancing - efforts to detach oneself from the</td>
<td>“I tried to distract myself - did not let it get to me”</td>
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<td></td>
<td>situation</td>
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<tr>
<td></td>
<td>Positive reappraisal - finding positive meaning in an</td>
<td>“I thought of how much more rounded as a person I would be for this</td>
</tr>
<tr>
<td></td>
<td>experience by focusing on personal growth</td>
<td>experience”</td>
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<td></td>
<td>Accepting responsibility - acknowledging one’s role</td>
<td>“I blame myself”</td>
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<tr>
<td></td>
<td>in the situation</td>
<td></td>
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<tr>
<td>Avoidance strategies</td>
<td>Escape - wishful thinking or efforts to avoid the</td>
<td>“I wished that I could sink into the floor” or smoking or eating to</td>
</tr>
<tr>
<td></td>
<td>situation</td>
<td>distract oneself from the situation</td>
</tr>
</tbody>
</table>
In general, if a situation is amenable to change, problem-oriented strategies tend to be applied (Folkman & Lazarus, 1980). These strategies involve action and changing the reality of a situation. An example is consulting a doctor about different treatment approaches for a given medical situation. Emotion-oriented coping aims to reduce emotional distress. Looking for positive aspects of the situation or wishing that things were different might achieve this.

Avoidance is rarely employed at the same time as active coping strategies and tends to be used when the active strategies have been unsuccessful (Endler & Parker, 1990a). Avoidance can take a number of different forms such as wishful thinking, denial or engagement in distracting activities. In some situations, otherwise positive coping strategies can be viewed as avoidant strategies. For example, cognitive reappraisal is generally viewed as an adaptive coping strategy. However, when used to justify or rationalise certain behaviour (such as excessive alcohol use or smoking cigarettes), it can be viewed as avoidance. Avoidance can be useful in the early stages of a stressful event, enabling the individual to mobilise more active coping skills and resources (Lazarus & Folkman, 1984). Long-term avoidance is generally associated with lower psychological well-being. For this reason avoidance is often described as maladaptive or unhelpful.

### 2.2.3 Factors Influencing Coping Responses

Evidence suggests that individuals vary their coping strategies to fit a given stressor. Factors that influence the choice of coping strategy include the acute or chronic nature of the stressor, observed coping responses of others, and previous experience with similar stressors (Wethington & Kessler, 1991). Psychological well-being may be associated, in part, with the ability to engage in a wide variety of coping strategies, rather than rigid adherence to a restricted collection of strategies. Fredrickson (2001) suggested that the
experience of positive emotions broadens an individual’s repertoire of thoughts and actions. For example, joy creates the urge and confidence to push limits and be creative. A broader range of thoughts and actions, in turn, enhances an individual’s physical, intellectual and social resources. In Fredrickson’s words: “…broadening builds enduring personal resources, which function as reserves to be drawn on later to manage future threats” (Fredrickson, 2001, p. 220). Thus, the experience of positive emotions is one factor that might influence which coping strategies are used in stressful situations.

There are a number of independent variables that potentially influence which coping strategies are used in a given situation. Temperament refers to an individual’s stable dispositional style (Rutter, 1981). Temperament is thought to have a biological and genetic basis, but is probably influenced by experience. The exact nature of the relationship between temperament and coping remains to be fully explored.

Personality type has been associated with coping strategies that are applied. This is not the same as the coping trait model outlined earlier. The relationship between personality type and coping is less rigid and more adaptable to the circumstances of the event. One study that measured personality type found that adolescents who were classified as Extroverted tended to use more positive and successful coping strategies than peers scoring highly on Neuroticism or Psychoticism criteria (White, Hill, Hopper, Frydenberg, 1995). Other associations between personality and coping style that have been reported include a link between the tendency to be good natured and agreeable and the use of positive interpersonal strategies and lower levels of maladaptive emotion-oriented coping, and conscientiousness (the tendency to be careful and reliable) with low levels of emotion-oriented coping and higher use of problem-oriented coping strategies (Aldwin, 1994). Several prospective studies in the 1980’s demonstrated that different personality types are associated with different ways of responding to stressors.
and also to specific health outcomes (Eysenck, 1987, 1988; Grossarth-Maticek, Eysenck, & Vetter, 1988).

Locus of control is also thought to impact on the coping strategies employed. An internal locus of control has been related to an increased use of problem-oriented coping (Bollini, Walker, Hamann, & Kestler, 2004; Giankos, 2002; Moore, 2002; O'Connor & Shimizu, 2002; Zuckerman, Knee, Kieffer, & Gagne, 2004). This makes sense: an individual will not usually attempt to change the outcome of an event unless they believe that this is possible.

Finally, some situation specific factors have been identified as important determinants of coping (Lazarus & Folkman, 1984). They are: novelty (has the individual been faced with this type of stressor in the past?); predictability (are there signs or warnings that a stressful event is likely to occur?); uncertainty (how likely is it that the event is going to occur?); imminence (how soon is the event likely to occur?); and duration (how long will the event last?). There appears to be some compatibility between certain types of stressful situations and coping effectiveness. Wethington and Kessler (1991) noted that if a particular action is necessary, positive reappraisal alone is associated with lower psychological well-being. The degree of threat, harm or challenge that is perceived as being associated with a stressful event may also influence the type of response (Folkman, Lazarus, Pimley, & Novacek, 1987). Aldwin (1994) suggested that emotion-oriented coping is more adaptive when the stressful situation involves loss (for example at times of bereavement), whilst problem-oriented coping is more effective when confronted with a threat or challenge. Age and gender differences in coping responses have also been commonly reported (Ben-Zur, 2002; Compas, Malcarne, & Fondacaro 1988; Frydenberg & Lewis, 1993; Frydenberg, 1997; Garnefski, Legerstee, Kraaij, van den Kommer, & Teerds, 2002; Hamarat, Thompson, Steele, Matheny, & Simons, 2002; Knapp, Stark, Kurkjian, &
2.2.4 Measurement of Coping

“Paper and pencil” tests or checklists are the most common ways of assessing coping, although qualitative research involving interviews has also been described (Coyne & Racioppo, 2000; Frydenberg & Lewis, 1993). Unfortunately many of the coping checklists that have been developed are weakened by poor psychometric properties and a failure to distinguish trait-like strategies from situation specific (state-like) strategies (Endler & Parker, 1994). Coyne and Racioppo (2000) referred to a ‘crisis’ in coping research associated with the inadequateness of many coping measures to provide information that is useful from clinical standpoint. They complained that most coping measures are too general to provide information that is valid and practically applicable. For example, they highlighted that the reduction of coping to a summary score on a questionnaire results in the loss of a great deal of qualitative information that is useful in determining the effectiveness or appropriateness of a coping response. Coyne and Racioppo (2000) suggested that coping research should move towards behavioural observation, experience sampling and structured diaries to assess coping. However, the development of such techniques is slow and a reliance on checklists remains.

2.2.5 Summary - Coping

The transactional model of stress and coping suggests that coping is a process that is influenced by many individual and environmental factors. The importance of an individual’s appraisal of stressful events in determining the coping response is now recognised by researchers and is beginning to be incorporated into scales that are used in research studies. An individual’s
perception of whether they have the resources to cope with an event or not appears to have a central role in determining the coping response and is commonly assessed in measures of stress and coping.

2.3 Social Support

There is growing evidence that social support is particularly important for physical and psychological health and might be an indicator of psychological well-being (Brugha, 1995; Cohen, 2004; Frydenberg, 1997; Rawlins, 2004). A few studies have even indicated that a lack of social support is a predictor of early mortality (Bowling & Grundy, 1998; Dalgard & Haheim, 1988; House, Landis, & Umberson, 1988; Robles & Kiecolt-Glaser, 2003; Rutledge, Matthews, Lui, Stone, & Cauley, 2003; Vaillant, Meyer, Mukamal, & Soldz, 1998) and poor mental health (Rhodes and Lakey, 1999). The associations between social support and health and mortality are similar in magnitude to the association between physical risk factors and health (Uchino, Uno, & Hol-Lunstad, 1999).

Like the concepts described above, social support is complex and multidimensional and once again there is no clear consensus on a definition. One reasonable definition of social support is “the process by which individuals manage the psychological and material resources available through their social networks to enhance their coping with stressful events, meet their social needs and achieve their goals” (Rodriguez & Cohen, 1998, p. 536).

2.3.1 The Relationship Between Social Support and Coping

Social support and coping are generally considered to be related (Cohen, 2004; Holahan & Moos, 1994; Thoits, 1986) and neglect of the social context is considered one of the biggest shortcomings of coping research (Schreurs & De
A number of different ways of integrating the two constructs have been described. The simplest way to connect the concepts is by viewing the act of seeking social support as a coping strategy (Heller & Swindle, 1983; Lazarus & Folkman, 1984). A more sophisticated way of linking social support and coping is to consider social support as a coping resource (Holahan & Moos, 1994; Thoits, 1986). Thoits (1986) stated “social support is the active participation of others in an individual’s stress management efforts” (p. 417). Others can assist an individual to change a situation directly, to change his or her perception of the situation or to change the emotional response to a situation through strategies such as creating a diversion from a stressful situation by offering food or a cup of tea, or by linking them in with an appropriate support service. Thoits (1986) hypothesised that social support alters or eliminates sources of threat to an individual through these strategies, indirectly promoting self-esteem.

Models of social support as a form of coping, such as those of Thoits (1986) and Holahan and Moos (1994), suggest that studies of coping strategies should also incorporate a measure of social support. There is obviously also an inherent degree of overlap between the concepts of social support and stress as both positive and negative social interactions can contribute to the occurrence of life events (such as marriage and divorce) and more minor stressors (arguments over money, for example) (Schuster et al., 1990). This needs to be kept in mind when measuring stress, coping and social support.

2.3.2 Models of Social Support

Early work addressing the issue of social support developed from the sociology and social anthropology fields and focused on structural support - the extent and interconnectedness of an individual’s social relationships. These concepts are typically measured by assessing marital status, regularity of contact with others, number of friends and membership of recreation or
social groups. This provides an indirect measure of the resources that are potentially available from one’s social relationships (Cassel, 1976; Rodriguez & Cohen, 1998). It also assumes that all network members provide equivalent levels of support (Wellman, 1998).

More recent considerations indicate that social support should be viewed as a broader construct, incorporating both structural and functional characteristics of social interactions and networks (Schreurs & de Ridder, 1997). Functional support refers to psychological and material resources that are available from an individual’s social network. Three main types of resources have been described: instrumental aid (actions or materials offered by others to influence functioning); socioemotional support (demonstrations of affection, love, sympathy or group belonging); and informational aid (provision of opinion, fact, and advice) (Thoits, 1986).

The relationship between social support and health is thought to be influenced by a number of other factors such as individual differences in the need or desire for social relationships and support, individual characteristics of both the supportee and the supporter, the nature of the relationship, and the match between support needs and available resources.

Two competing hypotheses have been developed to explain the relationship between health and social support (Cohen & Wills, 1985; Cohen, Gottlieb, & Underwood, 2001). The main-effect hypothesis proposes that social support has a uniform, beneficial influence on well-being regardless of the nature or degree of stress being experienced (Cohen, Gottlieb, & Underwood, 2000). According to this model, well-integrated social networks provide individuals with socially rewarding roles in society and regular positive interpersonal experiences. Further, socially integrated individuals are more likely to receive feedback from others that promotes feelings of self-worth and belonging (Rhodes & Lakey, 1999).
The buffering hypothesis suggests that social relationships do not impact directly on the individual but they moderate the impact of stressful circumstances. The belief that support is available from others to assist in coping with an event might influence how an individual appraises that event (Cohen et al., 2000). Similarly, how an individual responds to an event might be moderated if they anticipate receiving emotional and practical support from others.

Various studies have attempted to assess the legitimacy of both the main-effect and buffering hypotheses. Most of these studies have a cross-sectional design and therefore can only demonstrate associations rather than causal relationships. Few longitudinal studies have been conducted. Evidence for a buffering role between social support and mental health outcomes has been found in some studies (Dalgard, Bjork, & Tambs, 1995; Frese, 1999; Gonzales, Tein, Sandler, & Friedman, 2001; Olstad, Sexton, & Søgaard, 2001; Pierce, Frone, Russell, & Cooper, 1996; Ren, Skinner, Lee, & Kazis, 1999; Stansfeld, Rael, Head, Shipley, & Marmot, 1997; Ystgaard, Tambs, & Dalgard, 1999), whilst others have supported the main effect (Bal, Crombez, Oost, & Debourdeauhuij, 2003; Cohen, 2004; Dekker & Schaufeli, 1995; Ingledeuw, Hardy, & Cooper, 1997; Kalil, Born, Kunz, & Caudill, 2001). One general problem with these studies is that they usually focus on specific population groups, such as white collar workers or adolescents, or on people who are experiencing specific stressors such as job insecurity. Few studies have been conducted in the general population.

Some investigators have reasoned that support resources must match support needs if social support is to reduce the negative impact of stressful events (S. Cohen, 1988a; Cutrona, 1990; Cutrona & Russell, 1990). Further, the level of control an individual perceives that they have over the occurrence of a stressful event is important. The perception of a high level of control is associated with the need for support that enhances active coping.
Conversely, a low level of perceived control is associated with a need for social resources that assist in processing the event on an emotional level.

Other personality factors might also play a role in the relationship between social support and mental health. Dalgard and colleagues (1995) reported that social support protected against the development of mental distress only in individuals who expressed feelings of powerlessness and lack of control over their own lives.

Numerous determinants of social support have been described. Early developmental experiences of social support are likely to be important in determining the degree of social support reported in adulthood. Individuals who were placed in institutional care during childhood reported smaller social networks in adulthood than others raised in family environments (Brugha, Sturt, MacCarthy, Wykes, & Bebbington, 1990). Personality factors such as self-esteem and positive outlook are also likely to influence social support (Brugha, 1995).

Until recently, the potentially negative impact of social support was not widely recognised. This does not simply refer to the absence of social networks and support, but to conflict and discord that can occur in relationships (Cohen, 2004; Coyne & Downey, 1991; Curtis, Groarke, Coughlan, & Gsel, 2004; Mellins, Ehrhardt, Rapkin, & Havens, 2000; O’Reilly, 1988; Sarason, Sarason, & Pierce, 1990; Shinn, Lehmann, & Wong, 1984; Vaux, 1988). Coyne and Bolger (1990) observed, “for many persons, the cost of involvement in ... destructive relationships may be greater than that of being alone” (p. 155). Even well-intentioned support can produce negative outcomes. For example, a supportive environment may foster dependence and reinforce inappropriate health behaviours (Gil, Keefe, Crisson, & van Dalfsen, 1987). Further, ‘negative’ support can increase feelings of anxiety and depression (Liang, Krause, & Bennett, 2001; Ray, 1992; Rook, 1984; Schuster, Kessler, & Aseltine 1990; Wortman & Lehmann, 1985). Some
researchers have proposed that the absence of negative support accounts for much of the relationship between social support and health, rather than the presence of positive support (Coyne & Bolger, 1990; Coyne, Wortman, & Lehman, 1988). However, Okun & Keith (1998) reported that the impact of positive social interactions on depressive symptoms is stronger than the impact of negative interactions.

It has been suggested that most social relationships have a degree of both support and negativity or conflict within them (Abbey, Andrews, & Halman, 1995; Ruehlman & Wolchik, 1988; Schuster et al., 1990) and at least four negative features of social relationships have been described: ineffective helping, excessive helping, negative regulation and unpleasant interactions (Rook & Pietromonaco, 1987). In spite of the recognition of negative aspects of social interaction, most of the research in this field continues to focus on positive aspects of social relationships only. Exceptions are research into chronic pain conditions (Turk, Kerns, & Rosenberg, 1992) and the impact of negative expressed emotion on the course of schizophrenia (Barrowclough, Johnston, & Tarrier, 1994). Until a more appropriate label is determined, social ‘support’ continues to be used.

2.3.3 Measurement of Social Support

In reflection of the above discussion, there are two general approaches to the measurement of social support. The first addresses an individual’s subjective evaluation of their support network through self-report questionnaires. The second approach objectively quantifies the level of support that is available.
2.3.4 Summary - Social Support

The important relationship between social support and health has been recognised for some time, although the negative impact of social relationships has only recently been widely acknowledged. Social support and coping are generally viewed as related concepts, and it is suggested that studies of coping should incorporate assessment of social support and a coping resource. Assessment of the size of social networks and the perception of the quality of support that is available are equally important.

2.4 Summary

As this review has illustrated, there has been a great deal of debate around the psychological concepts of stress and coping over the past 40 years. Transactional, process-oriented conceptualisations of both stress and coping are the most valid and sound, particularly because they incorporate a cognitive component. In reflection of this, measurement needs to capture both subjective and objective features to fully assess the different aspects of this process.

In the current study, the measures used to assess stress and coping strategies employed by young people at ‘ultra’ high-risk of psychosis and a comparison group were consistent with the transactional model. These measures are described in detail in Chapter 7. The following two chapters provide a rationale and background to the approach taken to identify the UHR cohort.
CHAPTER 3

Onset of Psychotic Disorders

The primary aim of this study was to assess the contribution of stress and coping to the onset of psychosis. Central to this investigation was the identification of individuals who were experiencing mental state changes that suggested they were at heightened risk of experiencing a first psychotic episode, if not already experiencing the prodromal phase of a first episode when they entered the study. In recent years, the prodrome of psychotic disorders has risen in clinical and research importance with the recognition that the most promising avenue for preventing illness onset is to provide interventions during this critical phase (Mrazek & Haggerty, 1994).

In this chapter, research characterising the psychotic prodrome will be presented. Most importantly, reasons why the prodrome is not yet a valid target for preventive interventions and why it cannot yet be identified with a high degree of certainty will be discussed. An understanding of the current state of research into the prodrome and limitations of this concept leads to Chapter 4 in which the rationale behind the strategy to recruit the UHR group included in this study is described and discussed.

3.1 The Prodrome

The onset phase of psychotic disorders is commonly referred to as the ‘prodrome’. This expression derives from the Greek word prodromos meaning the precursor of an event (Fava & Kellner, 1991). In medicine ‘prodrome’ generally refers to symptoms occurring prior to the development of the characteristic signs of an illness that permit definitive diagnosis (Taylor, 1988; Thomas, 1985). Prodromal phases of asthma (Edmondstone, 2000),
Alzheimer's Disease (Hodges, 1998), Type 1 diabetes (Knip & Akerblom, 1999), migraine (Luciani et al., 2000; Rozen, 2004), herpes simplex (Ramanathan, Rammouni, Baran, & Khatib, 2000), stroke (Lee, Whitman, Lim, Lee, & Park, 2001), hepatitis B (Han, 2004), Parkinson's Disease (Woods & Troster, 2003) and other disorders have been clearly described. Within psychiatry, a prodromal phase of unipolar Depressive Disorder has been described (Fava & Kellner, 1991; Murphy et al., 1989; Pezawas et al., 2003) and Generalised Anxiety Disorder has been conceptualised as a prodrome of other disorders (Kessler, Keller, & Wittchen 2001). It should be noted that the prodrome is a retrospective concept that is confirmed only by the development of the diagnosable disorder.

Keith and Matthews (1991) defined the psychotic prodrome as “a heterogeneous group of behaviours temporally related to the onset of psychosis” (p. 53) which impact on thought processes, emotions and behaviour. Some authors have stated that virtually all patients with schizophrenia experience a prodrome, whilst others have reported that some patients experience a very rapid onset of symptoms at acute intensity with very little or no prodromal component (Varsamis & Adamson, 1971). A ‘relapse prodrome’ has also been described (Birchwood et al., 1989; Herz & Mellville, 1980; Malla & Norman, 1994). Most previous research characterising the prodrome has focussed on schizophrenia, whilst the few studies investigating affective psychotic disorders have focussed on the manic phase of bipolar disorder.

3.2 Describing the Prodrome

The most common methods to assess the psychotic prodrome are interviews with patients and informants and using other information sources such as medical records to develop a picture of changes in behaviour, personality and the development of symptoms prior to the onset of the acute episode. The
primary drawback of this retrospective approach is recall difficulties. ‘Effort after meaning’ effects, whereby individuals who seek an explanation for events that have occurred in their life place inappropriate emphasis on certain events, also threaten the validity of the retrospective approach. For example, an individual might attribute the onset of their illness to stress associated with a particular event in their life, such as death of a parent, whilst downplaying or ignoring other possible contributing events. Additionally, non-standardised interview procedures threaten the value of information brought to light from these studies.

Observation and description of the prodrome as it occurs is more methodologically sound but is also more difficult in practice due to the lack of clear criteria for identifying the onset of the prodrome or even the acute illness. Hence there are fewer studies that have followed this procedure (Anonymous, 1950; Bowers, 1965; Pious, 1961).

Utilising descriptions of the relapse prodrome obtained through prospective studies as a model for the initial prodrome has been a strategy used by some researchers (Docherty, van Kammen, Siris, & Marder, 1978; Keith & Matthews, 1991). Tracking psychotic patients over time enables the relapse prodrome to be monitored as it develops and is relatively easy to accomplish because potential subjects (relapsing psychotic patients) are reasonably common within the population of psychotic patients. However, the validity of the relapse prodrome as a model for the initial prodrome has not been established and the potential influence of factors such as treatment on the relapse prodrome remains unknown. One difference between the two phenomena that is already known is that the average duration of relapse prodromes is shorter than that of initial prodromes (Yung & McGorry, 1996a). Until similarities and differences between initial prodromes and relapse prodromes are clearly determined through longitudinal comparison studies, they are best considered separate and distinct entities. However, investigating relapse prodromes is important in its own right because early identification of
relapsing patients enables early treatment and possibly a minimisation or avoidance of the relapse.

3.3 Symptoms Experienced During the Prodrome

Reconstructions of the onset of schizophrenia have resulted in a wide range of symptoms being attributed to this phase including ‘neurotic’ symptoms, mood related symptoms, behavioural change, cognitive changes, subthreshold positive psychotic symptoms (suspiciousness, dissociative phenomena, delusional mood or perceptual change), obsessive-compulsive phenomena, movement change, and speech abnormalities (Yung & McGorry, 1996a). In reviewing earlier studies, Yung and McGorry (1996a) reported that the symptoms that were most commonly described by first episode psychosis patients and their families during the prodromal period were: reduced concentration, poor attention, reduced drive and motivation, anergia, depressed mood, sleep disturbance, anxiety, social withdrawal, suspiciousness, deterioration in role functioning, and irritability.

In a recent study, Norman, Scholten, Malla, and Ballageer (2005) assessed the frequency of various early or prodromal signs of psychosis in first episode patients and related pre-psychotic symptomatology to levels of recovery. A factor analysis revealed five primary dimensions of pre-psychotic symptomatology: i) emotional dysphoria and odd perceptual and cognitive content; ii) impaired functioning; iii) changes related to psychobiological or vegetative functioning; iv) suspiciousness accompanied by concentration difficulties; and v) irritability and aggression. Higher levels of negative symptoms at the time of first presentation for treatment of an acute psychotic episode were associated with poorer functioning in the pre-psychotic phase. Further, lower levels of positive psychotic symptoms one year after the commencement of treatment was associated with higher levels of psychobiological changes during the prodromal period.
A wide range of symptoms has also been attributed to the prodrome of the manic phase of bipolar disorder, including increased activity and speech, irritability, labile mood, decreased need for sleep, distractibility, increased self-worth, racing thoughts and feeling more talkative (Carlson & Goodwin, 1973; Lam & Wong, 1997; Molnar, Feeney, & Fava, 1988; Smith & Tarrier, 1992; Thompson, Conus et al., 2003). Altman et al. (1992) reported that manic episodes were also often preceded by unusual thoughts, such as ideas of reference and subthreshold delusional thoughts. The prodromal phase of the depressive component of bipolar disorder, in comparison, is marked by lowered mood, loss of energy, disinterest, poor concentration, weight loss and decreased sleep (Molnar et al., 1988).

Although a few studies have attempted to describe the prodrome of a depressive episode (Fava & Kellner, 1991; Fava, Grandi, Canestrari, & Molnar, 1990; Hays, 1976; Murphy et al., 1989; Pezawas et al., 2003; Winokur, 1976), no research has specifically investigated the prodrome of a major depressive disorder with psychotic features or schizoaffective disorder. Fava et al. (1990) used a structured interview with inpatients experiencing a first major depressive episode to examine prodromal symptomatology. The majority of patients (87%) described general anxiety in the 6 months prior to admission to hospital, 60% reported irritability, 53% reported decreased work performance and interests and one third of patients reported fatigue and a form of insomnia. Obviously replication of this study is required with particular attention being paid to psychotic symptoms as a feature of major depressive disorder and how they emerge with respect to lowered mood.

3.4 Course of the Prodrome

It has been widely observed that the range of symptoms experienced over the course of the prodromal phase of schizophrenia is changeable. Most researchers agree that non-specific ‘neurotic’ type symptoms emerge first in
association with some degree of compromised functioning, followed by more marked changes from normal functioning and first rank psychotic symptoms (Bowers, 1968; Cameron, 1938; Cutting, 1985; Häfner, Riecher-Rössler, Maurer, Fatkenheuer, & Löffler 1992; Hambrecht, Häfner, & Löffler, 1994; Heinrichs & Carpenter, 1985; Kubie, 1967; Meares, 1959; Stein, 1967; Yung & McGorry, 1996a).

Other research groups have proposed alternative models. For example, Chapman and colleagues proposed that attention disturbance develops first, rendering the individual unable to filter irrelevant sensory stimuli (Chapman, 1966; Kwapil, Miller, Zinser, Chapman, & Chapman, 1997; McGhie & Chapman, 1961; Mishlove & Chapman, 1985). As a result s/he tends to feel overwhelmed by information, setting the stage for the development of other symptoms such as perceptual disturbances, blocking phenomena (sudden disruptions in attention, thought, perception, memory and speech), disturbances in speech production and compromised motor functioning (including loss of spontaneous movement and coordination). Neurotic symptoms that are often reported in the onset or prodromal phase were considered to be reactions to the primary disturbances in attention or perception. More recently, Malla and Norman (1994) agreed that non-specific symptoms attributed to the prodrome such as anxiety and depression may in fact be reactions to early, but not always overt, positive psychotic symptoms. A longitudinal study by Chapman and colleagues revealed that individuals who scored highly on scales of perceptual abnormalities and emerging magical thinking were more likely than comparison subjects to have developed a psychotic disorder 10 years later (Chapman, Chapman, Kwapil, Eckblad, & Zinser, 1994).

A group of researchers from Bonn, Germany led by Huber have suggested that the earliest schizophrenia prodrome symptoms are unable to be observed by others but can be identified by the sufferer (Huber, Gross, Schütter, & Linz, 1980). These early subjective changes (‘Basic Symptoms’) include
subjective impairments in cognitive, emotional, motor and autonomic functioning, bodily functioning and sensation, perception, energy and tolerance to stress. A recent study demonstrated that adolescents with schizophrenia were more likely to experience Basic Symptoms than adolescents with other psychiatric diagnoses in the six months immediately prior to first hospital admission (Resch, Koch, Mohler, Parzer, & Brunner, 2002). In a cohort of 110 individuals who reported experiencing Basic Symptoms at intake, 70% had developed schizophrenia after an average follow-up period of 9.6 years (specificity: 0.59; false-positive rate 20%) (Klosterkötter, Hellmich, Steinmeyer, & Schultze-Lutter, 2001).

Using a different framework, Møller and Husby (2000) interviewed 19 recent onset first episode schizophrenia patients and their family members to identify core components of the onset phase - particularly from the patient’s viewpoint. They described eight dimensions of prodromal experiences and four dimensions of prodromal behaviours they considered to be integral to the onset phase (Table 3.1). Most of the patients had noticed these changes for a considerable length of time before they reported them to others. This was often because the early changes developed very gradually, almost imperceptibly. A preoccupation or anxiety associated with the early symptoms often prevented speaking with others about them. Møller and Husby (2000) commented that phenomena that are ‘intrinsic to core psychosis phenomenology’ (such as changed thought content or beliefs, changed perceptions or changed thinking style) are present in an attenuated form during the prodromal phase, increasing in frequency and intensity over time. On the other hand, symptoms that are not considered central to psychosis (anxiety, poor impulse control, and diminished motor activity or speech) fluctuate throughout the prodrome (Møller, 2001). Further work is required to determine whether these experiences can be used as risk markers for emerging illness.
Table 3.1
Dimensions of Prodromal Experiences and Behaviours Adapted from Møller and Husby (2000)

<table>
<thead>
<tr>
<th>Dimensions of prodromal experiences</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbance of perception of self</td>
<td>Indifference to others, loss of feeling, felt like spectator in my own life</td>
</tr>
<tr>
<td>Extreme preoccupation with overvalued ideas</td>
<td>Occupied by religious mysticism/philosophy, meditation, rituals</td>
</tr>
<tr>
<td>Neuroticlike disturbances</td>
<td>Depression, anxiety, panic, unstable mood, sleep disturbance, obsessions, irritability</td>
</tr>
<tr>
<td>Disturbance of formal thought</td>
<td>Concentration difficulty, scattered thoughts</td>
</tr>
<tr>
<td>Attenuated delusional ideas or perceptual change</td>
<td>Fragmented voices, thought that others might be spying on one</td>
</tr>
<tr>
<td>Disturbance of mental control</td>
<td>Impossible to control and monitor thoughts</td>
</tr>
<tr>
<td>Secondary coping</td>
<td>Use of alcohol/drugs, social withdrawal</td>
</tr>
<tr>
<td>Disturbance of simple perceptions</td>
<td>Distorted perception of one’s own or other’s body dimensions, ringing sounds, foggy vision</td>
</tr>
</tbody>
</table>

Dimensions of prodromal behaviours

- Quit school, university or job
- Marked and lasting observable shift in interests
- Marked and lasting social passivity, withdrawal or isolation or extreme social avoidance behaviours
- Marked and lasting change in global appearance/behaviour

In a thorough review that was not limited to schizophrenia, Yung and McGorry (1996a) developed a ‘hybrid/interactive’ model for the psychotic prodrome. They proposed that during the prodromal phase of illness, individuals move in and out of symptomatic periods and can experience neurotic, mood and non-specific behavioural changes and low-grade or
attenuated psychotic symptoms. The pattern of symptom development differs radically between individuals according to this model. As with all of the putative models already described, this model requires further investigation and validation.

3.5 Duration of the Prodrome

Just as the symptoms and changes during the prodromal phase appear to differ between patients, the duration of the prodromal period is also highly variable. Reports of the average length of the schizophrenia prodrome vary from a few days to months and years (Cameron, 1938; Varsamis & Adamson, 1971; Yung & McGorry, 1996a). Beiser and colleagues even reported prodromal phases that lasted for 20 years in duration with a median length of 52.7 weeks (Beiser, Erikson, Fleming, & Iacono, 1993). Loebel et al. (1992) reported that the mean duration of the prodromal phase of schizophrenia was 98.5 weeks. In that study no differences in the duration of the prodrome were found when comparing illness type (paranoid schizophrenia and disorganised schizophrenia) or gender. Häfner, Maurer et al. (1995) reported that the mean duration between the occurrence of the first sign of schizophrenia and first hospital admission with the fully developed disorder was 6.8 years for females and 5.7 years for males (6.3 years together). Møller and Husby (2000) reported a mean duration of schizophrenia prodrome of 127 weeks and a median of 50 weeks, while Yung and McGorry (1996b) reported that the duration of the pre-psychotic phase of the 21 recovered first episode patients they interviewed varied from three days to more than six years.

Most studies have reported that manic prodromes are shorter than depressive prodromes (Carlson & Goodwin, 1973; Winokur, 1976), although one study found the opposite (Molnar, et al., 1988). In these studies hospital admission is used as a marker of onset of a manic episode. Hospitalisation of individuals experiencing a manic episode is commonly a response to concerns
about safety and obvious behavioural disturbance but whether this is an adequate marker of episode onset is debatable. Beiser et al. (1993) compared the prodromal phase of different psychotic illnesses and found that insidious onset is a characteristic of the prodromes of psychotic disorders in general, with mean durations of 103, 129 and 113 weeks being reported for affective psychoses, bipolar disorder and schizophrenia respectively.

In summary, the existing literature suggests that the onset phase of psychotic disorders is characterised by a wide range of symptoms, including many non-psychotic symptoms. There is a paucity of research describing the prodrome of affective psychotic disorders at the present time. Differences exist between studies in the estimated duration of the schizophrenia prodrome and in the pattern of symptom development over time.

### 3.6 Formal Descriptions of the Prodrome

Despite the lack of clear and replicated descriptions of the prodrome, the DSM-III-R (APA, 1987) included a list of nine putative prodromal symptoms of schizophrenia. It was stated that these symptoms were observable phenomena reflective of “a clear deterioration in functioning before the active phase of the disturbance” (p. 194) that was not attributable to a mood or substance disorder. They were: i) marked social isolation/withdrawal; ii) marked impairment in role functioning; iii) markedly peculiar behaviour; iv) marked impairment in personal hygiene and grooming; v) blunted or inappropriate affect; vi) digressive, vague, overelaborate or circumstantial speech or poverty of speech or poverty of content of speech; viii) unusual perceptual experiences; and ix) marked lack of initiative, interests or energy. A diagnosis of ‘prodromal schizophrenia’ was obtained if two or more of these items were present (APA, 1987). Although the DSM-III-R did not stipulate how long these symptoms had to be experienced for them to be labelled
prodromal, it did recognise that not all sufferers of schizophrenia will experience a prodromal phase of illness.

Various studies have reported poor inter-rater and test-retest reliability for the DSM-III-R criteria (Andreasen & Flaum, 1991; Jackson, McGorry, & McKenzie, 1994; Jackson et al., 1996). They were further brought into question by two important studies. The first was a survey of 657 late-secondary school students, which indicated that one or more ‘prodromal symptoms’ were experienced by 75% of the sample at the time of the survey (McGorry et al., 1995). Further, 50% of the sample were experiencing two or more of the symptoms and therefore met diagnostic criteria for prodromal schizophrenia at the time of the study. Although the reliance on survey data without a measure of reliability and validity of the reported symptoms weakens this study, it highlighted limitations of the DSM-III-R criteria because it is highly unlikely that 50 per cent of the sample would have developed schizophrenia in the future.

Jackson, McGorry and Dudgeon (1995) examined the sensitivity, specificity and positive and negative predictive power of the individual DSM-III-R symptoms for various diagnostic groups. They indicated that the individual prodromal symptoms were relatively poor diagnostic indicators and were non-specific for schizophrenia.

A third study from this group of researchers was published in 2000 which indicated that prediction of schizophrenia was better achieved by taking note of the duration of decreased functioning prior to the onset of the first episode rather than the DSM-III-R Schizophrenia prodrome items (McGorry, McKenzie, Jackson, Waddell, & Curry, 2000). By this time the prodromal schizophrenia category had already been discarded from the fourth edition of the DSM (APA, 1994).
Although the DSM-IV does not list criteria for diagnosis of a prodrome, the concept of a schizophrenia prodrome has been retained. The duration criterion for Schizophrenia (Criterion C) states: “Continuous signs of disturbance persist for at least 6 months. This 6-month period must include at least 1 month of symptoms (or less if successfully treated) that meet Criterion A (i.e. active phase symptoms) and may include periods of prodromal or residual symptoms. During these prodromal or residual periods the signs of the disturbance may be manifested by only negative symptoms or 2 or more symptoms listed in Criterion A present in an attenuated form (e.g. odd beliefs, unusual perceptual experiences)” (APA, 1994, p. 285). The ICD-10 also recognises the prodrome as a component of schizophrenia (WHO, 1992).

3.7 Problems with the Prodrome

Although the prodrome is widely accepted as an important phase of psychotic disorders, not enough is known at this point in time to make it a valid target for treatment. First, the non-specific nature of most prodromal symptoms precludes firm diagnosis being made. It would be rash to ‘diagnose’ a psychotic prodrome (that is, impending psychotic disorder) with any certainty based on the presence of the most commonly described prodromal features: reduced motivation, poor concentration and low mood. These symptoms could indicate the presence of a threshold or subthreshold mood disorder, substance use, a physical illness or simply a temporary reaction to circumstances. An emerging psychotic episode cannot even be predicted from the presence of attenuated psychotic symptoms. Community surveys have consistently demonstrated that attenuated psychotic symptoms and ‘psychotic like experiences’ are found in the general population at far higher rates than the prevalence of psychotic disorders (Johns et al., 2004; Peters, 2001; van Os, Hanssen, Bijl, & Ravelli, 2000; van Os, Hanssen, Bijl, & Vollebergh, 2001). This indicates that at least some attenuated psychotic
symptoms must either resolve or persist without progressing to acute psychosis.

Another difficulty with operationalising the concept of the prodrome is the lack of a clear consensus in defining the onset of acute disorder. According to Beiser et al. (1993), there is no “standardised, replicable method for establishing illness onset” (p. 1349) and criteria used in research studies often differ from DSM or ICD criteria. There is no agreement about which symptoms should be used to define acute psychosis. The definition could be restricted to hallucinations and delusions or could include disorganized speech and behaviour as well. The intensity or severity symptoms must reach before acute psychosis is declared is also unclear. The subjective nature of psychotic symptoms, such that observers often date onset of psychotic symptoms well after the individual recalls them beginning, clouds the issue further (Häfner, Maurer, Löffler & Riecher-Rössler, 1993; Norman & Malla, 2001a; Yung & McGorry, 1996b). One of the most common definitions of the onset of acute psychosis in the existing literature is the initiation of treatment or first hospital admission (Day et al., 1987; Gift, Strauss, Harder, Kokes, & Ritzler, 1981; Johnstone, Crow, Johnson, & MacMillan, 1986). However, criteria for hospital admission is extremely variable and not just dependent on intensity of psychotic symptoms but reflective of other issues such as potential for self-harm or harm of others or lack of suitable supports in the community. Further, one first episode psychosis service reported that up to one-third of its patients were treated without requiring inpatient admission during the first three months of treatment (Power et al., 1998), suggesting that inpatients are not representative of the entire group of individuals experiencing a recent-onset psychotic disorder.

It is possible that factors other than changes in symptoms and functioning may signal the onset of a prodrome or acute episode of psychosis. Changes in other modalities, such as neurocognition, brain structure, or other aspects of neurobiology may precede symptom development and may be true markers of
the prodromal phase of schizophrenia. Further prospective research is required to examine these possibilities.

The difficulty in defining the onset of either the prodrome or the acute episode is exacerbated when prospective assessment of the prodrome is attempted. Another vexing issue is how the presence of a psychotic symptom relates to the diagnosis of psychotic disorder. The community surveys referred to earlier indicate that many individuals experience psychotic symptoms at some point in their lives, which are not distressing and which do not develop into an acute episode (Johns et al., 2004; Peters, 2001; van Os et al., 2000). The intensity of psychotic symptoms, their frequency and duration as well as whether they impair functioning and if the individual is distressed or help-seeking are also factors that might inform a decision of whether the individual is suffering from a disorder. Other parameters that could be included in a definition of psychotic ‘disorder’ include degree of comorbidity with other psychiatric syndromes such as depression, and level of suicidality and dangerousness.

These issues are yet to be resolved. Indeed, any further discussion about the definition of onset of psychotic disorder is likely to lead to a discussion about definitions of health, disease and illness in general, which is beyond the scope of this thesis.

Many of these difficulties in operationalising the prodrome are directly related to the fact that prodrome itself is a retrospective concept. The prodrome can only be confirmed by the development of the diagnosable disorder. The challenge for clinicians and researchers alike, therefore, is to develop methods to identify individuals in the early stages of development of a psychotic disorder. With this in mind, the following chapter provides an overview of so-called 'high-risk studies' that attempt to identify individuals at heightened risk of developing a psychotic disorder. This strategy was utilised in the current study.
CHAPTER 4

High-Risk Studies

The previous chapter presented a summary of research aimed at characterising the prodromal phase of psychotic disorders. Problems associated with the prospective identification of this phase of illness were described. The identification of individuals with an increased likelihood of developing a psychotic disorder in the future is an alternative strategy that allows investigation of the onset of these disorders. In this chapter, two approaches to identifying high-risk cohorts will be described and critiqued: genetic high-risk studies and ‘ultra’ high-risk studies. The primary aim of this chapter is to present a rationale for the high-risk strategy that underlies this study.

4.1 Genetic High-Risk Studies

Genetic studies have confirmed that having a first or second-degree relative with schizophrenia significantly increases the risk of developing the disorder (Gelder, Gath & Mayou, 1989; Gottesman & Shields, 1982; Kety, 1983; McGuffin, Farmer, Gottesman, Murray, & Reveley, 1984). The recruitment of individuals with a confirmed family history of psychotic illness (most often schizophrenia) is the traditional strategy used to identify a high-risk (HR) cohort. Subjects are generally recruited as children and are monitored over time until they have passed through the period during which psychotic disorders most commonly first emerge (late adolescence to early adulthood: Häfner et al., 1994). These studies look for phenotypic indicators of increased risk of psychosis but are primarily a longitudinal pursuit of valid and reliable variables that predict future schizophrenia spectrum disorders.
(Erlenmeyer-Kimling et al., 2000). Sample characteristics of five key genetic high-risk studies are outlined in Table 4.1.

Table 4.1  

**Summary of Sample Characteristics of Schizophrenia Genetic High-Risk Studies**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample characteristics</th>
<th>When recruited</th>
<th>Years of follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New York Infant Study</strong></td>
<td>Children of mother with schizophrenia (n = 12) or no maternal history of psychiatric illness (n = 12). All participants recruited shortly after birth.</td>
<td>1952 - 3 &amp; 1959 - 60</td>
<td>30 - 40</td>
</tr>
<tr>
<td><strong>Copenhagen High-Risk Project</strong></td>
<td>Children whose mother had schizophrenia (HR group: n = 207) or no family history of mental illness (control group: n = 104). Aged between 10 and 19 years at study entry. Groups were matched on age, gender, parental social class, urban/rural living environment and amount of time in residential care.</td>
<td>1962</td>
<td>&gt; 30</td>
</tr>
<tr>
<td><strong>Israeli High-Risk Study</strong></td>
<td>Children of parent with schizophrenia (n = 50); or no family history (n = 50). Age range at entry: 8.1 - 14.8 years.</td>
<td>1967</td>
<td>15 - 25</td>
</tr>
<tr>
<td><strong>New York High-Risk Project</strong></td>
<td>Children of a parent with schizophrenia (HRSz: n = 109), affective disorders (HRAff: n = 82) or no psychiatric history (NC: n = 165). Average age at entry: 9.25 years.</td>
<td>1971 - 2 &amp; 1977 - 9</td>
<td>23 - 30</td>
</tr>
<tr>
<td><strong>Edinburgh High-Risk Project</strong></td>
<td>High-risk group (n = 162); mean age at recruitment = 21.19 years; Comparison group (n = 36; mean age = 21.17); First episode psychosis group (n = 37; mean age = 21.63 years).</td>
<td>1994</td>
<td>Aimed to follow all participants for five years</td>
</tr>
<tr>
<td><strong>Helsinki High-Risk Study</strong></td>
<td>Children of mother with schizophrenia spectrum disorder (n = 159) or with no history of psychotic disorder (n = 99).</td>
<td>1960 - 4</td>
<td>Not stated</td>
</tr>
</tbody>
</table>
There are a number of important differences between the studies listed in Table 4.1. Most of the participants in these studies were recruited when they were less than 20 years of age. However, the Edinburgh High-Risk Project (EHRP) recruited participants considerably later - when they were aged between 16 and 25 years (Johnstone et al., 2000). The rationale for this was to minimise the duration of follow-up. The researchers wanted all participants to have passed through the peak age range for development of a first psychotic episode within five years of recruitment. However, this strategy limits the range of potential risk factors that can be examined to those that can be measured at the later age or relies heavily upon memory when attempting to evaluate factors such as childhood behaviour.

There are other differences in recruitment criteria. The Copenhagen High-Risk Project, New York Infant Study and Helsinki High-Risk Study considered only maternal history of schizophrenia when recruiting to the HR group, completely ignoring the influence of paternal history of illness on risk (Cannon & Mednick, 1993; Fish et al., 1992; Niemi, Suvisaari, Haukka, & Lönnqvist, 2005). The EHRP recruited participants to the high-risk group who had two or more first- or second-degree family members affected by schizophrenia (Johnstone et al., 2000), whereas other studies only recruited participants with a parent who had a history of schizophrenia.

Most genetic high-risk studies have stipulated that participants do not have a history of psychiatric symptoms at intake. However, many of the young people in both the high-risk and comparison groups of the EHRP reported previous psychiatric symptomatology at intake. Johnstone, Lawrie and Cosway (2002) reported that all of the individuals who had developed acute psychosis had experienced at least one psychiatric symptom, not limited to psychotic symptoms, at intake. This suggests that many of the EHRP participants may have already been in the prodromal phase of a first psychotic episode when recruited to that study. Fourteen per cent of EHRP participants met diagnostic criteria for a non-psychotic mental illness at
baseline (Johnstone, et al., 2002). This compromises the conclusions that can be made from that study about risk factors of psychosis and differentiates that study from the other genetic high-risk studies.

Clinical outcome of participants in the genetic high-risk studies is summarised in Table 4.2. Whilst the transition rate to psychotic disorder - usually schizophrenia - in the high-risk group is of paramount interest, some of the studies also reported the development of non-psychotic DSM Axis 1 disorders.

The primary aim of the genetic high-risk studies was to investigate potential aetiological and risk factors for psychosis. A wide range of potential risk factors have been investigated including childhood behaviour, personality factors and measures of neurocognition and brain structure. Childhood behaviour was found to be associated with later development of schizophrenia (Amminger et al., 1999; Cannon & Mednick, 1993; Cannon, Mednick, & Parnas, 1990; Miller, Byrne, Hodges, Lawrie & Johnstone, 2002; Niemi et al., 2005; Ott, Allen, & Erlenmeyer-Kimling, 2001) as was attention (Cornblatt, Lenzenweger, Dworkin, & Erlenmeyer-Kimling, 1992; Mirsky, 1988), verbal memory (Byrne et al., 2003; Erlenmeyer-Kimling et al., 2000), severe neurological symptoms (Niemi et al., 2005) and schizotypal personality features during childhood (Miller, Byrne, Hodges, Lawrie, Owens, et al., 2002; Miller, Lawrie, Byrne, Cosway, & Johnstone, 2002). The Copenhagen and Edinburgh studies have reported differences in brain structure at baseline (specifically ventricular and sulcal enlargement and abnormal cortical folding) between HR subjects who later developed a psychotic disorder and those who did not (Cannon et al., 1998; Harris, Whalley, Yates, Johnstone, & Lawrie, 2004).
Table 4.2
Transition Rates to Schizophrenia and Other Mental Health Disorders in the Genetic High-Risk Studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Infant Study (Fish et al., 1992)</td>
<td>One HR subject (8%) developed schizophrenia and 6 (50%) developed schizotypal or paranoid personality disorders by ~40 year follow-up.</td>
</tr>
<tr>
<td>Copenhagen High-Risk Project (Cannon &amp; Mednick, 1993)</td>
<td>By 27-year follow-up, 16.1% of the HR group and 1.9% of the control subjects had been diagnosed with schizophrenia.</td>
</tr>
<tr>
<td>Israeli High-Risk Study (Ingraham et al., 1995)</td>
<td>By 25-year follow-up, 8% of HR subjects had a lifetime diagnosis of chronic schizophrenia. No control subjects had developed schizophrenia. 36% of HR subjects had developed an affective disorder and 16% had developed a personality disorder compared to 24% and 4% of the control group respectively.</td>
</tr>
<tr>
<td>NYHRP (Erlenmeyer-Kimling et al., 1995; Erlenmeyer-Kimling et al., 2000)</td>
<td>By 23-year follow-up: HRSz: 15.2% had developed schizophrenia-related psychosis; 35.4% had developed a major affective disorder; and 16.5% had developed other major Axis I disorder; HRAff: 7% had developed schizophrenia related psychosis; 45.6% had developed a major affective disorder and 21.1% had developed other major Axis I disorder; NC group: 0.8% had developed schizophrenia-related psychosis; 30.1% had developed major affective disorder and 27.8% had developed other major Axis I disorder.</td>
</tr>
<tr>
<td>EHRP (Johnstone et al., 2005)</td>
<td>12% of the high-risk group developed psychosis within 2.5 years of recruitment. No control subjects developed a psychosis</td>
</tr>
<tr>
<td>Helsinki High-Risk Study (Niemi et al., 2005)</td>
<td>8% of the high-risk group developed schizophrenia spectrum disorder, 11% any psychotic disorder, 9% a mood disorder, 9% substance-related disorder, and 6% personality disorder with a high level of comorbidity.</td>
</tr>
</tbody>
</table>
Differences between HR subjects as a whole (regardless of later psychotic status) and healthy comparison subjects have been evaluated on a range of variables. For example, visuo-motor skills developed later in HR subjects than the comparison groups in the New York Infant Study (Fish et al., 1992). The Edinburgh study has reported that Minor Physical Abnormalities (MPA), poorer neuropsychological performance, schizotypal personality features, and smaller hippocampal volumes were more common in HR subjects in the EHRP than in healthy controls (Byrne et al., 2003; Lawrie, Byrne et al., 2001; Lawrie, Whalley et al., 2001; Miller, Byrne, Hodges, Lawrie, Owens et al., 2002). Participants in the HR group of the Helsinki study had more emotional problems during pre-school years, more attentional problems and social inhibition during school years and higher levels of neurological soft signs throughout childhood than the control group. Finally, the Copenhagen study reported differences between the HR group and healthy controls in responses to the MMPI (Carter et al., 1999). Although the predictive power of those variables has not been examined, the results of these comparisons suggest they might be risk markers for development of psychosis. They also suggest that a family history of psychotic illness has a broad range of potential implications for an individual’s functioning, in addition to increasing their risk of development of a psychotic disorder.

Only one HR study has investigated the level of stress experienced by HR subjects. Miller and colleagues reported that the number of life events experienced prior to recruitment to the EHRP was associated with the level of psychotic symptoms reported at baseline in both the HR and comparison groups and there were no differences between the groups in the number of events experienced (Miller et al., 2001). Whether the experience of stressful life events predicted the onset of psychotic disorder in either the HR or comparison group has not been reported.
4.2 Limitations of Genetic High-Risk Studies

This review of genetic high-risk studies provides an indication of the energy and effort that has gone into this area of research over time. These studies avoid many of the pitfalls of the retrospective research aiming to identify risk factors of psychosis and to characterise the prodrome such as recall difficulties, effort after meaning effects, and ‘sealing over’ (McGlashan, Levy, & Carpenter, 1975) due to their prospective framework.

In spite of those merits, the genetic high-risk studies have a number of limitations. First, whilst it is true that individuals with a family history have a higher transition rate to acute psychosis than the general population, the rate remains relatively low (10-15%: Gottesman, McGuffin, & Farmer, 1987). This means that very large numbers of participants need to be recruited to these studies to identify risk factors. Additionally, the findings of the genetic high-risk studies cannot be readily generalised to the wider population of individuals who develop schizophrenia, as most sufferers do not have a family history of illness (Asarnow, 1988).

Another major drawback of the genetic high-risk studies is their long-term nature, necessary due to the usual expression of illness after puberty. As Cornblatt and Obuchowski (1997) commented: “schizophrenia high-risk studies are extremely difficult, labour intensive projects that require great endurance on the part of the investigators and equally impressive cooperation from the subjects” (p. 440). The Edinburgh-based study has attempted to reduce what can be seen as a waiting period by recruiting participants when they are aged between 16 and 25 years. The compromise for this is the loss of some information that is only obtainable at a younger age, such as neurocognitive skills during childhood.

Unfortunately, these studies do not easily permit close analysis of state factors that might predict the onset of psychosis. The primary reason for this
is the lengthy follow-up period required in these studies and the level of involvement and contact with researchers participants can tolerate. The NYHRP assessed participants most frequently - once every two to four years for approximately 25 years and again approximately 10 years later. The Israeli study only assessed participants at baseline and then 15 and 25 years later.

Even the Edinburgh study, which attempted to avoid the difficulties associated with a prolonged follow-up period and focussed on the onset phase of psychosis, only contacted and assessed participants every 18 months over 5 years. Undoubtedly resource and participant tolerance and endurance considerations influence the design of these studies. However such infrequent contact makes close monitoring of state factors that could potentially influence the onset of psychosis within a short time frame, such as stress and coping, untenable.

It was initially hoped that genetic high-risk studies would be invaluable in the development of early intervention or preventative strategies as they might highlight problems requiring remediation and also flag those individuals who are in most need of receiving such interventions. However, they have not really fulfilled these expectations. No studies have assessed the impact of providing treatment to individuals in genetic high-risk studies and whether it is possible to reduce the rate of transition to psychosis in this population or even to increase functioning in general. Ethical considerations such as the high number of participants who meet high-risk criteria, but do not develop acute psychosis render such a study unlikely to proceed.

4.3 ‘Ultra’ High-Risk Studies

An alternative strategy to identify individuals at heightened risk of psychosis has been developed that has a higher rate of transition to psychosis, a lower false positive rate and shorter follow-up period than the genetic high-
risk studies and attempts to identify individuals closer to the point of onset of acute illness. The concepts underlying the development of criteria for identifying this group are outlined in the next section.

4.3.1 Multiple-gate Screening and Closing In

To minimise false positive rates in schizophrenia high-risk studies, Bell recommended applying ‘multiple-gate screening’ and ‘close-in follow-up’ strategies (Bell, 1992). Multiple-gate screening refers to maximising the level of risk in the selected sample by requiring that an individual must meet a number of conditions to be included in the high-risk sample, rather than just one. Close-in follow-up involves focusing on the period of time immediately preceding the transition to acute psychosis, thus shortening the duration of follow-up.

The recommendations by Bell (1992) for improving the identification of high-risk individuals were echoed by Mrazek and Haggerty who wrote about developing preventive strategies for mental illnesses in general (Mrazek & Haggerty, 1994). They proposed that the current state of knowledge about the aetiology and risk factors of psychotic disorders means that universal (targeting the entire population) and selective (targeting groups whose risk of developing psychosis is significantly higher than average) preventive interventions are not possible at the current time. They suggested that indicated prevention - targeting individuals who exhibit subthreshold signs and symptoms of psychosis - is most appropriate at this point in time. This is reminiscent of the close-in strategy. They further suggested that combining known risk factors provides the best chance for identifying high-risk individuals whilst minimising false positives - the multiple gate screening approach.
4.3.2 Ultra High-Risk Criteria

Criteria have been developed to identify high-risk individuals based on the concepts expressed by Bell (1992) and Mrazek and Haggerty (1994). To differentiate this approach from the genetic high-risk studies, the term ‘ultra’ high-risk (UHR) has been adopted. This label reflects the higher transition rate to acute psychosis that is achieved using this approach compared to the genetic high-risk studies. The term At Risk Mental State (ARMS) has also been employed to highlight that transition to acute psychosis is not inevitable in the UHR cohort (McGorry & Singh, 1995; Yung & McGorry, 1997) despite ‘precursor signs and symptoms’ (Eaton, 1995) being evident.

Bell (1992) recommended that attempts to identify high-risk individuals should focus on the age of peak incidence to maximise transition rates. For psychotic disorders this is between late adolescence and early adulthood (Häfner, et al., 1993; Kosky & Hardy, 1992). Therefore, the duration of follow-up of UHR studies is much shorter than the genetic high-risk studies. This reduces the cost of these studies, as well as reducing the demands upon participants and researchers alike.

Other criteria to identify the UHR group are drawn from retrospective research of the psychotic prodrome. As the UHR criteria aim to be specific for psychosis, they concentrate on positive psychotic symptoms. Structuring UHR criteria around non-specific symptoms such as reduced sleep and anxiety, which are commonly attributed to the prodrome, would be associated with an unacceptably high false positive rate.

Three inclusion groups have been defined. The first group combines the known trait risk factor of family history of a psychotic disorder in a first degree relative with a recent deterioration in mental state reflected in a deterioration in general functioning. The other two inclusion groups reflect low-grade, attenuated positive psychotic symptoms or a brief and
spontaneously abating episode of acute psychotic symptoms (Table 4.3). Some individuals who meet UHR criteria for the Attenuated Psychotic Symptom (APS) and Brief Limited Intermittent Psychotic Symptoms (BLIPS) groups might also meet diagnostic criteria for Brief Psychotic Episode or Psychosis Not Otherwise Specified according to the DSM system. This overlap in criteria is acknowledged but according to the UHR approach, psychotic symptoms that do not exceed severity and frequency criteria outlined in Table 4.3 do not constitute a clear psychotic episode. Operational criteria for the three intake groups as well as acute psychosis have been well defined and are provided in Chapter 7. Semi-structured interviews have been specifically developed to assess UHR symptomatology. These are the Comprehensive Assessment of At-risk Mental States (CAARMS: Yung et al., in press) and the Structured Interview for Prodromal Syndromes (SIPS: Miller, McGlashan et al., 2002).
### Table 4.3
**UHR Criteria and Criteria for the Onset of Acute Psychosis**

<table>
<thead>
<tr>
<th>UHR criteria</th>
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<tbody>
<tr>
<td><strong>Aged between 14 and 29 years;</strong></td>
</tr>
<tr>
<td><strong>Meets criteria for one or more of the following groups:</strong></td>
</tr>
<tr>
<td><strong>Group 1: Trait and State risk factors</strong></td>
</tr>
<tr>
<td>Schizotypal personality disorder in the identified individual or a first degree relative with a psychotic disorder;</td>
</tr>
<tr>
<td>Significant decrease in mental state or functioning</td>
</tr>
<tr>
<td>Duration: maintained for at least a month;</td>
</tr>
<tr>
<td>Recency: the decrease in functioning must have occurred within the past year.</td>
</tr>
<tr>
<td><strong>Group 2: Attenuated psychotic Symptoms (APS)</strong></td>
</tr>
<tr>
<td>Presence of at least one of the following: ideas of reference, odd beliefs or magical thinking, perceptual disturbance, paranoid ideation, unusual thoughts or disorganised speech;</td>
</tr>
<tr>
<td>Frequency: at least several times per week;</td>
</tr>
<tr>
<td>Duration: present for at least one week and not longer than five years</td>
</tr>
<tr>
<td>Recency: present within the past year.</td>
</tr>
<tr>
<td><strong>Group 3: Brief Limited Intermittent Psychotic Symptoms (BLIPS)</strong></td>
</tr>
<tr>
<td>Presence of at least one of the following: ideas of reference, odd beliefs or magical thinking, perceptual disturbance, paranoid ideation, unusual thoughts or disorganised speech;</td>
</tr>
<tr>
<td>Frequency: at least once per day;</td>
</tr>
<tr>
<td>Duration: less than one week with symptoms resolving spontaneously;</td>
</tr>
<tr>
<td>Recency: the BLIP must have occurred within the past year.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acute psychosis criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of at least one of the following: ideas of reference, odd beliefs or magical thinking, perceptual disturbance, paranoid ideation, unusual thoughts or disorganised speech;</td>
</tr>
<tr>
<td>Frequency: at least once per day;</td>
</tr>
<tr>
<td>Duration: greater than one week.</td>
</tr>
</tbody>
</table>
4.4 UHR Studies

The UHR strategy was developed and first implemented at the Personal Assessment and Crisis Evaluation (PACE) Clinic in Melbourne, Australia in 1994 (Phillips, Leicester et al., 2002; Yung, McGorry, McFarlane, & Patton, 1995). More recently the UHR concept has been adopted by the Prevention through Risk Identification, Management and Education (PRIME) Clinic at Yale University, New Haven USA (McGlashan et al., 2003). The PRIME group has coined the term Criteria of Prodromal Syndromes (COPS) to describe their intake criteria, which are essentially the same as the PACE criteria (Miller, McGlashan et al., 2002). Other UHR studies have been established in Manchester, United Kingdom (Early Identification and Intervention Evaluation - EDIE: French & Morrison, 2004; Morrison et al., 2002), Norway (TOPP Clinic: Larsen, 2002), San Diego (Cognitive Assessment and Risk Evaluation - CARE: Cadenhead, 2002), Newcastle, Australia (Psychological Assistance Service - PAS: Carr et al., 2000; Mason et al., 2004) and Portland, USA (Portland Identification and Early Referral - PIER: McFarlane, Cook, Robbins, & Downing, 2002).

Alternative UHR criteria have been developed at FrühErkennungs- und Therapie Zentrum for Psychische Krisen (FETZ) in Cologne (Hambrecht, Lammertink, Klosterkötter, Matuschek, & Pukrop, 2002) and the Hillside Recognition and Prevention (Hillside-RAP) programme in New York (Cornblatt, Lencz, Correll, Auther, & Smith, 2002; Lencz, Smith, Auther, Correll, & Cornblatt, 2004). As these criteria have each been implemented at one site only and their reliability has not been adequately demonstrated, they will not be considered further in this review.
4.5 Reliability of UHR Criteria

The reliability of the UHR criteria has been well supported in longitudinal studies. One study at the PACE Clinic in Melbourne followed a cohort of young people who met UHR criteria over a 12-month period. At the completion of the study, 20 of 49 participants (41%) had developed an acute psychotic episode (Yung et al., 1998). Comparable rates of transition to acute psychosis have been found in other centres. For example, researchers at PRIME reported conversion rates from UHR criteria to acute psychosis of 46% at 6 months and 54% at 12 months (Miller, McGlashan et al., 2002), the Norwegian group reported a 43% transition rate after 12 months (Larsen, 2002), the EDIE group in the UK reported a 22% transition rate to acute psychosis in 23 young people who were followed-up for 6-12 months (Morrison et al., 2002) and the PAS service in Newcastle, Australia reported a 50% transition rate (Mason et al., 2004). Regrettably, the sensitivity, specificity and false negative rates of the criteria have not yet been determined.

Although the false positive rate associated with the UHR studies is lower than the genetic high-risk studies, it is desirable for it to be lower still, particularly when considering implementing preventative interventions in this group of patients. With any treatment it is desirable to minimise the number of people who are treated unnecessarily. With this in mind, some work has been done to identify psychopathological and other features that distinguish those UHR individuals who do eventually develop a psychotic episode from those that do not. Results of this fine-grained analysis have not been altogether surprising: UHR individuals are more likely to develop an acute psychotic episode if they experience a lengthy duration of symptoms (greater than 900 days), poor global functioning, moderately high global psychopathology featuring attenuated psychotic symptoms, poor attention and moderate levels of depression when recruited (Yung, Phillips, Yuen, & McGorry, 2004). UHR criteria plus these features were associated with good sensitivity (86%), specificity (91%) positive predictive value (80%) and negative
predictive value (94%) within six months (Yung, Phillips, Yuen et al., 2004). Unfortunately, these results do not suggest any immediate practical changes to intake criteria that might increase the base transition rate to psychosis.

4.6 Evaluating Risk Factors for Psychosis

Like the genetic high-risk studies, UHR studies enable potential risk factors for psychotic disorders to be assessed. Most of the work that has been published to date has taken place at PACE due to the longevity of that program compared to the others. Many of the other programs have also focussed more on the development of preventive interventions than investigating aetiological processes.

In contrast to the genetic high-risk studies, the UHR studies allow the evaluation of both trait and state risk factors. Experience at the PACE Clinic has shown that the majority of participants in UHR studies can tolerate a monthly interview about mental state and other factors over at least a two year period. Therefore, fluctuations in psychopathology can be closely monitored to map the prodrome and the onset of illness if it occurs. Extraneous events and their impact on mental state features can also be monitored more reliably than retrospective recall allows.

Clear risk factors for psychosis have not yet been identified by research in the UHR cohort. Two major areas of study are neurocognition and brain structure. UHR individuals display neurocognitive impairments and reductions in brain volume compared to healthy comparison subjects that are often similar to first episode psychosis or schizophrenia patients (Brewer et al., 2005; Hawkins et al., 2004; Pantelis et al., 2003; Phillips, Velakoulis et al., 2002; Shafer, Seeber, & Cadenhead, 2003; Wood et al., 2003; Yücel et al., 2003), although clear markers for the development of psychosis have not yet been shown.
The group based in Newcastle, Australia, investigated whether family history, perinatal complications, premorbid social functioning, premorbid personality, recent life events and current symptom levels were able to predict onset of psychosis in young people meeting UHR criteria (Mason et al., 2004). The most reliable predictor of psychosis in addition to UHR criteria was schizotypal personality features. Psychosis was also predicted by odd beliefs or magical thinking, marked impairment in role functioning, blunted or inappropriate affect, anhedonia and auditory hallucinations. The experience of recent life events did not improve the ability to accurately predict onset.

Other studies at PACE have shown that neither obstetric complications in the pre- or peri-natal period [Yun, 2005 #2098] or cannabis use (Phillips, Curry et al., 2002) are associated with the onset of psychosis in a UHR cohort.

4.7 Development of Preventive Interventions

Intervention studies in UHR cohorts with a view to developing preventive treatments are in their infancy. The first randomized controlled trial specifically developed around the needs of the UHR population with the aim of preventing or delaying the onset of psychosis, or at the very least ameliorating presenting symptoms was conducted at the PACE Clinic from 1996-1999. At the end of six months treatment, there was a significantly lower transition rate to acute psychosis in a group of UHR patients who received intensive cognitive-behaviourally oriented psychotherapy plus low-dose neuroleptic medication compared to a group who received supportive therapy alone. This difference was no longer significant at the end of a post treatment 6-month follow-up period suggesting a delay in the onset of acute psychosis in the medication and psychotherapy group compared to the supportive therapy group. Both groups experienced a reduction in global psychopathology and functioning over the treatment phase (McGorry et al.,
 Longer-term follow-up of the participants in this study is now taking place and a second randomised trial is currently underway at PACE.

Preliminary results of the first randomised controlled trial at the PRIME Clinic indicated that UHR patients who received olanzapine medication reported lower levels of ‘prodromal’ symptomatology after eight weeks of treatment than UHR patients who received placebo medication. After one year of treatment, the group who received olanzapine had a significant reduction in psychotic (‘prodromal’) symptomatology whereas the placebo group did not. There was also a lower transition rate to acute psychosis in the olanzapine group than the placebo group after 12 months treatment (McGlashan et al., 2003; Miller et al., 2003; Woods et al., 2003).

The EDIE group has compared the impact of cognitive-behaviourally oriented psychotherapy compared to monitoring alone (that is, no active psychological or medical treatment) on the rate of transition to psychosis in 23 young people meeting ARMS criteria. After 6 months of cognitive therapy only two of the 35 participants (6%) in this group had developed acute psychosis compared to five of the 23 in the monitoring group (22%) (Morrison et al., 2004). Cognitive therapy significantly reduced the likelihood of developing psychosis and significantly reduced positive psychotic symptoms (Morrison et al., 2004). The results of the PACE, PRIME and EDIE interventions studies indicate that there is, potentially, a role for both psychological and pharmacological approaches in the prevention of transition to psychosis in UHR groups.

4.8 Criticisms

The UHR approach is not without its critics. Concern has been expressed about the potential negative impact of wrongful identification of young people as being at heightened risk of psychosis (the identification of false-
positives). The provision of anti-psychotic medication to young people identified as being at ‘ultra high-risk’ has also been questioned in light of the risk of significant side-effect that are associated with those medications (Corcoran, Malaspina, & Hercher, 2005; Cornblatt, Lencz, & Kane, 2001; DeGrazia, 2001). There are also concerns about the potential for stigmatisation that might result from being identified as at high-risk (Corcoran et al., 2005; Gosden, 2001).

Advocates for the UHR approach contend that the benefits of receiving treatment at this early phase of disorder far outweigh the potential damage. They assert that although treatment studies are in their infancy, improvement in symptoms and functioning has been shown across the board - by those individuals who did eventually develop a psychotic disorder and those who did not (McGorry et al., 2002; Woods et al., 2003). The level of help-seeking and distress associated with recent changes in mental state and functioning displayed by the UHR patients who are enrolled in these studies is given as further justification for the provision of treatment. The authors of these studies also actively discourage the widespread uptake and implementation of the UHR approach outside specialist mental health services at this early stage (Yung, Phillips, & McGorry, 2004).

Like the genetic high-risk studies, the results of UHR studies cannot be generalised beyond young people who meet the intake criteria. There are likely to be young people who develop a psychotic disorder who do not meet UHR criteria during the prodromal phase and there are certainly young people who develop a psychosis who are not help-seeking during the onset phase and would therefore not come to the attention of a UHR programme which is dependent on referrals of help-seeking, concerned young people. Further, those individuals who develop a late-onset psychotic disorder are completely excluded by existing UHR criteria.
4.9 Conclusion

Two strategies have been described in this chapter for recruiting individuals at high-risk of psychosis. The genetic high-risk studies described first have allowed some examination of risk factors of psychosis but have not resulted in a much clearer understanding of the aetiology or onset phase of psychosis. The lengthy duration, low transition rate to acute psychosis and infrequent follow-up of participants in these studies has meant that state factors that might be involved in the onset of acute disorder cannot be evaluated within that framework.

The UHR strategy has provided the best opportunity, to date, to study the onset of psychosis as it unfolds. Criteria for entry into these studies have been developed on sound epidemiological principles and allow a ‘close up’ view of the psychotic prodrome. The UHR studies have also enabled real steps to be taken towards the development of preventive interventions.

One limitation of the UHR approach is that it only predicts onset of psychosis within the target population with 30-40% accuracy. Although this is an improvement on the genetic high-risk approach that recruits individuals on the basis of a family history of illness, there remains a relatively high ‘false-positive’ rate. Criticism has been levelled at the UHR approach for potentially stigmatising and, worse, providing harmful and inappropriate treatment to those young people wrongly identified. It is anticipated that more accurate strategies will be developed in the future for identifying high-risk young people. It is likely that this will be achieved through refinement of the existing UHR criteria.

One important advantage of the UHR approach is that it allows the impact of state factors on psychopathology and the onset of acute psychosis to be evaluated. Thus, the current study of the role of stress and coping in the onset of psychosis was conducted within the PACE Clinic.
As indicated in Chapter 1, the stress-vulnerability model of schizophrenia contends that an endogenous, organic diathesis or vulnerability interacts with internal or external stressors in the development of these disorders. Zubin and Spring (1977) stated: “each of us is endowed with a degree of vulnerability that, under suitable circumstances, will express itself in an episode of schizophrenic illness” (p. 109). This model can be expanded to include other psychotic disorders such as schizophreniform disorder, schizoaffective disorder and even bipolar disorder. The central question in this research study concerns the role of stress and coping in the onset of psychotic disorders.

The stress-vulnerability model of psychosis has a high degree of ‘face validity’. It makes intuitive sense that stressful experiences that are not well managed and result in distress and anxiety might induce the expression of psychotic symptoms in those with a heightened vulnerability. The model also provides a possible explanation for some of the otherwise unexplained aspects of psychosis, such as the episodic nature of the illnesses. Additionally, psychosis most commonly develops in late-adolescence or early adulthood - a particularly vulnerable time of life when people are typically negotiating the often difficult transition to adulthood (DeLisi et al., 1992), including identity formation, education and career development and the formation of independent peer groups (McGorry, Edwards, Mihalopoulos, Harrigan, & Jackson, 1996). A leading schizophrenia researcher once went so far as to state that it is an ‘inescapable clinical fact’ that there is a role for stress in the onset and relapse of schizophrenia (Weinberger, 1987).
Importantly, the stress-vulnerability model also opens possibilities for preventive intervention and treatment of symptoms, particularly through psychological strategies that enhance stress management and coping. This contrasts with the Kraepelinian view of psychosis causing progressive functional and intellectual deterioration with no possible return to premorbid levels and the accompanying nihilistic view of treatment (Gelder et al., 1989).

Although the relationship between the experience of stress, coping and the onset of acute psychosis has now been investigated for many years, there is no compelling evidence of such an association and the physiological mechanisms underlying a relationship between the experience of stress and the onset of psychosis have not been elucidated. Further, it is unknown whether i) the potential relationship between stress and psychosis is a simple linear one and the quality and meaning of stressful experiences and the types of coping strategies employed are unimportant; ii) the probability of experiencing psychotic symptoms increases as more undesirable or threatening events are experienced or unhelpful coping strategies are used; or iii) whether particular types of stressful events need to be experienced to promote the development of psychotic symptoms. In this chapter, research investigating the relationship between stress, coping and onset of psychosis is reviewed. It will be shown that this research is plagued by poor methodology and that very few studies have investigated the potential roles of both the experience of stress and coping responses.

5.1 Vulnerability Markers of Psychosis

Despite the wide acceptance of the stress-vulnerability model, clear vulnerability markers of psychosis have not been identified. Markers are quantifiable indicators of disease, which may or may not be causal (Buchsbaum & Haier, 1983). Although no definitive markers of psychosis have been identified, at least two factors have strong support- eye tracking
dysfunction and sustained attention (Lee & Williams, 2000; Michie et al., 2000). Other factors that show some promise include event related brain potentials, structural brain abnormalities, electrodermal activity; and neurological/neuromotor abnormalities (Copolov & Crook, 2000; Ford et al., 1999; Jablensky, 2000; Karoumi et al., 2001; Lawrie, Whalley et al., 2001; Lee & Williams, 2000; McConagy, 2000; McNeil & Cantor-Graae, 2000a; McNeil & Cantor-Graae, 2000b; Michie et al., 2000; Sobin et al., 2001; Wuebben & Winterer, 2001).

5.2 The Relationship Between Stress and Psychosis

Studies of the relationship between stress and psychotic disorders have mainly focussed on schizophrenia and have primarily investigated either the concept of expressed emotion or the role of life events.

5.2.1 Expressed Emotion

Although Expressed Emotion (EE) is not the focus of the current study, it cannot be ignored in a review of research investigating the relationship between stress and psychotic disorder. Expressed emotion is a construct that has been investigated for nearly thirty years, particularly in relation to the course of schizophrenia. It refers to the emotional environment and attitude of caregivers towards an individual and particularly focuses on negative interactions. Key aspects of interpersonal relationships that are incorporated within the construct are criticism, hostility and emotional over-involvement (Brown, Birley, & Wing, 1972; Vaughn & Leff, 1976). It has been repeatedly demonstrated that high contact with emotionally over-involved, critical or hostile family members has a deleterious effect on the course of a range of mental and physical disorders (Butzalaff & Hooley, 1998; Wearden, Tarrier, Barrowclough, Zastownhy, & Armstrong-Rahill, 2000). More specifically,
individuals with schizophrenia who are discharged from hospital to live with relatives who express critical or hostile attitudes or are emotionally over-involved have an increased risk of relapse over those who live in a low EE environment (Bachman et al., 2002). EE influences outcome independently of other outcome predictors such as age, gender, marital status, premorbid functioning, illness duration, social adjustment and medication compliance (Heikkilä et al., 2002) and is negatively associated with social functioning (van Humbeeck et al., 2002). Recent research has suggested that EE is not a stable (or trait) factor within families but changes as the mental state of the family member with schizophrenia changes and also as the family unit adjusts and adapts to having an unwell member (Bachman et al., 2002). It is also suggested that EE might play a larger role in relapse of individuals with well-established, ‘chronic’ psychotic illness rather than first episode patients (Bachman et al., 2002; Heikkilä et al., 2002; MacMillan, Gold, Crow, Johnson, & Johnstone, 1986; Patterson, Birchwood, & Cochrane, 2000; Stirling et al., 1993). This suggests that EE develops in response to cumulative difficulties of living with a family member who has a psychotic disorder (Hooley, Rosen, & Richters, 1995).

When living within a high EE environment is regarded as an environmental stressor, EE fits well within the stress-vulnerability model of schizophrenia and psychosis (Gleeson, Jackson, Stavely, & Burnett, 1999). EE can also be viewed as a specific type of negative social support, as it highlights the potential negative impact social relationships can have on emotional health (Cohen, 2004). Complex models have been developed to explain the interaction between the individual and the level of EE in their environment in more detail (Nuechterlein, 1987; Nuechterlein et al., 1994).
5.2.2 Life Events and Psychosis

In spite of the limitations of such an approach, by far the most common way of measuring ‘stress’ in relation to psychosis is the ‘life events’ approach. As discussed in Chapter 2, life events such as death of a loved one, moving house, illness of a pet and so forth, are usually associated with a period of adaptation, and, often, even if the event is ultimately a positive one, a degree of distress.

Life events could impact on the development of psychotic disorders in a number of ways. First, stressful events might be necessary but not sufficient on their own to result in an episode of illness (Day et al., 1987). Second, life events might ‘trigger’ the onset of a psychosis. According to this model, psychosis would always have occurred, but the experience of sufficient life stress brings the onset of the disorder forward in time (Day et al., 1987). In this case, stress associated with the event is neither a necessary nor sufficient cause of illness. A recent British study has examined the association between the experience of psychotic symptoms by the general population and life events. Johns and colleagues (2004) reported that the experience of any psychotic symptoms by the general population, and specifically the experience of paranoid thoughts, was associated with the experience of at least one life event in the previous six-month period. This result suggests that the exploration of the association between life events and psychosis is definitely valid despite shortcomings of the approach.

Researchers in the United Kingdom have developed a cognitive psychological model of the role of stressors in the development and maintenance of psychotic symptoms (Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002; Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001). For example, they proposed that the experience of victimisation might lead individuals to believe that they are vulnerable and to view the world and other people as hostile and threatening. Stressful events are thought to
trigger symptoms under these circumstances. Recent studies have supported this model (Dudley & Over, 2003; Freeman et al., 2004).

Life event studies have focussed on both the first onset of disorder and relapse, and have had retrospective and longitudinal designs. Whilst most studies have employed a case-control methodology, a few studies have had a quasi-experimental design. A small number of studies have also investigated specific relationships such as the association between life events and suicide in individuals with psychosis. In the following review, studies are divided according to these considerations.

5.2.2.1 Quasi-experimental studies

In quasi-experimental studies all participants are exposed to the same stressful event. The earliest example of such a study indicated a six-fold increase in hospitalisation rates for schizophrenia among US soldiers during the first year of military service compared to the second year (Steinberg & Durrell, 1968). Increased hospital admission rates during the first year were not due to a pre-existing illness and prodromal symptoms did not influence the decision to join the army. Although it was recognised that the men who developed schizophrenia might have developed the disorder even if they had not joined up, the authors of the study concluded that: “emotional stress associated with the necessity of making a social adaptation was effective in inducing schizophrenic symptoms” (p. 1102).

In another quasi-experimental study with a military cohort, Paster (1948) found that soldiers who became psychotic after exposure to extreme combat had a lower probability of family history of psychosis than soldiers who became unwell after exposure to lower levels of stress. This suggests that stress associated with combat can precipitate the onset of psychosis over and above the influence of family history of illness. Wagner (1946) also reported
that two months of heavy fighting at Normandy during World War II was associated with an elevated incidence of psychosis and schizophrenia. However, more recent studies have suggested that onset of psychosis following exposure to warfare is quite rare and such episodes are brief (Beighley, Brown, & Thompson, 1992; Tennant, 1985).

Migration is another situation that provides an opportunity to assess the relationship between stress and schizophrenia although results from such studies have been mixed (Cantor-Graae & Selten, 2005; Tennant, 1985). Studies of refugee groups suggest that onset of psychosis is more common in those individuals who had been exposed to extreme duress before migration (Bhui et al., 2003; Zolkowska, Cantor-Graae, & McNeil, 2003). Other studies have suggested that the development of psychosis following migration in some cases is a result of social disadvantage and being in a cultural minority group in a new environment (Cantor-Graae & Selten, 2005; Hutchinson & Haasen, 2004). One difficulty with studies of migration is that individuals who are pre-disposed to develop schizophrenia or are in the prodromal phase might be more likely to relocate from where they live (Ödegaard, 1932), although this explanation is disputed by more recent researchers (Cantor-Graae & Selten, 2005; Selten, Cantor-Graae, Slaets, & Kahn, 2002).

Although quasi-experimental studies are very elegant and provide some support for the notion that stress can impact on the development of a psychotic disorder, they do not allow for investigation of an association between the experience of stressors and psychosis outside the particular stressful event under review.

5.2.2.2 Retrospective studies of stressful life events and psychosis onset

Most life event studies in the psychosis literature have involved interviewing a subject about events that have occurred during a specific time
period. For example a researcher might be interested in the experience of life events during the three months prior to first onset of psychotic symptoms. Sometimes an informant is also interviewed to verify the subject’s recall of events. In the earliest studies, subjects indicated which events from a checklist had occurred. More recent studies have included a qualitative component - respondents are asked how distressing an event was, whether it was a novel experience, and whether it was expected. In most studies, the degree to which events are considered independent of symptoms is also rated.

The first major study that investigated the potential relationship between the experience of stressors and the onset of a psychotic episode was conducted more than three decades ago (Brown & Birley, 1968). It remains the landmark study in this field and the model for many later studies.

Brown and Birley (1968) recruited 50 first episode and relapsing schizophrenia patients who had been recently admitted to a psychiatric ward. Psychotic episode onset was within 13 weeks of admission and could be dated to within a week based on the report of the patient and a family member. Forty-five participants in the study were diagnosed with schizophrenia whilst four were diagnosed as ‘schizo-affective’ and one ‘mixed affective with paranoid ideas’. A comparison group of 325 people of roughly matching age to the patient group was also recruited. All subjects were asked about life events that had occurred over the three months prior to illness onset (patient group) or three months prior to interview (comparison group).

When only ‘independent’ events were considered, it was found that the patient group experienced almost double the number of stressful events over the 13-week period (mean = 1.74 events) than the comparison group (mean = 0.96 events). Forty-six per cent of the patient group had experienced at least one independent event in the three-week period immediately preceding episode onset but only 12 per cent had an event in any of the other three-week periods under review. Event rate did not differ across the rating periods
for the comparison group. The same results were found when ‘dependent’ or ‘possibly independent’ events were considered.

The primary conclusion of this study was that there was ‘reasonably sound’ evidence that stressful events precipitated the onset or relapse of a schizophrenia spectrum illness and that such events tended to cluster in the three-week period immediately preceding the onset of a psychotic episode. The researchers were careful to add that they did not think that the stressful events that were reported were sufficient causes of an episode on their own but that they probably contributed to and coincided with other factors to produce the conditions necessary for episode onset. They estimated that life events were involved in the onset of symptomatology in approximately 50 per cent of cases, and in those cases the onset of the episode was brought forward by an average of 10 weeks (Brown, Harris, & Peto, 1973).

Supplementary analysis of the data revealed that there were no differences in the number of life events experienced in the three weeks prior to episode onset when the patient group was divided according to mode of onset (‘normal to schizophrenia’ vs ‘exacerbations from mild to severe schizophrenia’), diagnosis (‘definitely’ vs ‘probably’ schizophrenia), first episode vs relapse, or first admission vs later admission to hospital (Birley & Brown, 1970). It was noted that relapsing participants who had either reduced or discontinued their anti-psychotic medication were less likely to have experienced negative life events prior to their relapse. In other words, they were more likely to relapse, even if they had not experienced a negative life event.
Table 5.1
Retrospective Studies Investigating the Relationship Between Stressful Life Events and Onset of Psychosis

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample characteristics</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michaux, Gansereit, McCabe, and Kurland (1967)</td>
<td>20 individuals with schizophrenia: 10 who developed a relapse episode (mean age: 39.1 years; 80% male) and 10 who did not (mean age: 37.9 years; 80% male).</td>
<td>Patients with schizophrenia who experienced a relapse episode experienced significantly higher levels of stress in the six months prior to relapse than those patients who did not relapse in a comparison six-month period.</td>
</tr>
<tr>
<td>Jacobs and Myers (1976)</td>
<td>62 inpatients with schizophrenia (first hospitalisation); 62 healthy controls: matched on age, race, gender and SES (age and gender data not provided in paper).</td>
<td>Newly diagnosed schizophrenia patients experienced an average of 3.2 events in the year prior to hospital admission; Healthy comparison group reported an average of 2.1 events in year prior to interview; Difference between groups no longer significant when only independent events were examined.</td>
</tr>
<tr>
<td>Study</td>
<td>Sample Description</td>
<td>Findings</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Schwartz and Myers (1977a)</td>
<td>132 outpatients with schizophrenia; 132 healthy controls-matched on age, race, gender and SES.</td>
<td>Schizophrenia group experienced significantly more life events than comparison group (3.25 vs 1.51) in the six month period immediately preceding interview.</td>
</tr>
<tr>
<td>Gruen and Baron, (1984)</td>
<td>52 patients with chronic schizophrenia; 60% male, age range: 17-36 years.</td>
<td>15.4% of chronic schizophrenia patients experienced stressors at a severe or extreme level during 12 months prior to episode onset.</td>
</tr>
<tr>
<td>Canton and Fraccon (1985)</td>
<td>54 first episode and relapsing inpatients with schizophrenia; 54 healthy controls: 57% male; mean age: 30.3 years;</td>
<td>Patient group reported significantly more life events in the six months preceding hospital admission than healthy comparison group in six months prior to interview; Events concentrated in three months immediately preceding hospital admission rather than in other three month periods or equivalent periods in non-patient group.</td>
</tr>
</tbody>
</table>
Table 5.1, cont,

<table>
<thead>
<tr>
<th>Study</th>
<th>Patients/Diagnosis</th>
<th>Male Patients</th>
<th>Mean Age (years)</th>
<th>Male Control Subjects</th>
<th>Mean Age (years)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Khani, Bebbington, and Watson, and House (1986).</td>
<td>48 patients with schizophrenia: 21 first episode and 27 relapsing; 54% male; mean age: 26.1 years; 62 healthy control subjects: 60% male; mean age 26.8 years.</td>
<td>21 first episode and 27 relapsing; 54% male; mean age: 26.1 years; 62 healthy control subjects: 60% male; mean age 26.8 years.</td>
<td>33% of patients with a life event in the three weeks before onset also reported events earlier in the review period, but 41% of patients with no life event in the three weeks prior to onset reported events earlier.</td>
<td>No difference in the number of events reported by the male patients and the male control subjects; Female patients, particularly those who had not had a previous episode of illness, were significantly more likely to have experienced events than females in the control group.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chaven and Kulhara (1988)</td>
<td>22 patients suffering from a DSM-III brief reactive psychosis: 32% male; mean age: 31 years. 22 healthy comparison subjects- individually matched on age and gender.</td>
<td>22 patients suffering from a DSM-III brief reactive psychosis: 32% male; mean age: 31 years. 22 healthy comparison subjects- individually matched on age and gender.</td>
<td>Patients experienced a greater number of life events over the course of a year prior to onset of illness than comparison group.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 5.1, cont,

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gureje and Adewunmi (1988)</td>
<td>42 patients with recent onset schizophrenia (55% male, mean age: 24.2 years); 42 healthy control subjects (55% male; mean age: 22.9 years).</td>
<td>More control subjects reported experiencing a life event over the six- and three-month period prior to interview than patients in a comparative period prior to episode onset. Significantly more events experienced by control group in month prior to interview compared to month prior to episode onset for patient group.</td>
</tr>
<tr>
<td>Camberwell Collaborative Psychosis Study</td>
<td>97 patients with schizophrenia, mania or depressive psychosis; age range: 16-50 years; 207 healthy control subjects; age range: 18-50 years</td>
<td>Patient group experienced more life events in six months prior to illness onset than comparison group in six months period; Events experienced with greater frequency closer to illness onset in patient group; events evenly distributed over time for comparison group; No association between pattern of illness onset and number of life events experienced.</td>
</tr>
<tr>
<td>Das, Kulhara, and Verma (1997)</td>
<td>30 ‘relapsed’ schizophrenia patients and 30 ‘non relapsed’ patients matched on age and gender (data not provided in paper).</td>
<td>The relapsed group had significantly higher levels of stress and experienced more life events overall in year prior to relapse than the non-relapsing group in a comparative period; 60% of the relapsing group had experienced undesirable events in the year prior to relapse compared with 30% of the stable group. There was no increase in frequency of events immediately prior to relapse.</td>
</tr>
</tbody>
</table>
Table 5.1, cont,

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mazure, Quinlan, and Bowers (1997)</td>
<td>34 inpatients treated for ‘acute psychosis (schizophrenia, schizophreniform disorder, schizoaffective disorder, mood disorder with psychotic features, manic episode with psychotic features); 79% first hospitalisation; 47% male; age range 18 - 50 years.</td>
<td>Approximately 52% of relapsing and first episode schizophrenia patients experienced moderate to severe stressful events in the six months preceding hospital admission.</td>
</tr>
<tr>
<td>Ventura, Nuechterlein, and Subotnik (2000)</td>
<td>Outpatients with first-onset schizophrenia (n = 100; mean age: 23.4 years); Healthy comparison group (n = 57; demographically matched to schizophrenia group).</td>
<td>The control group reported experiencing almost twice as many negative life events and over two times as many positive life events as the schizophrenia group. However, the patient group rated the events they experienced as more distressing than the control group did.</td>
</tr>
</tbody>
</table>
Table 5.1, cont,

| Cullberg (2003) | Patients with first episode psychosis (n = 28; aged 18-45 years- more precise information about age/gender not provided). | Patients with good outcome 1-2 years after recruitment were more likely to have clearly defined stressful event preceding the onset of acute episode than those with poor outcome. Wide range of stressful events described by subjects. |
Other retrospective studies of the relationship between stressful life events and onset of a psychotic episode have now been conducted (summarised in Table 5.1). Results of these studies have been mixed. Some studies have replicated Brown and Birley (1968) by finding an increase in the number of life events experienced prior to the onset of an acute episode (Bebbington et al., 1993; Canton & Fraccon, 1985; Chaven & Kulhara, 1988; Mazure, Quinlan, & Bowers, 1997; Michaux, Gansereit, McCabe, & Kurland, 1967; Schwartz & Myers, 1977a). However, Chung, Langeluddecke, & Tennant (1986) reported no change in the frequency of life events prior to onset. Jacobs and Myers (1976) reported that newly-diagnosed schizophrenia patients experienced significantly more life events in the year prior to hospital admission than a healthy control group in a comparison year, but this difference was significant when only non-independent events were considered. They concluded that the role of life events in the onset of schizophrenia was probably ‘marginal’ and they possibly played a ‘small contributory role such as a precipitating or triggering effect’ (p. 86) but not a causative role. Gruen and Baron (1984) reported that only 15.4% of chronic schizophrenia patients experienced stressors at a severe or extreme level during the 12-months prior to onset of illness.

Other studies have also had interesting results. Ventura, Nuechterlein, and Subotnik (2000) reported that although members of a healthy comparison group experienced more adverse life events than a first episode psychosis cohort, the individuals with psychosis reported feeling more distressed. Al Khani, Bebbington, Watson and House (1986) reported that whilst female patients were more likely to report events preceding episode onset than female controls, a similar difference was not seen when comparing male patients with male controls. Gureje and Adewunmi (1988) reported that more control subjects than patients with schizophrenia from the same region in Nigeria reported experiencing life events over the six-month period prior to interview than patients in the six months prior to illness-onset. This difference was significant when the month directly preceding the interview
was compared with the month preceding episode onset. However, closer analysis of the data suggested that this difference was more pronounced in male than female participants and might have been attributable to the fact that many of the interviews with male control subjects were held towards the end of the school year when many commenced looking for full-time employment.

Perhaps the most ambitious study to assess the relationship between stressful life events and psychosis was conducted by Day and colleagues (1987). This World Health Organisation-sponsored study investigated life events experienced by individuals with schizophrenia at centres reflecting different socio-economic levels and cultures. This study was a sub-study of a larger multinational study: The Determinants of Severe Mental Disorder Project.

Any individual living in the regions included in the study who made first-ever contact with mental health services and was diagnosed with schizophrenia, a paranoid disorder or a non-organic schizophrenia-like psychosis was included in the study. In all cases, illness onset was characterised by the acute development or exacerbation of psychotic symptoms within the six-months prior to interview and onset could be reliably dated to within one week. Life events over the 12-weeks prior to the interview were assessed using a semi-structured interview developed to be applicable across the range of cultural and socio-economic groups involved in the study.

The mean number of events experienced by participants ranged from 0.5 to 2.33 with the least number of events experienced by those in Ibadan, Nigeria and the most by those living in Rochester, USA (Table 5.2). The mean number of events experienced by those living in Ibadan, Chandigarh and Agra (both of the latter are in India) differed significantly from the other nine sites.
Table 5.2
Summary of Results of Multi-Site Study by Day et al. (1987)

<table>
<thead>
<tr>
<th>Number of participants</th>
<th>Independent events only</th>
<th>All events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agra, India</td>
<td>48</td>
<td>0.58</td>
</tr>
<tr>
<td>Chandigarh, India</td>
<td>67</td>
<td>0.94</td>
</tr>
<tr>
<td>Cali, Colombia</td>
<td>51</td>
<td>1.10</td>
</tr>
<tr>
<td>Ibadan, Nigeria</td>
<td>84</td>
<td>0.33</td>
</tr>
<tr>
<td>Developed countries:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aarhus, Denmark</td>
<td>31</td>
<td>1.16</td>
</tr>
<tr>
<td>Honolulu, USA</td>
<td>13</td>
<td>0.69</td>
</tr>
<tr>
<td>Nagasaki, Japan</td>
<td>29</td>
<td>0.72</td>
</tr>
<tr>
<td>Prague, Czechoslovakia</td>
<td>48</td>
<td>1.04</td>
</tr>
<tr>
<td>Camberwell, UK</td>
<td>50</td>
<td>0.98</td>
</tr>
<tr>
<td>Rochester, USA</td>
<td>15</td>
<td>1.20</td>
</tr>
</tbody>
</table>

This study replicated Brown and Birley (1968) by dividing the 12-week period prior to psychosis onset into four three-week periods to compare the number of events experienced during each of these periods. In six of the regions - Aarhus (Denmark), Agra, Chandigarh (India), Cali (Colombia), Nagasaki (Japan) and Prague (Czechoslovakia) - there was a significant increase in the number of events reported in the three-week interval prior to the onset of positive symptoms. (The Honolulu and Rochester areas were excluded from this analysis, as the case set was too small to support the statistical approach used). The authors concluded that 60 to 65 per cent of acute onset schizophrenia patients were likely to report at least one life event that is
independent of their developing illness in the 2-3 week period immediately prior to illness onset.

The primary finding of this study was that there was evidence of a temporal relationship between stressful life events and the onset of schizophrenia across a number of cultural groups, although it was felt that stressful life events are best considered one of the ‘pool of causal factors’ associated with the onset of schizophrenia. The study was limited by the lack of comparison groups from each of the regions to obtain general population rates of life events in each of the areas for comparison purposes. In addition, the life events measure that was used was not appropriate for all sites.

5.2.2.3 Other retrospective life event studies

In addition to comparing the number of life events experienced by patients with schizophrenia and a healthy comparison group, Jacobs and Myers (1976) investigated whether the groups experienced different types of stressful events. They reported that the patient group was significantly more likely to have experienced events categorised as ‘family related’ or ‘relocations’ (moving house) than the comparison group. The patients were also more likely to have experienced events classed as ‘entries or exits from the social field of the individual’. This difference was attributed to a high rate of pet deaths within this group! The patient group was also significantly more likely to have experienced undesirable events compared to the control group- only 10 out of the 62 patient participants did not report having experienced an undesirable event.

The time immediately following discharge from hospital is a period of increased vulnerability for individuals with schizophrenia. Increased levels of stress have been reported by patients at this time, as have increased levels of psychiatric symptoms, non-compliance with medication, substance use and
suicide attempts (Bergen, Hunt, Armitage, & Bashir, 1998; Heilä et al., 1997). Kimhy, Harkavy-Friedman, and Nelson (2004) surveyed the life events experienced by a group of patients with schizophrenia in the week following discharge from a psychiatric hospital. Respondents were asked to list the three most stressful issues they were facing at that time. The most prevalent stressor was psychotic symptoms, followed by adjustment to housing situation, interpersonal stressors (loneliness, relationship difficulties and issues related to social activities), employment-related stress and anxiety regarding the future. Only four per cent of respondents were unable to identify any stressors at all. This is the first study that has focussed on the post-discharge period, but the results suggest that future research and interventions should not neglect this time of vulnerability.

The experience of life events has been compared between individuals with psychotic disorders and individuals experiencing another psychiatric diagnosis. Eisler and Polak (1971) failed to find differences in the number of significant interpersonal and situational stressors occurring over a two-year period prior to admission to hospital for individuals diagnosed with schizophrenia, depression, personality disorder or ‘transient situational reaction’. Similarly, Chung et al. (1986) found no difference in the level of chronic stress between patients with schizophrenia, schizophreniform disorder or hypomania in the six months prior to episode onset or compared to a healthy comparison group. The frequency of events also did not increase significantly in the four-week period immediately preceding episode onset for any patient group. Clancy, Crowe, Winokur, and Morrison, (1973), however, reported that 39% of unipolar affective disorder patients, 27% of bipolar disorder patients and 11% of schizophrenia patients had experienced at least one significant life event in the three-month period preceding episode onset.

Most other studies have similarly found that depressed patients report more stressful events than patients with psychosis (Beck & Worthen, 1972; Dang, Shyam, & Kumar, 1998; Jacobs, Prusoff, & Paykel, 1974), but it is possible
that this difference is a reflection of the reporting style of people who are
depressed. Beck and Worthern (1972) suggested that the difference between
depressive disorders and schizophrenia highlights the “private nature of the
symbolic processes” (p. 128) of many individuals with schizophrenia. In other
words, simply assessing the frequency of stressful events experienced by
individuals with schizophrenia is not sufficient to fully understand the
relationship with the course of the disorder. The meaning given to events and
the individual’s appraisal of them might be of crucial importance.

Unfortunately no studies have investigated the specific role of stressful
events in association with mood-related psychotic disorders such as
schizoaffective disorder or major depressive disorder with psychotic features.

5.2.2.4 Retrospective investigations of the relationship between life events
and general psychopathology

Five studies have investigated the relationship between life events and
psychopathology experienced by individuals with psychotic disorders. Harder,
Strauss, Kokes, Ritzler and Gift (1980) retrospectively surveyed the life events
experienced by a cohort of psychiatric patients with a range of diagnoses
including schizophrenia, situational or adjustment conditions, neuroses,
personality disorders, affective psychoses, and other psychoses in the 12-
month period prior to hospital admission. Psychopathology experienced by
the participants at the time of admission was also recorded. According to the
authors “more severe levels of schizophrenic and general psychotic symptoms
were associated with increases in life events stress in the 12 weeks before
admission” (p. 176). Unfortunately comparisons were not made between the
diagnostic groups.

Schwartz and Myers (1977b) were interested in evaluating the impact of life
events on ‘nonpsychotic’ symptoms that are commonly experienced by
individuals with psychotic disorders. Life events were found to have the
greatest impact on neurotic symptoms (anxiety, depression and somatic
concerns) and less impact on positive psychotic symptoms. Although this
study lends support to the hypothesis that life events play a role in the onset
and course of psychotic disorders, the impact of life events on psychotic
symptoms was less than anticipated.

Chintalapudi, Kulhara and Avasthi (1993) reported that patients who
developed significant levels of depressive symptoms during remission of
schizophrenia had experienced more life events than patients who did not
experience depressive symptoms over the previous year. Unfortunately the
design of this study did not account for differences between participants in
the duration of the remission period. For some participants the 12-months
prior to interview could have incorporated both an acute episode and the
prodromal phase of that episode, whilst for others it might have only included
the remission period. However, it is noted that the results of an earlier study
by Roy, Thompson and Kennedy (1983) also found that individuals with chronic
schizophrenia and depression experienced more life events in the six months
prior to the onset of their depressive symptoms than individuals who did not
develop depressive symptoms.

Van Os et al. (1994) attempted to assess whether the course of psychotic
illness differed between patients who had experienced stressful life events in
the three-month period prior to the onset of illness and those who had not.
Surprisingly, they reported that patients who had experienced a severe life
event prior to onset had milder symptom severity, spent less time in hospital
and took less anti-psychotic medication over a 42 month follow-up period than
the patients who had not experienced a severe event. The authors cautiously
concluded that stressful life events are possibly only one of a number of
factors that are likely to influence the course of psychotic disorders.
Finally, the more stressful life events experienced in the six-months prior to hospital admission by young people with schizophrenia, the higher the level of depression they experienced according to a study by Zalsman and colleagues (2004). Further, the life events that were correlated with level of depression were related to interpersonal events. Although replication of this study is required it suggests that treatment for young people with schizophrenia should include a focus on interpersonal relationships to potentially reduce the level of depression that might develop.

The mixed results of the studies described above indicate that the relationship between stressful life events and psychotic disorder might not be as clear-cut as first suggested by Brown and Birley (1968).

5.2.2.5 Methodological limitations of retrospective studies

Retrospective studies have been the most common method of evaluating the potential relationship between stressful life events and the onset and course of psychotic disorders. Most of the shortcomings of this approach are common to retrospective research in general. The central limitation is the reliance on participants’ memory of events that occurred up to a year prior to interview. This is relevant for patient groups as well as non-patient participants. Memory is not infallible and the recall of the exact nature and timing of events can easily be compromised. Similarly, effort after meaning effects need to be considered. Participants might have attributed causality or otherwise unintentionally biased their responses in an attempt to understand why they have become unwell. Day et al. (1987) referred to the “telescoping effect” which is endemic to retrospective research and is associated with the effort after meaning phenomenon. It suggests that patients tend to recall events as having occurred much closer to the onset of their illness than is actually true in an attempt to find reasons to explain why they became unwell.
In addition to these general problems common to all retrospective research, there are unique problems associated with the course and nature of psychotic disorders. First, the mental state of patients included in many of these studies is concerning. In some cases individuals with schizophrenia were interviewed shortly after admission to hospital or shortly after making contact with psychiatric services. Being acutely unwell at the time of interview could obviously impact on the responses given. Additionally, the impact of psychosis on memory and cognitive functioning is well documented (Heinrichs & Zakzanis, 1998), but not well controlled in the studies described above. In some cases, the researchers attempted to minimise this problem by interviewing an informant, most commonly a family member, to verify the information provided by the patient. However, family members are also prone to recall difficulties, effort after meaning or might simply not be aware of all of the events that the patient has experienced.

Differences in duration of illness among participants with psychotic disorders in these studies might also have had some bearing on results. Many studies failed to clearly indicate whether participants were experiencing a first or later episode of illness. Those studies that compared the life events of first onset patients with relapsing patients have indicated that first episode or early episode patients report a higher number of stressful events and in some cases more ‘severe’ events in the period of time preceding onset of their most recent episode than participants who have experienced multiple episodes (Canton & Fraccon, 1985; Castine, Meador-Woodruff, & Dalack, 1998). Furthermore, in a comparison of the experience of life events between individuals with various diagnoses of psychotic disorders, Chung et al. (1986) reported a tendency for events to be more likely to precede the onset of an episode of schizophreniform disorder than schizophrenia.

The relationship between frequency of stressful events and duration of illness might be critical to the understanding of the relationship between stress and psychosis. In bipolar disorder some studies have shown that a
kindling effect exists: higher levels of distress or stressful events precede the onset of a first manic episode than subsequent episodes (Ambelas, 1987; Dunner, Patrick, & Fiee, 1979; Paykel, 2003; Swann et al., 1990). A similar relationship might exist with schizophrenic illnesses (Castine et al., 1998), suggesting that it might be important to assess first episode patients separately from relapsing patients.

The methods used in various studies to date the onset of psychotic episode are also questionable. In many studies, the date of hospital admission for treatment of an acute episode is used as the date of episode onset. This is obviously not ideal: participants might have been acutely unwell for some time before coming to the attention of mental health services. Brown and Birley (1968) only included patients in their study for whom it was possible to accurately date the onset of illness to within one week. As a result, episode onset of individuals included in that study is characterised by the sudden appearance of symptoms. Patients with a datable onset constituted a minority, in fact, of all patients screened for inclusion in that study. This compromises the generalisability of the results.

Many of the studies described above can also be criticised for lack of a control group, limitations in the composition of the control groups that were included, small number of participants, differences in method used to obtain information about life events (interview with patient, interview with family member only, review of clinical case notes) and, in some cases, the consideration of events rated as ‘severe’ or ‘marked’ only. Further, Al Khani et al. (1986) highlighted the need to be aware of cultural factors when interpreting results of studies. Participants in their study followed the Islamic way of life, believing that life circumstances largely arise through the will of God alone and the individual has little control over what happens. This belief might affect the influence events have on symptoms and ultimately the course of illness. This also highlights that simply recording the number of events that occur is not sufficient because consideration needs to be paid to
other subjective elements of the stressful experience. Finally, most of the studies reviewed above did not consider factors that might moderate the impact of stressful life events on the development of a psychotic episode. Das et al. (1997) reported that treatment compliance was more important than stress, number of life events experienced and other variables such as marital status, illness duration and diagnosis in predicting psychosis relapse. Many of the other studies failed to assess or control for possible confounding factors.

5.2.2.6 Longitudinal studies

The few longitudinal studies that have assessed the role of stressful life events in the course of psychotic disorders are summarised in Table 5.3. These studies have, in fact, assessed the relationship between the experience of stressful events and relapse of illness. Individuals with an established psychotic illness are monitored over time and the occurrence of life events is regularly assessed. After a given period of time the number of life events experienced is compared between those individuals who experienced a relapse episode and those who did not.
### Table 5.3

**Longitudinal Studies Investigating the Relationship Between Stressful Life Events and Onset of Psychosis**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample and procedure</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventura, Nuechterlein, Lukoff, and Hardesty (1989)</td>
<td>30 outpatients with schizophrenia, 72% male; mean age 23.2 years; 11 participants experienced a relapse episode within 12 months of recruitment, 19 did not.</td>
<td>Relapsing group experienced significantly higher number of independent life events in month preceding relapse than other months; 45% of relapsing patients experienced at least one independent life event in the month prior to relapse, whilst only 9% of the relapsing patients experienced an event in a comparison month.</td>
</tr>
<tr>
<td>Hirsch et al. (1996)</td>
<td>71 relapsing patients with DSM-III-R schizophrenia, 80% male; mean age: 45.2 years.</td>
<td>No difference in number of life events experienced in the four weeks preceding relapse compared to another four week period.</td>
</tr>
<tr>
<td>Pallanti, Quercioli, and Pazzagli (1997)</td>
<td>41 relapsing patients with schizophrenia, 76% male, mean age 23.7 years.</td>
<td>Increased number of stressful life events experienced in the three months prior to relapse - particularly in the four weeks directly preceding the onset of the relapse episode.</td>
</tr>
<tr>
<td>Ventura, Nuechterlein, Subotnik, Hardesty, and Mintz (2000)</td>
<td>99 patients with schizophrenia (81% male, mean age = 23.2 years) monitored for one year; 17% of participants experienced an exacerbation of depressive symptoms over the follow-up period.</td>
<td>Patients who experienced a life event were more than three times likely to have an increase in depressive symptomatology than those who did not. An increase in psychotic symptoms was also found to be likely in the month following a life event but the risk of increased psychotic symptoms was not greater than the risk of increased depressive symptoms.</td>
</tr>
</tbody>
</table>
An increase in the number of life events experienced in the four-week period immediately preceding a relapse was reported by Ventura, Nuechterlein, Lukoff, and Hardesty (1989) and Pallanti, Quercioli, and Pazzaglia (1997). However, Hirsch and colleagues (1996) failed to find a significant difference in the number of events experienced in the four weeks preceding relapse compared to another four-week period. One advantage of this latter study was that relapse was not simply taken as hospitalisation but was defined as “the emergence of one or more florid psychotic symptoms not present at the start of the study (delusions, hallucinations, bizarre behaviour or thought disorder) or an increase from one to two or more psychotic symptoms or a deterioration of psychotic symptoms sufficient to warrant hospitalisation” (p. 50).

Another study by Ventura, Nuechterlein, Subotnik, Hardesty, and Mintz (2000) assessed the relationship between life events and depressive symptomatology experienced by individuals with schizophrenia. They found that patients who experienced a life event were more than three times likely to have an increase in depressive symptomatology than those who did not. Although an increase in psychotic symptoms was also found to be likely in the month following a life event, the risk of increased psychotic symptoms was not greater than the risk of increased depressive symptoms. This suggests that depressive symptoms are more reactive to life events than psychotic symptoms experienced by individuals with schizophrenia.

Hardesty et al. (1985) failed to find a relationship between the experience of stressful life events by individuals with schizophrenia and illness course. They reported that only 11% of life events reported by individuals with schizophrenia over a 12-month period could be considered major events and approximately 20% of these major events occurred independently of the patients’ mental state and behaviour. Furthermore, there was very little evidence that individuals with higher levels of symptoms were predisposed towards experiencing more frequent or stressful life events.
5.2.2.7 Methodological limitations of longitudinal studies

Although prospective studies of the potential relationship between stressful life events and psychotic episodes are more sound than retrospective studies, fewer have been conducted. It should be noted that, by and large, the criticisms made of the retrospective studies about defining the onset of a psychotic episode and shortcomings in the control groups can also be levelled at these prospective studies. Clearly more studies with a longitudinal design are required.

5.2.2.8 The investigation of potential moderating factors

Ventura et al. (1989) highlighted that 55% of relapsing patients in that study did not report experiencing a stressful event in the months prior to relapse and suggested that other factors might moderate the impact of stressful events on symptomatology and relapse. Expressed emotion and the use of anti-psychotic medication have been proposed as mediators between life events and psychotic symptoms.

Many studies have indicated that a relapse psychotic episode was more likely to be preceded by an increase in the frequency of stressful life events experienced by individuals who were taking anti-psychotic medication than individuals who were not (Bartkó, Mayláth, & Herczeg, 1987; Leff, Hirsch, Gaind, Rhode, & Stevens, 1973; McEvoy, Howe, & Hogarty, 1984; Ventura, Nuechterlein, Hardesty, & Gitlin, 1992). This suggests that neuroleptic medication ‘protects’ individuals with a psychotic disorder against everyday stress, but additional stressors in the form of one or more life events might result in relapse. In other words, patients taking anti-psychotic medication might need to experience higher levels of stress to suffer a relapse.
Leff and Vaughn (1980) reported that for patients living in a high EE environment, a relapse episode of schizophrenia is less likely to be preceded by stressful life events than a depressive relapse is. The occurrence of stressful life events appears to be less important in precipitating a relapse of either depression or schizophrenia in low EE environments.

In a second study, Leff, Kuipers, Berkowitz, Vaughn and Sturgeon (1983) evaluated the role of both EE and anti-psychotic medication use in psychotic relapse. They reported that independent life events were more likely to precede a relapse of high EE patients who were taking anti-psychotic medication compared to those who were not. Leff et al. (1983) suggested that individuals with schizophrenia who are living in the community experience two main types of stress: acute stress in the form of life events, and chronic stress associated with living in a high EE environment. If the patient was not taking anti-psychotic medication, the authors proposed that they were prone to relapse if either type of stress occurred. Patients taking anti-psychotic medication were protected from one or other of the stressors, but if both occurred at the same time they were no longer protected. This suggests that relapse should be less common in psychotic patients who live in low EE environments assuming that the level of stress associated with living in a high EE environment is equivalent to the acute stress associated with experiencing a life event and that the two types of stress are additive.

Day et al. (1987) stated that conclusions about the ‘protective’ nature of anti-psychotic medication are purely speculative and a study by Hirsch, Cramer and Bowen (1992) found no significant relationship between compliance with anti-psychotic medication, exposure to life events and risk of relapse. While the exact nature of the impact anti-psychotic medication has on the relationship between life events and psychosis is unknown, studies should at least make some note of medication use by participants. Unfortunately this has rarely been the case to date.
5.2.2.9 Life event studies - Conclusions and problems

The relationship between life events and psychosis is not fully understood. For every study that has shown an association between the experience of life events and the onset of a psychotic episode, another has suggested otherwise. Further, there are common methodological problems with these studies that Hirsch et al. (1992) outlined: i) retrospective design; ii) inadequate subject numbers prohibiting generalisation of results; iii) the examination of events over a long time course which may mask the possibility that stressors might impact on symptoms over a much shorter period of time (three to six weeks for example compared to a year); and iv) demographic and other differences between control and subject groups influencing the number and type of stressful events that are reported.

These studies have also been criticised for only including individuals with schizophrenia and, usually, only those whose episode onset can be clearly dated. These biases limit the generalisability of results from these studies. Additionally, most studies have focussed only on independent life events. A number of studies illustrating that a higher level of dependent events is associated with episode onset suggest that the impact of those events should not be totally ignored (Brown & Birley, 1968; Dohrenwend, 1974; Fontana, Marcus, Noel, & Rakusin, 1972; Leff et al., 1973; Michaux et al., 1967).

Limitations of the life events approach to assessing stress were clearly outlined in Chapter 2. Rabkin (1980) summarised the major limitation of this approach: life events inventories are limited in the number and range of events included and they ignore potentially important information associated with the appraisal of events such as whether they are anticipated, desired, sudden, or a single event.
5.2.3 Minor Events and Psychosis

Norman and Malla (1993) suggested that individuals with schizophrenia are more likely to be adversely affected by chronic difficulties and stressors experienced in comparatively normal circumstances than more unusual major life changes and challenges. They demonstrated that the level of distress reported by individuals with schizophrenia was significantly correlated with the number of minor stressors experienced, but not with the number of life events (Norman & Malla, 1991). Beck and Worthen (1972) reported that individuals with schizophrenia were likely to attribute symptom exacerbation to stressors of ‘low severity’.

Norman and Malla have conducted a number of studies investigating the role of minor stressors in the course of schizophrenia. In the first study they reported that individuals with schizophrenia who experienced a relapse reported more major and minor stressful events over the course of a year than non-relapsing patients (Malla, Cortese, Shaw, & Ginsberg, 1990). The relapsing group also reported an increased number of independent events (major and minor) in the three-month period prior to relapse than during the other three-month periods of the year, but this difference did not reach significance. No significant differences were found between the groups when major and minor events were considered separately, but small subject numbers might have influenced this result.

In a second study, they evaluated the longitudinal relationship between symptomatology and daily stressors or hassles (Norman & Malla, 1994). The experience of hassles was an independent predictor of depression, somatic concerns, anxiety and positive psychotic symptoms (particularly reality distortion) over and above the influence of prior level of symptoms.

Finally, they reported that hassles and distress were more consistent correlates of symptoms than life events, which were significantly correlated
with positive psychotic symptoms and anxiety only (Malla & Norman, 1992). Partial correlations were calculated between stress and symptom measures at Time 2 while controlling for level of symptoms at Time 1. Under these conditions, no significant correlations remained between life events and any symptom measure. Hassles were no longer associated with positive or negative psychotic symptoms, but they were still associated with other symptom measures. This indicated that whilst life events might not play a role in determining symptoms associated with schizophrenia, hassles might have a small contributory role.

The only other study comparing the influence of major and minor events on the experience of psychotic symptoms was conducted by Hardesty et al. (1985). They reported that major life events experienced by individuals with schizophrenia were often followed by an increase in negative symptomatology, but minor events (often including positive events) were more likely to be associated with a decrease in depressive symptoms. The impact of either major or minor stressors on ‘florid schizophrenic psychopathology’ (positive symptoms) in this study was small.

These studies suggest that minor stressful events have a role in determining the level of distress and the symptoms experienced by individuals with schizophrenia. Norman and Malla (2001b) suggested that family history of schizophrenia might be a moderator of the degree to which stress impacts on symptoms experienced by individuals with schizophrenia. They found a stronger relationship between hassles and later psychotic symptoms in patients with a positive family history of illness than patients with no known family history of illness. Further studies are required to evaluate the importance of minor events more completely and to expand studies from only focussing on schizophrenia.
5.3.4 Other Measures of Stress

Myin-Germeys, et al. (2001) used a novel approach to assess the potential relationship between daily life stress and level of reactivity of individuals with psychosis. In this ‘in vivo’ study, 42 patients with a psychotic disorder (mean duration of illness was nine years), 47 of their first-degree relatives and 49 control subjects were asked to record what they were doing, their thoughts at the time, their mood and appraisals of the current situation at ten time points over six consecutive days. An alarm was given to all participants to remind them of when to rate the various factors. Positive and negative aspects of mood were rated as well as four different stress variables: event-related stress, activity-related stress, thought-related stress, and social stress. This is called the Experience-Sampling Method.

No differences were found between relatives or controls on any of the four stress measures. The patient group scored significantly higher than the control group on the event-related stress measure and higher on the social stress measure than both other groups. The patient group also reported significantly higher levels of both negative and positive mood than both other groups who did not differ from one another. The four stress variables were all significantly associated with mood: an increase in subjective stress was associated with an increase in negative affect and a decrease in positive affect in all groups. Different patterns of stress reactions were noted, however. The patients with psychosis recorded more intense emotional reactions to stress than the control subjects. Their family members responded to stress with a decrease in positive mood that was similar to that of the patient group but an increase in negative mood that was mid-way between the patient and control groups.

Myin-Germeys and colleagues (2001) concluded that daily life stress and mood is related in a dose-response fashion with level of genetic or familial risk of psychosis. They stated that stress reactivity could be viewed as a
vulnerability marker for psychosis but as the study was cross-sectional, this possibility has not been evaluated. They also conceded that the differences seen in stress reactivity between the groups could be associated with different environmental and social circumstances. For example, many studies have shown that patients with psychosis report lower levels of social support than others. Furthermore, a lack of social support has been associated with increased emotional reactivity towards daily stressors. Alternatively, patients with psychotic disorders are more sensitive to environmental stress and therefore would be more likely to report higher levels of stress in a given situation.

In a second study, Myin-Germeys, Krabbendam, Jolles, Delespaul and Van Os (2002) sought to investigate whether cognitive impairment that is common to schizophrenia is related to stress sensitivity. Multiple regression analyses indicated that the emotional reaction to stress (assessed through the Experience-Sampling Method described above) was not necessarily a consequence of cognitive impairments (results on a range of neuropsychological tests). The authors proposed that cognitive impairments and sensitivity to stress have two different aetiologies which might be related to the different clinical outcomes that are seen in schizophrenia: an episodic, reactive, good outcome form of the illness that is associated with high sensitivity to stress and a more chronic form of illness associated with negative symptoms and cognitive impairments. This is speculative at this time.

Horan and Blanchard (2003) examined the association between affective traits, coping and emotional responses in individuals with schizophrenia using role-playing. Individuals with schizophrenia and control subjects took part in a series of tasks, which simulated ‘real life’ social situations such as confronting a landlord about fixing a leaky roof, and interacting with a new colleague. After taking part in the role-plays, participants completed a number of questionnaires assessing mood, personality traits and coping style.
The results suggested that trait negative affectivity (a disposition to experience aversive emotional states, increased likelihood to experience distress at all times and heightened sensitivity to stressors) and maladaptive coping (denial and avoidance) were associated with mood changes during the role-playing tasks in the schizophrenia group.

5.2.5 The Experience of Stress By Individuals at Heightened Risk of Psychosis

Only two high-risk studies have investigated the level of stress experienced by high-risk subjects. Miller and colleagues (2001) reported that the number of life events experienced over the lifetime prior to recruitment to the EHRP was associated with the level of psychotic symptoms reported at baseline in both the HR and comparison groups and there were no differences between the groups in the number of events experienced. The experience of ‘intermediate’ or ‘minor’ stressors was not associated with symptom levels. The hypothesis that high-risk subjects whose genetic liability/risk for psychosis was highest would develop psychotic symptoms at lower levels of life stress was not supported in this study. This result contradicts the finding by Norman and Malla (2001b). Although psychotic symptoms were associated with the experience of life stressors it is not possible to make any conclusions about direction of the association because symptom onset dates were not reported. The independence of stressful events from symptoms was also not reported. This finding suggests that seriously upsetting events are required to elicit psychotic symptoms and that the aggregation of several smaller events is not sufficient. This possibility has not yet been further investigated.

Mason and colleagues (2004) in Newcastle, Australia, evaluated the validity of a number of putative predictors of psychosis, including life events. A cohort of individuals meeting UHR criteria completed the Schedule of Recent Experiences (Amundsen, Hart, & Holmes, 1981). Responses to this measure did not predict the onset of psychosis in the UHR group. Unfortunately the
study was cross-sectional and limited measurement to the experience of life events alone. Additionally, the authors did not indicate how much time passed between completing the SRE and the onset of acute symptoms. Therefore, although it is encouraging that other UHR groups have considered the role of stress in the onset of psychosis, this study is weakened by many of the same methodological flaws that are common in studies in individuals with established psychotic illnesses.

5.2.6 Conclusion - Stress and Psychosis

Despite almost over forty years of research, the relationship between the experience of stress and the onset and course of psychotic disorders remains unclear. Although some studies have demonstrated an apparent association between the experience of stressful events and the onset of a psychotic episode or increase in psychotic symptomatology, others have failed to demonstrate this association. The number of studies that have adequately examined a temporal relationship between the two variables is unfortunately low.

This area of research has been strongly criticised for methodological limitations such as an over-reliance on the life events approach to assessing stress, inadequate control groups, inadequate characterisation of the onset of psychotic episode and an almost complete disregard of psychotic illnesses aside from schizophrenia. It is only relatively recently that methods of assessing stress other than the life events approach have been considered.

The relationship between the onset of a first episode of psychosis and the experience of stress has only been investigated in retrospective or cross-sectional studies so far. In many studies, first episode patients are mixed in with relapsing patients, confounding the investigation of the relationship between stress and both the first onset of disorder and relapse. The only UHR
study, to date, that has explored the contribution of stress and coping to the onset of psychosis has also had a cross-sectional design.

Most importantly, investigations of the relationship between stress and psychosis have not taken into consideration the appraisal of stressors. In Chapter 2, appraisal was described as a pivotal process in determining the impact of stressful experiences on an individual (Folkman, Lazarus, Dunkel-Schetter, et al., 1986). Norman and Malla (1993) stated “the meaning of some events to a patient, and therefore the level of stress engendered by them, is likely to be lost on anyone who is not familiar to his/her circumstances” (p. 168). Zubin and Spring (1977) agreed: “it is doubtful that all response systems will be identically affected by any stressful event” (p.111). Research investigating the potential relationship between stress and psychotic disorders has not yet examined the experience of stressors in this broader way.

5.3 Coping and Psychosis

Wiedl and Schottner (1991) stated that the symptoms and impairments related to schizophrenia cause specific strain and burden and thus bring about stress for the individual. Furthermore, they stated that the degree of effective coping might significantly affect processes that contribute to the illness course. Successful coping might be integral to the processes of ‘integration’ that is important in recovery from psychotic illness. Integration is characterised by the individual being curious about the symptoms they have experienced and regarding them as part of life’s wider experience (Drayton, Birchwood & Trower, 1998; Jackson et al., 1998; McGlashan et al., 1975). As a result, a more flexible attitude towards illness develops and strategies are developed to successfully cope with its impact. Conversely, individuals who ‘seal-over’ tend to have fixed beliefs of their illness as negative and interrupting the progress of their lives (McGlashan et al., 1975; Tait,
Birchwood, & Trower, 2003; Thompson, McGorry, & Harrigan, 2003). The 'sealing-integration' dimension of coping has been found to predict engagement with treatment services (Tait et al., 2003), but is independent of insight or psychotic symptoms (Drayton et al., 1998; Tait et al., 2003). Tait, Birchwood and Trower (2004) suggested that sealing over is more likely in individuals with a history of attachment difficulties. Sealing over resembles an 'escape-avoidance' coping mechanism (Lysaker, Clemens, Wright, Evans, & Marks, 2001), but is not fully explained by a lack of insight because even individuals who do have insight into the nature of their illness may 'seal over' in an attempt to maintain their self esteem (Tait, et al., 2003). Integration and sealing-over have been described as personality styles (McGlashan, 1987), although Thompson et al. (2003) reported that the recovery style of first episode patients often changes over the first 12-months of treatment.

Studies of coping strategies utilised by individuals with psychotic disorders have focussed either on coping with symptoms or coping with other stressors such as life events and hassles.

5.3.1 Coping with Symptoms

Most studies of the relationship between coping and psychotic disorders have addressed the capacity to cope with symptoms. Once again these studies have primarily focussed on individuals with schizophrenia, largely ignoring other psychotic illnesses. Results from these studies are summarised in Table 5.4.

Although it is usually assumed that successful coping with symptoms is associated with a better outcome, only one longitudinal study has investigated this assumption. Boschi and colleagues (2000) asked patients with a recent onset schizophrenia, schizoaffective disorder or schizophreniform disorder how they coped with their symptoms. Responses
were grouped into three general coping styles: active-behavioural, active-cognitive and avoidant. At baseline most of the participants reported that their symptoms were highly stressful and felt that they had little control over them. Active-behavioural strategies (such as talking with a health professional) were found to be the most helpful with active-cognitive strategies (ignoring symptoms) rated as the next most helpful and avoidant strategies least helpful. Level of distress was not significantly associated with coping strategies.

No significant associations were found between coping strategies at baseline and functioning or quality of life six months later. Active coping at baseline was associated with better outcome at 24 months. However perceived stress and sense of control were not associated with functioning at either follow-up point.

It is interesting that the coping strategies identified as the most helpful were not those that were utilised the most frequently. People with more severe symptoms tended to endorse a greater range of coping strategies but using more strategies did not reduce the amount of distress associated with severe symptoms nor did it lead to better outcomes later.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Participants</th>
<th>Conclusions</th>
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<tbody>
<tr>
<td>Breier &amp; Strauss (1983)</td>
<td>20 individuals with a range of psychotic diagnoses (schizophrenia, schizoaffective disorder, bipolar disorder, MDE with psychotic features); mean age: 30 years; 40% male.</td>
<td>Strategies used to cope with symptoms divided into three categories: self instruction/self-talk; decrease activity/minimise external stimuli; increase activity/distraction.</td>
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<tr>
<td>Cohen &amp; Berk (1985)</td>
<td>86 outpatients with schizophrenia; mean age: 43.3 years; 52% male.</td>
<td>A range of strategies reported in response to anxiety, depressive and ‘schizophrenia’ symptoms: (in descending order of use) fighting back (trying to overpower unwanted thoughts); do nothing/helpless; do nothing/acceptance; diversion; time out; increased social contact; prayer; take medication/consult health professional.</td>
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Table 5.4, cont

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Details</th>
<th>Coping Strategies Reported</th>
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<tbody>
<tr>
<td>Thurm &amp; Häfner (1987)</td>
<td>37 individuals with schizophrenia; median age: 33 years; 62% male.</td>
<td>A range of coping strategies was reported: avoiding conflict and emotional strain (endorsed by 43% of participants); avoiding overexertion (35%); taking regular medication (27%); adhering to a regulated lifestyle (24%); low social involvement (41%); engaging in work or leisure (27%); ‘intrapsychic’ coping (43%); helplessness (8%).</td>
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<tr>
<td>Carr, (1988)</td>
<td>200 outpatients diagnosed with schizophrenia; mean age: 42 years; 61% male.</td>
<td>Five major groups of coping strategies reported: behaviour control; cognitive control; socialisation; medical; symptomatic.</td>
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<tr>
<td>Kumar, Thara, &amp; Rajkumar (1989)</td>
<td>30 outpatients with schizophrenia who had experienced at least one relapse; mean age: 30 years; 66% male.</td>
<td>Five coping strategies identified: positive self-talk (used by 43% of subjects); talking to a relative/friend (23%); seeking psychiatric help (7%); adjusting medication (13%); engaging in work (10%).</td>
</tr>
<tr>
<td>Dittmann &amp; Schlutter (1990)</td>
<td>50 individuals with schizophrenia; mean age: 35.9 years; 50% male.</td>
<td>28% participants used withdrawal to cope with symptoms: 18% increased interpersonal contact; 18% tried to ignore experiences or convince self they were unreal; 8% adjusted their medication; 8% could not identify any coping strategies.</td>
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### Table 5.4, cont,

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Size &amp; Characteristics</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Wiedl (1992)</td>
<td>60 patients with schizophrenia; mean age: 32 years; 52% male.</td>
<td>Patients reporting higher levels of stress: more likely to utilise non-problem oriented coping strategies; Patients reporting higher levels of negative symptoms: more likely to use emotion oriented coping strategies; Patients reporting higher levels of positive symptoms: more likely to use cognitively oriented coping strategies; Patients with predominately negative symptoms: reported coping strategies less effective than patients with positive symptoms.</td>
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<tr>
<td>Lee, Lieh-Mak, Yu, &amp; Spinks (1993)</td>
<td>101 outpatients with schizophrenia; mean age: 33 years; 49% male.</td>
<td>14 coping strategies identified (in order of ‘helpfulness’): medication; cognitive coping efforts; social support and guidance; better organisation/occupation of time; work; stress reduction; efforts at self-improvement; positive life events; health promotion; hospital admission; professional help; development of sense of responsibility; learning from illness experience; miscellaneous.</td>
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**Table 5.4, cont,**

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<thead>
<tr>
<th>Study</th>
<th>Sample Description</th>
<th>Strategies Reported by Participants</th>
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<tbody>
<tr>
<td>McNally &amp; Goldberg (1997)</td>
<td>10 outpatients with schizophrenia; mean age: 33 years; 70% male.</td>
<td>A range of strategies was reported by participants. These were classified as: behavioural techniques (‘fighting and ignoring’); ‘belief in recovery’; coping with symptoms with the aid of medication, doctors, therapists; distraction techniques; ‘moment of doubt’ strategies (not defined further by the authors); and 9 different styles of coping self-talk.</td>
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<tr>
<td>Farhall &amp; Gehrke (1997)</td>
<td>81 individuals with a psychotic disorder who had experienced auditory hallucinations; mean age: 34 years.</td>
<td>84% participants reported using one or more strategies to cope with auditory hallucinations: taking action against the problem (32% of respondents); mental disengagement (26%); behavioural disengagement (26%); decreasing physiological arousal (20%); Active acceptance of voices was associated with a sense of control; passive coping was associated with less subjective distress; and problem-oriented coping was associated with an increased level of distress.</td>
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### Table 5.4, cont,

<table>
<thead>
<tr>
<th>Study</th>
<th>Participant Details</th>
<th>Outcomes/Findings</th>
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<tr>
<td>Jimeno Bulnes, Jimeno Valdes, Vargas Aragon, &amp; Lopez Fernandez (1997)</td>
<td>123 patients with schizophrenia (mean age: 28 years; 76% male); 65 patients with toxic psychosis (substance induced psychosis or substance use problems; mean age: 24 years; 86% male); 105 patients with acute psychoses (brief reactive and schizophreniform disorder; mean age: 28 years; 47% male); 40 healthy comparison individuals (mean age: 26 years; 50% male).</td>
<td>Patient groups reported that they were most likely to avoid quarrels to minimise symptoms but also indicated that they were also likely to pace themselves when doing activities, focus on one thing at a time, minimise interactions with others and avoid emotions. No difference between diagnostic groups. The comparison group were most likely to focus on one thing at a time rather than trying to do many things at once.</td>
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<tr>
<td>Boschi et al. (2000)</td>
<td>95 first admission individuals with psychosis (within previous six months); most participants aged 18-22 years; 66% male.</td>
<td>At baseline most of the participants reported that symptoms were highly stressful and they had little control over them. Active-behavioural strategies were found to be the most helpful followed by active-cognitive. Avoidant strategies were rated least helpful. No significant associations were found between coping strategies at baseline and functioning or quality of life six months later but active coping at baseline was associated with better symptom outcome at 24 months.</td>
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Table 5.4, cont,

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<tr>
<th>Study</th>
<th>Sample Description</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Rudnick (2001)</td>
<td>58 outpatients diagnosed with schizophrenia; mean age: 42 years; 69% male.</td>
<td>Negative symptoms correlated inversely with level of problem-oriented coping; Coping not correlated with quality of life; Neither problem-oriented or emotion-oriented coping moderated between symptoms and quality of life.</td>
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<tr>
<td>Yanos (2001)</td>
<td>360 individuals with a severe mental illness (schizophrenia/schizoaffective disorder, bipolar disorder; other diagnoses); mean age: 43 years; 50% male.</td>
<td>93% of respondents use at least one proactive coping strategy: talking with health professionals; sports/exercise; attending to personal hygiene; accessing social support; taking medication; ensuring proper sleep/diet; religious observance/prayer.</td>
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<tr>
<td>Singh, Sharan, &amp; Kulhara (2003)</td>
<td>75 individuals with stable, but chronic, schizophrenia, 65% male, average duration of illness &gt;10 years.</td>
<td>Help-seeking strategies most likely to be used to cope with hallucinations, followed by diversion, problem-solving and avoidance. Stepwise regression indicated that severity of hallucinations and problem-solving coping contributed significantly to distress due to hallucinations.</td>
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</table>
5.3.2 Effectiveness of Coping with Symptoms

The effectiveness of the strategies used by patients to cope with psychotic symptoms has not really been assessed. Tarrier (1987) reported that people with schizophrenia perceived that almost 25% of the strategies they employed to cope with their symptoms were ineffective, and that patients who coped best with their symptoms used multiple coping strategies. However, Falloon and Talbot (1981) reported that individuals who relied on a limited number of strategies were more confident in their efficacy. Takai, Uematsu, Kaiya, Inoue and Ueki (1990) suggested that individuals with more severe symptoms were more likely to report that they were unable to find a satisfactory way of coping with them.

Lee, Lieh-Mak, Yu and Spinks (1993) attempted to assess the relationship between strategies used to cope with symptoms and clinical outcome. Positive social functioning was associated with cognitive coping strategies, stress reduction, efforts at self-improvement, and hospital admission; good quality of life was associated with positive work performance, stress reduction and self-improvement; and symptom improvement was associated with psychotropic medication and self-improvement. It should be noted that this study was cross-sectional and outcome was determined from an interview with the participants and reviewing case notes. The authors suggest that these results indicate that successful outcome depends on a range of coping strategies and treatment approaches being available.

Kanas and Barr (1984) hypothesised that patients learn successful coping techniques over time through trial and error. Thurm and Häfner (1987) found that the longer an individual had been unwell, the more strategies they used to cope with symptoms, but paradoxically the more relapses experienced, the fewer strategies used. It is not known whether employing fewer coping strategies leads to more relapses or whether more relapses lead to a feeling of helplessness and discouragement. Other studies that have compared the
coping strategies used by individuals with different durations of illness have had mixed results. Wiedl and Schottner (1991) reported that people with schizophrenia with fewer hospital admissions were more likely to use problem-oriented coping, but Takai et al. (1990) found that people who had spent less time in hospital were more likely to use emotion-oriented coping. Cohen and Berk (1985), however, failed to find an association between the type of coping strategies used and the likelihood of having been hospitalised in the previous 18 months, and Yagi, Kinoshita, and Kanba (1992) found no differences in the coping strategies of people who had a single or multiple episodes of illness or between inpatients and outpatients. Takai et al. (1990), reported that individuals with a later onset of illness utilised more coping strategies, however Falloon and Talbot (1981) failed to find a difference between the type of coping used by people with an early or late onset of illness or those with recent or prolonged illness.

5.3.3 Summary - Coping with Symptoms Associated With Psychosis

In summary, the investigations described above reveal that a wide range of strategies is employed by individuals with psychotic disorders to cope with their symptoms. Most studies indicated that the strategies implemented depended on the type of symptoms experienced (Böker, Brenner, & Wurgler, 1989) and the level of distress associated with them (Aldwin & Revenson, 1987; Carter, Mackinnon, & Copolov, 1996; Nayani & David, 1996; Vitaliano, Maiuro, Russo, & Becker, 1987), although there is a focus on positive and negative symptoms only in these studies. Importantly, the studies indicate that patients with psychosis do not see themselves as ‘passive victims’ of their illness but believe that they can influence its course. Parker and Endler (1992) suggested that task-oriented coping is most effective in controllable situations where one is able to change the stressor. When confronted by unchangeable circumstances, task-oriented coping becomes ineffective and emotion-oriented coping might be the most successful approach to take. This
might explain why emotion-oriented coping is often used by individuals with psychosis and reflects their beliefs about their illness. Unfortunately most studies have been cross-sectional with small sample sizes, have only included individuals with established schizophrenia or grouped individuals with different psychotic disorders together, and few have included a comparison group.

The measures to assess coping strategies have been unsophisticated. For example, Jimeno Bulnes, Jimeno Valdes, Vargas Aragon, and Lopez Fernandez (1997) assessed coping strategies using a six-item questionnaire that focussed on non-active or avoidance strategies only. Also changes in coping strategies over time have also not been assessed in most studies. To date, no studies have assessed strategies used by individuals at risk of psychosis in coping with their symptoms and changed functioning.

5.3.4 Generalised Coping

It is not surprising that Wiedl (1992) reported that the causes of distress for patients with psychotic disorders extend beyond their symptoms to aspects of personal and interpersonal functioning. What is surprising is that there has been limited research addressing how individuals with psychotic disorders cope with more generalised stressors - particularly in light of the large body of research reviewed earlier that has investigated those sources of distress and anxiety. Little is known about the way people with a psychotic illness cope with ambient tensions, daily hassles and stressful life events and how coping with these events might influence the onset or course of illness.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Participants</th>
<th>Conclusions</th>
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<tr>
<td>Brenner, Böker, Muller, Spichtig, and Wurgler (1987)</td>
<td>60 patients with schizophrenia, 30 patients with neurotic disorders and 30 healthy controls.</td>
<td>Patients with schizophrenia higher usage of problem-solving compared to the two other groups.</td>
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<td>Wiedl &amp; Schottner, (1991)</td>
<td>40 individuals with schizophrenia; mean age: 31 years; 50% male.</td>
<td>Participants more likely to use behavioural strategies than emotional-oriented coping strategies.</td>
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<tr>
<td>van den Bosch, van Asma, Rambouts, and Louwerens (1992)</td>
<td>Patients with schizophrenia (n = 30; mean age: 29.9 years); patients with depressive disorder (n = 19; mean age: 43.1 years); patients with ‘neurotic’ disorders (n = 25; mean age: 28.9 years); and healthy control group (n = 21; mean age: 32.2 years).</td>
<td>All patient groups were significantly less likely to use problem solving and more likely to report depressive reaction to stress than the healthy comparison group. Additionally, patients with schizophrenia were more likely to report using avoidance than the healthy comparison group.</td>
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Table 5.5, cont,

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<tr>
<th>Study</th>
<th>Sample Description</th>
<th>Findings</th>
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<tr>
<td>Pallanti, et al. (1997)</td>
<td>Recently relapsed outpatients with schizophrenia (n = 41; 76% male; mean age: 23.7 years).</td>
<td>Participants who had experienced at least one severe life event in the month prior to relapse had a significantly higher rate of problem-centred coping strategies and used more effective behavioural and cognitive coping strategies than those who did not have any life events preceding relapse. No differences were found between the two patient subgroups in levels of emotional coping.</td>
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<td>Macdonald, Pica, McDonald, Hayes, &amp; Baglioni et al. (1998)</td>
<td>Patients with early psychosis (n = 50; 78% male; mean age: 22.9 years); healthy comparison group (n = 23; 78% male; mean age: 23.3 years).</td>
<td>Patient group perceived that they coped less well with stressors than the comparison group did. Patients who reported symptom-related distress coped by internalising, seeking social support and distraction. Patients experiencing stress associated with social relationships reported using problem-solving, seeking social support and internalising. Patients experiencing stress associated with everyday functioning reported using internalising and seeking social support.</td>
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<tr>
<td>Study</td>
<td>Description</td>
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<tr>
<td>Jansen, Gispen-de Wied, and Kahn (1999)</td>
<td>Patients with schizophrenia (n = 18; mean age: 27.7 years); healthy comparison group (n = 21; mean age: 27.1 years).</td>
<td>Patients with schizophrenia generally use more passive and avoidant and less active coping strategies - particularly in social situations.</td>
</tr>
<tr>
<td>Ventura, Nuechterlein, and Subotnik (2000)</td>
<td>Outpatients with first-onset schizophrenia (n = 100; mean age: 23.4 years); Healthy comparison group (n = 57; demographically matched to schizophrenia group).</td>
<td>Control group were more likely to report using cognitively and behaviourally-oriented coping strategies than the patient group but there was no difference in the tendency to use avoidance coping techniques. High levels of self-efficacy and the experience of stressors rated as distressing were associated with the use of active problem-oriented coping techniques by the patient group.</td>
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<td>Lewin et al. (2001)</td>
<td>Individuals identified as being UHR for psychosis (n = 22; 59% male; mean age: 17.18 years); individuals with first episode psychosis (n = 25; 60% male; mean age: 19.48 years); individuals with established schizophrenia (n = 126; 68% male; mean age: 38.38 years).</td>
<td>UHR group used less adaptive coping and had fewer social supports than those participants with either first psychotic episode or established schizophrenia. There was an increase in adaptive coping and level of support seeking as the ‘level of schizophrenia’ increased across the groups (i.e. from UHR to first episode to established schizophrenia).</td>
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<tr>
<td>Study</td>
<td>Population Description</td>
<td>Findings</td>
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<td>Lysaker, Bryson, Marks, Greig, and Bell</td>
<td><strong>Individuals with established schizophrenia or schizoaffective disorder (n = 71; 55% male; mean age: 42.4 years).</strong></td>
<td>Cognitive deficits and neuroticism associated with increased avoidant coping decreased active problem solving; extroversion associated with social support seeking.</td>
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<tr>
<td>Ventura, Nuechterlein, Subotnik, Green,</td>
<td><strong>Outpatients with recent onset of schizophrenia, schizoaffective disorder, schizophreniform disorder (n = 29; mean age: 25.8 years); Healthy comparison group (n = 24; mean age = 26.9 years).</strong></td>
<td>Recent onset schizophrenia group were less likely to utilise ‘approach coping responses’ (cognitive or behavioural coping strategies than a healthy comparison group but no differences were found between the groups in the use of avoidance coping responses. In the schizophrenia group, lower levels of self-efficacy and worse performance on a cognitive test assessing attention were associated with less use of approach coping strategies.</td>
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A number of studies have revealed that individuals with psychotic disorders utilise a range of strategies to cope with general stressors compared to healthy comparison or other diagnostic groups (Table 5.5). Whilst Brenner, Böker, Muller, Spichtig, and Wurgler (1987) reported that people with schizophrenia were more likely to use problem-oriented coping strategies than a clinical comparison group of people with a ‘neurotic’ illness and a healthy control group, van den Bosch, van Asma, Rambouts, and Louwerens (1992) reported that patients with schizophrenia were significantly less likely to use problem solving and more likely to report a depressive reaction to stress than healthy controls were. Additionally, van den Bosch et al. (1992) reported that patients with schizophrenia were more likely to report using avoidance than the healthy comparison group.

Jansen, Gispen-de Wied and Kahn (1999) assessed the coping styles of patients with schizophrenia and healthy comparison subjects in different situations. Globally, the patient group reported using significantly less active coping techniques and sought social support less than the comparison group but employed avoidance and passive coping more. When presented with a fictional non-social situation (being stuck in traffic), the patient group reported that they would use significantly more confrontational coping, seeking social support and accepting responsibility, whilst in a fictional social situation (an argument with a friend) they said they would use more distancing, escape/avoidance and planful problem solving than the comparison group. Coping strategies also differed between the patients and controls in response to an actual psychosocial stressful situation - a public speaking task. The patients used more confrontational coping and escape/avoidance than the control group.

The authors concluded that patients with schizophrenia are more likely to use passive and avoidance coping strategies, particularly in social situations, than individuals without schizophrenia. They concluded that patients with
schizophrenia are less able to actively cope with stress and this might add to their increased vulnerability to stress.

Ritsner and colleagues (2003) conducted a study to explore whether the coping style of individuals with schizophrenia mediates the relationship between psychopathology, distress and quality of life. Inpatients with schizophrenia completed questionnaires assessing positive and negative psychotic symptoms, general distress, strategies used to cope with various upsetting situations and quality of life. They found that quality of life was highly associated with distress and moderately related to level of symptoms. Quality of life was inversely correlated with emotion-oriented coping, but positively correlated with avoidance and task-oriented coping. Emotion-oriented coping was also significantly positively associated with symptom level. Task-oriented and social avoidance coping were the strongest predictors of quality of life, suggesting that coping style mediates distress and quality of life of individuals with schizophrenia. The authors questioned whether treatment strategies, such as medication, that only target symptoms address the need to improve quality of life.

The question of what determines the coping style of individuals with schizophrenia has been explored by Lysaker, Bryson, Marks, Greig and Bell (2004). They explored relationships between coping style, neurocognitive functioning and two personality dimensions - extraversion and neuroticism - and found that individuals with schizophrenia who performed worse on a range of neurocognitive tests of executive functioning and memory, and also had heightened levels of neuroticism were more likely to utilise avoidant coping strategies and less likely to employ active problem solving. Meanwhile, individuals with higher levels of extroversion appeared more likely to employ social support seeking in response to stressful events. Whilst the results of this study require replication, they suggest that psychosocial treatment for individuals with schizophrenia needs to consider neurocognitive
functioning, personality and coping style and needs to be tailored for the individual.

Three studies have specifically investigated the general coping strategies used by individuals with recent onset psychotic disorders. Ventura, Nuechterlein and Subotnik (2000) reported that members of a control group were more likely to report using cognitively and behaviourally-oriented coping strategies than members of a first episode psychosis group, but there was no difference in the tendency to use avoidance coping techniques. High levels of self-efficacy and the experience of stressors rated as distressing were associated with the use of active problem-oriented coping techniques by the patient group.

In another study, Ventura and colleagues reported that a recent onset schizophrenia group were less likely to utilise ‘approach coping responses’ (cognitive or behavioural coping strategies) than a healthy comparison group, but no differences were found between the groups in the use of avoidance coping responses (Ventura, Nuechterlein, Subotnik, Green, & Gitlin, 2004). In the schizophrenia group, lower levels of self-efficacy and worse performance on a cognitive test assessing attention were associated with lower use of approach coping strategies.

Macdonald, Pica, McDonald, Hayes and Baglioni (1998) asked young people with a recent onset psychotic disorder, and age and gender-matched healthy controls “What is a stressful event that you commonly experience?” Thirty per cent of the patient group identified symptoms of their illness as stressful, 42% listed relationship difficulties (such as family conflict, social withdrawal or social rejection) and 26% cited problems related to everyday functioning (boredom, daily hassles). The type of stressful situation was independent of the severity of positive and negative psychotic symptoms. In the comparison group, 43.5% of participants identified stressful relationship difficulties and 52.2% identified stressful aspects of everyday functioning. The patient group
perceived that they coped less well with stressors than the comparison group did. Those patients who reported symptom-related distress coped by internalising, seeking social support and distraction. Those experiencing stress associated with social relationships reported using problem-solving, seeking social support and internalising. Finally the patients experiencing stress associated with everyday functioning reported using internalising and seeking social support.

To date, no studies have investigated whether the general coping strategies used by individuals with psychotic disorders change over time as the illness progresses, even though it has been shown that strategies used to cope with symptoms change with illness duration. Pallanti et al. (1997) assessed coping strategies used by outpatients with schizophrenia who had experienced a relapse episode. Participants who had experienced at least one severe independent life event in the month prior to relapse had a significantly higher rate of problem-centred coping strategies and used more effective behavioural and cognitive coping strategies than those who did not have any life events preceding relapse. This is not surprising - those participants who did not experience life events did not need to initiate any coping strategies. No differences were found between the two patient subgroups in levels of emotional coping. This study is limited by the lack of a non-relapse comparison patient group and would have been strengthened by assessing the coping strategies used outside of the relapse period. It is difficult to determine whether the different coping strategies used by the patients who experienced a life event and those who did not was a response to those life events or a pre-existing difference.

Finally, Lewin and colleagues at PAS in Newcastle, Australia compared the strategies used to cope with general stressors by UHR, first episode psychosis and established schizophrenia groups (Lewin et al., 2001). In this cross-sectional study, the UHR group used less adaptive coping and had fewer social supports than those participants with either first episode or established
schizophrenia. There was an increase in adaptive coping and level of support seeking as the ‘level of schizophrenia’ increased across the groups (from at-risk to first episode to established schizophrenia). This suggests that the strategies used to cope with general stressors change as psychotic disorders progress. Only a prospective study can assess this fully. To date there have been no reports on the role coping might play in the onset of psychosis in a UHR group.

5.3.5 Summary - Generalised Coping

Only a few studies have been conducted that have assessed the strategies used by individuals with psychotic disorders to cope with general stressors. The only conclusion that can be drawn from these studies is that individuals generally have a range of coping strategies that they employ depending on the type of stressor that is experienced. Whether the type of strategy changes over time as illness progresses and with recovery is yet to be determined. These studies have focussed on individuals with schizophrenia: studies with individuals with other psychotic disorders are yet to take place. Prospective studies are also required - none have been conducted to date. Further, the relationship between coping style and the onset of a psychotic disorder has not yet been established.

5.3.6 Conclusion - Coping and Psychosis

It is premature to make any firm conclusions about coping strategies used by individuals with psychotic disorders to cope with either general stressors or with the symptoms of their illness. Although it has consistently been reported that individuals with psychotic disorders utilise different coping strategies - particularly more emotion-oriented coping - than healthy comparison groups, little is known about differences in strategies used by individuals with
schizophrenia compared to other psychotic disorders or whether a relationship exists between coping style and the onset, course and likelihood of recovery from a psychotic disorder.

A number of socio-demographic factors have not been taken into consideration in most of the studies of the strategies used by individuals with psychotic disorders to cope with symptoms of their illness or more global stressors. Age is one factor that could influence coping strategies used. Aldwin and Revenson (1994) reported that the coping strategies an individual employs are a function of the types of stressors experienced (which tend to be different at different stages of life), the life experience of the individual and practice in coping. Younger people tend to use more behavioural forms of emotion-oriented coping such as expressing emotion and information seeking whilst older people tend to rely on more cognitive forms of emotion-oriented coping such as cognitive reappraisal and reflection (Aldwin & Revenson, 1994). Studies of coping by individuals with psychotic disorders have not usually controlled for age. Only Cohen and Berk (1985) and Takai et al. (1990) have looked at the relationship between age and coping in psychotic populations and found no association between the two.

Similarly, gender differences in coping style have been reported in the wider coping literature. Generally, men are more likely to use active and problem-oriented coping and to express their emotions though acting out or denial, whilst women are more likely to seek social support and to use distraction and relaxation to cope with general difficulties (Defares, Brandjes, Nass, & Van der Ploeg, 1984; Frydenberg & Lewis, 1991; Matud, 2004; Tamres et al., 2002; Wadsworth et al., 2004). Only Cohen and Berk (1985) have looked for differences in strategies used to cope with psychotic symptoms by men and women and failed to identify any.
Inconsistency between studies in the names given to coping strategies and differences in the strategies investigated hinder firm conclusions being made about the relationship between psychotic disorders and coping.

There have been a number of published reports of studies incorporating stress management strategies in the treatment of individuals with schizophrenia or other psychoses. Starkey, Deleone and Flannery (1995) indicated that individuals with schizophrenia were able to learn a range of behavioural stress management techniques, such as breathing and relaxation exercises, and to adapt them to their particular needs. Another study evaluated the effect of the addition of specific stress management training to pharmacological and psychological treatments that have established efficacy in the treatment of schizophrenia (Norman et al., 2002). No differences were found in symptom levels, perceived stress or life skills immediately after the completion of treatment or at one-year follow-up between patients who received either structured stress management or attended a social activities group in addition to treatment-as-usual. However, there were significantly fewer hospitalisations due to increased psychiatric symptoms in the year following treatment in the Stress management group. The authors suggested that the benefits of the addition of stress management techniques to regular treatment might not be apparent immediately, but become evident when the individual has had an opportunity to put the strategies into action, potentially some time after learning them.

This conclusion supports results of an earlier study by Hogarty et al. (1997) which indicated that the impact of a treatment approach that focussed on improvements in general coping as well as reduction of physiological arousal and identification of symptom triggers, was the reduction in the rate of relapse episodes. Andres, Pfammatter, Fries and Brenner (2003) recently published a study exploring the effect of a ‘coping-oriented’ therapy with individuals with schizophrenia or schizoaffective disorder. Coping-oriented group therapy, incorporating psychoeducation about psychosis and stress
management, was compared to supportive group therapy. Both treatments were offered for 24 sessions over a period of three months. Active, problem-oriented coping at the end of the treatment phase was a significant predictor of overall psychopathology and negative symptoms at follow-up. Andres et al. (2003) concluded that the results of the study highlighted the clinical relevance of coping styles and drew attention to the need to focus on aspects of coping in psychological interventions with individuals with psychosis. Although replication of these studies is required, they suggest that stress management is beneficial for individuals with psychotic disorders.

5.4 Social Support and Psychosis

5.4.1 Social Networks of Individuals with Psychotic Disorders

The social network of individuals with psychotic disorders has consistently been described as smaller, with fewer intimate relationships, than social networks of healthy individuals or individuals with neurotic or physical disorders (Cohen & Sokolovsky, 1978; Hammer, 1981; Meeks & Murrell, 1994; Neeleman & Power, 1994; Nettelbladt, Svensson, Serin, & Ojehagen, 1995; Patterson et al., 1997; Semple et al., 1997; Sokolovsky, Cohen, Berger, & Geiger, 1978; Tolsdorf, 1976). A relationship has been reported in a number of studies between poor insight and social functioning deficits in individuals with psychotic disorders (Francis & Penn, 2001).

Social skills deficits are thought to be common in individuals with psychotic disorders (Bellack, Morrison, Mueser, & Wade, 1989; Mueser, Bellack, Douglas & Morrison, 1991) and one study reported that social skills decrease as psychiatric symptomatology increases (Patterson et al., 1997). Wing (1978) hypothesised that individuals with schizophrenia might withdraw from social relationships as a protective mechanism due to poor social skills or to avoid conflict. Efforts to increase the social involvement of people with a psychotic
illness may place them at risk by exposing them to demands they are unable to cope with. It is noted, however, that Bengtsson-Tops and Hansson (2001) and Clinton, Lunney, Edwards, Weir and Barr (1998) reported that many people with schizophrenia indicate that they would like more opportunities for social interaction. Francis and Penn (2001) reported that a relationship exists between social skills and insight into illness which is possibly explained by the influence of insight on the social behaviour and ‘impression management’ of individuals with schizophrenia.

Social skills training for individuals with schizophrenia and related illnesses would appear to be an appropriate intervention to assist people in achieving this aim. However, a recent meta-analysis of randomised controlled trials of social skills training failed to find any clear benefits on relapse rate, social functioning, quality of life or treatment compliance (Pilling et al., 2003). One advocate for this approach has suggested that social skills training is appropriate as a targeted treatment for social impairment, not as a broad based treatment for schizophrenia (Bellack, 2004).

5.3.2 Moderators of Social Network Size

A range of potential moderators of social networks of individuals with schizophrenia has been investigated. Smaller social networks have been associated with multiple hospital admissions (Hammer, 1963), dependency on psychiatric services (Faccincani, Mignolli, & Platt, 1990), and increasing levels of negative symptoms (Bengtsson-Tops & Hansson, 2001; Brugha, Wing, Brewin, MacCarthy, & Lesage, 1993; Cresswell, Kuipers, & Power, 1992; Hamilton, Ponzoha, Cutler, & Wiegel, 1989; Romney, 1995). Bengtsson-Tops and Hansson (2001) reported that smaller social networks were associated with more positive symptoms, but Hamilton and colleagues (1989) failed to find an association between positive psychotic symptoms and social network size. Howard, Leese and Thornicroft (2000) reported that there was a
positive correlation between the size of the social network, the number of ‘active’ interactions reported by patients with psychosis at baseline, and functional outcome two years later. Brekke, Long and Kay (2002) found that the strongest predictors of level of social functioning of individuals with schizophrenia were satisfaction and reciprocity of social relationships and number of close friends, whilst social competence was the weakest predictor.

A number of studies have reported that the social network of individuals with a longer duration of illness and more hospital admissions is more likely to be smaller and restricted to mental health and other professionals, other patients and family, than the social networks of individuals with a shorter duration of illness (Lipton, Cohen, Fischer, & Katz, 1981; Holmes-Eber & Riger, 1990; Howard et al., 2000; Neeleman & Power, 1994). Tolsdorf (1976) suggested that social networks are affected early in the course of illness with first episode psychosis patients having a higher proportion of ‘family’ relationships than non-family linkages in their networks than non-clinical controls. Individuals with more established schizophrenia had even fewer non-family intimate relationships. Erickson, Beiser, Iacono, Fleming and Lin (1989) reported that a group of first episode psychosis patients had fewer friends but the same number of acquaintances as a non-clinical comparison group. Additionally, non-family supports were associated with better social and occupational functioning at 18 months for first episode and affective psychosis patients, but five years later level of non-family support only predicted functional outcome in schizophrenia patients but not patients with affective psychosis (Erickson, Beiser & Iacono, 1998). Level of family support at baseline did not predict outcome at five years in either the schizophrenia or affective psychosis group (Erickson et al., 1998).

A longitudinal study in Finland has assessed the relationship between social network of first admission schizophrenia patients at baseline and clinical status one, two and five years later (Salokangas, 1997). Participants were divided according to whether they lived with their family of origin, with a
spouse or partner, with non-relatives, or alone. There were no differences in level of psychotic symptoms associated with living arrangements at one year (all groups improved) but at two and five years further improvement was only seen in the group living with a spouse/partner. Depressive symptoms followed the same pattern. At the beginning and the end of the study participants living with their parents had significantly lower levels of negative symptoms than the other groups. Psychotic and depressive symptoms showed little association with family network whilst negative symptoms were negatively correlated with family networks. Psychotic and depressive symptoms were much more strongly associated with non-family networks. The researchers concluded that living situation is a major factor influencing clinical and functional recovery from psychosis.

In summary, the research cited above suggests that people with a psychotic illness have fewer social contacts than comparison groups and are less likely to be able to identify friends and non-family within their social networks. No previous studies have assessed the social relationships of individuals at heightened risk of psychosis.

5.4.2 Qualitative Aspects of Social Support and Psychosis

As indicated in Chapter 2, social network size provides an indirect measure of social support. Assessments of social support should include an evaluation of both the structure and function of the social interactions experienced by an individual (Schreurs & de Ridder, 1997). A small number of studies of the quality and availability of social relationships experienced by individuals with psychotic disorders have been conducted.

Compared to a non-clinical comparison group, Neeleman and Power (1994) reported that people with long-term psychotic illnesses perceived that significantly less emotional and practical support was available to them. In
another study, individuals with schizoaffective disorder were less satisfied with their social relationships than a healthy comparison group and had less access to deeper emotional contacts (Nettelbladt et al., 1995). They also described their partners in positive terms less frequently than a diabetes comparison group and a healthy comparison group (Nettelbladt et al., 1995).

Other studies have reported that people with a psychotic illness were more likely to be the recipients of support, less likely to be providers of support and less likely to engage in reciprocal relationships than non-clinical controls (Sokolovsky et al. 1978; Tolsdorf, 1976). Individuals with a psychotic disorder who report higher levels of available social support are likely to have higher levels of functioning, use inpatient facilities less (Faccincani et al. 1990), have higher levels of social competence (Brugha et al., 1993; Denoff & Pilkonis, 1987; Faccincani et al., 1990) and report better quality of life (Rüesch, Graf, Meyer, Rössler, & Hell, 2004). People with schizophrenia with more friends and fewer family members and professionals in their social network are the most satisfied with the level of support available to them (Goering et al., 1992). Similarly, Cresswell et al. (1992) reported that people with schizophrenia with a larger network and more regular contacts with support figures reported higher levels of emotional, practical and overall support.

Once again, negative symptoms appear to be important. Increased levels of negative symptoms have been associated with fewer reciprocal relationships, less frequent social contact and less frequent emotional and practical support (Cresswell et al., 1992; Hamilton et al., 1989). The direction of causality of these relationships is unknown. In contrast, Rudnick and Kravetz (2001) did not find an association between level of psychotic symptoms and social support-seeking by individuals with schizophrenia.

Chintalapudi et al. (1993) reported that individuals with established psychotic disorders who developed significant levels of depressive symptoms
during a remission phase perceived themselves to be lacking in social support compared to individuals who did not develop post-psychotic depression. Baynes et al. (2000) also reported a negative correlation between depressive symptoms experienced by individuals with schizophrenia and level of social support (higher depression was associated with lower levels of social support).

Macdonald, Jackson, Hayes, Baglioni, and Madden (1998) assessed the relationships between social skills, available social support and psychotic symptomatology of patients with schizophrenia. There were no differences in the perception of the amount of social support available, the size of social networks or social skills between individuals who had experienced either one or multiple inpatient admissions. Those patients who were more socially skilled had larger social networks, whilst smaller social networks were associated with higher levels of negative symptoms. There were no differences in the perception of available support between the more socially skilled participants, those who were less socially skilled, or those with more negative symptoms. Level of negative symptoms directly influenced an individual’s social skills, whilst social skills only accounted for some of the variation in the size of social networks. Younger people with schizophrenia were more socially skilled and had larger social networks than older people.

In another study, Macdonald, Hayes and Baglioni (2000) reported that there were no differences in the perceived availability of social support or the number of family members or acquaintances in the social networks of young people experiencing a first episode psychosis (mean duration of illness: seven months) and closely-matched healthy controls. However, the psychosis group had significantly smaller networks, fewer friends and fewer people to turn to in a crisis than the comparison group. The majority of participants in the psychosis group identified either one or no friends (68%) whilst most of the control group participants were able to identify two or more friends (84%).
It was surprising that although the early psychosis group had a smaller social network and fewer people to turn to in a crisis than the control group, no differences were found in the level of perceived support. Macdonald et al. (2000) suggested that this might be associated with the duration of illness and the impact of psychotic disorder on social networks might not have been fully realised at this stage.

Lipton et al. (1981) compared the structure and function of social networks of first admission schizophrenia patients and multiple-admission patients. In keeping with Macdonald et al. (2000), the first admission group had a larger social network than the multiple admission group, including a significantly greater number of non-family and formal contacts. Additionally the multiple admission group had nearly half the number of weekly social contacts than the first admission group and one third did not have a good friend, a very close contact or a very important person in their lives. As this is a cross-sectional study, care must be made in drawing conclusions. However, social isolation appeared to increase as illness duration and number of hospital admissions increased. Comparison with a non-clinical sample indicated that the reduction in social network (called a ‘network collapse’ by the authors), particularly the loss of non-family relationships, might occur post-first admission. This is consistent with the results of Macdonald et al. (2000) reported above. It is hypothesised that some patients with schizophrenia are unable to reciprocate within social relationships and this accounts for the decrease in non-family relationships as illness progresses.

Only one longitudinal study has been conducted to assess whether the level of social support reported by individuals with psychotic disorders changes over time. Breier and Strauss (1984) interviewed 20 patients with a psychotic disorder at bi-monthly intervals over the course of a year to assess any changes in various aspects of social interactions. The patients described 12 helpful functions of social relationships: ventilation, material support, social approval and integration, problem solving, constancy, motivation, reality
testing, modelling, symptom monitoring, empathic understanding, reciprocal relating and insight. Ventilation, material support, problem solving and social approval and integration were the most commonly reported functions of social networks, but as time in the study progressed, modelling and empathic understanding became more commonly reported, social approval and involvement decreased. Network size was not monitored over time.

Breier and Strauss (1984) suggested that the social needs of psychotic patients changes over time following discharge from hospital. Shortly after discharge, when patients face reintegration, the most useful roles of social relationships during this time are ventilation, reality testing, social approval and integration, material support, problem solving and constancy. The relationships during this phase tend to be one-sided and dependent. As recovery progresses, the main functions of social support become motivation, reciprocal relating and symptom monitoring.

5.4.3 Social Support as a Coping Resource

A number of studies already described in this chapter have indicated that individuals with psychotic disorders often report seeking social support to assist in coping with symptoms and other stressors. For example, Carr (1988), Cohen and Berk (1985), Dittman and Schlutter (1990), Kumar, Thara, and Rajkumar (1989), Lee et al., (1993) and Yanos (2001) all reported that individuals with established psychotic disorders sought increased social interaction when feeling distressed. However, Jansen et al. (2000), Jimeno Bulnes et al. (1997) and Thurm and Häfner (1987) reported the opposite.
5.4.4 Summary - Social Support and Psychosis

Many studies have demonstrated that sufferers of schizophrenia and other psychotic disorders commonly describe small social networks. It should be noted that in the DSM-IV, a change in social or occupational functioning, which could include a change in the level or intensity of interpersonal relationships, is one of the key diagnostic criteria for schizophrenia (APA, 1994). With this in mind it is perhaps not surprising that the social networks of individuals with schizophrenia are described as smaller than those of other cohorts (Beels, Gutwirth, Berkeley, & Streuning, 1984; Cresswell et al., 1992). Network size of psychosis patients does appear to depend on length of illness and severity of negative symptoms. Few studies have investigated patients’ satisfaction with the amount of support they perceive is available to them.

Unfortunately most of the studies that have attempted to evaluate social support with relation to psychosis have had small sample sizes and only one study has not had a cross sectional design. Many of the studies include inadequate descriptions of participants and omit pertinent details such as level of symptoms, illness duration and prior hospitalisation, and in some cases do not provide sufficient detail about age, gender, marital status, education and socio-cultural background. All of these factors have been associated with social support and social networks in people without a psychiatric diagnosis (Vaux, 1988) and with illness course and outcome for people with schizophrenia (McGlashan, 1988; Shepherd, Watt, Falloon, & Smeeton, 1989). Further, psychosis and comparison groups have often not been adequately matched on factors that might influence perceptions of social support - age, gender, ethnicity, accommodation, employment status and socio-economic status.

None of the studies acknowledged that the common sequelae of psychotic illnesses (living alone, unemployment, low socio-economic status) can impact negatively on social functioning and are likely to contribute to the restricted
social networks and lower levels of perceived support associated with psychosis. Depressive symptoms, often secondary to psychotic illness, might also account for some of the observed differences in the social networks and social support of people with a psychotic disorder and those of the general population. However, depression was not usually controlled for in the studies described above and most studies only included individuals with schizophrenia.

Most studies have been undertaken in Western developed societies. Ohaeri (2001) assessed Nigerian psychotic patients’ perceptions of social support from their extended family. The perceived material support network of individuals with schizophrenia or bipolar disorder who were inpatients or who were experiencing psychotic symptoms at the time of interview was rated higher than that of outpatients without psychotic symptoms. Although this difference did not reach significance, they also reported that patients who were experiencing symptoms reported a wider social network than outpatients without psychotic symptoms. No other studies set in developing societies that investigate the relationship between social support and psychosis have been found.

The potential negative impact of social relationships (Cohen, 2004) has largely been neglected in the research to date. The exception, of course, is the huge literature base that has arisen around the concept of EE that was referred to earlier.

Husky and colleagues explored relationships between mood, anxiety and social environmental circumstances in individuals who were identified to have heightened ‘psychosis-proneness’ (Husky, Grondin, & Swensden, 2004). They reported that psychosis-proneness was associated with an increase in anxiety when individuals were with friends. Although the study did not directly assess whether psychosis-proneness was related to social withdrawal, the authors state that their results indicate that psychosis-prone individuals have
difficulty in situations requiring involvement with others and suggest that this is consistent with previous studies indicating social competence deficits in individuals with a family history of psychosis (Dworkin, Lewis, Cornblatt, & Erlenmeyer-Kimling, 1994). Psychosis-proneness was determined in this study based on responses to the Community Assessment of Psychic Experiences (CAPE: Stefanis et al., 2002). The reliability of the CAPE in accurately identifying individuals who do develop a psychotic disorder has not been assessed.

The only previous study to report the perception of available social support by a UHR cohort is that of Lewin et al. (2001). They reported that UHR subjects had fewer social supports than individuals with either first episode psychosis or established schizophrenia. Longitudinal studies are required to assess if the level of social support changes as acute psychosis develops.

**5.5 Research Integrating Stress, Coping and Social Support**

As demonstrated above, although there has been a growth in the amount of research addressing the potential role of stress and coping in the onset and course of psychotic disorders in recent years, this research has been marred by methodological problems and results from studies have been mixed. To date, most studies have assessed the impact of stress, coping or social support on psychosis in isolation. Few studies have attempted to merge these concepts even though they are thought to be related to one another.

One exception is a study by Hultman, Wieselgren, and Ohman (1997). Participants with a psychotic disorder reported lower levels of perceived social support than a healthy comparison group. For the psychosis group, frequency of contact with spouse/partner, family and friends was significantly correlated with the perceived availability of support and the perceived adequacy of support.
The coping strategy reported most often by participants in the psychosis group was withdrawal. However, there was a tendency for patients with high availability of social integration to orient themselves towards others in stressful situations.

The psychosis participants were then monitored for nine months. At the end of this time, 35.9% of the psychosis group had experienced a relapse episode. There were no significant differences in social support dimensions between the relapsing and non-relapsing groups.

Life events experienced by 25 participants in the psychosis group over the preceding nine-month period were assessed at follow-up. Those participants who had relapsed had experienced at least one life event in the three weeks prior to relapse and there was a significant increase in the rate of life events experienced in the three weeks prior to relapse. The mean number of events experienced per week by the relapsing group from baseline to three weeks prior to relapse did not differ from the mean number of events over the nine month period for the non-relapsing patients.

The authors attempted to assess the stress-buffering effect of social support by comparing the level of social support available to individuals who had experienced at least one independent life event within the nine months following hospital discharge or before relapse. A significant difference in relapse rates was found between patients with high or low availability of attachment. In other words, patients with a high availability of attachment had a significantly lower rate of relapse after a life event. This suggests that the level of social support experienced by individuals with psychosis might buffer the impact of life events on symptomatology.

Although this study considers stress, coping and social support together in determining causes of relapse, it is hampered by the problems that beset
studies described earlier - small sample size, mixed diagnoses, and a narrow assessment of stressful experiences. Conclusions that can be drawn from the study are very limited.

Macdonald, Pica et al. (1998) looked at the association between social support, coping style and symptoms in a recent onset schizophrenia group and found that problem-oriented coping was more likely when participants reported higher levels of social support, higher self-efficacy and higher levels of negative symptoms.

Only one study has been identified that has attempted to assess the contributions of stress, coping and social support by individuals thought to be at heightened risk for developing schizophrenia. Schuldberg, Karwacki and Burns (1996) divided a cohort of ‘nonclinical’ undergraduate psychology students into three groups according to responses to the ‘psychosis-proneness’ scales developed by Chapman and colleagues (Chapman & Chapman, 1980; Chapman, et al., 1994). The Per-Mag group reported experiencing subthreshold perceptual abnormalities and/or magical thinking. The Anhedonic group reported an inability to perceive pleasure, which was thought to be indicative of subclinical negative symptoms. There was also a comparison group that did not score highly on any of the psychosis-proneness scales.

The Anhedonic individuals experienced a greater number of hassles in the month prior to answering the questionnaire than the other groups. Per-Mag individuals were more likely than Control subjects to rate stressful academic events as something they could change, but Anhedonic subjects were less likely than Control subjects to perceive academic events in this light. However, these differences were not significant. Thus, there were only minor differences in the stressful experiences of the three groups.
Strategies used to cope with everyday experiences were compared between the groups. Per-Mag subjects reported using ‘accepting responsibility’ for events and using ‘escape-avoidance’ more than the Anhedonia or Control groups. The Anhedonia group reported using ‘positive reappraisal’ more than the other groups.

Finally, perceptions of social support were compared. Per-Mag participants reported significantly less support from friends and family than the other two groups.

Although this study is commended for extending the boundaries of previous research, it too is beset with many shortcomings. First all participants were drawn from a university population. This has obvious implications on the ability to extend results of this study to the wider population. Second, the method through which the high-risk (psychosis-prone) individuals were identified is problematic. Only the Per-Mag scale has been associated with transition to psychosis over a 10-year period (Chapman et al., 1994) and it could be argued that the Chapman scales assess aspects of personality rather than psychosis-proneness. The rate of transition to psychosis in the cohort was not reported in any case. Therefore the results of this study may in fact not have any bearing on any relationship between stress and psychosis.

Lecomte and Mercier (2005) have conducted the most sophisticated study, to date, that has incorporated a range of variables. They developed a model of social adaptation to schizophrenia that incorporated demographic variables, symptoms, social variables (expressed emotion and attitudes towards illness), psychological vulnerability (self-esteem and psychological distress), life events, daily hassles and coping. A group of 101 people aged 18-65 years who were diagnosed with schizophrenia completed a series of questionnaires, each assessing an aspect of the model. Regression analysis indicated that social demographic variables, such as age and education level, and negative symptoms had the largest influence on adaptation. The
experience of more life events was associated with better adaptation, as was the coping strategy ‘accommodation’ (defined as adjusting desires to meet the situation). None of the other variables were associated with level of adaptation.

Lecomte and Mercier (2005) concluded that the association between the use of ‘accommodation’ as a coping strategy and adaptation to illness makes sense in light of the transactional model of stress: when faced with a stressor that cannot be immediately changed (such as experiencing psychotic symptoms), an individual must learn to adjust their thinking to accommodate the illness to maintain adequate levels of functioning. The association between the experience of life events and increased adaptation suggests that engagement in social activities and relationships might be a marker of recovery from psychosis even if is this involvement is sometimes stressful.

Although it is encouraging that some recent studies have focussed on more than one aspect of the stress/coping/social support triad, no studies have been identified that assess stress and coping and psychosis in a prospective framework. Studies of this nature are required to further understanding of the potential relationship between the onset and course of psychosis, stress and coping.
CHAPTER 6

Rationale and Hypotheses

The preceding chapter illustrated that despite the widespread acceptance of the stress-vulnerability model of psychosis, there is little empirical evidence to support a relationship between the experience of stress, coping and onset of a psychotic disorder. Further, methodological shortcomings in the assessment of stress and coping have marred this research. There is a distinct lack of well-designed prospective studies incorporating different aspects of the stress and coping process. There have been even fewer studies that have amalgamated the different concepts to evaluate a model of how they might interact with one another to influence the onset and course of psychosis. Overall, the nature of the relationship between stress, coping, social support and psychosis remains unclear.

The current study investigated the relationship between the role of stress, coping and social support and the onset of psychosis in an ‘ultra’ high-risk (UHR) group. The study has a number of strengths over previous research: i) it has a prospective design; ii) the stress concept is evaluated from both a subjective and objective viewpoint; and iii) coping strategies, including social support, that are utilised by a UHR group are assessed.

6.1 Aims of the Current Study

The first aim of the current study was to examine the experiences of stress, coping and social support by a UHR cohort. Thus, major and minor stressors experienced by a UHR cohort were assessed at monthly intervals over a 12-month period. The availability and perception of coping resources, with a particular focus on social support, were also assessed over the course of a
year. The same parameters were assessed at bi-monthly intervals in a healthy comparison group (HC) and experiences of the two groups were compared.

The second level of analysis sought to determine the role of stressful events, coping strategies and social support in the development of acute psychosis and whether the onset of a psychotic episode was preceded by changes in these parameters. This was achieved by comparing experiences of stress, coping and social support as reported by members of the UHR group who developed a psychotic episode within a year of recruitment with those members of the UHR group who did not develop psychosis.

6.2 Research Questions

The main research questions this study sought to answer were:

1. Do young people who are identified as being at UHR of developing an acute psychotic disorder experience more stressful events and hassles and higher levels of distress than members of a healthy comparison (HC) group whilst utilising different coping techniques and having fewer social supports?

2. Is the onset of psychosis in the UHR group related to stress and coping? Specifically, is the risk of onset of psychosis in the UHR cohort associated with the number of life events and hassles and levels of distress experienced, the type of coping strategies employed and the numbers of, and satisfaction with, social supports?

3. Is onset of psychosis in the UHR group preceded by changes in stress, coping and social support?
6.3 Hypotheses

In line with the research questions, the hypotheses of this study were:

1. Members of the UHR group would report more stressful events (life events and hassles), higher levels of distress, would utilise different coping techniques (specifically emotion-oriented and avoidance strategies) and would have fewer and less satisfactory social supports than the HC group.

2. Higher levels of major life events and hassles, higher levels of distress, higher use of emotion-focussed and avoidance coping strategies and fewer and less satisfactory social supports would be predictive of the onset of acute psychosis in the UHR cohort.

3. It was expected that the number of life events and hassles experienced by the UHR cohort who developed acute psychosis (the UHR-P group) would increase immediately prior to the onset of acute psychosis. Additionally, the UHR-P participants would report higher levels of distress, fewer and less satisfactory social supports, and would use more emotion-focussed and avoidance coping strategies immediately prior to the onset of the acute episode compared to an earlier time point.
CHAPTER 7

Method

7.1 Participants

7.1.1 UHR Group

UHR participants were recruited from patients attending the Personal Assessment and Crisis Evaluation (PACE) Clinic, which was introduced in Chapter 4 (Phillips, Leicester et al., 2002; Yung et al., 1996; Yung, Phillips, & McGorry, 2004). The current study was incorporated within a larger program of research investigating factors underlying the development of psychosis and evaluating potential preventive interventions aimed at the UHR population.

Consecutive referrals to PACE between 1 January 1999 and 30 November 2003 were screened for inclusion in the study. Referrals were from health, education and support services that provide assistance to young people aged 14 to 30 years across the entire Melbourne metropolitan area. All referrals were initially triaged over the telephone and a face-to-face assessment with a clinician was organised if information gathered over the telephone suggested that UHR criteria might be met.

UHR and acute psychosis criteria were operationalised according to scores on the Comprehensive Assessment of At-Risk Mental States (CAARMS: Yung et al., in press). This semi-structured interview was developed at the PACE Clinic to assess and monitor pre-psychotic symptomatology. The complete CAARMS consists of seven subscales and 27 items that assess a wide range of symptomatology that has been associated with the psychotic prodrome. However, only three scales are used when determining if UHR or acute
psychosis criteria are met. These are the Disorders of Thought Content, Perceptual Abnormalities and Disorganised Speech subscales (Appendix A).

As described in Chapter 4, UHR group membership relied on meeting criteria for at least one of the following groups.

7.1.1.1 Trait and State Risk Factors Group.

These participants had both trait and state risk factors for psychosis. The trait risk factor was a history of any psychotic disorder or Bipolar Disorder with psychotic features in a first degree relative. This was determined through interview with the individual and family members and was confirmed by consulting the Victorian statewide psychiatric services database or private practitioners where possible. The state risk factor was a deterioration in global functioning within the past year equivalent to a 30% reduction in Global Assessment of Functioning (GAF: APA, 1994) score which had been maintained for at least one month.

7.1.1.2 Attenuated Psychotic Symptoms (APS) Group.

This group of participants were experiencing psychotic symptoms that were considered below acute psychosis threshold in either intensity or frequency. Operationalised criteria for the APS group are shown in Table 7.1.
Table 7.1
Operationalised Criteria for the APS Group

Severity Scale Score of 3-5 on Unusual Thought Content, Perceptual Abnormalities and/or Disorganised Speech subscales;
Frequency Scale Score of 2-6 on Unusual Thought Content, Perceptual Abnormalities and/or Disorganised Speech subscales;
Symptoms present in past year and not for longer than five years.

7.1.1.3 Brief Limited Intermittent Psychotic Symptoms (BLIPS) Group.

This group had experienced a brief burst of psychotic symptoms that were deemed to have crossed the ‘acute psychosis’ threshold, but were self-limiting and resolved in less than seven days without treatment. Operationalised criteria for this group according to CAARMS scores are shown in Table 7.2.

Table 7.2
Operationalised Criteria for the BLIPS Group

Severity Scale Score of 6 on Unusual Thought Content, Perceptual Abnormalities and/or Disorganised Speech subscales;
Frequency Scale Score of less than or equal to 2 on Unusual Thought Content, Perceptual Abnormalities and/or Disorganised Speech subscales;
Symptoms present for less than one week and spontaneously remit on every occasion;
At least one BLIP must have occurred within the previous year and BLIPs had not been experienced for more than five years.
7.1.1.4 Exclusion criteria.

Young people were not accepted by the PACE Clinic if they did not meet CAARMS criteria or met one of the exclusion criteria shown in Table 7.3.

Table 7.3
UHR Group Exclusion Criteria

<table>
<thead>
<tr>
<th>Exclusion Criteria</th>
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<tbody>
<tr>
<td>Previously treated or untreated psychotic episode</td>
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<tr>
<td>Any previous treatment with anti-psychotic medication</td>
</tr>
<tr>
<td>Neurological disorder</td>
</tr>
<tr>
<td>Inadequate fluency or comprehension of English</td>
</tr>
<tr>
<td>Intellectual disability (IQ &lt; 70 or registered with Disability Services, Department of Human Services)</td>
</tr>
<tr>
<td>Psychotic symptoms experienced only whilst intoxicated after using alcohol, stimulants, or hallucinogens. If subthreshold psychotic symptoms were experienced only after marijuana use, the individual was considered eligible for entry in the study.</td>
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7.1.1.5 Transition to psychosis.

Criteria have also been developed at PACE to identify when an acute psychotic episode has developed. These criteria are based on the intensity and frequency of psychotic symptoms that would routinely result in anti-psychotic medication being prescribed by a psychiatrist (Yung, Phillips, & McGorry, 2004)(Table 7.4).
Table 7.4
Operationalised Criteria for Acute Psychosis Threshold

Severity Scales Score of 6 on Unusual Thought Content, Perceptual Abnormalities and/or Disorganised Speech subscales;
Frequency Scale Score of at least 3 on Unusual Thought Content, Perceptual Abnormalities and/or Disorganised Speech subscales;
Symptoms present for at least one week.

7.1.1.6 Treatment

All of the UHR participants attended the PACE Clinic for treatment and support whilst they were involved in this study. They had a psychologist/case manager assigned to work with them and at the minimum received supportive counselling and assistance with practical difficulties such as housing or seeking employment. Some participants also received more structured, cognitively-oriented therapy. Anti-depressant and anxiolytic medication was prescribed if appropriate. All UHR participants had access to a 24-hour crisis service and family support and education was available.

UHR subjects recruited after August 2000 were given the opportunity to be involved one of two treatment trials. The first was a 12-month randomised controlled trial comparing cognitive behavioural therapy and risperidone (up to 2mg nocté), cognitive behavioural therapy and placebo, or supportive therapy and placebo. At the time of writing, randomisation remains blinded and therefore treatment assignment and compliance are unknown. The second study was an open trial of lithium (up to 450mg day) for 12 months. Results of this study are also pending.
7.1.2 Healthy Comparison Group

Healthy comparison (HC) participants were recruited via advertisements placed at local employment agencies, a university and a residential college for tertiary students. The advertisement called for volunteers for a research project who were aged between 16 and 30 years and had no personal or family history of mental illness. In many cases a young person who volunteered for the study spoke with their friends who then also became involved. It was initially hoped that UHR participants might be able to suggest friends who would take part in the research as it was thought that this would result in well-matched comparison subjects. Unfortunately, however, no UHR participants nominated friends to be approached for inclusion in the study.

Potential comparison group participants were excluded from involvement if they met UHR criteria, if they met any of the UHR exclusion criteria (Table 7.3) or if they had a family or personal history of mental illness.

7.1.3 Payment

Both UHR and HC participants received $60 for their time and travel expenses following the initial interview and completion of study questionnaires. They received $20 for their time and expenses following subsequent interviews.
7.2 Measures

7.2.1 Demographic Information

Demographic information was collected from both UHR and HC participants including date of birth, country of birth of participant and parents, years of formal education, current employment status, marital status, current housing and for the UHR group duration of time they had experienced any psychological symptoms.

7.2.2 Cognitive Functioning

The National Adult Reading Test (NART: Nelson & Willison, 1991) was administered to both UHR and HC participants at the baseline interview to obtain a measure of cognitive ability. The NART is traditionally used to measure ‘premorbid’ intellectual ability. Participants were asked to read a list of 50 irregular words out loud and the accuracy of their pronunciation was recorded. An estimated full scale Wechsler Adult Intelligence Scale - Revised (WAIS-R: Wechsler, 1981) IQ score was calculated based on an equation with Australian norms that incorporated NART error score and years of education (Willshire, Kinsella, & Prior, 1991).

The NART has been widely used in research, including studies with psychotic populations. It has been found to be highly reliable with an internal reliability of 0.93 (Nelson & Willison, 1991), inter-rater reliability between 0.96 and 0.98 (Crawford, Parker, Stewart, Besson, & DeLacy, 1989; O’Carroll, 1987) and test-retest coefficient of 0.98 (Crawford et al., 1989).

Schizophrenia is known to impact on cognitive functioning (Sharma & Antonova, 2003). Two studies have been performed to ensure that the NART provides a valid estimate of premorbid IQ of individuals with schizophrenia.
Crawford et al. (1992) reported that the NART was valid with community residents but not long-term inpatients. O’Carroll and colleagues (1992) reported that the NART provided an acceptable estimate of premorbid IQ in acutely ill unmedicated schizophrenia patients. Further, high test-retest reliability over six to seven years with schizophrenia patients has been reported (Morrison, Sharkey, Allardyce, Kelly, & McCreadie, 2000). The validity of the NART with the UHR population has not been reported.

7.2.3 Psychopathology Measures

7.2.3.1 Global Assessment of Functioning.

The Global Assessment of Functioning (GAF) is Axis V of the DSM-IV (APA, 1994). A clinician or researcher rates the level of overall functioning of the subject on a scale from zero to 100, taking into consideration psychological, social and occupational functioning but ignoring physical health needs. The scale is divided into 10-point intervals with well-described anchor points to assist scoring. The GAF was reported as a reliable and valid measure of psychiatric dysfunction in a study of 103 mentally ill patients by Jones, Thornicroft, Dunn and Coffey (1995). Another study by Patterson and Lee (1995) found that GAF ratings were independent of Axis I and II diagnoses and were also significantly predicted by factors that influence social and occupational functioning. Jones et al. (1995) concluded that the GAF provides a quick and reliable assessment of overall functioning, that does not require a significant amount of training to administer and can be easily incorporated into routine clinical practice. In the current study, the GAF was used to determine whether inclusion criteria for the UHR Trait And State Risk Factor Group are met (see above) and also to compare functioning of the UHR and HC groups at study entry.
7.2.3.2 Scale for the Assessment of Negative Symptoms.

The Scale for the Assessment of Negative Symptoms (SANS: Andreasen, 1982) purports to allow cross-sectional assessment of the negative symptoms of schizophrenia. Repeated administration of the SANS enables analysis of the change in negative symptoms over time. The 25 items of the scale are rated by an observer from zero (absent) to five (severe). A total score from zero to 125 can be calculated as well as scores for five subscales: Affective flattening, Alogia, Avolition-apathy, Anhedonia-asociality and Attention. High inter-rater reliability and internal consistency have been reported for each of the subscales across a number of cultural settings (Andreasen, 1982, 1983).

7.2.3.3 Brief Psychiatric Rating Scale.

The extended 24-item version of the Brief Psychiatric Rating Scale (BPRS: Lukoff, Liberman, & Nuechterlein, 1986; Overall & Gorham, 1962) was used to assess observed and subjective psychopathology. As items were rated from zero (absent) to six (severe) according to clearly defined anchor points, possible scores range from zero to 144. A psychosis subscale (BPRS-psychosis) has been defined consisting of the Suspiciousness, Unusual Thought Content, Hallucinations and Conceptual Disorganisation items of the full BPRS with possible score ranging from zero to 16.

The BPRS has been widely used in research due to its robust psychometric properties. Consistently high interrater reliability (median Pearson and intraclass correlation coefficients ranging from 0.67 to 0.88 for individual items and the overall score) has been reported (Hedlund & Vieweg, 1980), as well as good discriminant validity in studies of medication responses, particularly in schizophrenia (Faustman, 1994). Studies of schizophrenia populations using the BPRS and other symptom measures have confirmed good concurrent validity (Faustman, 1994). A major review concluded that the
BPRS can be confidently used in a range of research and clinical applications in psychiatry as a measure of psychopathology (Faustman, 1994). It “meets many of the goals for rapid and reliable assessment of psychiatric symptoms” (Faustman, 1994, p. 371).

**7.2.3.4 Structured Clinical Interview for the DSM-IV.**

The Structured Clinical Interview for DSM-IV (SCID-IV: (First, Spitzer, Gibbon, & Williams, 1996) is based on Axis I of the DSM-IV and was used to determine diagnosis of the UHR participants who developed acute psychosis. The SCID-IV was developed for use in research by trained clinicians and operationalises criteria from the DSM-IV using a categorical rating system for symptoms and an algorithm to establish the diagnosis. The interviewer rates the presence or absence of symptoms based on information from all possible sources- the individual, family, clinicians and so forth.

Unfortunately there are few reports of psychometric properties of the SCID-IV. Martin, Pollock, Bukstein and Lynch (2000) reported that the interrater reliability of the alcohol and substance use sections of the SCID-IV were high with kappas ranging from 0.82 to 1.0 for individual diagnoses. Ventura, Liberman, Green, Shaner, and Mintz (1998) assessed inter-rater reliability and diagnostic accuracy following a SCID-IV training program. They reported excellent agreement on SCID symptoms (overall $K = 0.85$) and very good agreement on diagnosis (82%) for a group of 30 interviewers.

**7.2.4 Measures of Stress and Coping**

Copies of the measures used to assess stress and coping are included in Appendix B.
7.2.4.1 Life Events Interview Schedule.

The experience of life events (LE) was assessed using the Life Events Interview Schedule (LEIS) developed by Ventura and colleagues at UCLA for research with psychotic cohorts - particularly individuals experiencing a first psychotic episode. At the time of writing the scale had not been published but is available from its author. The LEIS expanded and updated the Life Event and Difficulty Schedule (LEDS: Harris, 1991), which was used by Brown and Birley (1968). Unlike the LEDS, which only assesses the experience of major stressful life events, the LEIS assesses the experience of both major and minor events.

The LEIS was administered as a semi-structured interview. Participants were asked to describe any positive or negative events that had occurred in all areas of daily living - such as employment, education, finances, relationships, and accommodation - during the month prior to the interview. The interviewer presented the participant with a list of 250 possible events to prompt recall. For each reported event the respondent completed an eight-item questionnaire. Each item related to a LEIS subscale, which assessed various qualitative features of the LE that were reported: familiarity of the event (Familiarity), level of control over the occurrence of the event (Control), advance notice of impending event (Notice), change to routine caused by event (Routine), amount of time the event has been in the respondents thoughts (Time), the desirability of the event (Desirability), how well they felt they coped with the event (Coping) and how upsetting or uplifting the event was (Uplifting). The individual was asked to reflect on their own experience of the LE they had already reported and to rate each feature on a nine-point Likert scale from one to nine with higher scores indicating more extreme levels of each attribute. Possible LEIS subscale scores ranged from nine to 72.
As the LEIS was developed in America, some of the listed events were not relevant in the Australian context and had to be re-worded. The list of events also did not include several events that were quite commonly experienced by both the UHR and HC participants such as difficulties obtaining social security benefits. Unfortunately, reliability and validity data for the LEIS were not available at the time of completion of this thesis. Ventura has indicated that they are forthcoming (J. Ventura, personal communication, September 2004).

7.2.4.2 Hassles Scale.

The experience of ‘hassles’ or minor distressing events was assessed using the adult version of the Hassles Scale (Kanner et al., 1981). This self-report scale lists 121 common negative events associated with work, health, family, friends, and chance occurrences. Respondents indicated which events occurred during the previous month and rate the severity of events from one to three (Somewhat severe, Moderately severe or Extremely severe). Three scores were derived from the Hassles Scale: i) Number of hassles - a count of the number of items occurring over the rating period (possible scores: zero to 121); ii) Cumulative severity - sum of the severity ratings (possible scores: zero to 351); and (3) Intensity - Cumulative severity score divided by the number of hassles - an indication of how strongly or intensely the average hassle was experienced. The number of hassles and Cumulative severity score correlate extremely highly with one another (Kanner et al., 1981). High test-retest correlations of number of hassles were reported when the questionnaire was completed over consecutive months, indicating that comparable numbers of hassles are experienced from month to month (Kanner et al., 1981). No report was given about the content of these events. A moderate correlation between the number of hassles according to the Hassles Scale and scores on the Hopkins Symptom Checklist (a general measure of psychological symptoms) of 0.6 is given as evidence of construct validity of
the Hassles Scale (Kanner et al., 1981). The reliability of the Hassles Scale in psychiatric or psychotic populations has not been reported.

### 7.2.4.3 Perceived Stress Scale

Level of distress (“the degree to which situations in one’s life are appraised as stressful”) was assessed using the 14-item Perceived Stress Scale (PSS: Cohen, Kamarck, & Mermelstein, 1983). Participants responded to statements such as ‘How often in the past month have you been upset because something unexpected happened?’ or ‘How often in the past month have you found you could not cope with all of the things you had to do?’ on a five point scale (Never, Almost never, Sometimes, Fairly often and Very often). Possible PSS-Total scores ranged from zero to 56, with higher scores indicating higher levels of distress. The PSS was designed for participants with at least a ‘junior high’ education (years 7 and 8 in the Australian system). Cohen et al. (1983) reported that the internal reliability of the scale in American college student samples was 0.84 to 0.86 and test-retest reliability of the scale over a two-day period was 0.85, while over six weeks it was 0.55. When used with a mixed psychiatric sample, the internal reliability was 0.80 and PSS-Total score was significantly correlated with Beck Depression Inventory scores (Hewitt, Flett, & Mosher, 1992). There was a small to moderate correlation between scores on the PSS and number of life events experienced (0.17 to 0.39) in college samples and an adult smoking-cessation sample (Cohen et al., 1983). The concurrent validity increased when PSS-Total scores were correlated with the self-rated impact of life events that were experienced (0.24 - 0.49) (Cohen et al., 1983). Thus, the PSS appears to be a robust measure of distress and is related to measures of physical symptoms, health service usage and health related behaviours (S. Cohen, 1988b; Cohen & Berk, 1985; Glasgow, Klesges, Mizes, & Pechacek, 1985). Hewitt and colleagues (1992) analysed the factor structure of the PSS when used with a psychiatric population. Two factors were described: General distress and Perceived coping, with possible
scores ranging from zero to 28 and 16 respectively. Higher scores for the subscales indicate higher levels of distress and a perception of poorer coping skills.

7.2.4.4 Coping Inventory for Stressful Situations.

The Coping Inventory for Stressful Situations (CISS: Endler & Parker, 1990b) is a 48-item scale that assessed three facets of coping: task-oriented coping, emotion oriented coping, and avoidance oriented coping. The adult version of the CISS was used in this study. Participants indicated on a five-point scale (1: Not at all; to 5: Very much) how much they used strategies listed within the scale in response to a stressful or difficult situation over the previous month. Examples of items are ‘Focus on my general inadequacies’, ‘Go to a party’, ‘Become very tense’, and ‘Determine a course of action and follow it’. Scores were derived for three basic coping scales (Task, Emotion and Avoidance) - each made up of 16 items- and two subscales of the Avoidance scale (Distraction and Social Diversion) - eight and five items respectively. Factor analysis with college student and psychiatric samples supported the three main scales (Endler & Parker, 1994). Factor analysis of the items making up each of these scales confirmed that the Task and Emotion scales were unidimensional but the Avoidance scale contained two subscales.

The CISS has been used in college student, adult, adolescent and psychiatric samples (Endler & Parker, 1990b). The coefficient alpha of the various scales and subscales of the adult form of the scale ranged from 0.69 to 0.91, indicating satisfactory internal consistency. Test-retest reliability over a six-week period was moderate to high (0.51 to 0.73) for the various subscales when tested with an undergraduate sample.

Construct validity of the CISS has been assessed in a number of ways. First, scores on the CISS were correlated with those on the Marlowe-Crowne Social
Desirability scale (Crowne & Marlowe, 1964) to determine if responses to the CISS are influenced by concerns about social desirability. These correlations were low (-0.47 to 0.00) indicating that the CISS is not unduly influenced by social desirability (Endler & Parker, 1990b). Responses to the CISS were compared with those to the Ways of Coping Questionnaire (WCQ) - another widely used measure of coping (Folkman & Lazarus, 1988). The CISS-Emotion scale correlated moderately with most of the WCQ Emotion-focussed subscales, the CISS-Task scale correlated moderately with the WCQ Problem-focussed scale and the CISS-Social Diversion scale was strongly correlated with the WCQ Seeking Social Support scale (Endler & Parker, 1990b).

Although it does not incorporate a situation specific component, the CISS is the most rigorously validated coping measure that has thus far been developed.

7.2.4.5 Social Relationships Scale.

The Social Relationship Scale (SRS: McFarlane, Neale, Norman, Roy & Streiner, 1981; McFarlane, Norman, Streiner, Roy, & Scott, 1980) is a self-administered questionnaire that measures both the quantity and quality of an individual’s support network. Respondents were asked to list who they had talked to about different aspects of their life (work, money and finances, home and family, personal and social, personal health and society in general) over the previous month. They were encouraged to list friends, family and professionals. They then rated how helpful each contact was from 1: Makes things a lot worse to 7: Helps things a lot. They were also asked to indicate whether the listed individuals would approach them to talk about their own issues. Finally they were asked how satisfied they were with the level of support they had over the previous month (1: Very dissatisfied; to 6: Very satisfied).
Information obtained using the SRS included (1) the size of the social network (total number of individuals); (2) the amount of perceived support offered by individuals in the network; (3) the number of reciprocal relationships; and (4) the different types of relationships (such as family, work-associates, or professionals).

The content validity of the SRS has been rated as adequate by a panel of raters (McFarlane et al., 1981). Test-retest reliability over a seven-day period was assessed in a college student sample (McFarlane et al., 1981). Correlations between scores on successive administrations of the scale varied from 0.62 to 0.99 for the number of individuals listed in each category of the scale. The mean ‘helpfulness’ score for each category ranged from 0.54 to 0.94. These results indicated that social networks in the college student sample were fairly stable over the seven-day period (McFarlane et al., 1981).

An examination of response bias with undergraduate students indicated that the instructions to the scale did not influence the responses given (McFarlane et al., 1981). Jackson and Edwards (1992) reviewed a number of social support scales with schizophrenia subjects and concluded that despite complexities in scoring, the SRS was one of the better scales. Macdonald, Pica, et al., (1998) used the scale in a study of social support experienced by first episode and multi-episode psychosis patients.

7.3 Ethical Considerations

The study was conducted according to ethical guidelines outlined by the North Western Mental Health Behavioural and Psychiatric Research and Ethics Committees (UHR group) and the University of Melbourne, Human Research Ethics Committee (HC group). Copies of the Ethics Committees approval are in Appendix C.
All participants were informed that they could withdraw from the study at any time. UHR participants were assured that withdrawal from the study would not impact on the treatment they received at PACE. The clinical well being of UHR participants was monitored over the course of the study. Any distress resulting from or revealed by the assessment procedures was referred to the PACE treating team. HC participants were informed that they would be provided with short-term counselling or debriefing by the author if stressful events had occurred that resulted in ongoing distress. They were further told that referral to another clinical service such as a private psychiatrist or General Practitioner would be arranged, if further assistance was required.

All data associated with this study are stored securely in locked cabinets at the PACE Clinic, Orygen Research Centre in Melbourne, Australia. Data will be stored for a minimum of five years after the completion of this study. Participant confidentiality has been protected through the use of identification numbers.

7.4 Procedure

As indicated above, potential members of both subject groups were initially screened over the telephone to assess if intake criteria were met. The UHR group were screened further at a subsequent interview. Written consent to participation in the study was obtained from young people who met intake criteria. Copies of Participant Information and Consent Forms are in Appendix D. Information about the current study for potential UHR participants was included in a Participant Information and Consent Form outlining a range of research studies taking place at the PACE Clinic at the time of recruitment.

The baseline interview was scheduled as soon as possible once consent was obtained. Subsequent interviews took place at monthly intervals for the UHR group and every two months for the HC group. For the purposes of conducting
this study one month was equivalent to 28+/− 4 days. The measures administered at each interview are shown in Table 7.5.

If a UHR participant developed an acute psychotic episode they were interviewed with the SCID-IV as soon as possible to determine a diagnosis and the stress and coping questionnaires were completed focusing on the month immediately prior to the onset of acute levels of symptoms. This interview usually took place within a month of commencing anti-psychotic medication. Members of the UHR group were withdrawn from follow-up if acute psychosis developed.

Table 7.5
Summary of Study Assessments

<table>
<thead>
<tr>
<th>Scales</th>
<th>UHR group</th>
<th>HC group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic information</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>NART</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>GAF</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SANS</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>BPRS</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SCID-IV</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>LEIS</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Hassles Scale</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PSS</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CISS</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SRS</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Administration time
2-3 hours 1 hour 1 ½ hours 2 hours 1 hour
Missing data, through participant drop-out or missing follow-up points is common to longitudinal studies (Anstey & Hofer, 2004). Strategies aimed at minimising drop-out included providing all participants with the small payment for their time and travel expenses following each interview and conducting interviews at a site chosen by the participant, such as home or a local café.

7.5 Data Analysis

7.5.1 Power Analysis

Previous work with the UHR cohort suggested that 40% would develop acute psychosis within 12 months of recruitment (Yung, Phillips, Yuen, et al., 2003). Using this transition rate and the conventional significance level of 5% and power of 80%, the sample size needed to detect a medium sized effect using a two-tailed test is 134 according to Cohen (J. Cohen, 1988). However, as most of the hypotheses in this study were exploratory and focused on the UHR group as a whole, rather than only comparing those UHR subjects who become psychotic and those who did not, the required sample size was reduced to 100.

Fifty subjects was initially considered to be an adequate sample size for the HC group. Due to slowness in recruitment the minimum sample size for the group was revised to 30 in consultation with a statistician (H.P. Yuen, personal communication, August 2003).

7.5.2 Analysis

All of the raw data was initially entered into a Microsoft Access database. To verify the accuracy of data entry, data for 20 UHR participants and 20 HC
participants was entered into a second database and compared with the original database entry. Any discrepancies between the two entries were investigated by consulting the hard copies of the original data to determine which entry was correct. As less than 0.5% data entry errors were detected in the original entries it was concluded that the data entry had an acceptable level of accuracy.

Data analysis was divided into three parts in line with the three hypotheses. All statistical procedures were conducted using Statistical Package for the Social Sciences (SPSS) 12.0.1 for Windows (SPSS Inc., 2003).

**7.5.2.1 Hypothesis 1**

The first area of analysis focused on comparisons between the UHR and HC groups. First, demographic and baseline psychopathology were compared between the groups. Categorical data were analysed using chi-square tests, whilst t-tests were used for comparisons of continuous variables between two groups.

It was initially thought that the longitudinal nature of the stress and coping data lent itself to the application of repeated measures analysis of variance (ANOVA) to compare responses to the stress and coping measures between the UHR and HC groups. However, whilst the timing of the baseline interview for the UHR participants had some significance (it coincided with referral to the PACE Clinic), the baseline interview date of the HC group was arbitrary. Additionally, repeated measures ANOVA did not utilize all of the available data because participants with data missing at any assessment point were excluded from the analysis. Repeated measures ANOVA were therefore not considered the most appropriate approach. Instead mean scores of the monthly, or bi-monthly, assessments were calculated for each variable and were compared between the UHR and HC groups using SPSS General Linear
Model (GLM) controlling for age. The exceptions to this were the comparisons of the number of life events and hassles. The number of life events reported at months 1, 3, 5, 7, 9 and 11 were added and compared between the groups. These were the months that the HC group was assessed. Adding the number of events reported by the UHR participants at every month would have inflated the total for that group. The same procedure was used to compare the number of hassles experienced.

To reduce the likelihood of Type 1 error, a Bonferroni adjustment was made to the alpha level. There were 22 comparisons all together (Number of life events, LEIS subscales, Number, Severity and Intensity of hassles, five CISS subscales, PSS-Total score and two PSS subscales, number of social contacts and satisfaction with social support) so the adjusted $p$-value required for significance was 0.002.

Effect sizes were also calculated. An effect size is the strength or magnitude of the difference between two sets of data and is independent of sample size (J. Cohen, 1988). Using SPSS, the effect size index that is computed when the GLM feature is performed is the partial $\eta^2$ (eta-squared). The partial $\eta^2$ ranges in value from zero to one and is interpreted as the proportion of variance of the dependent variable related to the fixed factor (group) whilst partialling out the covariate. An $\eta^2$ of 0.01, 0.06 and 0.14 represent small, medium and large effect sizes respectively (Pallant, 2004).

Correlation coefficients were computed among the stress and coping measures to determine the relationship between the variables. A Bonferroni adjustment of the $p$-value was performed to control for Type 1 error across the correlations. Correlation coefficients of 0.10, 0.30 and 0.50 are interpreted as small, medium and large effect sizes respectively (Pallant, 2004).
7.5.2.2 Hypothesis 2

In the second part of the analyses, the UHR cohort was divided according to psychotic status 12-months after recruitment (UHR-psychotic: UHR-P; UHR-non psychotic: UHR-NP). Three individuals are known to have developed acute psychosis after the first 12-months of involvement at PACE, and it is acknowledged that there could be participants currently classified as UHR-NP who will develop acute psychosis at some point in the future.

Demographic and baseline psychopathology were compared between the UHR subgroups. Categorical data were analysed using chi-square tests, whilst t-tests were used for comparisons of continuous variables. The only month that all UHR participants were not psychotic was Month 1 (baseline). Baseline scores on the range of stress and coping measures were compared between the UHR-P and UHR-NP groups using t-tests to further characterise them. Once again, to reduce the likelihood of Type 1 error a Bonferroni adjustment was made to the alpha level. As there were 22 comparisons all together, the adjusted p-value required for significance was 0.002.

The role of the stress and coping variables in predicting onset of psychosis (Hypothesis 2) was analysed using survival analysis. The Cox proportional hazards regression model tests the association between a particular variable and an outcome of interest. In this study the outcome of interest was transition to acute psychosis. The Cox model is widely used with ‘survival’ data and takes into account the time to psychosis (number of days from baseline assessment).

First, Cox regression was used to determine whether the level of the stress and coping measures at baseline was associated with the later onset of acute psychosis. Individuals with missing baseline data were excluded from this analysis. For this analysis, baseline scores on all of the stress and coping measures were entered into the analysis as a block.
Cox regression analyses incorporating the repeated measures of stress and coping as covariates were then performed. As the scores on the stress and coping measures were likely to vary over time, the time-dependent nature of these scores was factored into the analysis. Unfortunately when performing survival analysis using SPSS, the program deletes any cases with data missing from any follow-up point from the analysis. In the current study that meant the exclusion of over 80% of the UHR cohort. In order to maximise the number of cases in the analysis, missing scores were replaced with the mean score for that subject on that variable. As this procedure introduced a level of unreliability into the analysis, only those participants with 50% or less of missing scores replaced via mean substitution were included in the analyses.

Separate Cox regression analyses were performed for the individual stress and coping variables. If an individual was not psychotic at Month 2 (two months after study entry), the measures of psychopathology, stress and coping at baseline (Month 1) were treated as if the person was non-psychotic. If that individual developed acute psychosis at 10.5 months after study entry, the measures for the month immediately preceding transition (Month 10) were treated as for someone with psychosis. The remaining nine months would be treated as for someone who was considered not psychotic.

7.5.2.3 Hypothesis 3

The final area of analysis focused on whether the onset of psychosis in the UHR-P group was preceded by changes in the level of stress experienced or the coping responses utilised. As a number of previous longitudinal and retrospective studies have indicated an increase in the number of stressors experienced in the month immediately preceding the onset of an acute psychotic episode compared to earlier months (Bebbington, et al. 1993; Brown & Birley, 1968; Canton & Fraccon, 1985; Chaven & Kulhara, 1988; Mazure, et
al., 1997; Michaux, et al., 1967; Pallanti et al., 1997; Schwartz & Myers, 1977a; Ventura, et al., 1989). In this study the responses to stress and coping measures four months prior to onset (Time 1) were compared with responses in the month immediately prior to the onset of psychosis (Time 2). Therefore, only those UHR-P subjects who developed acute psychosis at least three months after study entry and who had data for the month immediately preceding onset as well as four months earlier could be included in the analysis. Three months was chosen as the ‘index of change’ primarily because Brown and Birley (1968), Canton and Fraccon (1985) and Malla et al. (1990) all previously demonstrated a significant increase in the number of stressful events experienced over the three months prior to psychotic episode onset. Mean scores on the stress and coping variables at the two timepoints were compared using paired samples $t$-tests. As before, a Bonferroni adjustment of the $p$-value was required. Once again, there were 22 comparisons, so a $p$-value less than 0.002 was required for a significant difference between the Time 1 and Time 2 values. The effect size for these comparisons was determined by calculating $\eta^2$. To interpret the $\eta^2$ values, the following convention was used: $\eta^2$ of 0.01, 0.06 and 0.14 represent small, medium and large effect sizes respectively (Pallant, 2004).
CHAPTER 8

Results: Comparing the UHR and HC Groups

Data analysis and results are divided into two chapters. In this chapter, comparisons of the stress and coping measures between the UHR and HC groups are presented. The following chapter focuses on the UHR group alone and the contribution of stress and coping to the development of psychosis.

The analysis described in this section aimed to assess support for Hypothesis 1 which predicted that members of the UHR group would report more stressful life events and hassles and higher levels of distress, would utilise different coping techniques and would have fewer social supports than the HC group. Demographic and psychopathology characteristics of the two groups are presented first, followed by the analysis of stress and coping measures.

8.1 Screening and Recruitment

8.1.1 UHR Group

Consecutive referrals to PACE between 1 January 1999 and 30 November 2003 were screened for inclusion in the study. Of 1484 young people referred over this time, 410 (28% of total referrals) met UHR criteria. All of those young people were given information about the current study and 143 agreed to involvement and subsequently completed questionnaires. There were no differences between the UHR cohort included in this study and the young people who met UHR criteria but declined involvement in this research in age ($t (1, 408) = -1.33, p = .185$) or gender ($\chi^2 (1, N = 410) = 1.01, p = .315$).
Sixty-five UHR participants (46%) did not complete the full twelve-month follow-up period because they were either lost to follow-up, missed assessment points or developed acute psychosis and were therefore withdrawn from the study. Out of a maximum of twelve interviews that were possible, the mean number of interviews that actually took place was 7.64 (SD = 3.51) with only 18 subjects participating in all 12 interviews.

Of the UHR cohort included in this current study, 81 young people were also enrolled in either of the two intervention studies that were underway at the same time at the PACE Clinic.

8.1.2 HC Group

Recruitment to the HC group took place between May 2002 and December 2003. All 32 young people who responded to advertisements calling for participants or who were nominated by a friend already in the HC group, met HC criteria and agreed to involvement in the study. There were fewer drop outs in the HC group compared to the UHR group: 19 of the 32 participated in all six interviews with the mean number of interviews being 5.12 (SD = 1.39). Twenty-five HC participants were involved for the full twelve months of the study.

8.2 Demographics

Basic demographic data for the two subject groups are shown in Table 8.1. Results of statistical tests assessing differences between the groups are also shown.
Table 8.1
Descriptive Information for the UHR and HC Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>UHR (N = 143)</th>
<th>HC (N = 32)</th>
<th>$\chi^2$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Male</td>
<td>46.15</td>
<td>43.75</td>
<td>0.061</td>
<td>.805</td>
</tr>
<tr>
<td>% Never married</td>
<td>96.50</td>
<td>87.50</td>
<td>4.345</td>
<td>.037</td>
</tr>
<tr>
<td>% Born in Australia</td>
<td>81.12</td>
<td>81.25</td>
<td>0.000</td>
<td>.986</td>
</tr>
<tr>
<td>% Mother born in Australia</td>
<td>68.53</td>
<td>68.75</td>
<td>0.001</td>
<td>.981</td>
</tr>
<tr>
<td>% Father born in Australia</td>
<td>57.34</td>
<td>56.25</td>
<td>0.013</td>
<td>.910</td>
</tr>
<tr>
<td>Occupation (%)</td>
<td></td>
<td>40.43</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>secondary student</td>
<td>48.25</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tertiary student</td>
<td>16.78</td>
<td>59.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unemployed</td>
<td>20.98</td>
<td>21.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>homemaker</td>
<td>2.10</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unskilled</td>
<td>4.19</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>skilled manual/clerical</td>
<td>5.59</td>
<td>15.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>admin/minor professional</td>
<td>2.10</td>
<td>3.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living arrangements (%)</td>
<td></td>
<td>83.64</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>living with</td>
<td>83.92</td>
<td>9.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>partner/parents/siblings</td>
<td>9.79</td>
<td>50.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>living with friends</td>
<td>4.20</td>
<td>3.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>living alone</td>
<td>2.10</td>
<td>37.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable (M, SD)</td>
<td>UHR</td>
<td>HC</td>
<td>t</td>
<td>p-value</td>
</tr>
<tr>
<td>Age (years)</td>
<td>18.69 (3.15)</td>
<td>21.47 (3.10)</td>
<td>-4.529</td>
<td>.000</td>
</tr>
<tr>
<td>Education (years completed)</td>
<td>12.27 (1.99)</td>
<td>14.91 (1.12)</td>
<td>-7.237</td>
<td>.000</td>
</tr>
<tr>
<td>IQ</td>
<td>104.31 (11.46)</td>
<td>113.72 (6.78)</td>
<td>-4.375</td>
<td>.000</td>
</tr>
</tbody>
</table>

The majority of members of both the UHR and HC groups were born in Australia, as were their parents. The UHR group were significantly younger
than the HC group. In line with the age difference, the UHR group were significantly less likely to be married or in a de facto relationship and were more likely to be living with family (in most cases their parents) at entry into the study. The UHR group had also spent significantly fewer years in formal education than the HC group. Most of the UHR group were enrolled in secondary education at the time of entry into the study, whilst the majority of the HC group were enrolled in some form of tertiary education. The UHR group had significantly lower IQ than the HC group according to NART scores. Differences between the two groups in IQ, level of education, occupation and living circumstances are likely to be largely attributable to the significant difference in age. However, when comparisons between the groups were repeated controlling for the influence of age, both NART score ($F(1, 154) = 9.208, p = .003$) and years of education ($F(1, 175) = 28.349, p = .000$) remained significantly different.

8.3 Psychopathology

The average duration of any psychological symptoms experienced by the UHR group prior to referral to PACE was 355.63 days ($SD = 446.93$). Duration of symptoms ranged from two to 2937 days.

To further characterise the UHR and HC groups, the level of psychological symptoms experienced at the time of each interview was assessed. Baseline GAF, SANS, BPRS, and BPRS-psychosis scores are shown in Table 8.2. T-tests indicated that the baseline GAF score of the UHR group was significantly lower than that of the HC group whilst their mean SANS, BPRS and BPRS-psychosis scores were significantly higher.
Table 8.2
Mean BPRS and SANS Scores for the UHR and HC Groups

<table>
<thead>
<tr>
<th></th>
<th>UHR</th>
<th>HC</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAF</td>
<td>56.43</td>
<td>81.06</td>
<td>-15.34</td>
<td>.000</td>
</tr>
<tr>
<td>SANS</td>
<td>31.11</td>
<td>1.03</td>
<td>12.62</td>
<td>.000</td>
</tr>
<tr>
<td>BPRS</td>
<td>25.79</td>
<td>2.13</td>
<td>9.96</td>
<td>.000</td>
</tr>
<tr>
<td>BPRS-psychosis</td>
<td>5.83</td>
<td>0.28</td>
<td>10.64</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. Standard deviation in brackets

To assess if there was any change in levels of psychopathology over the course of the study in the HC group, a series of paired t-tests was performed comparing SANS, BPRS or BPRS-psychosis scores at one assessment point with the score at the next assessment point (Table 8.3). As 15 comparisons were performed a Bonferroni adjustment indicated that p-value less than .003 was required for significance. Under these conditions, no significant changes in levels of psychopathology were found across the study for the HC group. Similar comparisons were not performed for the UHR group as fluctuations in symptomatology in this group were expected over the course of the study.
Table 8.3
Results of t-tests Comparing Levels of Psychopathology Experienced by the HC Group Over the Study Period

<table>
<thead>
<tr>
<th>Months compared</th>
<th>BPRS</th>
<th>t</th>
<th>p-value</th>
<th>BPRS-psychosis</th>
<th>t</th>
<th>p-value</th>
<th>SANS</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month 1 and 3</td>
<td>-2.47</td>
<td>.020</td>
<td></td>
<td>-0.37</td>
<td>.713</td>
<td></td>
<td>-0.72</td>
<td>.479</td>
<td></td>
</tr>
<tr>
<td>Month 3 and 5</td>
<td>1.37</td>
<td>.185</td>
<td>0.83</td>
<td>.417</td>
<td>0.12</td>
<td>.907</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month 5 and 7</td>
<td>1.17</td>
<td>.254</td>
<td>1.00</td>
<td>.329</td>
<td>0.38</td>
<td>.707</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month 7 and 9</td>
<td>0.72</td>
<td>.481</td>
<td>1.00</td>
<td>.329</td>
<td>1.43</td>
<td>.167</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month 9 and 11</td>
<td>-0.75</td>
<td>.460</td>
<td>-1.00</td>
<td>.327</td>
<td>0.00</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.4 Summary of Demographic and Psychopathology Comparisons

Some important differences in demographic variables were found between the UHR and HC groups at entry into the study. The UHR group were significantly younger than the HC group. Associated with this, they were less likely to be involved in a long term relationship or married, were less likely to be tertiary educated and were more likely to be residing with their immediate family. They also had a significantly lower IQ than the HC group. In light of the significant age difference between the two groups, age was included as a covariate in all of the following comparisons of stress and coping between the groups. The UHR group reported significantly higher levels of psychopathology at baseline than the HC group. There was no change in the level of psychopathology reported by the HC group across the study.
8.5 Stress and Coping Measures

As described earlier, five stress and coping scales were administered at each assessment point. Results of comparisons for each individual scale are reported separately.

8.5.1 Life Events Interview Schedule

The number of life events (LE) experienced by each participant in the month preceding a follow-up interview was recorded using the LEIS. In Figure 8.1, boxplots comparing the total number of LE reported at Months 1, 3, 5, 7, 9, and 11 are shown. The UHR group reported experiencing significantly fewer LE (marginal mean = 12.018, standard error = 0.656) than the HC group (marginal mean = 17.767, standard error = 1.411) when controlling for age ($F (1, 170) = 13.206, p = .000$). The effect size of this comparison was medium (partial $\eta^2 = .07$).

The LEIS subscales assessed a number of qualitative features of LE and subjects were asked to reflect on their own experience of LE when responding to these items. Mean subscale scores for the UHR and HC groups across the assessment period and results of comparisons between the groups are shown in Table 8.4.
The UHR group rated the LE they experienced as significantly more upsetting (Uplifting subscale) than the HC group rated LE they experienced. The effect size of this difference was medium. The biggest difference between the groups was in their perception of their ability to cope with LE (Coping). The UHR group rated their coping ability as significantly poorer than the HC group and the effect size of this difference was large (partial $\eta^2 = 0.178$). The UHR group also indicated that they felt they had less advance warning about events (Notice), and that the events they experienced were more undesirable (Desirability), but these differences were not significant (after Bonferroni adjustment, the $p$-value required for significance was 0.002). There were no differences between the groups in the amount of change to their daily routine caused by LE (Routine), the amount of time they thought about events (Time), the level of control they felt they had over the occurrence of events (Control), or the novelty of events (Familiarity).
Table 8.4
Mean LEIS Subscale Scores for the UHR and HC Groups and Results of Comparisons Controlling for Age

<table>
<thead>
<tr>
<th>LEIS subscales</th>
<th>UHR</th>
<th>HC</th>
<th>F</th>
<th>p-value</th>
<th>partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>5.12 (1.35)</td>
<td>1.35 (1.18)</td>
<td>3.304</td>
<td>.071</td>
<td>.019</td>
</tr>
<tr>
<td>Control</td>
<td>4.01 (4.35)</td>
<td>1.32 (1.21)</td>
<td>0.693</td>
<td>.406</td>
<td>.004</td>
</tr>
<tr>
<td>Notice</td>
<td>4.20 (1.21)</td>
<td>4.97 (0.91)</td>
<td>6.870</td>
<td>.010</td>
<td>.039</td>
</tr>
<tr>
<td>Routine</td>
<td>4.54 (1.37)</td>
<td>4.95 (1.16)</td>
<td>2.328</td>
<td>.129</td>
<td>.013</td>
</tr>
<tr>
<td>Time</td>
<td>5.18 (2.55)</td>
<td>5.08 (0.88)</td>
<td>0.012</td>
<td>.913</td>
<td>.000</td>
</tr>
<tr>
<td>Desirability</td>
<td>4.11 (1.18)</td>
<td>4.70 (1.08)</td>
<td>3.840</td>
<td>.052</td>
<td>.022</td>
</tr>
<tr>
<td>Coping</td>
<td>5.40 (1.01)</td>
<td>6.64 (0.70)</td>
<td>37.131</td>
<td>.000</td>
<td>.178</td>
</tr>
<tr>
<td>Uplifting</td>
<td>4.28 (1.12)</td>
<td>5.11 (0.91)</td>
<td>10.777</td>
<td>.001</td>
<td>.059</td>
</tr>
</tbody>
</table>

Note. Standard deviation in brackets

The LEIS also provided information about the type of events that were experienced (Figure 8.2). The events that were most commonly reported by the UHR group were those associated with their own health, family, romantic relationships and daily activities (employment, education and social activities). The events that were most commonly reported by the HC group were associated with employment, education and housing.
When the influence of age was controlled for, the UHR group reported significantly more life events associated with platonic relationships, social activities, own health and family than the HC group (Table 8.5). The effect sizes of the first two comparisons were small and the latter were large (partial $\eta^2 = 0.024, 0.037, 0.058$ and $0.061$ respectively).
Table 8.5
Results of Comparisons of Types of LE Experienced by the UHR and HC Groups

<table>
<thead>
<tr>
<th>LE type</th>
<th>UHR M</th>
<th>UHR SD</th>
<th>HC M</th>
<th>HC SD</th>
<th>F</th>
<th>p-value</th>
<th>Partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>2.83</td>
<td>2.95</td>
<td>2.50</td>
<td>1.83</td>
<td>0.024</td>
<td>.876</td>
<td>.000</td>
</tr>
<tr>
<td>Employment</td>
<td>2.31</td>
<td>3.07</td>
<td>3.63</td>
<td>2.77</td>
<td>0.700</td>
<td>.404</td>
<td>.004</td>
</tr>
<tr>
<td>Housing</td>
<td>1.44</td>
<td>2.43</td>
<td>2.44</td>
<td>1.56</td>
<td>2.434</td>
<td>.121</td>
<td>.014</td>
</tr>
<tr>
<td>Romantic relationships</td>
<td>2.03</td>
<td>2.49</td>
<td>1.47</td>
<td>1.63</td>
<td>1.364</td>
<td>.245</td>
<td>.008</td>
</tr>
<tr>
<td>Platonic relationships</td>
<td>1.67</td>
<td>2.19</td>
<td>0.81</td>
<td>1.12</td>
<td>4.292</td>
<td>.040</td>
<td>.024</td>
</tr>
<tr>
<td>Pets</td>
<td>0.29</td>
<td>0.58</td>
<td>0.00</td>
<td>0.00</td>
<td>3.523</td>
<td>.062</td>
<td>.020</td>
</tr>
<tr>
<td>Family health</td>
<td>0.45</td>
<td>0.87</td>
<td>0.75</td>
<td>1.22</td>
<td>1.084</td>
<td>.299</td>
<td>.006</td>
</tr>
<tr>
<td>Own health</td>
<td>2.75</td>
<td>2.69</td>
<td>1.03</td>
<td>1.00</td>
<td>10.458</td>
<td>.001</td>
<td>.058</td>
</tr>
<tr>
<td>Family</td>
<td>3.19</td>
<td>3.23</td>
<td>1.16</td>
<td>1.97</td>
<td>11.041</td>
<td>.001</td>
<td>.061</td>
</tr>
<tr>
<td>Social activities</td>
<td>2.70</td>
<td>3.07</td>
<td>1.50</td>
<td>1.32</td>
<td>6.647</td>
<td>.011</td>
<td>.037</td>
</tr>
<tr>
<td>Financial</td>
<td>1.15</td>
<td>1.69</td>
<td>1.22</td>
<td>1.36</td>
<td>0.706</td>
<td>.402</td>
<td>.004</td>
</tr>
<tr>
<td>Transport</td>
<td>0.38</td>
<td>0.86</td>
<td>0.50</td>
<td>0.84</td>
<td>0.258</td>
<td>.612</td>
<td>.002</td>
</tr>
<tr>
<td>Legal</td>
<td>0.55</td>
<td>1.03</td>
<td>0.38</td>
<td>0.61</td>
<td>0.858</td>
<td>.356</td>
<td>.005</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>0.92</td>
<td>1.31</td>
<td>0.75</td>
<td>0.88</td>
<td>1.359</td>
<td>.245</td>
<td>.008</td>
</tr>
</tbody>
</table>

8.5.2 Hassles Scale

The HS evaluated the experience of minor stressful events or ‘hassles’ and provided information about their severity. The total number of hassles reported at Months 1, 3, 5, 7, 9, and 11 was compared between the groups. The HC group reported experiencing more hassles than the UHR group but this difference was not significant at the adjusted p-value (Table 8.6). The partial η² of this difference was .029 indicating a small effect size. However, the UHR group rated the hassles they experienced as significantly more intense
than the HC group rated their hassles. The effect size of this difference was medium (partial $\eta^2 = .065$). The groups did not differ in the cumulative severity of hassles that were experienced.

Table 8.6
Average Hassle Scale Scores Across Entire Study and Comparison Between Groups

<table>
<thead>
<tr>
<th></th>
<th>UHR</th>
<th></th>
<th>HC</th>
<th></th>
<th>F</th>
<th>p-value</th>
<th>partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of hassles</td>
<td>131.64</td>
<td>106.45</td>
<td>185.06</td>
<td>110.42</td>
<td>5.09</td>
<td>.025</td>
<td>.029</td>
</tr>
<tr>
<td>Cumulative severity</td>
<td>59.39</td>
<td>36.89</td>
<td>49.06</td>
<td>26.74</td>
<td>2.21</td>
<td>.139</td>
<td>.013</td>
</tr>
<tr>
<td>Average intensity</td>
<td>1.64</td>
<td>0.44</td>
<td>1.30</td>
<td>0.20</td>
<td>11.94</td>
<td>.001</td>
<td>.065</td>
</tr>
</tbody>
</table>

8.5.3 Perceived Stress Scale

The PSS measured the level of distress experienced by respondents. In addition to the PSS-Total score, there were two subscales: General distress and Perceived coping. Mean scores for the UHR and HC groups are shown in Table 8.7.

The UHR group scored significantly higher PSS-Total and subscale scores than the HC group, indicating that they reported significantly higher levels of general distress (indicated by the total score and the first subscale score) than the HC group but rated their own capacity to cope with stressors significantly worse than the HC group rated their coping abilities. Effect sizes of each of these comparisons were medium (partial $\eta^2$ for PSS-Total: 0.145, General distress: 0.110 and Perceived coping: 0.151).
Table 8.7
PSS Scores for UHR and HC Groups and Results of Comparisons Between the Groups

<table>
<thead>
<tr>
<th></th>
<th>UHR</th>
<th></th>
<th>HC</th>
<th></th>
<th>F</th>
<th>p-value</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29.74</td>
<td>7.34</td>
<td>21.67</td>
<td>5.98</td>
<td>29.122</td>
<td>.000</td>
<td>.145</td>
</tr>
<tr>
<td>General distress</td>
<td>14.95</td>
<td>4.77</td>
<td>10.81</td>
<td>3.61</td>
<td>21.253</td>
<td>.000</td>
<td>.110</td>
</tr>
<tr>
<td>Perceived coping</td>
<td>8.27</td>
<td>2.54</td>
<td>5.23</td>
<td>1.64</td>
<td>30.510</td>
<td>.000</td>
<td>.151</td>
</tr>
</tbody>
</table>

8.5.4 Coping Inventory for Stressful Situations

The CISS assessed the type of coping strategies used by respondents. The scale evaluated three types of coping: task-oriented (Task), emotion-oriented (Emotion) and avoidance-oriented (Avoidance). The Avoidance scale had two subscales: Distraction and Social Diversion. Summary scores are displayed in Table 8.8.

Table 8.8
CISS Subscale Scores for UHR and HC Groups and Results of Comparisons Between the Groups

<table>
<thead>
<tr>
<th></th>
<th>UHR</th>
<th></th>
<th>HC</th>
<th></th>
<th>F</th>
<th>p-value</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>38.96</td>
<td>12.43</td>
<td>53.02</td>
<td>9.62</td>
<td>24.095</td>
<td>.000</td>
<td>.123</td>
</tr>
<tr>
<td>Emotion</td>
<td>43.58</td>
<td>11.98</td>
<td>30.98</td>
<td>6.39</td>
<td>32.432</td>
<td>.000</td>
<td>.159</td>
</tr>
<tr>
<td>Avoidance</td>
<td>39.58</td>
<td>10.52</td>
<td>42.24</td>
<td>7.11</td>
<td>1.419</td>
<td>.235</td>
<td>.008</td>
</tr>
<tr>
<td>Distraction</td>
<td>19.20</td>
<td>5.68</td>
<td>17.71</td>
<td>3.71</td>
<td>3.187</td>
<td>.076</td>
<td>.018</td>
</tr>
<tr>
<td>Social Diversion</td>
<td>13.44</td>
<td>4.35</td>
<td>16.58</td>
<td>3.39</td>
<td>13.924</td>
<td>.000</td>
<td>.075</td>
</tr>
</tbody>
</table>
The UHR group reported significantly higher usage of emotion-oriented coping strategies than the HC group and significantly less use of task-oriented strategies. The effect sizes for these differences were large and moderate respectively. Whilst there were no differences between the groups in the use of Avoidance strategies overall, the UHR group were significantly less likely to utilise Social Diversion than the HC group (medium effect size). There were no differences between the groups in the use of Distraction as a coping technique.

8.5.5 Social Relationships Scale

The SRS measured the size of the social network reported by respondents, their satisfaction with their social supports and with whom they had been in contact (family, friends and so forth). Summary scores for the UHR and HC groups are shown in Table 8.9.

<table>
<thead>
<tr>
<th></th>
<th>UHR</th>
<th>HC</th>
<th>F</th>
<th>p-value</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of social contacts</td>
<td>19.40 11.91</td>
<td>38.13 15.36</td>
<td>51.52</td>
<td>.000</td>
<td>.246</td>
</tr>
<tr>
<td>Satisfaction with social support</td>
<td>4.47 0.96</td>
<td>5.36 0.61</td>
<td>21.92</td>
<td>.000</td>
<td>.119</td>
</tr>
</tbody>
</table>

The UHR group reported significantly fewer social contacts than the HC group. The UHR group were also significantly less satisfied with the level of
social support they perceived was available to them. The effect size of both of these comparisons was large.

Figure 8.3 shows the social contacts experienced by participants over the course of the study. Both groups had contact with friends most frequently, followed by immediate family members.

![Figure 8.3](image_url)

**Note.** Immediate family = first degree relatives only.

**Figure 8.3.** Type of social contacts made by UHR and HC participants presented as percentage of all contacts.

When the influence of age was controlled, the UHR group reported significantly fewer contacts with partner or boy/girlfriends, friends and colleagues than the HC group (Table 8.10). The effect sizes of these differences were small to medium.
Table 8.10
Comparison of Social Contacts Between Groups

<table>
<thead>
<tr>
<th></th>
<th>UHR M</th>
<th>UHR SD</th>
<th>HC M</th>
<th>HC SD</th>
<th>F</th>
<th>p-value</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner or boy/girlfriend</td>
<td>1.75</td>
<td>2.77</td>
<td>2.81</td>
<td>2.61</td>
<td>4.581</td>
<td>.034</td>
<td>.026</td>
</tr>
<tr>
<td>Immediate family</td>
<td>10.88</td>
<td>9.44</td>
<td>9.00</td>
<td>5.25</td>
<td>1.332</td>
<td>.250</td>
<td>.008</td>
</tr>
<tr>
<td>Other family</td>
<td>2.10</td>
<td>3.79</td>
<td>0.84</td>
<td>2.24</td>
<td>2.048</td>
<td>.154</td>
<td>.012</td>
</tr>
<tr>
<td>Professionals</td>
<td>2.59</td>
<td>5.88</td>
<td>1.16</td>
<td>2.82</td>
<td>1.402</td>
<td>.238</td>
<td>.008</td>
</tr>
<tr>
<td>Colleagues</td>
<td>0.59</td>
<td>1.36</td>
<td>1.97</td>
<td>2.35</td>
<td>11.733</td>
<td>.001</td>
<td>.064</td>
</tr>
<tr>
<td>Friends</td>
<td>16.27</td>
<td>15.45</td>
<td>22.34</td>
<td>10.81</td>
<td>5.116</td>
<td>.025</td>
<td>.029</td>
</tr>
</tbody>
</table>

8.5.6 Correlations between measures

Correlation coefficients were calculated between the measures of stress and coping and psychopathology. A p-value of less than .002 (.05/26 = .002) was required for significance using the Bonferroni approach to control for Type I error across the correlations. Responses of the UHR and HC groups were considered separately.

8.5.6.1 UHR group.

Correlations between scores for the UHR group are shown in Table 8.11. Correlations between the psychopathology measures and the measures of stress and coping will be considered first. GAF score was not significantly correlated with any of the stress and coping measures. Significant correlations were found between the other psychopathology measures (BPRS, BPRS-psychosis and SANS) and indicators of distress or intensity of stressors (PSS-Total, PSS-General distress and Hassles-Severity). These correlations indicated that as the level of symptoms increased, so did level of distress. The psychopathology measures were also significantly correlated with self-
rated coping ability (LEIS-Coping subscale, PSS-Perceived coping). Although not all of these correlations were significant at $p < .002$, they indicated that increasing symptom levels were associated with a perception of poorer coping abilities. A significant negative correlation was found between SANS score and the Social Diversion subscale of the CISS, indicating that increased negative symptoms were associated with lower levels of social diversion as a coping strategy. Significant negative correlations were also found between total BPRS and BPRS-Psychosis scores and Satisfaction with social support according to the SRS, indicating that as symptom levels increased, respondents reported less satisfaction with their social support.

Many significant correlations were also found amongst the stress and coping variables. The number of life events, number of hassles and number of social contacts reported were all significantly positively correlated with one another. These correlations were medium to large in magnitude. Interestingly, these variables were not significantly correlated with the PSS-Total or General distress scores.

There were some significant correlations between LEIS subscale scores. For example, large correlations were found between the Desirability subscale score and the Coping and Uplifting scores - as the desirability of events increased, so did the level of perceived ability to cope with them and the level of distress associated with them decreased. The Coping subscale score was also significantly associated with the Uplifting score in a positive direction. The Control subscale was significantly correlated with Notice, Desirability, Coping and Uplifting - the UHR participants felt they had greater level of control over an LE if they had advance notice about its occurrence, if it was desirable, if they felt they could cope with it and if they did not feel too distressed by it. Notice subscale scores were significantly correlated with Routine and Uplifting scores indicating that advance notice about a LE was associated with less distress about it but also a greater degree of change to routine.
Significant correlations were also found between LEIS subscale scores and other measures. PSS-Total score was significantly negatively correlated with the LEIS Desirability, Coping and Uplifting subscale scores, but a positive correlation was found between PSS-Perceived coping subscale score and the LEIS Coping subscale score. The more time an event was thought about (LEIS Time subscale), the more likely emotion-oriented coping strategies were utilised according to the CISS. Emotion-oriented coping was also more likely if events were undesirable, upsetting and the individual did not perceive that they could cope very well. The application of task-oriented or avoidance coping was not associated with any of the other LEIS subscales.

Severity of hassles was significantly positively correlated with levels of general distress (PSS-Total and General distress scores), and the use of emotion-focussed and avoidance coping strategies (CISS-Emotion, CISS-Avoidance, CISS-Distraction and CISS-Social Diversion scores). Level of distress was associated with the type of coping strategies employed: PSS-Total score was positively correlated with CISS-Emotion score and negatively correlated with CISS-Task score. CISS-Social Diversion was significantly correlated with satisfaction with social support but not with the number of social contacts reported. Finally, the correlation between number of social contacts reported and satisfaction with social support was not significant despite being medium in magnitude, according to criteria given by Pallant (2004).
Table 8.11
Correlation Coefficients Between Stress, Coping and Psychopathology Measures: UHR group

<table>
<thead>
<tr>
<th></th>
<th>GAF</th>
<th>SANS</th>
<th>BPRS</th>
<th>BPRS-psycho</th>
<th>Number</th>
<th>LEIS-Familiarity</th>
<th>LEIS-Control</th>
<th>LEIS-Notice</th>
<th>LEIS-Time</th>
<th>LEIS-Routine</th>
<th>LEIS-Desirability</th>
<th>LEIS-Coping</th>
<th>LEIS-Uplifting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPRS</td>
<td>-.340*</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPRS-Psychosis</td>
<td>-.413*</td>
<td>.658*</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number LE</td>
<td>-.158</td>
<td>-.105</td>
<td>.051</td>
<td>-.047</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEIS-Familiarity</td>
<td>-.005</td>
<td>.092</td>
<td>.138</td>
<td>.129</td>
<td>.114</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEIS-Control</td>
<td>-.011</td>
<td>.116</td>
<td>.166</td>
<td>-.216</td>
<td>.020</td>
<td>.156</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEIS-Notice</td>
<td>.065</td>
<td>-.097</td>
<td>.116</td>
<td>-.133</td>
<td>.061</td>
<td>.222</td>
<td>.368*</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
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Note. * Correlation is significant at the .002 level (2-tailed).
8.5.6.2 HC group.

Fewer significant correlations were found when the responses of the HC group were considered alone (Table 8.12). No significant correlations were found between the psychopathology measures and the stress and coping measures. Significant correlations between the stress and coping measures were limited to correlations between subscale scores of the various scales. For example LEIS-Coping subscale score was significantly positively correlated with LEIS-Uplifting subscale score.

8.6 Summary of Comparisons of Stress and Coping Measures Between UHR and HC Groups

A number of significant and interesting differences were found between the UHR and HC groups in the number and type of stressful events they reported, their coping responses, how successful they perceived their coping to be, and the quantity and quality of social support accessed. As predicted by Hypothesis 1, the UHR group reported significantly higher levels of distress than the HC group. However, the UHR group reported significantly fewer life events than the HC group and no differences were found between the groups in the number of hassles reported. Although the UHR group reported significantly fewer LE than the HC group, they rated their LE as more distressing and perceived that they were able to cope with them less successfully than the HC group rated their own experiences. The UHR group reported more life events associated with their own health, platonic relationships, social activities and their family than the HC group.

The UHR group were more likely to use emotion-oriented coping strategies than the HC group who were more likely to use task-oriented strategies. They reported significantly fewer social contacts than the HC group and were less
satisfied with the level of social support available to them than the HC group were.

The results of this study largely supported Hypothesis 1. The next chapter focuses on Hypotheses 2 and 3.
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Correlation Coefficients Between Stress, Coping and Psychopathology Measures: HC group

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<td>.045</td>
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<td>.021</td>
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<td>-.174</td>
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<th>Hassles-intensity</th>
<th>PSS-Total</th>
<th>PSS-General distress</th>
<th>PSS-Perceived coping</th>
<th>CISS-Task</th>
<th>CISS-Emotion</th>
<th>CISS-Avoidance</th>
<th>CISS-Distraction</th>
<th>CISS-Social Diversion</th>
<th>Number of social contacts</th>
<th>Satisfaction with social support</th>
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</tr>
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<td>.152</td>
<td>.073</td>
<td>.825 *</td>
<td>.655 *</td>
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<td>-.287</td>
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<td>.417</td>
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<td>.191</td>
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<td>-.062</td>
<td>-.023</td>
<td>.092</td>
<td>.111</td>
<td>.486</td>
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<td>.261</td>
<td>-.086</td>
<td>.150</td>
<td>.135</td>
<td>.188</td>
<td>-.130</td>
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<td>.744 *</td>
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</tr>
<tr>
<td>CISS-Social Diversion</td>
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<td>.044</td>
<td>.007</td>
<td>-.119</td>
<td>-.208</td>
<td>-.128</td>
<td>-.271</td>
<td>.176</td>
<td>.198</td>
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<td>.223</td>
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<tr>
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<td>-.017</td>
<td>-.159</td>
<td>-.208</td>
<td>-.190</td>
<td>-.259</td>
<td>.363</td>
<td>-.246</td>
<td>-.066</td>
<td>-.095</td>
<td>.020</td>
<td>.092</td>
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<tr>
<td>Satisfaction with social support</td>
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<td>.307</td>
<td>.291</td>
<td>-.224</td>
<td>-.405</td>
<td>-.408</td>
<td>-.279</td>
<td>.174</td>
<td>-.087</td>
<td>.252</td>
<td>-.020</td>
<td>.333</td>
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</table>

Note: * Correlation is significant at the .002 level (2-tailed).
CHAPTER 9

Results: Relationship Between Stress and Coping Measures and Transition to Psychosis

In the analyses described in this chapter, the UHR group was divided according to outcome 12 months after baseline assessment. Demographic and psychopathology variables were first compared to characterise the two UHR subgroups - those who developed acute psychosis (UHR-P) and those who did not (UHR-NP).

Hypothesis 2 predicted that the experience of more major life events and hassles, higher levels of distress, higher use of emotion-focused and avoidance coping strategies, and fewer and less satisfactory social supports would be predictive of the onset of acute psychosis in the UHR cohort. Analysis of the contribution of stress and coping in predicting the onset of acute psychosis in the UHR group is described in the second part of this chapter.

Finally, analyses were performed to determine if the number of stressors, levels of distress, number of social supports and coping strategies employed by the UHR-P subgroup changed immediately prior to the onset of acute psychosis in line with Hypothesis 3.

9.1 Transition to Psychosis

Of the 143 UHR participants recruited to this study, 18 (12.5%) are known to have developed an acute psychosis during the 12-month period following baseline assessment. Using survival analysis (Kaplan-Meier method), an
estimate of the transition rate by 12 months is .402, 95% CI (-.070, .671). Transition to psychosis occurred at various times during the follow-up period as illustrated in Figure 9.1. In this graph each vertical drop in the curve represents a transition to psychosis and how many days after baseline assessment this occurred. UHR participants who developed acute psychosis did so between 42 and 380 days after entry to the study (mean number of days to transition = 209.33 days; SD = 103.56, median = 213.50). The lower transition rate to acute psychosis in this cohort compared to other UHR cohorts (such as Mason et al., 2004; Miller, McGlashan et al., 2002; Morrison et al., 2002; Yung et al., 1998) will be addressed in the Discussion.

![Survival curve showing number of days until acute psychosis developed for UHR-P group.](image)

**Figure 9.1.** Survival curve showing number of days until acute psychosis developed for UHR-P group.

Diagnoses of the 18 participants who developed acute psychosis were determined using the SCID-IV and are shown in Figure 9.2. Most of the UHR-P group developed a schizophrenia spectrum disorder.
Note. sz = schizophrenia, szf = schizophreniform disorder; mdd = major depressive disorder

Figure 9.2. Psychotic diagnoses of UHR-P group.

9.2 Comparison of Demographic and Psychopathology Variables Between the UHR Subgroups

Basic demographic data for the two UHR subgroups at entry to the study and results of comparisons between the groups are shown in Table 9.1. There were no significant differences between the UHR-P and UHR-NP groups on any of the demographic variables except duration of symptoms prior to referral to PACE: the UHR-P group had experienced symptoms for a significantly longer period of time than the UHR-NP group. There was a wide variance in duration of symptoms in both groups.
Table 9.1
Descriptive Information for the UHR-P and UHR-NP Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>UHR-P (n = 18)</th>
<th>UHR-NP (n = 125)</th>
<th>$\chi^2$</th>
<th>p -value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Male</td>
<td>45.6</td>
<td>50.0</td>
<td>0.123</td>
<td>.726</td>
</tr>
<tr>
<td>% Never married</td>
<td>100.0</td>
<td>96.0</td>
<td>0.746</td>
<td>.388</td>
</tr>
<tr>
<td>% Born in Australia</td>
<td>88.9</td>
<td>80.0</td>
<td>0.812</td>
<td>.368</td>
</tr>
<tr>
<td>% Mother born in Australia</td>
<td>77.8</td>
<td>67.2</td>
<td>0.816</td>
<td>.366</td>
</tr>
<tr>
<td>% Father born in Australia</td>
<td>61.1</td>
<td>56.8</td>
<td>0.120</td>
<td>.730</td>
</tr>
<tr>
<td>Occupation (%)</td>
<td></td>
<td></td>
<td>5.27</td>
<td>.510</td>
</tr>
<tr>
<td>secondary student</td>
<td>61.1</td>
<td>46.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tertiary student</td>
<td>11.1</td>
<td>17.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unemployed</td>
<td>11.1</td>
<td>22.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>homemaker</td>
<td>5.6</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unskilled</td>
<td>0.0</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>skilled manual/clerical</td>
<td>5.6</td>
<td>5.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>admin/minor professional</td>
<td>5.6</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living arrangements (%)</td>
<td></td>
<td></td>
<td>2.291</td>
<td>.514</td>
</tr>
<tr>
<td>living with family of origin</td>
<td>83.3</td>
<td>84.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>living with friends</td>
<td>16.67</td>
<td>8.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>living alone</td>
<td>0.0</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>0.0</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable (M, SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>18.17 (3.22)</td>
<td>18.76 (3.15)</td>
<td>0.745</td>
<td>.457</td>
</tr>
<tr>
<td>Education (years)</td>
<td>12.33 (2.30)</td>
<td>12.26 (1.95)</td>
<td>-0.138</td>
<td>.890</td>
</tr>
<tr>
<td>IQ</td>
<td>105.96 (9.29)</td>
<td>104.10 (11.73)</td>
<td>-0.571</td>
<td>.569</td>
</tr>
<tr>
<td>Duration of symptoms (days)</td>
<td>750.06 (775.62)</td>
<td>296.47(341.99)</td>
<td>-4.259</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 9.2 shows which UHR intake group criteria were met by members of the two UHR subgroups at entry to the study. Most participants (80% of the total UHR group) had experienced attenuated psychotic symptoms. Of the
UHR-P group alone, 89% had experienced attenuated symptoms at entry and 78% of that group met criteria for the APS group only. However there were no significant differences in PACE criteria met between the UHR-P and UHR-NP groups ($\chi^2 (5, N = 143) = 4.763, p = .445$).

Table 9.2
UHR Participants Divided According to Intake Criteria Met (Displayed as Percentages)

<table>
<thead>
<tr>
<th>Intake group</th>
<th>All UHR participants (N = 143)</th>
<th>UHR-P (N = 18)</th>
<th>UHR-NP (N = 125)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait and State Risk Factors</td>
<td>16.1</td>
<td>5.6</td>
<td>17.6</td>
</tr>
<tr>
<td>APS</td>
<td>60.8</td>
<td>77.8</td>
<td>58.4</td>
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<tr>
<td>BLIPS</td>
<td>3.5</td>
<td>5.6</td>
<td>3.2</td>
</tr>
<tr>
<td>APS + BLIPS</td>
<td>2.8</td>
<td>5.6</td>
<td>2.4</td>
</tr>
<tr>
<td>APS + Trait and State Risk Factors</td>
<td>16.1</td>
<td>5.6</td>
<td>17.6</td>
</tr>
<tr>
<td>BLIPS + Trait and State Risk Factors</td>
<td>0.7</td>
<td>0.0</td>
<td>0.8</td>
</tr>
</tbody>
</table>

9.3 Baseline Psychopathology

Baseline levels of psychopathology of the UHR-P and UHR-NP groups are shown in Table 9.3. There were no significant differences between the groups on any of the measures of psychopathology and functioning at entry to the study, although there was a trend towards a higher BPRS-psychosis score of the UHR-P group ($p = 0.087$).
Table 9.3
Baseline psychopathology for the UHR-P and UHR-NP groups

<table>
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<tr>
<th></th>
<th>UHR-P</th>
<th></th>
<th>UHR-NP</th>
<th></th>
<th>t</th>
<th>p - value</th>
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</thead>
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<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
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<td>BPRS</td>
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<td>25.41</td>
<td>9.98</td>
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<td>.254</td>
</tr>
<tr>
<td>BPRS-psychosis</td>
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<td>3.65</td>
<td>5.66</td>
<td>3.01</td>
<td>-1.724</td>
<td>.087</td>
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<td>30.69</td>
<td>15.77</td>
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<td>.404</td>
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<td>GAF</td>
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<td>8.69</td>
<td>56.74</td>
<td>8.88</td>
<td>1.101</td>
<td>.273</td>
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</table>

9.4 Comparison of Baseline Stress and Coping Measures

The only month that all UHR participants were not psychotic was Month 1 (baseline). Therefore, baseline scores on the range of stress and coping measures were compared between the UHR-P and UHR-NP groups (Table 9.4). Due to the Bonferroni adjustment, the only significant difference found between the groups was in level of satisfaction with social support - the UHR-P group were significantly less satisfied with the social support available to them at baseline than the UHR-NP group. According to J. Cohen (1988), for sample sizes of 18 and 125, the power is 50% for a medium effect size (0.5) and 88% for a large effect size (0.8). In other words, the power of these comparisons is acceptable.
Table 9.4
Mean Scores on Stress and Coping Measures for the UHR-P and UHR-NP Groups at Baseline and Results of t-tests

<table>
<thead>
<tr>
<th></th>
<th>UHR-P M</th>
<th>UHR-NP M</th>
<th>t</th>
<th>p - value</th>
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<td>3.50</td>
<td>-0.382</td>
<td>.703</td>
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<td>Notice</td>
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<td>3.27</td>
<td>2.335</td>
<td>.021</td>
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<td>Mind</td>
<td>5.35</td>
<td>5.03</td>
<td>0.637</td>
<td>.526</td>
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<td>Routine</td>
<td>4.41</td>
<td>4.63</td>
<td>-0.393</td>
<td>.695</td>
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<td>Desirability</td>
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<td>3.44</td>
<td>0.520</td>
<td>.604</td>
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<td>Coping</td>
<td>4.94</td>
<td>5.06</td>
<td>-0.224</td>
<td>.823</td>
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<td>Uplifting</td>
<td>3.78</td>
<td>3.93</td>
<td>0.329</td>
<td>.743</td>
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<td><strong>HS</strong></td>
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</tr>
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<td>Number of hassles</td>
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<tr>
<td>Severity</td>
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<td>71.90</td>
<td>0.815</td>
<td>.417</td>
</tr>
<tr>
<td>Intensity</td>
<td>1.93</td>
<td>1.75</td>
<td>1.709</td>
<td>.090</td>
</tr>
<tr>
<td><strong>PSS</strong></td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>33.31</td>
<td>32.59</td>
<td>0.315</td>
<td>.754</td>
</tr>
<tr>
<td>General distress</td>
<td>17.13</td>
<td>17.56</td>
<td>0.293</td>
<td>.770</td>
</tr>
<tr>
<td>Perceived coping</td>
<td>9.19</td>
<td>8.34</td>
<td>0.947</td>
<td>.346</td>
</tr>
<tr>
<td><strong>CISS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>39.13</td>
<td>41.58</td>
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<td>.501</td>
</tr>
<tr>
<td>Emotion</td>
<td>50.75</td>
<td>50.78</td>
<td>-0.010</td>
<td>.992</td>
</tr>
<tr>
<td>Avoidance</td>
<td>40.94</td>
<td>42.13</td>
<td>-0.409</td>
<td>.683</td>
</tr>
<tr>
<td>Distraction</td>
<td>20.44</td>
<td>20.44</td>
<td>0.001</td>
<td>.999</td>
</tr>
<tr>
<td>Social Diversion</td>
<td>13.38</td>
<td>14.53</td>
<td>-0.868</td>
<td>.387</td>
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<tr>
<td><strong>SRS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of social contacts</td>
<td>5.15</td>
<td>6.49</td>
<td>-1.380</td>
<td>.171</td>
</tr>
<tr>
<td>Satisfaction with social support</td>
<td>3.38</td>
<td>4.67</td>
<td>3.465</td>
<td>.001</td>
</tr>
</tbody>
</table>


The types of life events that were experienced by members of the UHR-P and UHR-NP groups were examined. As shown in Figure 9.3, the types of events that were most likely to be reported by members of both groups were those associated with education or training, employment, family, own health and social activities. There were no significant differences between the groups in the frequency of reporting the various event types (Table 9.5).

### 9.5 Prediction of Psychosis

Cox regression analysis was used to determine whether onset of acute psychosis was associated with baseline scores on the stress and coping measures. The baseline scores were entered into the analysis in a block as covariates. The results of this analysis are shown in Table 9.6.
Table 9.5
Results of Comparisons of Types of LE Experienced by the UHR-P and UHR-NP Groups

<table>
<thead>
<tr>
<th>LE type</th>
<th>UHR-P</th>
<th>UHR-NP</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Education</td>
<td>3.00</td>
<td>3.24</td>
<td>2.79</td>
<td>2.91</td>
</tr>
<tr>
<td>Employment</td>
<td>2.50</td>
<td>4.38</td>
<td>2.29</td>
<td>2.85</td>
</tr>
<tr>
<td>Housing</td>
<td>1.39</td>
<td>1.75</td>
<td>1.45</td>
<td>2.52</td>
</tr>
<tr>
<td>Romantic relationships</td>
<td>1.50</td>
<td>1.65</td>
<td>2.10</td>
<td>2.59</td>
</tr>
<tr>
<td>Platonic relationships</td>
<td>1.83</td>
<td>2.33</td>
<td>1.65</td>
<td>2.17</td>
</tr>
<tr>
<td>Pets</td>
<td>0.17</td>
<td>0.38</td>
<td>0.30</td>
<td>0.60</td>
</tr>
<tr>
<td>Family health</td>
<td>0.56</td>
<td>1.10</td>
<td>0.44</td>
<td>0.84</td>
</tr>
<tr>
<td>Own health</td>
<td>2.33</td>
<td>1.85</td>
<td>2.81</td>
<td>2.79</td>
</tr>
<tr>
<td>Family</td>
<td>2.78</td>
<td>2.82</td>
<td>3.26</td>
<td>3.29</td>
</tr>
<tr>
<td>Social activities</td>
<td>2.72</td>
<td>2.93</td>
<td>2.70</td>
<td>3.10</td>
</tr>
<tr>
<td>Financial</td>
<td>1.22</td>
<td>2.13</td>
<td>1.14</td>
<td>1.62</td>
</tr>
<tr>
<td>Transport</td>
<td>0.28</td>
<td>0.57</td>
<td>0.39</td>
<td>0.90</td>
</tr>
<tr>
<td>Legal</td>
<td>0.33</td>
<td>0.84</td>
<td>0.58</td>
<td>1.06</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>0.83</td>
<td>1.34</td>
<td>0.94</td>
<td>1.31</td>
</tr>
</tbody>
</table>

The baseline scores on the various stress and coping measures did not significantly predict the later onset of psychosis in the UHR group ($\chi^2$ (22, $N = 83$) = 32.483, $p = .070$). Only the baseline scores on the LEIS subscales assessing perceptions of advance notice of life events (Notice) and the amount of time events were thought about (Time), as well as the level of satisfaction with social support and the use of distraction as a coping strategy appeared to have any influence on the later development of psychosis in the UHR-P subgroup, although none were significant. Together these four variables accounted for only 5% variance in probability of developing acute psychosis. The other variables did not account for any variance in outcome.
The association between the repeated stress and coping measures and onset of acute psychosis was analysed using Cox regression with the stress and coping variables as time dependent covariates. As indicated in the Method section, missing scores were replaced with the mean score for that subject on that variable. As this procedure introduced a level of unreliability into the analysis, only those participants with 50% or less of missing scores replaced via mean substitution were included in the analyses. The transition rate to acute psychosis within this cohort of 110 subjects was 16.4% and using survival analysis (Kaplan-Meier method), an estimate of the transition rate by 12 months is .426, 95%CI (-.040, .683). Mean substitution was not required for 50% of the UHR-P group and 17% of the UHR-NP group who were included in the Cox regression analysis. The difference in rate of substitution between the groups was significant ($\chi^2 (1, N = 110) = 9.115, p = 0.003$). (The Cox regressions were also performed using data for only those participants with a full data set or with less than 25% of data missing. Results are shown in Appendix E and F. In the analysis that only included participants with a full data set, Satisfaction with social support was not significant. No other differences were found).
Table 9.6
Results of Cox Regression Analysis of Onset of Acute Psychosis with Baseline Responses to Stress and Coping Measures as Covariates

<table>
<thead>
<tr>
<th>Covariate</th>
<th>( B )</th>
<th>Wald</th>
<th>( p )-value</th>
<th>( R )</th>
<th>OR</th>
<th>CIL</th>
<th>CIU</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEIS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of LE</td>
<td>0.218</td>
<td>0.543</td>
<td>.461</td>
<td>.000</td>
<td>1.243</td>
<td>0.697</td>
<td>2.218</td>
</tr>
<tr>
<td>Familiarity</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
<td>.000</td>
<td>1.000</td>
<td>0.548</td>
<td>1.826</td>
</tr>
<tr>
<td>Control</td>
<td>0.353</td>
<td>0.953</td>
<td>.329</td>
<td>.000</td>
<td>1.423</td>
<td>0.701</td>
<td>2.888</td>
</tr>
<tr>
<td>Notice</td>
<td>0.575</td>
<td>3.672</td>
<td>.055</td>
<td>.130</td>
<td>1.776</td>
<td>0.987</td>
<td>3.197</td>
</tr>
<tr>
<td>Time</td>
<td>0.985</td>
<td>3.260</td>
<td>.071</td>
<td>.113</td>
<td>2.679</td>
<td>0.919</td>
<td>7.808</td>
</tr>
<tr>
<td>Routine</td>
<td>-0.296</td>
<td>0.653</td>
<td>.419</td>
<td>.000</td>
<td>0.744</td>
<td>0.362</td>
<td>1.526</td>
</tr>
<tr>
<td>Desirability</td>
<td>-0.481</td>
<td>0.754</td>
<td>.385</td>
<td>.000</td>
<td>0.619</td>
<td>0.209</td>
<td>1.830</td>
</tr>
<tr>
<td>Coping</td>
<td>0.541</td>
<td>1.901</td>
<td>.168</td>
<td>.000</td>
<td>1.717</td>
<td>0.796</td>
<td>3.704</td>
</tr>
<tr>
<td>Uplifting</td>
<td>0.056</td>
<td>0.008</td>
<td>.930</td>
<td>.000</td>
<td>1.058</td>
<td>0.301</td>
<td>3.715</td>
</tr>
<tr>
<td>HS</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Number of hassles</td>
<td>0.054</td>
<td>0.272</td>
<td>.602</td>
<td>.000</td>
<td>1.055</td>
<td>0.862</td>
<td>1.291</td>
</tr>
<tr>
<td>Severity</td>
<td>-0.022</td>
<td>0.137</td>
<td>.712</td>
<td>.000</td>
<td>0.978</td>
<td>0.871</td>
<td>1.100</td>
</tr>
<tr>
<td>Intensity</td>
<td>2.259</td>
<td>1.121</td>
<td>.290</td>
<td>.000</td>
<td>9.569</td>
<td>0.146</td>
<td>625.917</td>
</tr>
<tr>
<td>PSS</td>
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<tr>
<td>Total</td>
<td>0.451</td>
<td>0.783</td>
<td>.376</td>
<td>.000</td>
<td>1.569</td>
<td>0.578</td>
<td>4.259</td>
</tr>
<tr>
<td>General distress</td>
<td>-0.541</td>
<td>1.051</td>
<td>.305</td>
<td>.000</td>
<td>0.582</td>
<td>0.207</td>
<td>1.638</td>
</tr>
<tr>
<td>Perceived coping</td>
<td>-0.209</td>
<td>0.133</td>
<td>.716</td>
<td>.000</td>
<td>0.811</td>
<td>0.263</td>
<td>2.502</td>
</tr>
<tr>
<td>CISS</td>
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</tr>
<tr>
<td>Task</td>
<td>0.112</td>
<td>0.040</td>
<td>.843</td>
<td>.000</td>
<td>1.012</td>
<td>0.900</td>
<td>1.137</td>
</tr>
<tr>
<td>Emotion</td>
<td>-0.008</td>
<td>0.013</td>
<td>.911</td>
<td>.000</td>
<td>0.992</td>
<td>0.856</td>
<td>1.149</td>
</tr>
<tr>
<td>Avoidance</td>
<td>0.304</td>
<td>1.572</td>
<td>.210</td>
<td>.000</td>
<td>1.356</td>
<td>0.842</td>
<td>2.182</td>
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<tr>
<td>Distraction</td>
<td>-0.433</td>
<td>2.928</td>
<td>.087</td>
<td>-.100</td>
<td>0.648</td>
<td>0.395</td>
<td>1.065</td>
</tr>
<tr>
<td>Social Diversion</td>
<td>-0.237</td>
<td>0.652</td>
<td>.419</td>
<td>.000</td>
<td>0.789</td>
<td>0.443</td>
<td>1.403</td>
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<tr>
<td>SRS</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Number of social contacts</td>
<td>-0.031</td>
<td>0.039</td>
<td>.844</td>
<td>.000</td>
<td>0.969</td>
<td>0.711</td>
<td>1.321</td>
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<tr>
<td>Satisfaction with social support</td>
<td>-1.044</td>
<td>3.412</td>
<td>.065</td>
<td>-.119</td>
<td>0.352</td>
<td>0.116</td>
<td>1.066</td>
</tr>
</tbody>
</table>

Note. OR - Odds ratio; CIL - lower limit of 95% confidence interval for odds ratio; CIU - upper limit for 95% confidence interval for odds ratio.
Separate survival analyses were performed for each measure but results are displayed together in Table 9.7. When considered independently, all of the stress and coping variables were significantly associated with the risk of onset of acute psychosis in the UHR group. In other words, responses to the stress and coping variables over the twelve-month period after recruitment to the study predicted the onset of acute psychosis. Interestingly, the B-value for each of the variables is negative indicating that an increase in scores over time would decrease the probability of development of acute psychosis. For example, both increasing satisfaction with social support and increasing distress (PSS-Total) decrease the likelihood of developing psychosis. The odds ratios (OR) approached one. This also indicates that the higher the scores, the lower the likelihood of developing psychosis. The stress and coping measures individually accounted for between 3% (Hassles-Severity) and 27% (satisfaction with social support) of variance in outcome.
Table 9.7
Results of Cox Regression Analyses of Onset of Acute Psychosis with Stress and Coping Measures as Time-Dependent Covariates

<table>
<thead>
<tr>
<th>Covariate</th>
<th>B</th>
<th>Wald</th>
<th>p-value</th>
<th>R</th>
<th>OR</th>
<th>CIL</th>
<th>CIU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEIS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of LE</td>
<td>-0.108</td>
<td>25.125</td>
<td>.000</td>
<td>-0.390</td>
<td>0.897</td>
<td>0.860</td>
<td>0.936</td>
</tr>
<tr>
<td>Familiarity</td>
<td>-0.088</td>
<td>27.222</td>
<td>.000</td>
<td>-0.407</td>
<td>0.916</td>
<td>0.886</td>
<td>0.947</td>
</tr>
<tr>
<td>Control</td>
<td>-0.123</td>
<td>29.340</td>
<td>.000</td>
<td>-0.424</td>
<td>0.884</td>
<td>0.846</td>
<td>0.925</td>
</tr>
<tr>
<td>Notice</td>
<td>-0.118</td>
<td>26.950</td>
<td>.000</td>
<td>-0.405</td>
<td>0.889</td>
<td>0.850</td>
<td>0.929</td>
</tr>
<tr>
<td>Time</td>
<td>-0.109</td>
<td>33.580</td>
<td>.000</td>
<td>-0.455</td>
<td>0.896</td>
<td>0.864</td>
<td>0.930</td>
</tr>
<tr>
<td>Routine</td>
<td>-0.136</td>
<td>28.076</td>
<td>.000</td>
<td>-0.414</td>
<td>0.873</td>
<td>0.830</td>
<td>0.918</td>
</tr>
<tr>
<td>Desirability</td>
<td>-0.122</td>
<td>27.192</td>
<td>.000</td>
<td>-0.407</td>
<td>0.885</td>
<td>0.846</td>
<td>0.927</td>
</tr>
<tr>
<td>Coping</td>
<td>-0.105</td>
<td>29.819</td>
<td>.000</td>
<td>-0.427</td>
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<td>0.867</td>
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<tr>
<td>Uplifting</td>
<td>-0.127</td>
<td>27.503</td>
<td>.000</td>
<td>-0.409</td>
<td>0.881</td>
<td>0.840</td>
<td>0.924</td>
</tr>
<tr>
<td><strong>HS</strong></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Number of hassles</td>
<td>-0.006</td>
<td>10.345</td>
<td>.001</td>
<td>-0.234</td>
<td>0.994</td>
<td>0.991</td>
<td>0.998</td>
</tr>
<tr>
<td>Severity</td>
<td>-0.003</td>
<td>6.964</td>
<td>.008</td>
<td>-0.181</td>
<td>0.997</td>
<td>0.996</td>
<td>0.999</td>
</tr>
<tr>
<td>Intensity</td>
<td>-0.206</td>
<td>25.159</td>
<td>.000</td>
<td>-0.390</td>
<td>0.814</td>
<td>0.751</td>
<td>0.882</td>
</tr>
<tr>
<td><strong>PSS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>-0.022</td>
<td>39.377</td>
<td>.000</td>
<td>-0.495</td>
<td>0.978</td>
<td>0.971</td>
<td>0.985</td>
</tr>
<tr>
<td>General distress</td>
<td>-0.033</td>
<td>37.594</td>
<td>.000</td>
<td>-0.483</td>
<td>0.967</td>
<td>0.957</td>
<td>0.978</td>
</tr>
<tr>
<td>Perceived coping</td>
<td>-0.049</td>
<td>43.799</td>
<td>.000</td>
<td>-0.524</td>
<td>0.953</td>
<td>0.939</td>
<td>0.966</td>
</tr>
<tr>
<td><strong>CISS</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>-0.010</td>
<td>21.349</td>
<td>.000</td>
<td>-0.356</td>
<td>0.990</td>
<td>0.986</td>
<td>0.994</td>
</tr>
<tr>
<td>Emotion</td>
<td>-0.012</td>
<td>29.859</td>
<td>.000</td>
<td>-0.428</td>
<td>0.989</td>
<td>0.984</td>
<td>0.993</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-0.016</td>
<td>31.737</td>
<td>.000</td>
<td>-0.442</td>
<td>0.984</td>
<td>0.979</td>
<td>0.990</td>
</tr>
<tr>
<td>Distraction</td>
<td>-0.028</td>
<td>34.385</td>
<td>.000</td>
<td>-0.461</td>
<td>0.972</td>
<td>0.963</td>
<td>0.981</td>
</tr>
<tr>
<td>Social Diversion</td>
<td>-0.037</td>
<td>31.814</td>
<td>.000</td>
<td>-0.442</td>
<td>0.964</td>
<td>0.952</td>
<td>0.976</td>
</tr>
<tr>
<td><strong>SRS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of social contacts</td>
<td>-0.022</td>
<td>33.241</td>
<td>.000</td>
<td>-0.453</td>
<td>0.978</td>
<td>0.971</td>
<td>0.986</td>
</tr>
<tr>
<td>Satisfaction with social support</td>
<td>-0.025</td>
<td>44.527</td>
<td>.000</td>
<td>-0.528</td>
<td>0.976</td>
<td>0.969</td>
<td>0.983</td>
</tr>
</tbody>
</table>

*Note. OR - Odds ratio; CIL - lower limit of 95% confidence interval for odds ratio; CIU - upper limit for 95% confidence interval for odds ratio.*
It is possible that involvement in one of the clinical trials that were taking place at the PACE Clinic at the same time as the current study could have predicted the development of psychosis in the UHR group as well as potentially influencing the participants’ perception of stress and strategies employed to cope with stressors. The Cox regression analyses described above were repeated including only those UHR participants who were not included in a treatment trial and for whom less than 50% of stress and coping data was missing. With this restriction 56 UHR subjects were included in the analysis, 10 of who developed psychosis (18% transition rate).

Results of these analyses are shown in Table 9.8. The overall result was the same as the earlier analysis - the experience of stress and coping over time by the UHR subjects predicted the development of acute psychosis. The direction of the influence of the stress and coping variables on outcome also remained the same. That is, increasing scores on all of the variables over time reduced the likelihood that acute psychosis would develop. The degree of variation in outcome that was accounted for by the stress and coping measures individually accounted for between 4% (Hassles-Severity) and 27% (PSS-Perceived coping subscale).
Table 9.8
Results of Cox Regression Analyses of Onset of Acute Psychosis with Stress and Coping Measures as Time-dependent Covariates Excluding UHR Subjects Involved in a Clinical Trial

<table>
<thead>
<tr>
<th>Covariate</th>
<th>B</th>
<th>Wald</th>
<th>p-value</th>
<th>R</th>
<th>OR</th>
<th>CIL</th>
<th>CIU</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEIS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of LE</td>
<td>-1.335</td>
<td>11.207</td>
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<td>-.368</td>
<td>0.875</td>
<td>0.809</td>
<td>0.946</td>
</tr>
<tr>
<td>Familiarity</td>
<td>-0.087</td>
<td>12.549</td>
<td>.000</td>
<td>-.394</td>
<td>0.917</td>
<td>0.874</td>
<td>0.962</td>
</tr>
<tr>
<td>Control</td>
<td>-0.113</td>
<td>11.465</td>
<td>.001</td>
<td>-.374</td>
<td>0.893</td>
<td>0.837</td>
<td>0.954</td>
</tr>
<tr>
<td>Notice</td>
<td>-0.122</td>
<td>12.328</td>
<td>.000</td>
<td>-.390</td>
<td>0.886</td>
<td>0.827</td>
<td>0.948</td>
</tr>
<tr>
<td>Time</td>
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<td>14.880</td>
<td>.000</td>
<td>-.436</td>
<td>0.914</td>
<td>0.873</td>
<td>0.957</td>
</tr>
<tr>
<td>Routine</td>
<td>-0.109</td>
<td>12.653</td>
<td>.000</td>
<td>-.396</td>
<td>0.987</td>
<td>0.844</td>
<td>0.952</td>
</tr>
<tr>
<td>Desirability</td>
<td>-0.092</td>
<td>12.516</td>
<td>.000</td>
<td>-.394</td>
<td>0.912</td>
<td>0.867</td>
<td>0.960</td>
</tr>
<tr>
<td>Coping</td>
<td>-0.074</td>
<td>14.847</td>
<td>.000</td>
<td>-.435</td>
<td>0.929</td>
<td>0.894</td>
<td>0.964</td>
</tr>
<tr>
<td>Uplifting</td>
<td>-0.096</td>
<td>12.725</td>
<td>.000</td>
<td>-.398</td>
<td>0.908</td>
<td>0.861</td>
<td>0.958</td>
</tr>
<tr>
<td>HS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hassles</td>
<td>-0.006</td>
<td>6.870</td>
<td>.009</td>
<td>-.268</td>
<td>0.994</td>
<td>0.979</td>
<td>0.998</td>
</tr>
<tr>
<td>Severity</td>
<td>-0.003</td>
<td>5.011</td>
<td>.025</td>
<td>-.211</td>
<td>0.997</td>
<td>0.995</td>
<td>1.000</td>
</tr>
<tr>
<td>Intensity</td>
<td>-0.168</td>
<td>11.663</td>
<td>.001</td>
<td>-.377</td>
<td>0.845</td>
<td>0.798</td>
<td>0.931</td>
</tr>
<tr>
<td>PSS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>-0.021</td>
<td>17.714</td>
<td>.000</td>
<td>-.481</td>
<td>0.980</td>
<td>0.970</td>
<td>0.989</td>
</tr>
<tr>
<td>General distress</td>
<td>-0.030</td>
<td>16.507</td>
<td>.000</td>
<td>-.463</td>
<td>0.971</td>
<td>0.957</td>
<td>0.975</td>
</tr>
<tr>
<td>Perceived coping</td>
<td>-0.428</td>
<td>20.572</td>
<td>.000</td>
<td>-.523</td>
<td>0.958</td>
<td>0.941</td>
<td>0.976</td>
</tr>
<tr>
<td>CISS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>-0.009</td>
<td>10.287</td>
<td>.000</td>
<td>-.356</td>
<td>0.990</td>
<td>0.986</td>
<td>0.994</td>
</tr>
<tr>
<td>Emotion</td>
<td>-0.010</td>
<td>13.325</td>
<td>.000</td>
<td>-.409</td>
<td>0.990</td>
<td>0.984</td>
<td>0.995</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-0.014</td>
<td>15.705</td>
<td>.000</td>
<td>-.450</td>
<td>0.986</td>
<td>0.979</td>
<td>0.993</td>
</tr>
<tr>
<td>Distraction</td>
<td>-0.025</td>
<td>16.101</td>
<td>.000</td>
<td>-.456</td>
<td>0.975</td>
<td>0.963</td>
<td>0.987</td>
</tr>
<tr>
<td>Social Diversion</td>
<td>-0.034</td>
<td>16.132</td>
<td>.000</td>
<td>-.457</td>
<td>0.996</td>
<td>0.950</td>
<td>0.983</td>
</tr>
<tr>
<td>SRS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of social contacts</td>
<td>-0.017</td>
<td>11.726</td>
<td>.001</td>
<td>-.379</td>
<td>0.923</td>
<td>0.973</td>
<td>0.993</td>
</tr>
<tr>
<td>Satisfaction with social support</td>
<td>-0.019</td>
<td>14.039</td>
<td>.000</td>
<td>-.421</td>
<td>0.982</td>
<td>0.972</td>
<td>0.991</td>
</tr>
</tbody>
</table>

Note. OR - Odds ratio; CIL - lower limit of 95% confidence interval for odds ratio; CIU - upper limit for 95% confidence interval for odds ratio.
9.6 Change in Stress and Coping Preceding Onset of Acute Psychosis

Hypothesis 3 predicted that the onset of psychosis in the UHR-P group would be preceded by increases in the number of life events and hassles, higher levels of distress, fewer and less satisfactory social supports, and increased use of emotion-oriented and avoidance coping strategies immediately prior to the onset of the acute episode compared to an earlier timepoint. In this final section the responses of the UHR-P group four months prior to onset (Time 1) were compared to responses in the month immediately prior to the onset of psychosis (Time 2). Only those UHR-P subjects who developed acute psychosis at least four months after study entry and who had data for the month immediately preceding onset as well as four months earlier could be included in the analysis. As a result, although there were 18 participants in the complete UHR-P group, the number included in this analysis ranged from five to 12 (not all of the measures were completed by all participants). Mean substitution of missing data was not carried out at this point to ensure that a bias was not introduced to the analysis.

Mean scores on the stress and coping variables for the UHR-P subgroup at Time 1 and Time 2 are shown in Table 9.9. Results of the paired samples t-tests are also shown in Table 9.9 and indicated that there were no significant differences between stress and coping scores at Time 1 and Time 2 for the UHR-P subgroup when the Bonferroni adjustment was applied. It is likely that these comparisons are significantly underpowered.
Table 9.9

Mean Scores on Stress and Coping Measures for the UHR-P Subgroup at Time 1
and Time 2 and Results of Comparisons Between the Two Timepoints

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
<th>t</th>
<th>p-value</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEIS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of LE</td>
<td>3.00 (1.41)</td>
<td>3.17 (1.40)</td>
<td>-0.411</td>
<td>.689</td>
<td>.015</td>
</tr>
<tr>
<td>Familiarity</td>
<td>6.12 (2.27)</td>
<td>5.39 (2.20)</td>
<td>1.373</td>
<td>.197</td>
<td>.146</td>
</tr>
<tr>
<td>Control</td>
<td>3.28 (2.18)</td>
<td>3.07 (2.24)</td>
<td>0.542</td>
<td>.599</td>
<td>.026</td>
</tr>
<tr>
<td>Notice</td>
<td>4.79 (2.90)</td>
<td>4.40 (1.94)</td>
<td>0.616</td>
<td>.550</td>
<td>.033</td>
</tr>
<tr>
<td>Time</td>
<td>5.16 (2.50)</td>
<td>5.00 (2.29)</td>
<td>0.283</td>
<td>.782</td>
<td>.007</td>
</tr>
<tr>
<td>Routine</td>
<td>4.38 (2.44)</td>
<td>5.24 (2.35)</td>
<td>-1.078</td>
<td>.304</td>
<td>.096</td>
</tr>
<tr>
<td>Desirability</td>
<td>3.98 (2.33)</td>
<td>4.15 (1.85)</td>
<td>-0.185</td>
<td>.857</td>
<td>.003</td>
</tr>
<tr>
<td>Coping</td>
<td>5.81 (1.88)</td>
<td>4.84 (1.75)</td>
<td>1.533</td>
<td>.156</td>
<td>.190</td>
</tr>
<tr>
<td>Uplifting</td>
<td>4.30 (1.61)</td>
<td>4.00 (1.50)</td>
<td>0.652</td>
<td>.528</td>
<td>.037</td>
</tr>
<tr>
<td><strong>HS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hassles</td>
<td>30.50 (18.90)</td>
<td>24.20 (11.08)</td>
<td>1.116</td>
<td>.293</td>
<td>.122</td>
</tr>
<tr>
<td>Severity</td>
<td>56.40 (39.52)</td>
<td>47.10 (27.27)</td>
<td>0.653</td>
<td>.530</td>
<td>.044</td>
</tr>
<tr>
<td>Intensity</td>
<td>1.88 (0.53)</td>
<td>1.94 (0.70)</td>
<td>-0.392</td>
<td>.704</td>
<td>.017</td>
</tr>
<tr>
<td><strong>PSS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34.33 (9.55)</td>
<td>28.00 (11.63)</td>
<td>2.506</td>
<td>.037</td>
<td>.440</td>
</tr>
<tr>
<td>General distress</td>
<td>18.11 (5.16)</td>
<td>13.00 (6.48)</td>
<td>2.931</td>
<td>.019</td>
<td>.518</td>
</tr>
<tr>
<td>Perceived coping</td>
<td>9.67 (4.06)</td>
<td>7.89 (4.57)</td>
<td>1.259</td>
<td>.244</td>
<td>.165</td>
</tr>
<tr>
<td><strong>CISS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>38.11 (15.10)</td>
<td>43.00 (18.53)</td>
<td>-1.027</td>
<td>.335</td>
<td>.116</td>
</tr>
<tr>
<td>Emotion</td>
<td>41.11 (11.95)</td>
<td>39.56 (20.21)</td>
<td>0.385</td>
<td>.711</td>
<td>.018</td>
</tr>
<tr>
<td>Avoidance</td>
<td>35.56 (8.96)</td>
<td>37.33 (14.12)</td>
<td>-0.498</td>
<td>.632</td>
<td>.030</td>
</tr>
<tr>
<td>Distraction</td>
<td>18.44 (5.50)</td>
<td>20.56 (8.63)</td>
<td>-1.065</td>
<td>.318</td>
<td>.124</td>
</tr>
<tr>
<td>Social Diversion</td>
<td>11.00 (5.43)</td>
<td>10.67 (5.45)</td>
<td>0.320</td>
<td>.757</td>
<td>.013</td>
</tr>
<tr>
<td><strong>SRS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of social contacts</td>
<td>3.56 (2.51)</td>
<td>4.22 (2.82)</td>
<td>-1.155</td>
<td>.282</td>
<td>.143</td>
</tr>
<tr>
<td>Satisfaction with social support</td>
<td>3.20 (1.30)</td>
<td>4.20 (1.10)</td>
<td>-1.195</td>
<td>.298</td>
<td>.263</td>
</tr>
</tbody>
</table>

Note. Standard deviation in brackets
9.7 Summary of Analysis of Relationship Between Stress and Coping and Transition to Psychosis

At the end of the 12-month follow-up period, 12.5% of the UHR cohort had developed acute psychosis. No differences were found between the groups on measures of stress and coping at baseline and these baseline scores did not significantly influence the onset of psychosis, except satisfaction with social support.

Analysis of the measures of stress and coping over the 12-month follow-up period had interesting results. It was found that all of the stress and coping variables were significantly associated with the risk of onset of acute psychosis in the UHR group. A possible explanation for the counter-intuitive finding that an increase on the scores obtained over time for each of those variables was associated with a decreased probability of developing acute psychosis will be given in the next chapter.

The second area of analysis described in this chapter focussed on the UHR-P group alone and investigated whether the onset of acute psychosis was preceded by a change in the experience of stress and coping. No significant change was found in any of the measures of stress and coping immediately preceding the development of acute symptoms. The small sample size of the UHR-P group has resulted in this last part of the analysis being significantly underpowered.
CHAPTER 10

Discussion

This study explored the contribution of stress and coping to the onset of psychosis in a high-risk group. First, the experiences of stress and coping reported over the course of a year by young people who were identified as being at ‘ultra’ high-risk of psychosis (UHR group) were compared with experiences of a group of young people without mental health concerns (HC group). Second, the experiences of stress and coping were compared between the UHR group members who developed psychosis (UHR-P) within the 12-month period with those who did not (UHR-NP). Finally, changes in experiences of stress and coping in the period of time preceding the onset of acute psychosis were investigated in the UHR-P subgroup.

In this chapter the results of these investigations are presented followed by detailed discussion of their implications. Limitations of the study and suggestions for future research are also considered.

10.1 Comparison of Stress and Coping Measures Between UHR and HC Groups

Hypothesis 1 predicted that members of the UHR group would report experiencing more stressful events (life events and hassles) and higher levels of distress, would utilise different coping techniques and would have fewer social supports than the healthy comparison group. Whilst all other predictions were supported, the UHR group reported significantly fewer life events than the HC group and no difference was found between the groups in the number of hassles they experienced. The UHR group was not ‘event-free’ as they reported experiencing an average of 12 events over the 12-month period compared to 18 events reported by the HC group.
A number of differences in coping style were observed between the groups. The UHR group were significantly more likely to use emotion-oriented coping strategies than the HC group and were significantly less likely to use task-oriented strategies. The UHR group were also significantly less likely to utilise social diversion than the HC group, but there were no differences in the use of general avoidance strategies or distraction to cope with stress. Furthermore, the UHR group rated their own success in coping with stressors significantly lower than the HC group rated their coping abilities. Finally, the UHR group reported significantly fewer social contacts and were significantly less satisfied with the available social support than the HC group were.

Significant differences were observed in the types of stressful events experienced by members of the two groups. The UHR group reported experiencing significantly more life events associated with platonic relationships, social activities, personal health and family than the HC group.

Significant differences also existed between the two groups in who they were more likely to have contact with. Although both groups most frequently had contact with friends, followed by immediate family members, the UHR group reported significantly fewer contacts with partners or boy/girlfriends, friends and colleagues than the HC group.

10.1.1 Life Events

The lower number of life events reported by the UHR group compared to the HC group was not anticipated from earlier studies that have assessed the experience of life events by individuals with established psychotic disorders. Individuals with established psychosis have usually reported experiencing more life events than healthy comparison groups (Brown & Birley, 1968; Canton & Fraccon, 1985; Schwartz & Myers, 1977a), although there have been exceptions (Al Khani et al., 1986; Gureje & Adewunmi, 1988; Ventura,
It was expected that the results of the current study would show that individuals at heightened risk of psychosis experienced more life events than members of a healthy comparison group. As the current study did not monitor the experiences of the UHR-P group after the onset of psychosis it is premature to make any conclusions about the relationship between stage of psychotic disorder and experience of life events. However, at first glance, the results of this study and studies of individuals with established psychosis suggest that there might be differences in the experience of life events depending on the stage or phase of psychotic illness. In other words, individuals in the onset phase of psychotic disorders might experience fewer stressful events than individuals who have developed a full psychotic disorder. Such a relationship is in direct opposition to a ‘kindling’ effect as seen in association with bipolar disorder, where higher levels of distress or stress precede the onset of a first manic episode than subsequent episodes (Ambelas, 1987; Dunner et al., 1979; Swann et al., 1990). Longitudinal studies that follow UHR-P subjects after the onset of psychosis are required to assess the relationship between illness progression and the experience of stressful events.

It is noted that the average number of life events reported by both groups in the current study was higher than the number of events reported in studies of established psychotic disorders. In the current study, the UHR group reported experiencing an average of three events per month and the HC group reported an average of four. However, in the study by Schwartz and Myers (1977b) individuals with schizophrenia reported experiencing an average of three events during a six-month period, while a healthy comparison group reported an average of two events over the same time period. Similarly, in the study by Brown and Birley (1968), the patient group experienced almost double the number of stressful events over a 13-week period (mean = 1.74 events) than the comparison group (mean = 0.96 events).

The difference in number of life events reported by participants in this study and earlier studies is possibly associated with the different measures
that were used to quantify the number of life events experienced. The questionnaires used in the earlier studies assessed the experience of major stressful life events only. The LEIS, which was used in the current study, was developed to assess the experience of both major and minor events. This is reflected in the significant correlations that were found between the number of life events assessed using the LEIS and the number of hassles assessed using the Hassles Scale in both the UHR and HC groups. Unfortunately reliability and validity data have not yet been published for the LEIS, but the correlations between the LEIS subscales and some of the other measures indicated good construct validity. For example, the LEIS-Coping subscale score was significantly correlated with the PSS-Coping subscale score in both the UHR and HC groups and the LEIS-Uplifting subscale score was significantly correlated with the PSS-Total Score. Although longitudinal data were collected, test-retest reliability was not assessed for the LEIS (or the other measures) as the parameters that were being assessed were expected to change over time.

The LEIS was chosen for the current study because it was developed specifically for use with first episode psychosis populations and was therefore thought to be particularly appropriate for use with the UHR population. It also improved upon older scales by assessing qualitative aspects of the events that were reported. Using a measure that simply counted the number of major life events that were experienced might have produced different results, but the quality of the information gathered from participants would not have been as detailed.

It is also possible that the differences in the number of life events reported by participants in this study compared to other studies was associated with differences in age between study cohorts. There is a great deal of evidence that the type of stressful events that are experienced, and the associated coping responses, vary across the life-span (Babcock, Laguna, Laguna, & Urusky, 2000; Finney, 2002; Goodyer, 1990; McGuire, Mitic, & Neumann,
The participants in this study (both the UHR and HC groups) were younger than participants in most of the studies that have investigated the relationship between stress, coping and established psychosis. This was expected, as the average age of individuals who are potentially experiencing the onset phase of disorder would, logically, be younger than individuals who have already developed the disorder. Also, studies in established psychotic disorders have tended to include individuals who have been unwell for a number of years. Therefore, the difference in the number of life events reported by participants in this study compared to other studies might also be partly attributable to the age difference between the groups.

The Edinburgh High-Risk Project (EHRP) assessed the experience of stressful events by a cohort of young people deemed at ‘high-risk’ by virtue of a family history of psychosis. Miller and colleagues (2001) reported that there were no differences in the number of life events experienced by their high-risk and comparison groups. However, data regarding the experience of life events that were collected in the EHRP assessed the number of events experienced over the entire lifetime prior to recruitment to that study whilst each assessment point in the current study only reviewed events experienced over the previous month. The design of the EHRP did not allow investigation of whether the experience of stress and coping changed during the prodromal phase of psychosis and subjective or qualitative aspects of the experience of stressful events were also not assessed.

To date, the only other UHR study that has explored experiences of stress is that of Mason and colleagues at the Personal Assistance Service (PAS: Mason et al., 2004). The results of that study are similar to the current study in that the experience of recent stressful events did not predict onset of psychosis in their UHR group. Unfortunately the PAS study was cross-sectional and did not evaluate subjective experiences of stressors. It is hoped that these
researchers are considering or are currently conducting further research in this area.

Most life event studies with individuals with established psychotic disorders have simply quantified the number of events experienced by subjects and have not investigated the content of those events. One exception is Jacobs and Myers (1976) who reported that individuals with schizophrenia were more likely to have experienced events categorised as ‘family related’ or ‘relocations’ (moving house) than a healthy comparison group. In the current study, the events that were most commonly reported by the UHR group were those associated with their own health, family, romantic relationships and daily activities (employment, education and social activities). They reported experiencing significantly more life events associated with platonic relationships, social activities, personal health and family than the HC group. These results suggest that the UHR group remained socially active despite experiencing significant levels of psychiatric symptomatology. However, the results also indicate that this level of activity was maintained with some difficulty and distress.

10.1.2 Hassles

No significant difference was found in the number of hassles reported over the 12-month period between the UHR and HC groups, although the analysis suggested a trend towards the UHR group reporting more minor stressful events. However, the UHR group rated the hassles they experienced as significantly more intense or distressing than the HC group rated the hassles they experienced. This suggests that young people identified as being at heightened risk of developing a psychotic disorder are more likely to be negatively affected by stressors that are associated with comparatively normal circumstances than young people without mental health difficulties.
There have been no previous studies that have investigated the experience of minor events or hassles by young people at heightened risk of psychosis. Unfortunately the previous studies that have investigated the experience of hassles by individuals with established psychotic disorders did not compare their experiences with comparison groups and used different measures than the current study (Beck & Worthen, 1972; Malla et al., 1990; Norman & Malla, 1993, 1994).

10.1.3 Distress

The UHR group reported significantly higher levels of general distress, as well as distress in response to both minor and major events than the HC group. Therefore, a key point of difference between the UHR and HC groups was the impact events had on the individual’s sense of well being, rather than the number of stressful events that were experienced. This will be expanded upon later. The current study is the first to investigate this subjective quality of stress in a UHR cohort. In fact, there are few studies that have investigated the level of distress of individuals with established psychotic disorders (Farhall & Gehrke, 1997; Malla & Norman, 1992; Nayani & David, 1996; Norman & Malla, 1991). Ventura, Nuechterlein, and Subotnik (2000) conducted a study with individuals who were experiencing a first psychotic episode and reported similar results to the current study. In that study, individuals who had experienced a first psychotic episode reported fewer life events than a healthy comparison group but were significantly more distressed. Norman and Malla (1991) reported that the level of distress reported by individuals with schizophrenia was significantly correlated with the number of minor stressors experienced, but not with the number of life events. They concluded that individuals with schizophrenia were more distressed as a result of comparatively normal circumstances (hassles) than less frequent major life changes and challenges. However, in the current study the level of distress reported by the UHR group was not significantly
correlated with either the number of major or minor events that were reported. Thus, the level of distress reported by the UHR group was not simply a reflection of the number of stressful events that were experienced, but was potentially associated with the thoughts and appraisals of those events. This point will be expanded upon later.

10.1.4 Coping

In addition to appraising events as more distressing or upsetting than the HC group, the UHR group also indicated they felt less able to cope with stressors than the HC group. Although there have been no previous studies of perceptions of coping ability in a UHR cohort, the perception of poorer coping skills has been reported in a study of young people with recent onset first episode psychosis (Macdonald, Pica, et al., 1998).

Significant differences were found between the UHR and HC groups in the coping strategies they were likely to use to respond to stress. The UHR group were less likely to utilise task-oriented coping strategies and more likely to utilise emotion-oriented strategies than the HC group. This finding is similar to that of van den Bosch et al. (1992) who reported that individuals with established psychosis were more likely to use emotion-oriented strategies than task-oriented strategies, however, other studies have not reported such coping characteristics in psychotic populations (Brenner et al., 1987; Wiedl & Schottner, 1991). The only previous study of coping strategies employed by UHR individuals also reported that the UHR group used less adaptive coping (task-oriented coping) than individuals with either first psychotic episode or established schizophrenia (Lewin et al., 2001). Unfortunately that study did not include a healthy comparison group.

The finding that the UHR group were more likely to utilise emotion-oriented coping strategies than task-oriented strategies is in line with the
view held by the UHR group that they were unable to cope well with stressors. Generally, if a person perceives that a situation is amenable to change then task-oriented coping strategies tend to be applied (Folkman & Lazarus, 1980; Parker & Endler, 1992). If the person does not believe that they can influence events, emotion-oriented strategies are more likely. This also ties in with the finding that the UHR group felt they had less control over events occurring as locus of control has been cited as a key influence on coping strategies (Bollini, et al., 2004; Giankos, 2002; Moore, 2002; O’Connor & Shimizu, 2002; Zuckerman et al., 2004).

There was no overall difference between the UHR and HC groups in the use of avoidance as a way of coping with stressors. There was also no difference between the UHR and HC groups in the use of distraction as a specific avoidance technique, but the UHR group were less likely to utilise social diversion than the HC group. There have been no previous investigations of the use of avoidance as a coping technique by UHR groups.

10.1.5 Social Support

The lower use of social diversion as a coping strategy by members of the UHR group was not surprising given that they had significantly fewer social contacts than the HC group and were less satisfied with the social supports they were able to draw upon. It is noted that the UHR group did not indicate high levels of dissatisfaction with the social support that was available to them. Rather, mean scores indicated that they were ‘a little satisfied’ with their social support. In comparison, the HC group reported being ‘fairly’ to ‘very satisfied’ on average. This suggests that the UHR group had some positive social experiences, albeit fewer than the HC group.

As indicated in Chapter 5, low levels of social support and social contact are endemic to psychotic illnesses. Further, social withdrawal is described as
a common pre-psychotic feature (Yung & McGorry, 1996a). Therefore, it was expected that the UHR group would report having fewer social contacts than the comparison group members.

The UHR group reported significantly fewer contacts with partners, friends and colleagues than the HC group but there was no difference between the groups in the number of reported contacts with family (first degree relatives and others) and professionals. This indicates that the UHR group remained engaged in some regular social interaction. Contact with professionals appears to have been under-reported by the UHR groups because most UHR participants had some level of involvement with the PACE Clinic as patients as well as research participants but few participants listed PACE clinicians or research interviewers regularly in their list of contacts. The difference between the groups in contact with partners reflects the fact that more HC group members were involved in a long-term relationship than UHR members, and was significant even when the age difference between the groups was controlled for. The difference between the groups in contact with partners, friends and colleagues suggests that the UHR participants were socially withdrawn and/or had poorer social skills than the HC group. Lewin et al. (2001) reported that their UHR group also had few social supports compared to individuals with either a first psychotic episode or established schizophrenia. The results of these two studies with UHR cohorts challenge the assertion by Lipton et al. (1981) that the ‘network collapse’ that has been described in association with schizophrenia occurs following an initial admission to hospital and suggests that it might, in fact, begin to manifest during the onset phase of illness. Once again, longitudinal studies of individuals who have experienced an acute psychotic episode are required.

The experience of negative aspects of social support was not formally assessed in the current study. As outlined in Chapter 2, ‘negative’ social support is not simply the absence of support networks, but is associated with unsupportive and destructive relationships. It would be particularly
interesting to study the experience of negative relationships and the concept of expressed emotion in the UHR group and the relationship between unsupportive relationships and onset of acute psychosis.

10.1.6 Summary and Implications

In summary, the comparison of stress and coping variables between the UHR and HC groups indicated that the groups experienced different types of stressors and interpreted and reacted to them differently. Unfortunately, the study did not permit analysis of whether the experiences of stress and coping described by the UHR group preceded the onset of UHR symptoms or if there had been a change with the onset of the UHR mental state changes. To do this, individuals would need to be followed longitudinally from before the onset of any UHR symptoms through to the onset of acute psychosis.

Although the young people identified as being at heightened risk of psychosis did not experience more stressful events than young people without mental health concerns, they interpreted their experiences of stress and distress differently. Using Lazarus’ terminology from the transactional model of stress (Lazarus & Folkman, 1984), the UHR group appraised their experiences as more distressing than the HC group rated their own experiences.

The heightened distress reported by the UHR group has two potential sources. First, the UHR group rated events as more upsetting and undesirable than the HC group did, although the latter was not significant. Applying Lazarus’ terminology again, this suggests that the primary appraisal of stressful events by the UHR group was that they posed a degree of threat to the individual resulting in heightened feelings of distress. Levels of distress experienced by the UHR group were negatively correlated with perceptions of desirability, advance notice and control over events as well as coping ability.
Second, the UHR group rated their ability to cope with stressors significantly more poorly than the HC group rated their own coping abilities. In other words, their secondary appraisal was that they had insufficient resources to manage stressors effectively. This perception is likely to have influenced the finding that the UHR group were more likely to utilise emotion-oriented coping strategies than the HC group and less likely to utilise task-oriented strategies, as well as heightening feelings of distress. Heightened feelings of distress are also likely to be associated with lower confidence in the ability to handle new situations and a lack of confidence in reviewing past experiences. Therefore, social withdrawal was possibly used by the UHR group in a bid to reduce the number of life events experienced and, hence, to minimise feelings of distress. Indeed, positive correlations were found between levels of social contacts, hassles and life events. In this context, the significant differences between the UHR and HC groups in the number of social contacts reported and satisfaction with social support were expected.

Positive associations were found between the number of social contacts, number of life events and number of hassles reported by the UHR group. However, significant relationships were not found between the number of stressors experienced (life events or hassles), number of social contacts and level of distress. In fact, level of distress increased as the desirability of events and the perception of coping ability decreased. The more advance notice an individual had about an impending event, the higher the degree of control they felt they had over its occurrence and the more desirable it was, the greater the perceived ability to cope and the less distress associated with that event. These associations make sense in terms of the transactional model of stress. Of course, the temporal relationships between these variables can only be speculated at this time.

Significant relationships were found between the stress and coping variables and the measures of psychiatric symptomatology reported by the UHR group. As the levels of distress increased, so did the level of general
psychiatric symptomatology, as did specific positive and negative psychotic symptoms. A positive relationship was also found between the level of psychiatric symptomatology experienced by the UHR group and perceptions of coping ability. Higher levels of global symptomatology and psychotic symptoms were associated with lower levels of satisfaction with social support. Further, as negative symptoms increased, the use of social diversion as a coping strategy decreased. These results lend support to the stress-vulnerability model of psychosis.

A tentative model of the interaction between stress, coping and symptomatology in the UHR cohort is illustrated in Figure 10.1. The current study did not enable the direction of the associations between factors to be determined so this model is somewhat speculative at the present time.

![Tentative model of stress, coping, and symptomatology](image)

**Figure 10.1.** Preliminary model of the experiences of stress and coping of UHR cohort.

Differences in the patterns of inter-correlations between the various stress and coping measures lend some preliminary support to the model. For example, a significant positive correlation was found between the symptom measures and the PSS-Total score (indicating level of distress) for the UHR
group and a negative correlation existed between the PSS-Total score and the LEIS subscale indicating perception of coping ability. These measures were not significantly correlated with one another when considering the responses of the HC group. This suggests that the symptoms experienced by the UHR group might mediate between perceptions of coping ability and distress as suggested in Figure 10.1. Another interesting pattern of results was that for the UHR group, number of hassles and life events experienced were both significantly positively associated with the number of social contacts reported. This pattern was not found for the HC group. Once again, this supports the model proposed in Figure 10.1 and suggests that social stressors are particularly salient for young people meeting UHR criteria. This is also indicated by the finding that the UHR group were significantly more likely to report life events that were associated with platonic relationships, social activities and family than the HC group (as reported earlier).

10.2 Do Stress and Coping Predict the Onset of Psychosis in the UHR Cohort?

Hypothesis 2 focussed on the role of stress and coping in the development of psychosis in the UHR cohort. It was predicted that those UHR participants who developed an acute psychotic episode within 12 months of entering the study (the UHR-P subgroup) would report more minor and major stressors, higher levels of distress, different coping strategies and fewer and less satisfactory social supports than the participants who did not develop acute psychosis (UHR-NP subgroup). Furthermore, it was hypothesised that these factors would influence the likelihood of onset of psychosis.

Survival analysis indicated that, when analysed independently, each of the stress and coping variables that were assessed was significantly associated with the risk of onset. In other words, each of the variables was predictive of onset of acute psychosis in the UHR group. Interestingly, the direction of the relationship between risk of onset and the variables was not always as
expected based on previous research (Brown & Birley, 1968; Canton & Fraccon, 1985; Schwartz & Myers, 1977a), or the stress-vulnerability model (Zubin & Spring, 1977), which suggest that onset of psychosis is associated with the experience of more stressful events. The results of the analyses indicated that for all variables, an increase in the phenomenon being measured was associated with decreased likelihood that acute psychosis would develop. Thus, increasing experience of major and minor stressors and increasing levels of distress were associated with decreased likelihood of acute psychosis developing. Similarly, increasing use of each of the coping strategies measured - task-oriented, emotion-oriented, and avoidance - was associated with a decreased likelihood that psychosis would develop, as was increased number of social contacts and satisfaction with social support. Thus, there was mixed support for Hypothesis 2.

These results suggest that although increasing levels of major or minor stressors or increasing levels of distress did not predict the onset of psychosis, increasing use of coping strategies as well as a perception of better coping might be protective against the onset of acute psychosis in the UHR group. The impression that increased coping resources is not predictive of acute psychosis is supported by the finding that increased numbers of social contacts and increased satisfaction with social support were also associated with a decreased likelihood of the onset of psychosis.

Analysis of the individual LEIS subscales, which assessed qualitative aspects of life events, was interesting. Greater levels of familiarity, advance notice, desirability and control over the experience of life events were associated with decreased risk of psychosis as were increasing amount of time spent thinking about events and increasing disruption to routine and distress associated with them. In other words, time to prepare for an impending event helped to reduce stress and potentially reduced the application of emotionally-driven coping strategies.
At first glance these results do not appear to support the stress-vulnerability model of psychosis, which suggests that increased risk of psychosis is associated with increased stressful experiences and increased level of distress in individuals with pre-existing heightened vulnerability (Zubin & Spring, 1977). However, upon closer examination, the results suggest that the coping response to stressful experiences might be an important factor determining the onset of psychosis in the UHR group, rather than the experience of stressful events alone. The experience of increased levels of distress and increasing numbers of stressful events was met by an increase in the utilisation of all coping strategies, including social support, which reduced the likelihood of acute psychosis actually developing. This interpretation is supported by the finding that most of the variance in probability of onset of acute psychosis was accounted for by the different types of coping strategies, the number of social contacts and level of satisfaction with social support, the amount of time events were thought about, the amount of control the individual felt they had over the occurrence of events and the individual’s perception of their own capacity to cope with stressors.

These results suggest that simply quantifying the number of stressors experienced by young people at heightened risk of psychosis is not sufficient to judge whether onset is more or less likely. The relationship between stress, coping and the onset of psychosis in vulnerable young people is more complex and, once again, the appraisal of stressors and coping responses appear to play a pivotal role. Participants in the UHR group who were able to enact coping strategies and, perhaps most importantly, perceived that they could respond to stressors appropriately and adequately, even when those stressors were associated with heightened feelings of distress, were at reduced risk of developing psychosis.

The finding that the experience of fewer stressful events was predictive of the onset of acute psychosis might reflect the relationship between psychotic
symptoms and social and role functioning. The transition to acute psychosis was defined by the intensity of psychotic symptoms exceeding a defined threshold. It is possible that as the level of psychotic symptoms such as paranoia or hallucinations increases, the individual becomes increasingly socially withdrawn and less likely to maintain usual levels of occupational and social functioning. Under these circumstances, an individual is possibly less likely to experience new and challenging life events and, therefore, is less likely to report heightened distress about stressful events. Increased levels of symptomatology, which was also shown to be associated with stress and coping, might also compromise the implementation of coping strategies so that the individual reports lower usage of all coping strategies. In other words, they do not rate their coping abilities as poor because they will have had little opportunity to utilise and assess them. This model is shown in Figure 10.2.

Although this model was unable to be fully assessed in the current study as the sample size was too low, the results are similar to those of the study of adaptation to schizophrenia conducted by Lecomte and Mercier (2005). They found that increased experience of life events, particularly life events associated with social relationships, was associated with better adaptation to illness. They concluded that the experience of life events by individuals with established schizophrenia reflects the maintenance of a level of social functioning and this might be a protective factor against ongoing disability. Similarly in the UHR group, maintaining social relationships might decrease vulnerability to developing a psychotic illness because the individual remains engaged with the wider world.
Increasing psychotic symptoms
\[\rightarrow\]
Social withdrawal and decreased functioning
\[\uparrow\]
Fewer stressful events
\[\downarrow\]
Lower use of coping skills

**Figure 10.2.** Model of interaction between stress and coping variables and psychotic symptoms in UHR-P group.

### 10.3 Is There a Change in the Experience of Stress and Coping Immediately Before the Onset of Acute Psychosis?

The final hypothesis aimed to determine whether there was an increase in the number of stressors and level of distress, a change in the coping strategies used and a decrease in the number of social contacts and satisfaction with social support experienced in the month immediately preceding the onset of psychosis compared with three months earlier. The data did not support this hypothesis. There was no change in the number of stressors or level of distress experienced, the type of coping strategies used or the number of social contacts or satisfaction with social support reported by the UHR-P subgroup in the month immediately preceding the onset of psychosis compared with three months earlier.

The small sample size of the UHR-P group significantly reduced the likelihood of detecting any differences between the time points. As indicated above, further investigation with a larger cohort of UHR participants who develop psychosis is required to assess this model further.
10.4 Theoretical Implications

A major objective of this study was to evaluate the stress-vulnerability model of psychosis, which suggests that psychotic disorders develop from an interaction between an underlying vulnerability towards illness, possibly associated with a pre-or peri-natal event, and the experience of increased levels of distress (Zubin & Spring, 1977). Psychosis sufferers themselves often cite a link between the experience of stressors, level of distress and psychotic symptoms when describing their own experiences. For example, when describing a psychotic relapse, one young woman stated “...a stressful time in my life came up and the psychosis is now back” (Early Psychosis Prevention & Intervention Centre, 2000, p. 30).

Previous studies of the relationship between stress, coping and psychotic illness have largely focussed on established psychotic disorders, have had retrospective designs and have only incorporated simple quantitative measures of stressful event to estimate levels of distress. The current study extended this literature by shifting the focus to the pre-psychotic phase of psychosis. Indeed, it is among the first study to assess psychological parameters of stress and coping in a cohort of young people identified as being at ultra high risk for psychosis. It is certainly the most comprehensive description to date. The measures used to assess experiences of stress and coping in this study not only quantified the number of stressful events that occurred, but also assessed individuals’ subjective evaluation of the stressors they experienced and their coping responses.

The comparison of the experiences of stress and coping between the UHR and HC cohorts indicated that the UHR group experienced significantly fewer stressful life events and the same number of minor events as the HC group, but were more distressed, employed different coping techniques and felt they coped with stressors more poorly. They also reported fewer social contacts that the HC group and less satisfaction with contacts they did have. These
results suggest that the appraisal of stressors and coping responses and resources was the key factor that differentiated the groups. This is the first known study to provide some direct validation for the ‘stress’ aspect of the stress-vulnerability model of psychosis.

The second component of this study aimed to determine if the experience of stress and associated coping responses can predict the onset of acute psychosis in the UHR cohort. This is the first study to directly evaluate this relationship prospectively in a group of young people who have not previously experienced a psychotic episode and was possible due to the relatively recent development of reliable criteria for identifying the UHR population (Yung, Phillips & McGorry, 2004). Once again, the results suggested that appraisals made of stressful experiences and coping responses might play a significant role in the onset of acute psychosis.

10.5 Practical Implications

The results of this study suggest that UHR individuals might benefit from treatment that incorporates a focus on stress management and coping skills. For example, cognitive therapy, whereby appraisals about stressors are evaluated and challenged, and relaxation training could reduce distress and could provide some insight into the use of maladaptive coping strategies and protection against the development of acute psychosis. The UHR participants had smaller social networks than the HC group and were less satisfied with their social supports, suggesting that they might also benefit from social skills training, and therapy addressing social withdrawal and possibly social anxiety.

The efficacy of cognitive therapy has been clearly demonstrated in studies with individuals with established psychotic disorders (Drury, Birchwood, & Cochrane, 2000; Haddock et al., 1998; Lewis et al., 2002; Sensky et al., 2000; Tarrier et al., 1998). A specific ‘coping-oriented’ therapy, incorporating
psychoeducation, and stress management has been shown to have beneficial impact on symptomatology and social functioning in individuals with established schizophrenia (Andres, et al., 2003). Norman et al. (2002) reported that the addition of stress management to an existing pharmacological and psychological treatment for individuals with schizophrenia did not have an immediate impact on symptom level or perceived stress but reduced relapse rates at one-year follow-up. Penn and colleagues (2004) presented a convincing discussion on the merits of psychological treatment for individuals with schizophrenia that incorporates supportive therapy. They suggest that provision of a supportive therapeutic alliance has wide ranging benefits including impacting on social cognition and described a “functional” CBT approach (FCBT) that focuses on enhancing the level of functioning and well-being of individuals with schizophrenia (Penn et al., 2004). Similar approaches might be appropriate for the UHR group. Results from the first studies that have assessed the efficacy of cognitive therapy with UHR cohorts have been promising (McGorry et al., 2002; Morrison et al., 2004). The specific impact of therapy on variables associated with stress and coping has not yet been assessed.

Future studies exploring other psychological factors that are known to influence the appraisals made about stressors and coping, such as hardiness, locus of control and self-efficacy, in UHR individuals could influence the development of treatment approaches for UHR individuals further. Obviously the merits of treatment directly targeting subthreshold psychotic symptoms and other symptomatology should also continue to be studied.

10.6 Future Research

The current study has focussed solely on psychological aspects of stress and coping and assessment has been limited to the completion of questionnaires by participants. Future studies with the UHR population could incorporate an
'in vivo' measure of stress and coping such as the Experience-Sampling Method described by Myin-Germys et al. (2001) or the role-playing approach described by Horan and Blanchard (2003) to enhance the information that is obtained about individual responses to stressors.

An area of research that has not been addressed in the current study is whether the physiological processes that underlie the experience of stress are associated with the neurobiological changes that are thought to be involved in the development of psychosis. For example, temporal lobe structures, particularly the hippocampus, play a central role in regulating Hypothalamic-Pituitary-Adrenal (HPA) axis functioning (Sherwood, 1989) and also appear to be centrally involved in the development and maintenance of psychotic disorders (Pantelis et al., 2003). Therefore, a potential area for future study is whether correlates of HPA-axis functioning (such as cortisol levels) are associated with the transition to acute psychosis in the UHR group (Corcoran et al., 2005; Cotter & Pariante, 2002). It is also possible that the experience of stress influences the physical health of individuals either at risk of psychosis or experiencing established psychotic illnesses. For example, one researcher has recently proposed that the experience of stress by individuals with schizophrenia can lead to the development of diabetes mellitus through increased production of cortisol and adrenaline via the HPA and sympathoadrenal-medullary axes (Dinan, 2004). Obviously this requires further study.

Although this study has found significant differences in variables associated with stress and coping between the UHR and HC groups, it was not possible to assess whether these differences emerged with the onset of UHR symptoms or were more long-standing and ‘trait-like’. Investigating whether the differences found between the UHR and HC groups pre-date the onset of UHR symptoms is not possible without a reliable method to identify the UHR cohort even earlier prior to the onset of UHR symptoms. Furthermore, this study did not attempt to investigate the role stress and coping play in the course of
established psychotic illnesses. Whilst some previous studies have indicated that relapse episodes are preceded by an increase in the experience of stressful events (Brown & Birley, 1968; Das et al., 1997; Michaux et al., 1967; Pallanti et al., 1997; Ventura et al., 1989), others have not demonstrated that relationship (Hardesty et al., 1985; Hirsch et al., 1996). Future longitudinal studies could be broader, investigating coping, and appraisal of stressors and whether those factors differentially influence the course and outcome of various established psychotic illnesses.

Although the current study has focussed on experiences of stress and coping in the ‘ultra’ high-risk cohort, there are many other factors that were not assessed that are likely to be important in both the development of an ‘at risk mental state’ and the transition from ‘at risk’ to acute psychosis. Further research is required incorporating measures of stress and coping with other aetiological factors of psychosis to determine the relative contribution of different factors to onset. Factors that have been proposed to play a role in these processes include pre- and peri-natal events such as maternal infection during pregnancy and obstetric complications, family relationships and other environmental factors (Bachman et al., 2002; Flensmark, 2004; McNeil & Cantor-Graae, 2000a, 2000b; Torrey, Bowler, & Clark, 1997; Yolken, Karlsson, Yee, Johnston-Wilson, & Torrey, 2000). An example of such a study in a UHR cohort would be the longitudinal assessment of psychological aspects of stress and coping in conjunction with longitudinal assessment of brain structure and function. This could determine whether experiences of stress and coping during the onset phase of psychosis are associated with neuronal changes that are thought to underlie the development of illness (Block et al., 2000). The outcome of such studies will further inform the development of preventive interventions.

A previous study has reported that 75% of a UHR cohort met criteria for at least one diagnosable psychiatric disorder. They are primarily diagnosed with mood and anxiety disorders in addition to meeting UHR criteria when first
assessed (Leicester, Amminger, Phillips, Yuen, & McGorry, 2002). It would be interesting to determine the relationships between subthreshold psychotic symptoms, more general psychiatric symptomatology, and the appraisal of stressors by the UHR group. Future studies could also incorporate a comparison group of young people with a mood or anxiety disorder but not subthreshold psychotic symptoms to determine if the UHR groups have a unique way of viewing stress and coping, or if this is shared by young people with other mental health concerns.

10.7 Limitations of the Current Study

Many of the limitations of the current study are inherent to research with the UHR population. One major criticism of this research is that UHR groups recruited through clinical services such as the PACE Clinic are not representative of the entire population of young people who eventually develop a psychotic episode (Corcoran et al., 2005). It has already been acknowledged that the UHR individuals were distressed about the symptoms they had experienced and had sought assistance to moderate this distress. However, not all young people who experience subthreshold psychotic symptoms are motivated to seek treatment or are even aware how to go about seeking treatment.

UHR cohorts are also characterised by young people who have experienced some symptoms and/or a change in functioning for an extensive period of time - the mean duration of any symptoms in the UHR cohort in this study was 355.63 days (SD = 446.93). Thus, young people with a rapid onset of psychosis are under-represented in UHR cohorts.

Most members of both the UHR and HC groups were born in Australia, as were their parents. This compromises the generalisability of results of this study because the wider Australian community is made up of a much more
diverse cultural mix, including a significant proportion of individuals who do not have English as their primary language (Australian Bureau of Statistics, 2005). This has previously been identified as a limitation of the research undertaken at the PACE Clinic (Phillips, Yung, Yuen, Pantelis, & McGorry, 2002). Inclusion criteria for both groups specified that participants were fluent in English and unfortunately it was beyond the resources of this study to develop copies of the measures in community languages other than English.

A more specific limitation of the current study is the small sample size of the UHR-P group. This limited the analyses that could be performed and, particularly, did not allow the interaction between the various measures of stress and coping and psychosis onset to be fully explored. The 12-month transition rate to acute psychosis in the current cohort (12.5%) was lower than that reported in earlier PACE cohorts (24- 41%: Yung et al., 2004), as well as cohorts at other UHR clinics (PRIME Clinic, USA - 54%: Miller, McGlashan et al., 2002; Norway - 43%: Larsen, 2002; EDIE, UK - 22%: Morrison et al., 2002; PAS, Australia - 50%: Mason et al., 2004). The transition rate to psychosis in young people attending PACE has decreased over time and this is a phenomenon that has been seen in other UHR clinics (P. McGorry, personal communication, November 2004). Reasons for this can only be speculated at the current time, but possibly include subtle shifts in threshold for inclusion and acute psychosis in UHR (‘lowering and raising the bar’; Corcoran et al., 2005), as well as improvements in treatment in line with the advent of clinical trials with this population (McGorry et al., 2002; Morrison et al., 2004; Woods et al., 2003). Although the transition rate in the current study is lower than other UHR cohorts, it remains considerably higher than the reported incidence rates of psychosis in the general population (Frangou & Murray, 2000; Jablensky et al., 1992). Inclusion of a much larger group of young people who met UHR criteria and who developed psychosis would have allowed the models that were developed from the current study to be evaluated using sophisticated statistical approaches such as structural equation modelling.
All of the members of the UHR group in this study received supportive counselling, aimed at reducing distress and minimising health-damaging behaviours, as well as whatever anti-depressant or anxiolytic medication was considered necessary to treat presenting symptoms. They also all had access to a 24-hour crisis service and family support and education was available. In addition, some of the UHR participants were involved in clinical trials being conducted at the PACE Clinic at the same time as the current study. The provision of some form of clinical treatment to UHR individuals who attend the PACE Clinic is considered an ethical responsibility in light of the distress that is commonly experienced by this group of young people and their help-seeking behaviour (McGorry, Yung, & Phillips, 2001; Yung, Phillips, & McGorry, 2004). Nevertheless, treatment was a confounding factor that could have impacted on the development of psychosis, as well as on the appraisal of stressors and implementation of coping strategies. However, it is noted that the results of the analysis of potential predictors of psychosis did not change if the UHR individuals who were enrolled in the clinical trials were not excluded from the analysis, suggesting that the influence of the specific treatments on the relationship between the stress and coping variables and onset of psychosis was minimal. Studies by Bartkó et al. (1987), Leff et al. (1973), McEvoy et al. (1984), and Ventura et al. (1992) have all indicated that a relapse psychotic episode was more likely to be preceded by an increase in the frequency of stressful life events experienced by individuals who were taking anti-psychotic medication than individuals who were not, suggesting that individuals taking anti-psychotic medication might need to experience higher levels of stress to suffer a relapse. A similar relationship might be seen in the onset of a first psychotic episode. As indicated above, further research is obviously required to determine the benefits of treatment in the UHR population.

The UHR group were experiencing significant levels of positive and negative psychotic symptoms and general psychiatric symptomatology at the baseline assessment as well as significantly reduced levels of global functioning.
compared to the HC group. A significant limitation of the current study was that the influence of psychiatric symptoms on the experience of stressors, appraisal of stressors or coping was not assessed or controlled for. Wiedl and Schottner (1991) stated that it is assumed that the symptoms related to schizophrenia cause specific strain and burden and thus bring about stress for the individual and the effectiveness of coping with symptoms might significantly affect processes that contribute to the illness course. The symptoms experienced by the UHR cohort and how well they coped with those symptoms could have had a similar impact on the initial onset of disorder. This should be considered in future studies of stress and coping with the UHR population. The Coping with Symptoms Checklist (Yanos, Knight, & Bremer, 2003) was recently developed, and could be incorporated in such an investigation.

Finally, a number of significant demographic differences were found between the UHR and HC groups included in this study. The UHR group were significantly younger than the HC group. The disparity in age between the groups is thought to contribute towards other differences such as marital status, years of formal education and living arrangements. Furthermore, previous studies have suggested that the type of stressful events that are experienced and coping responses vary with age (Finney, 2002; Sperling, 2003). Consequently, age was included as a covariate in the comparisons of stress and coping variables between the groups.

Another difference between the groups was in employment status at the baseline interview. The majority of UHR subjects were enrolled in secondary education at the time of entry into this study (48%) or were unemployed (21%), whilst the HC group were more likely to be enrolled in tertiary education (59%). These differences were most likely due to the age difference between the groups as well as the fact that the HC group were recruited through the placement of advertisements in employment agencies, a university and a residential college for tertiary students, whilst the UHR
group were referred to the PACE Clinic from education, health and welfare agencies.

According to NART scores, the IQ level of the HC group was significantly higher than the UHR group. This difference is partly explained by the disparities in age and educational level between the groups, as the NART-IQ equivalent was calculated using a formula that incorporates highest educational level achieved (Willshire et al., 1991). The reliability of the NART in younger cohorts is questionable as the derived IQ score also depends on an individual’s ability to read and correctly pronounce irregular words. It is unlikely that word knowledge is fully developed by late adolescence, so the NART might be systematically biased against younger subjects.

Another potential explanation for the difference in NART scores between the groups is that the lower IQ of the UHR group might reflect the impact that UHR symptoms and compromised functioning has already had on cognitive ability of the that cohort. Further research is required to explore this possibility. It is noted that the use of the NART as an estimate of IQ in the UHR cohort has not been adequately validated.

Future studies comparing a UHR group with a healthy comparison group should aim to match the groups more closely on a range of variables - particularly those that might have some bearing on the central parameters being investigated. When this study was initially designed it was thought that the HC group could be recruited from friends of the UHR group and that this strategy would, hopefully, have limited differences between the groups. Unfortunately this did not eventuate as the UHR group either were reluctant to nominate friends for inclusion in the study or did not have friends to nominate. In retrospect, this is not surprising given that the results of the study have indicated that the UHR group has a smaller social network size than the HC group.
Unfortunately, only 54% of the UHR group remained involved in the study for the complete 12-month period. The retention rate for the HC group was significantly better, with 78% remaining involved for 12-months. Missing data, through participant drop-out is common to longitudinal studies (Anstey & Hofer, 2004). Further, the extent of required involvement of participants in the current study was not insignificant. This is particularly true of the UHR group, who ideally would have been followed-up monthly. Their involvement in this study occurred at a time of considerable uncertainty and change, including involvement with a mental health service usually for the first time, and it is not surprising that a number of assessments were missed. Further, most of the HC group and many of the UHR group were involved in education or employment and these commitments took precedence over involvement in the study. Strategies aimed at minimising drop-out included providing all participants with a small payment for their time and travel expenses following each interview and conducting interviews at a site chosen by the participant, such as home or a local café. Obviously, valuable information is missing from those participants who did not remain involved for the full duration of the study.

10.8 Conclusion

Young people at ‘ultra’ high-risk of psychosis experience higher levels of distress and react differently to stressful events than young people without mental health concerns. This result supports previous research, which has suggested that the experience of stress of individuals with established psychotic disorders differs from experiences of healthy comparison groups. It also extends previous research by evaluating subjective perceptions of stressors and coping and by having a prospective design.

The experience of stress and coping also influenced the onset of acute psychosis in the UHR group. This is the first study to clearly demonstrate such
a relationship and indicates that treatment strategies focusing on stress management and enhanced coping skills might be important in the development of preventive interventions.


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APPENDICES
Appendix A: CAARMS Subscales Used to Determine UHR and Acute Psychosis Status.
### A.1: Disorders of Thought Content - Severity Scale

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<tr>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never, absent</td>
<td>Questionable</td>
<td>Mild</td>
<td>Moderate</td>
<td>Moderately severe</td>
<td>Severe</td>
<td>Psychotic and Severe</td>
</tr>
<tr>
<td>No disorders of thought content.</td>
<td>Mild elaboration of conventional beliefs as held by a proportion of the population.</td>
<td>Vague sense that something is different, or not quite right with the world, a sense that things have changed but not able to be clearly articulated. Subject not concerned or worried about this experience.</td>
<td>A feeling of perplexity. A stronger sense of uncertainty regarding thoughts than 2. OR Odd or unusual thoughts but whose content is not entirely implausible—may be some logical evidence. More evidence than rating of 4. Content of thoughts not original i.e. jealousy, mild paranoia.</td>
<td>Unusual thoughts, which can be easily dismissed. Clearly idiosyncratic beliefs, which although ‘possible’ have arisen without logical evidence. Less evidence than rating of 3 (referential ideas that certain events, objects or people have a particular and unusual significance.)</td>
<td>Unusual thoughts about which there is some doubt (not held with delusional conviction), or which the subject does not believe all the time. May result in some change in behaviour, but minor.</td>
<td>Unusual thoughts containing original and highly improbable material held with delusional conviction (no doubt). May have marked impact on behaviour.</td>
</tr>
</tbody>
</table>
### A.2: Perceptual Abnormalities - Severity Scale

<table>
<thead>
<tr>
<th>Severity Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Never, absent</td>
<td>No abnormal perceptual experience.</td>
</tr>
<tr>
<td>1 Questionable</td>
<td>Heightened, or dulled perceptions, distortions, illusions (eg lights or shadows). Not particularly distressing. Hypnogogic or hypnopompic experiences</td>
</tr>
<tr>
<td>2 Mild</td>
<td>More puzzling experiences: more intense or vivid distortions or illusions, indistinct murmuring etc. Subject unsure of nature of experiences. Able to dismiss. Not distressing. Derealisation/depersonalisation.</td>
</tr>
<tr>
<td>3 Moderate</td>
<td>Much clearer experiences than 3 such as name being called, hearing phone ringing etc, but may be fleeting or transient. Able to give plausible explanation for experience. May be associated with mild distress.</td>
</tr>
<tr>
<td>4 Moderately severe</td>
<td>True hallucinations i.e. hearing voices or conversation, feeling something touching body. Subject able to question experience with effort. May be frightening or associated with some distress.</td>
</tr>
<tr>
<td>5 Psychotic but not severe</td>
<td>True hallucinations which the subject believes are true at the time of, and after, experiencing them. May be very distressing.</td>
</tr>
<tr>
<td>6 Psychotic and severe</td>
<td></td>
</tr>
</tbody>
</table>

### A.3: Disorganised Speech - Severity Scale

<table>
<thead>
<tr>
<th>Severity Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Never, absent</td>
<td>Normal logical speech, no disorganisation, no problems communicating or being understood.</td>
</tr>
<tr>
<td>1 Questionable</td>
<td>Slight subjective difficulties eg problems getting message across. Not noticeable by others.</td>
</tr>
<tr>
<td>2 Mild</td>
<td>Somewhat vague, some evidence of circumstantial -ity, or irrelevance in speech. Feeling of not being understood.</td>
</tr>
<tr>
<td>3 Moderate</td>
<td>Clear evidence of mild disconnected speech and thought patterns. Links between ideas rather tangential. Increased feeling of frustration in conversation.</td>
</tr>
<tr>
<td>4 Moderately severe</td>
<td>Marked circumstantial -ity, or tangentiality in speech, but responds to structuring in interview. May have to resort to gesture, or mime to communicate.</td>
</tr>
<tr>
<td>5 Severe</td>
<td>Lack of coherence, unintelligible speech, significant difficulty following line of thought. Loose associations in speech.</td>
</tr>
<tr>
<td>6 Psychotic</td>
<td></td>
</tr>
</tbody>
</table>
### A.4: Frequency and Duration Scale for all CAARMS Subscales

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent.</td>
<td>Less than once a month.</td>
<td>Once a month to twice a week - less than one hour per occasion.</td>
<td>Once a month to twice a week - more than one hour per occasion OR 3 to 6 times a week - less than one hour per occasion.</td>
<td>3 to 6 times a week - more than an hour per occasion OR daily - less than an hour per occasion.</td>
<td>Daily - more than an hour per occasion. OR several times a day.</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
Appendix B: Stress and Coping Measures
### B.1: Life Events Interview Schedule

Questionnaire completed by participants for each Life Event that was reported

<table>
<thead>
<tr>
<th>Question</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has this event ever happened to you before?</td>
<td>Not at all familiar</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>2. How much control did you have over whether this event happened?</td>
<td>No control at all</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>3. Did you have any advance notice about the event?</td>
<td>No advance notice at all</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>4. How much of the time has the event been on your mind?</td>
<td>Not at all on my mind</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>5. How much of a change in your daily routine has the event caused?</td>
<td>No change at all</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>6. How desirable was this event?</td>
<td>Extremely undesirable</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>7. Were you successful at handling the event?</td>
<td>Extremely unsuccessful</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
</tbody>
</table>
8. How upsetting or uplifting was this event for you?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely upsetting</td>
<td>Moderately upsetting</td>
<td>Neither uplifting or upsetting</td>
<td>Moderately uplifting</td>
<td>Extremely uplifting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Event List**

**Instructions**

This list contains major, minor and micro events. Due to the numerous potential life events, skip out questions have been added so that irrelevant sections may be skipped. For example, if the interviewee is not involved in school, or planning on becoming involved in school, the interviewer should ask the skip-out questions and proceed to the next category (i.e. training program). Open-ended questions should be asked (e.g. Are you still attending the job club? Vs Are you in a training program?)

1. **School**
   
   Are you in school right now? Are you taking any classes? Are you planning to begin school or take classes? What are your plans regarding school?
   
   (If person is in school, ask all items)
   
   1. Started school
   2. Graduated from school
   3. Failed school
   4. Ceased attending school
   5. Changed school
   6. Returned to full-time or part-time classes after semester break (Count even if subject is taking one class)
   7. Problems in school (e.g. poor grades)
   8. Dropped a class
   9. Problems getting enrolled or deciding to enrol
   10. Home study to improve employment opportunities
   11. Made decision to enrol in school
   12. Miscellaneous positive school event ______________________________________  
      ______________________________________________________________________
   13. Miscellaneous negative school event _____________________________________  
      ______________________________________________________________________

2. **Training program/TAFE/apprenticeship**
   
   Are you in a training program? Are you planning to begin a training program? What are your plans regarding training programs?
   
   (If a person is in a training program, ask all items)
   
   14. Problems getting enrolled
   15. Started training program
   16. Changed training program
   17. Had noticeable success in a training program
   18. Completed training program
   19. Had problems in training program
   20. Failed training program
21. Did not complete training program (quit)
22. Told by training program staff to leave
23. Miscellaneous positive training program event ______________________________
24. Miscellaneous negative training program event _____________________________

3. **Employment**

Have you done any work recently? Are you looking for work? Are you having problems with a recent job? What are your plans regarding employment?

If not currently working, but is looking...

25. Submitting applications
26. Job interviews
If currently working....

27. Started work for the first time
28. Returned to work
29. Changed jobs for a better one
30. Changed jobs for a worse one
31. Changed jobs for one that was no better or no worse than the last one
32. Had a noticeable success at work
33. Conditions at work improved, not counting promotion or other personal success
34. Troubles with boss
35. Troubles with co-workers
36. Troubles with persons under your supervision
37. Demoted at work
38. Took a cut in wage or salary without a demotion
39. Received an increase in wage or salary without promotion
40. Did not get an expected wage or salary increase
41. Conditions at work got worse, other than demotion or trouble with the boss
42. Found out that you were not going to be promoted at work
43. Demoted
44. Had increased workload
45. Had reduced workload
46. Increased responsibility at work
47. Decreased responsibility at work
48. Took business trip
49. Transferred job
50. Laid off
51. Fired
52. Quit
53. Retired

Have you gone into business for yourself? Are you planning to start a business?

54. Started a business
55. Expanded business or professional practice
56. Had a business success
57. Suffered a business loss
58. Business failed
59. Miscellaneous positive employment event _________________________________

60. Miscellaneous negative business event _________________________________

4. **Residence**
Have you moved? Has your living situation changed? Are you planning on moving? Have you been told to move? Do you foresee any changes in the future regarding your residence?
61. Moved to a better living situation
62. Moved to a worse living situation
63. Moved to a living situation no better or no worse than before
64. Changed living conditions in the same location (i.e moved rooms)
65. Roommate or person moved in (subject not living with family)
66. Roommate or person moved out (subject not living with family)
67. Had a problem with a roommate(s)
68. Person visit/moves in temporarily
69. Person visits/moves in temporarily
70. Person/visitor leaves after having moved in temporarily
71. Someone stay on after he/she was expected to leave
72. In process of trying to find new location
73. Unable to move after expecting to be able to move
74. Told by the landlord or the housing authority to move
75. Threatened with eviction
76. Made announcement of upcoming move
77. Remodelled house/apartment
78. Lost a home
79. Miscellaneous positive housing event _________________________________

80. Miscellaneous negative housing event _________________________________

5. **Relationship issues**
Are you seeing anyone? Have you had any contact with a girlfriend or boyfriend? Have you been trying to find a partner but unable to? Are you interested in dating?

(If person is in relationship ask all items)

**Romantic**
81. Began casual dating
82. Began serious relationship or casual dating became steady relationship
83. Improved relations with significant other
84. Became engaged
85. Got married
86. Became pregnant- desired event
87. Marital reconciliation
88. Had an argument or increased arguments with significant other
89. Relations with significant other changed for the worse without separation or divorce
90. Ceased steady dating
91. Made significant announcement regarding steady relationship
92. Broke engagement
93. Separated from spouse or steady girlfriend/boyfriend by distance
94. Marital separation
95. Divorced
96. Unwanted pregnancy
97. Began extra-marital affair
98. Significant other had extramarital affair
99. Significant other/subject had an abortion
100. Trouble with in laws
101. Spouse dies
If appropriate ask.....

Have you had any sexual difficulties?
102. Sexual difficulty with a known organic cause
103. Sexual difficulty with no known-identifiable organic cause
104. Miscellaneous positive romantic event ________________________________
    ___________________________________________________________________
105. Miscellaneous negative romantic event ________________________________
    ___________________________________________________________________

Platonic relationship issues (ASK ALL ITEMS)
106. Argued with a friend
107. Broke-up with a friend
108. Made-up with a friend
109. Separation with a friend
110. Friend dies
111. Friend committed suicide
112. Friend developed chronic illness (AIDS, cancer etc.,)
113. Miscellaneous positive platonic event ________________________________
    ___________________________________________________________________
114. Miscellaneous negative platonic event ________________________________
    ___________________________________________________________________

6. Family
Have there been any changes in your household recently? Has anyone moved in recently? Are they staying temporarily or permanently?
(Ask all items regardless of how questions are answered)
115. Family member or person moved in (subject lives with family)
116. Family member or person moved out (subject lives with family)
117. Family member moves in (temporarily)
118. Family member moves out (after temporary stay)
119. Someone stayed on in household after they were expected to leave
120. Increase in the number of family-get-togethers or contact with family members
121. Decrease in the number of family get-togethers or contact with family members
122. Took a trip regarding a family matter
123. Family argument with someone other than a spouse
124. Increase in arguing between other family members
125. Parents experiencing marital difficulties
126. Parents separated or divorced
127. Remarriage of a parent
128. Family member joined the armed forces

Did you get a pet? Did a pet of yours become ill?

129. Acquired a pet
130. Illness of pet
131. Death of pet

Has anyone in your family been ill, have gone to the hospital or had an accident? Has anyone in your family needed psychiatric treatment?

Note: Ask about each of the following items

132. Family member had an accident
133. Family member required medical attention, e.g. Emergency room or has received a serious diagnosis
134. Family member admitted to regular hospital
135. Family member needs psychiatric treatment
136. Family member admitted to psychiatric hospital
137. Family member (child or spouse) died
138. Family member (other than child or spouse) died

Do you have children? How do you get along with them?

139. Had a problem with child(ren)
140. Child(ren) a problem
141. Child(ren) left home--appropriately
142. Child(ren) left home -inappropriately
(if appropriate ask:)

Are you expecting a child?

143. Birth of first child
144. Birth of another child
145. Adoption of first child
146. Adoption of another child
147. Birth of grandchild
148. Miscellaneous positive family event ___________________________________

149. Miscellaneous negative family event ___________________________________

7. Health

Have you been ill? Have you seen a doctor or a dentist? Went to the hospital? Had an accident? Having any problems with your health?
(Ask about each of the following items)

150. Minor physical illness
151. Serious physical illness
152. Minor injury or accident
153. Serious injury
154. Hospitalised by illness or injury
155. Discharged from hospital (must have been in for more than one week)
156. Physical health improved
157. Unable to get treatment for an illness or injury
158. Minor dental work
159. Major dental work

FOR WOMEN ONLY ask each item (160-164):
160. Premenstrual distress
161. Menopause
162. Miscarriage
163. Stillbirth
164. Abortion
165. Miscellaneous positive health event

166. Miscellaneous negative health event

8. Social activities

Have you:
167. Increased church, synagogue or organisational attendance
168. Decreased church, synagogue or organisational attendance
169. Increased socialisation
170. Decreased socialisation
171. Took up a new hobby, sport, craft or recreational activity
172. Dropped a hobby, sport, craft or recreational activity
173. Took a vacation
174. Was not able to take a planned vacation
175. Made new friend(s)
176. Miscellaneous positive social event

177. Miscellaneous positive social event

9. Financial

Did you take out a loan? Did you apply for a loan or credit? Did you get turned down for a loan or credit?

Ask each item
178. Obtained a loan
179. Foreclosed on a loan
180. Difficulty encountered in applying/obtaining a loan
181. Credit rating difficulties
182. Started buying a car, furniture or other large purchase on a instalment plan
183. Repossession of car, furniture or other large purchase on a instalment plan
184. Major purchase not on instalment plan
185. Took out a mortgage
186. Foreclosure on a mortgage
187. Suffered a financial loss or loss of property not related to work
188. Had minor financial improvement (not payment for work done)
189. Had major financial improvement (not payment for work done)
190. Financial status a lot worse than usual
191. Expected check and did not come
192. Lost money gambling
193. Went on medical, disability benefit
194. Went off medical, disability benefit
195. Spouse started/ended work
196. Miscellaneous positive financial event _________________________________
______________________________________________________________________
197. Miscellaneous negative financial event ________________________________
______________________________________________________________________

10. Crime and legal matters
Have you had any contact with the police? For example, have you been stopped by the police? Have you received any tickets? Have you been in court or jail recently? Have you committed any crimes? Have you been involved in a lawsuit?
(Subject as a victim)
198. Involved in a lawsuit or legal action
199. Accident in which there were no injuries
200. Accident with injuries, but not hospitalised (e.g. went to ER)
201. Accident with injuries and was hospitalised
202. Got involved in court case
203. Court appearance (as victim)
204. Loss or damage of personal property (e.g. car)
205. Threat to personal property
206. Assaulted
207. Robbed
208. Miscellaneous victim negative event _________________________________
______________________________________________________________________

(Subject as perpetrator)
209. Assaulted someone
210. Robbed someone
211. Involved in a lawsuit or legal action e.g. suing someone
212. Accused of something for which the person could be sent to jail
213. Stopped by police for traffic violation
214. Minor violations of the law
215. Was involved in court case
216. Caused accident In which there were no injuries
217. Caused accident with injuries
218. Lost privilege to drive
219. Arrested and went to jail
220. Convicted of a crime
221. Acquitted of a crime
222. Court appearance (as perpetrator)
223. Released from jail
224. Did not get out of jail when expected
225. Miscellaneous perpetrator negative events ____________________________

_____________________________________________________________________

11. Transportation
(Ask about each item)
226. Had car trouble
227. Other transportation problem (i.e. bicycle)
228. Miscellaneous positive transportation event ____________________________

_____________________________________________________________________

229. Miscellaneous negative transport event ________________________________

_____________________________________________________________________

12. Miscellaneous
(Ask about each item)
230. Serious argument with neighbour, mailman etc.,
231. Improved relations with neighbour, mailman etc
232. Separated by distance from significant person
233. Major decision regarding the future
234. Community crisis e.g. fire, flood, heard things in the news that were upsetting)
235. Entered armed services
236. Left armed services
237. Miscellaneous positive event
238. Miscellaneous negative event
(Ask all of the following)

13. Have there been any problems or crises, which we have not covered yet? (If yes, could you tell me more about that)
239.
240.
241.

14. Have you felt under pressure? If so what about? (For example, financial)
242.
243.
244.

15. Has there been any event you hoped would happen that did not?
245.
246.
247.

16. Other events elicited by further inquiry
248.
249.
250.
B.2: Hassles Scale

Directions: Hassles are irritants that can range from minor annoyances to fairly major pressures, problems or difficulties. They can occur few or many times.

Listed on these pages are a number of ways in which a person can feel hassled. Look at the numbers on the right of the items. Indicate by circling a 1, 2 or 3 how SEVERE each of the hassles has been for you IN THE PAST MONTH. If a hassle did NOT occur in the last month, circle 0.

<table>
<thead>
<tr>
<th></th>
<th>Did not occur</th>
<th>Somewhat severe</th>
<th>Moderate severity</th>
<th>Extreme severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Misplacing or losing things</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Troublesome neighbours</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Social obligations</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Inconsiderate smokers</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Troubling thoughts about your future</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Thoughts about death</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Health of a family member</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Not enough money for clothing</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Not enough money for housing</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Concerns about owing money</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Concerns about getting credit/a loan</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Concerns about money for emergencies</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Someone owes you money</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Financial responsibility for someone who does not live with you</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Cutting down on electricity, water etc.,</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Smoking too much</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Use of alcohol</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Personal use of drugs</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Too many responsibilities</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Decisions about having children</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Non-family members living in your house</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Care for pet</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Planning meals</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Concerned about the meaning of life</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Trouble relaxing</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Trouble making decisions</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Did not occur</td>
<td>Somewhat severe</td>
<td>Moderate severity</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>27</td>
<td>Problems getting along with fellow workers</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>28</td>
<td>Customers or clients giving you a hard time</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>Home maintenance (inside)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>Concerns about job security</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>31</td>
<td>Concerns about retirement</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>32</td>
<td>Laid-off or out of work</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>33</td>
<td>Don’t like current work duties</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>34</td>
<td>Don’t like fellow workers</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>35</td>
<td>Not enough money for basic necessities</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>36</td>
<td>Not enough money for food</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>37</td>
<td>Too many interruptions</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>38</td>
<td>Unexpected company</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>39</td>
<td>Too much time on hands</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>Having to wait</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>41</td>
<td>Concerns about accidents</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>42</td>
<td>Being lonely</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>43</td>
<td>Not enough money for health care</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>44</td>
<td>Fear of confrontation</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>45</td>
<td>Financial security</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>46</td>
<td>Silly practical mistakes</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>47</td>
<td>Inability to express yourself</td>
<td>0</td>
<td>1</td>
<td>2</td>
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<tr>
<td>48</td>
<td>Physical illness</td>
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<td>1</td>
<td>2</td>
</tr>
<tr>
<td>49</td>
<td>Side effects of medication</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>50</td>
<td>Concerns about medical treatment</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>51</td>
<td>Physical appearance</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>52</td>
<td>Fear of rejection</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>53</td>
<td>Difficulties with getting pregnant</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>54</td>
<td>Sexual problems that result from physical problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>55</td>
<td>Sexual problems resulting from other than physical problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>56</td>
<td>Concerns about health in general</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>57</td>
<td>Not seeing enough people</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Did not occur</td>
<td>Somewhat severe</td>
<td>Moderate severity</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>58</td>
<td>Friends or relatives too far away</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>59</td>
<td>Preparing meals</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>60</td>
<td>Wasting time</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>61</td>
<td>Auto maintenance</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>62</td>
<td>Filling out forms</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>63</td>
<td>Neighbourhood deterioration</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>64</td>
<td>Financing children’s education</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>65</td>
<td>Problems with employees</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>66</td>
<td>Problems on job due to being a woman or man</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>67</td>
<td>Declining physical abilities</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>68</td>
<td>Being exploited</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>69</td>
<td>Concerns about bodily functions</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>70</td>
<td>Rising prices of common goods</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>71</td>
<td>Not getting enough rest</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>72</td>
<td>Not getting enough sleep</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>73</td>
<td>Problems with aging parents</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>74</td>
<td>Problems with your children</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>75</td>
<td>Problems with persons younger than yourself</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>76</td>
<td>Problems with your lover</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>77</td>
<td>Difficulties seeing or hearing</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>78</td>
<td>Overloaded with family responsibilities</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>79</td>
<td>Too many things to do</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>80</td>
<td>Unchallenging work</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>81</td>
<td>Concerns about meeting high standards</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>82</td>
<td>Financial dealings with friends or acquaintances</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>83</td>
<td>Job dissatisfaction</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>84</td>
<td>Worries about decisions to change jobs</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>85</td>
<td>Trouble with reading, writing or spelling abilities</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>86</td>
<td>Too many meetings</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>87</td>
<td>Problems with divorce or separation</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Code</td>
<td>Item</td>
<td>Did not occur</td>
<td>Somewhat severe</td>
<td>Moderate severity</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>88</td>
<td>Trouble with arithmetic skills</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>89</td>
<td>Gossip</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>90</td>
<td>Legal problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>91</td>
<td>Concerns about weight</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>92</td>
<td>Not enough time to do the things you need to do</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>93</td>
<td>Television</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>94</td>
<td>Not enough personal energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>95</td>
<td>Concerns over inner conflicts</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>96</td>
<td>Feel conflicted over what to do</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>97</td>
<td>Regrets over past decisions</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>98</td>
<td>Menstrual (period) problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>99</td>
<td>The weather</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>100</td>
<td>Nightmares</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>101</td>
<td>Concerns about getting ahead</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>102</td>
<td>Hassles from boss/supervisor</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>103</td>
<td>Difficulties with friends</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>104</td>
<td>Not enough time for family</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>105</td>
<td>Transportation problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>106</td>
<td>Not enough money for transportation</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>107</td>
<td>Not enough money for entertainment and recreation</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>108</td>
<td>Shopping</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>109</td>
<td>Prejudice and discrimination form others</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>110</td>
<td>Property, investments or taxes</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>111</td>
<td>Not enough time for entertainment and recreation</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>112</td>
<td>Garden or outside home maintenance</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>113</td>
<td>Concern about news events</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>114</td>
<td>Noise</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>115</td>
<td>Crime</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>116</td>
<td>Traffic</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>117</td>
<td>Pollution</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Have we missed any of your hassles? If so, write them in below:

<table>
<thead>
<tr>
<th>118</th>
<th>Did not occur</th>
<th>Somewhat severe</th>
<th>Moderate severity</th>
<th>Extreme severity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

One more thing: Has there been a change in your life that affected how you answered this scale? If so, tell us what it was:
### B.3: Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case you will be asked to indicate *how often* you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don’t try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Never</th>
<th>Almost never</th>
<th>Sometimes</th>
<th>Fairly often</th>
<th>Very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In the last month, how often have you been upset because of something that happened unexpectedly?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>In the last month, how often have you felt that you were unable to control the important things in your life?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>In the last month, how often have you felt nervous and “stressed”?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>In the last month, how often have you dealt successfully with irritating life hassles?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>In the last month how often have you felt that you were effectively coping with important changes that were occurring in your life?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>In the last month, how often have you felt confident about your ability to handle your personal problems?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>In the last month, how often have you felt that things were going your way?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>In the last month, how often have you found that you could not cope with all of the things that you had to do?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>In the last month, how often have you been able to control irritations in your life?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>In the last month, how often have you felt that you were on top of things?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>In the last month, how often have you been angered because of things that happened that were outside of your control?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>In the last month, how often have you found yourself thinking about things that you have to accomplish?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>In the last month, how often have you been able to control the way you spend your time?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
### B.4: Coping Inventory for Stressful Situations

The following are ways people react to various difficult, stressful or upsetting situations. Please circle a number from 1 to 5 for each item. Indicate how much you engage in these types of activities when you encounter a difficult, stressful or upsetting situation.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Not at all</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Schedule my time better</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Focus on the problem and see how I can solve it</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Think about the good times I’ve had</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Try to be with other people</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Blame myself for putting things off</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Do what I think is best</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Become preoccupied with aches and pains</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Blame myself for having gotten into this situation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Window shop</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Outline my priorities</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Try to go to sleep</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Treat myself to a favourite food or snack</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Feel anxious about not being able to cope</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Become very tense</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Think about how I solved similar problems</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Tell myself that it is really not happening to me</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Blame myself for being too emotional about the situation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Go out for a snack or meal</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Become very upset</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Buy myself something</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Determine a course of action and follow it</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Blame myself for not knowing what to do</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Go to a party</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Work to understand the situation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>“Freeze” and not know what to do</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Take corrective action immediately</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Think about the event and learn from my mistakes</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Not at all</td>
<td>Very much</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
<td>-----------</td>
</tr>
<tr>
<td>28</td>
<td>Wish that I could change what had happened or how I feel</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Visit a friend</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Worry about what I am going to do</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Spend time with a special person</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Go for a walk</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Tell myself that it will never happen again</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Focus on my general inadequacies</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Talk to someone whose advice I value</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Analyse my problem before reacting</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Phone a friend</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Get angry</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Adjust my priorities</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>See a movie</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Get control of the situation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Make an extra effort to get things done</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Come up with several different solutions to the problem</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Take some time off and get away from the situation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Take it out on other people</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Use the situation to prove that I can do it</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Try to be organised so I can be on top of the situation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Watch TV</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
B.5: Social Relationships Scale

Your relationship with other people

This questionnaire asks about who you talk to when things happen in your daily life.

*On the next pages, please fill in the spaces following steps 1 to 5 as shown in the example below.*

**Step 1** Please list the people with whom you generally discuss things. For example: Friend, family members, boy/girlfriend, husband/wife, teachers, people at clubs, youth leaders/workers, minister, doctor etc.

**Step 2.** Write in what their relationship is to you

**Step 3** Circle the number to show how helpful or unhelpful you find these discussions

**Step 4** Circle ‘yes’ or ‘no’ if you think this person would come to you to discuss the same things

**Step 5** Lastly, on the last page write the number of these people you have listed who you would turn to in a crisis.

**EXAMPLE**

<table>
<thead>
<tr>
<th>Name &amp; who they are</th>
<th>Helpfulness of discussion (circle one number)</th>
<th>Would this person come are to you to discuss their personal or social concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>______________</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Work
This includes change in job, retirement, troubles on the job, change in the workload, strike, promotion etc.

I discuss my work with:

<table>
<thead>
<tr>
<th>Name &amp; who they are</th>
<th>Helpfulness of discussion (circle one number)</th>
<th>Would this person come are to you to discuss their personal or social concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>___________</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

|                     | Makes things a lot worse | Makes things a bit worse | Helps things a bit | Helps things a lot | Yes | No |
| ___________         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

|                     | Makes things a lot worse | Makes things a bit worse | Helps things a bit | Helps things a lot | Yes | No |
| ___________         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

|                     | Makes things a lot worse | Makes things a bit worse | Helps things a bit | Helps things a lot | Yes | No |
| ___________         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

|                     | Makes things a lot worse | Makes things a bit worse | Helps things a bit | Helps things a lot | Yes | No |
| ___________         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

|                     | Makes things a lot worse | Makes things a bit worse | Helps things a bit | Helps things a lot | Yes | No |
| ___________         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Now turn to the next page to answer questions about your money and finances.
Money and finances
This includes wage increase or decrease, bill payments, investments, taxes, loans, making ends meet etc.

I discuss my finances with:

<table>
<thead>
<tr>
<th>Name &amp; who they are</th>
<th>Helpfulness of discussion (circle one number)</th>
<th>Would this person come are to you to discuss their personal or social concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
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<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Now turn to the next page to answer questions about your home and family.
Home and family
This includes demands, difficulties or changes in where you live or with whom you live, places where you study or places where you spend your time at home, death in the family, conflict, separation or divorce in the family, home renovations, issues in the neighbourhood.

I discuss my home and family with:

<table>
<thead>
<tr>
<th>Name &amp; who they are</th>
<th>Helpfulness of discussion (circle one number)</th>
<th>Would this person come are to you to discuss their personal or social concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>_______________</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>_______________</td>
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<td>_______________</td>
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<td>2</td>
</tr>
<tr>
<td>_______________</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Now turn to the next page to answer questions about your personal health.
Personal health
This includes change in amount of recreation, sickness, diet, allergies, pregnancy, impairment of sight/hearing

I discuss my personal health with:

<table>
<thead>
<tr>
<th>Name &amp; who they are</th>
<th>Helpfulness of discussion (circle one number)</th>
<th>Would this person come are to you to discuss their personal or social concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>Name 1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Name 2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Name 3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Name 4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Name 5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Name 6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Name 7</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Name 8</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Now turn to the next page to answer questions about your personal and social life.
Personal and social life
This includes making new friends, changes in relationships, loneliness, achievement, boredom etc.

I discuss my personal and social life:

<table>
<thead>
<tr>
<th>Name &amp; who they are</th>
<th>Helpfulness of discussion (circle one number)</th>
<th>Would this person come are to you to discuss their personal or social concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>_________</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

|                     | Makes things a lot worse | Makes things a bit worse | Helps things a bit | Helps things a lot | Yes | No |
| _________            | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

|                     | Makes things a lot worse | Makes things a bit worse | Helps things a bit | Helps things a lot | Yes | No |
| _________            | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Now turn to the next page to answer questions about society in general
Society in general
This includes politics, economy, pollution, violence, housing, inflation, education items in the news etc.

I discuss society in general with:

<table>
<thead>
<tr>
<th>Name &amp; who they are</th>
<th>Helpfulness of discussion (circle one number)</th>
<th>Would this person come are to you to discuss their personal or social concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>__________</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>__________</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>__________</td>
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<td>2</td>
</tr>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>__________</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>__________</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>__________</td>
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<td>2</td>
</tr>
<tr>
<td></td>
<td>Makes things a lot worse</td>
<td>Makes things a bit worse</td>
</tr>
<tr>
<td>__________</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
How many of all of the people listed would you turn to in a crisis/severe stress?

Circle how satisfied you are with the overall support you have:

1  2  3  4  5  6
very fairly a little a little fairly very
dissatisfied dissatisfied dissatisfied satisfied satisfied satisfied
Appendix C: Ethics Committee Approval

C.1 UHR group (North West Mental Health Behavioural and Psychiatric Research and Ethics Committee)

C.2: HC group (University of Melbourne Human Research Ethics Committee)
Appendix D: Participant Information and Consent Forms
1. Your consent
You are invited to take part in this research project. This Participant Information contains detailed information about the research project. Its purpose is to explain to you openly and clearly as possible all the procedures involved in this project before you decide whether or not to take part in it.
Please read this Participant Information carefully. Feel free to ask questions about any information in the document. You may also wish to discuss the project with a relative or friend or your local health worker. Feel free to do this.
Once you understand what the project is about and if you agree to take part in it, you will be asked to sign the Consent Form. By signing the Consent Form, you indicate that you understand the information and that you give your consent to participate in the research project.
You will be given a copy of the Participant Information and Consent form to keep as a record.

2. Purpose and background
At the Personal Assessment and Crisis Evaluation (PACE) Clinic we are trying to understand some of the problems young people face today. We are trying to determine how we can best assist young people who are experiencing similar difficulties. We are also trying to determine what may be the cause of the difficulties that you are currently experiencing that have resulted in you coming to PACE. Therefore as well as being a specialist clinic that can provide you with counselling and support, PACE is also a research programme.

This research project at PACE will involve approximately 200 young people. The study has several parts. If you do not feel comfortable with being involved in all of the study you are free to agree to those parts you are happy with.

The main part of this research project is a study that evaluates the treatment that is provided at the PACE Clinic. This treatment aims to address the problems and difficulties that lead young people to come to PACE and also to stop those problems from getting worse. The study compares three treatments that we think will assist young people who come to PACE. All treatments combine counselling and medication.

Two counselling approaches are going to be tested. The first is general support- talking about how best to deal with difficulties with family or friends and problem solving. The second approach deals more specifically with symptoms you might be experiencing and is called cognitive-behavioural therapy. So that we can make sure you are getting the type of therapy you are allocated to we would like to audio-tape all of your therapy sessions. These tapes will be listened to at a later date by your psychologist and other members of the PACE Research Team. They will not be broadcast to a wider audience.

If you agree to be involved in this study, in addition to counselling, you will receive medication. This will be either a medicine called ‘risperidone’ or a ‘placebo’. Risperidone specifically targets experiences such as hearing voices or hearing things and can help with attention and concentration. This medication is approved for use in Australia for the treatment of certain mental health difficulties. The placebo is not a real tablet- it contains only a small amount of sugar. There is no expected effect from the placebo. Therefore, by comparing the risperidone and the placebo we can determine what effect the risperidone has. More information about risperidone is available from your doctor. Your doctor will be in touch with you regularly throughout the study to monitor the medication.

Previous experience has shown that providing PACE patients with combined counseling and medication is effective in reducing the difficulties young people experience. This was the first study of its kind with PACE patients and we now want to understand better how to help young people attending PACE.

You are invited to participate in this research project because you have reported experiencing problems and difficulties that are having an effect on your day-to-day functioning. We want to help you to ensure that these difficulties do not get any worse.
Janssen-Cilag Pharmaceuticals, the National Health and Medical Research Council of Australia and the Stanley Foundation are sponsoring this study. This trial has been initiated by the investigator, Professor Patrick McGorry.

3. Procedures

Participation in this project will involve a number of different procedures and tests. We do not yet know which treatment will be more effective or useful but we want to find out (we think that all will be helpful but one may be more so). To compare the treatments fairly we need to randomly assign patients to one of the three treatments. That means we will allow a computer to decide which treatment group you are in. This is a fair way of comparing the treatments. All treatments will last for 12 months.

To make the comparison of the treatments even fairer, no one (including the treatment team or researchers) will know what treatment group you are in until the study has finished, although your psychologist will obviously know which sort of counselling you will be receiving. This means that your expectations about how the treatment might help you will not influence the results. There are independent research staff associated with PACE who also will not know which group you are in. If we feel that there are problems with your treatment we will withdraw you from the study and change the treatment. Your progress will be closely monitored throughout the study by your doctor and psychologist. If you experience any bad effects as a result of being in this study, the study would be stopped immediately.

So that we can measure how the treatment is going, we need to interview you regularly. Therefore a member of the research team will meet with you once a month to ask you questions about your symptoms, and how life is going generally. This means asking you about stressful events you may have experienced and how you have dealt with them. This will happen for a total of 24 months: 12 months while you are receiving treatment and another 12 months after the treatment finishes, to assess its long-term effects. We will then compare the experiences of young people in the three groups to see which treatment is most helpful. We may also contact everyone in five years time to see how things are going at that stage.

Although we will not know which group you are in, if it becomes clear that one of the treatments is much more effective than the others, or one group is not doing as well, we will stop the study. You will be notified immediately if, during the study, information becomes available that may affect your decision to participate.

Other assessments

There are a number of reasons why people develop changes in the way they think, feel or behave that are not usual for them (what we call ‘symptoms’). We are conducting a series of assessments with people who come to PACE to try to determine why the symptoms they are experiencing may have come about.

It is possible that how your brain works may have influenced the symptoms you are experiencing. To assess this we would like to run a series of tests that focus on memory, attention, and concentration with you (this is called neuropsychological testing). This will take about 1 ½ hours. We would like to do this when you first come to PACE and also after 1 and 2 years.

Early life experiences and development may be important in how things are going for you now. With this in mind we would like to talk with a family member (preferably your Mum or Dad) about your birth, when you started walking and talking etc., and their perception of how things are going now.

c. Various researchers have proposed that one reason some young people experience problems that lead to them seeing doctors and counselors may be due to a viral infection. We want to investigate these ideas at PACE by taking a small amount of blood from your forearm to analyse. The blood sample will be sent to a laboratory where tests are run to determine the levels of viral antibodies and other factors that are important for the protection of your brain. We would like to take 50ml of your blood to do so when you first start coming to PACE and the same amount after 3-, 6- and 12- months. Together with these tests, we will arrange that you will have all routine blood tests done and a physical examination to check on your physical health. All of these tests are free of charge.

d. Preliminary data suggest that pre-existing disturbances in fatty acid metabolism might contribute to the problems you have been experiencing. An easy skin test where we put niacin patches on your forearm can check whether your fatty acid metabolism is normal. Niacin is a vitamin B that is common in nature. If your skin comes in contact with niacin, it might react with a red flushing (like blushing). This reaction is completely normal and goes away over time. We want to apply a tape with four different concentrations of niacin for one minute on your forearm. After 5, 10, 15, and 20 minutes the skin will be assessed by a doctor and a picture is taken to document the skin reaction. The skin might become red and a little bit itchy, but this will disappear within one or two hours. Similar tests are carried out to test for allergies. We would like to repeat the test in 3 and 12 months time. We believe that this test could be used to detect people who are at risk of developing the type of difficulties you have been experiencing. This skin test cannot harm you in any way.
5. Possible benefits
We believe that being in this study will help to reduce the difficulties and problems you have been experiencing and to help you cope better with these problems if they arise again in the future. Additionally your involvement will help us to develop treatments that will assist young people coming to the PACE Clinic in the future. We also hope that information obtained will help us to understand better why young people develop certain problems and will help us to develop ways of stopping them from arising.

6. Possible risks
We do not believe any of the assessments (neuropsychological tests and the interviews) can harm you in any way. The assessments do not all have to be conducted on the same day. We also do not believe that there are any risks associated with the counselling.

All medications have some side effects that are experienced by some people. We will be prescribing risperidone at a very low dose and for a relatively short period of time. The most commonly reported side effects at this dose are tiredness and some muscle stiffness, which goes away over time and can be treated by reducing the dose. The placebo medication should not cause any side effects. Everyone will have a doctor who they will see regularly who will monitor how things are going.

You should not take part in this research if you are pregnant or think you may be pregnant, if you are trying to become pregnant or if you are breastfeeding. Both male and female participants are strongly advised to use effective contraception during the course of the study. You should discuss methods of effective contraception with your doctor. If you do become pregnant whilst participating in the study you should advise your treating doctor immediately. You must not continue in the study if you become pregnant.

7. Other treatments whilst in this study
It is important to tell your doctor and the research staff about any treatments or medications you may be taking, including non-prescription medications, vitamins or herbal remedies and any changes to these during your participation in the study.

8. Alternatives to participation
As mentioned earlier we ask everyone who attends PACE to take part in our research. Your decision to become involved or not is completely your own, but can be discussed with your family, friends or other supportive people. If you do not wish to take part or decide to cease taking part halfway through you can still attend PACE. In this case you will receive support and counselling as well as medication that your doctor might feel will assist you. This will not affect your future treatment or your relationship with those who are treating you. Also, if you agree to participate in just some parts of the study, that is fine. We do not know yet whether any of the things we are assessing affect the symptoms you are having or will be helpful so we would like your help in testing this.

9. Privacy, confidentiality and disclosure of information
Any information obtained in connection with this research project that can identify you will remain confidential and will only be used for the purpose of this research project. It will only be disclosed with your permission, except as required by law. All information relating to this study is stored in secure, locked filing cabinets at the PACE Clinic, Maribyrnong. Only those people directly associated with the study can have access to your test results and information about you. Your name or personal details will not be released when we publish the results of this research.

Our health records and any information obtained during the study are subject to inspection (for the purpose of verifying the procedures and the data) by the Food and Drug Administration (FDA) of the United States of America (USA), other national drug regulatory authorities such as the Australian Government’s Therapeutic Goods Administration (TGA) and authorised representatives of the sponsor, Janssen-Cilag or as required by law. By signing the attached Consent Form you authorise release of, or access to, this confidential information to the relevant study personnel and regulatory authorities as noted above.

In any publication, information will be provided in such a way that you cannot be identified. Information for individual participants will not be published.

10. New information arising during the project
During the research project, the researchers may know new information about the risks and benefits of the project. If this occurs, you will be told about this new information. This new information may mean that you can no longer participate in this research. If this occurs, the person(s) supervising the research will stop your participation. In all cases you will be offered all available care to suit your needs and medical condition.

11. Results of project
We aim to make the results of this project available to all participants via a mailout and through the PACE Clinic website.
12. Further information or any problems
If you require any further information or if you have any problems concerning this project (for example side effects), you can contact the principal researcher or the other researchers responsible for this project. They are:

Professor Patrick McGorry (Director, Orygen Youth Health)
Dr Alison Yung (Consultant Psychiatrist/Director PACE Clinic)
Dr Shona Francey (Clinical Psychologist/Clinic Coordinator)
Dr Gregor Berger (Consultant Psychiatrist)
Lisa Phillips (Research Coordinator/Psychologist) Dr Annette Thampi (Consultant Psychiatrist)
Dr Francois Trumpler (Psychiatry Registrar) Dr Judith Regan (Consultant Psychiatrist)
Steven Leicester (Psychologist) Lisa O’Dwyer (Social Worker/Intake worker)
Kath Baker (Psychologist/Intake worker) Margaret Dell’Olio (Research Interviewer)
Lakshika Tennakoon (Research Interviewer) Carrie Stanford (Research Interviewer)
All of these people can be contacted on (03) 9317 6300.

13. Other issues
If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact Dr Tom Peyton the Chair of the North Western Health Ethics Committee on (03) 9342 7098. You will need to tell Dr Peyton the name of one of the researchers listed in Section 12 above.

14. Participation is voluntary
Participation in any research project is voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your routine treatment, your relationship with those treating you or your relationship with Orygen Youth Health. Before you make your decision, a member of the research team will be available so that you can ask any questions you have about the research project. You can ask for any information you want. Sign the Consent Form only after you have had a chance to ask your questions and have received satisfactory answers. If you decide to withdraw from this project, please notify a member of the research team before you withdraw. This notice will allow that person or the research supervisor to inform you if there are any health risks or special requirements linked to withdrawing.

15 Reimbursement for your costs
You will not be paid for your participation in this trial. However, you will be reimbursed for any of the specific costs that you incur as a result of participating in this trial. This will be up to $60 for travel costs for the initial assessment phase and $20 for each subsequent research visit.

16. Ethical guidelines
This project will be carried out according to the National Statement on Ethical Conduct in Research Involving Humans (June 1999) produced by the National Health and Medical Research Council of Australia. This statement has been developed to protect the interests of people who agree to participate in human research studies. The ethical aspects of this research project have been approved by the Human Research Ethic Committee of this Institution.

17 Injury
In the event that you suffer an injury as a result of participating in this research project, hospital care and treatment will be provided by the public health service at no extra cost to you.

18. Compensation
The sponsor, Janssen-Cilag, has agreed to provide compensation to you for any injury suffered as a result of your participation in the research project in accordance with the Australian Pharmaceutical Manufacturers Association (APMA) Guidelines for compensation for injury resulting from participating in a company-sponsored research project. A copy of the APMA Guidelines is available to you from the research staff on request.

19. Termination of the study
This research study may be stopped for a variety of reasons. These may include reasons such as: unacceptable side effects, the drug being shown to not be effective, or the drug being shown to work and not need further investigation. If the study is terminated participants will not continue to be supplied with the trial drug.
Consent Form
PACE Clinic

Randomised trial of treatment approaches in the PACE Clinic

I have read, or have had read to me in my first language, and I understand the Participant Information version 3, August 2003.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in the following components of this research project according to the conditions in the Participant Information.

Treatment study

a. Random assignment to one of the three treatment groups  Yes / No
b. Interview about my symptoms and how things have been going at intake and monthly for 2 years  Yes / No
c. Audiotaping of psychology sessions  Yes / No
d. Follow-up in five years time  Yes / No
Neuropsychological testing at intake, 12 and 24 months  Yes / No
Interview with ......................... (family member)  Yes / No
Blood test at intake, 3, 6 and 12 months  Yes / No
Skin flush test at intake, 3 and 12 months  Yes / No

I will be given a copy of the Participant Information and Consent Form to keep.

I understand that the researcher has agreed not to reveal my identity and personal details if information about this project is published or presented in any public form.

Participant’s name (printed) .................................................................

Signature: ................................................................. Date: .................

Name of witness to Participant’s Signature (printed) ...........................................................

Signature: ................................................................. Date: .................

Declaration by researcher: I have given a verbal explanation of the project, its procedures and risks and I believe the participant has understood that explanation.

Researcher’s name (Printed) ...........................................................................

Signature: ................................................................. Date: .................
D.2: HC group

PLAIN LANGUAGE STATEMENT- COMPARISON GROUP

A Prospective Study of the Relationship Between Stress and Coping

At the PACE clinic we are trying to understand some of the problems young people face today and how we can best help people to cope with these difficulties.

We are currently undertaking a study to investigate why people who attend the clinic to see psychologists and psychiatrists experience the problems they describe. We think that there might be a number of reasons why people develop changes in the way they think, feel or behave that are not usual for them (what we call ‘symptoms’). Sometimes, symptoms can be caused by things in your environment such as stress with work, family or friends. We want to assess the levels of stress young people commonly experience and how this affects them. We wish to compare the experiences of our patients with those of a group of young people not attending the Clinic. This project is being conducted by the PACE Clinic in association with the Departments of Psychology and Psychiatry, University of Melbourne.

We would like to interview you regularly over the course of a year about experiences you have and how you cope with them. We will contact you six times over the year (once every two months) and every interview will take about an hour. We will reimburse you for your time and any other costs.

We do not believe that participating in this study can harm you. If you do find the interviews distressing in any way, you will be able to discuss issues raised further with the project coordinator (Lisa Phillips). If necessary we will arrange for ongoing counselling with an appropriate service.

Before you do take part in this project, we will ask you to sign a consent form indicating that you allow us to use the results for our research. It is important that your participation in this study is voluntary. If you do not wish to take part you are under no obligation to do so. Also, if you decide to take part but later change your mind, you are free to withdraw from the project at any stage. Your decision to take part or not to take part, or to withdraw, will not affect your relationship with the PACE Clinic or the hospital with which we are associated.

If you take part in this project, your confidentiality will be maintained at all times (unless researchers are concerned that you are being abused in some way, are planning to harm yourself or others or other legal limitations). Only those people directly involved in the study will have access to your test results and any information that may be published will be released in such a way that an individual’s identity will not be divulged. Test results are stored in secure, locked filing cabinets and your name is changed to a code name on all documents relating to you.

Before deciding whether to take part or not in this study you might wish to discuss the matter with a relative or friend or with your local doctor. You should feel free to do this.

If you would like more information about the study or if there is any matter about it that concerns you, either now or in the future, do not hesitate to ask one of the researchers involved with the project. The person overseeing this research is Lisa Phillips who can be contacted on (03) 9483 4556. This study forms part of Lisa Phillips’ PhD research and is being supervised by Dr Nancy McMurray (Department of Psychology, University of Melbourne-ph 9344 4000) and Dr Jane Edwards (Clinical Director, MH-SKY-ph 9342 2800).

The study has been approved and is monitored by the University of Melbourne Human Research Ethics Committee who can be contacted at the Melbourne Research and Innovation Office The University of Melbourne VIC 3010, Telephone: 83447507; Fax: 9347 6739
CONSENT/REQUEST TO PARTICIPATE IN A RESEARCH PROJECT - Comparison Group

TITLE OF RESEARCH PROJECT: A longitudinal assessment of stress and coping of young people attending the PACE Clinic

RESEARCHER:

I, .................................................................................................................. CERTIFY THAT I have fully explained the aims, risks, and procedures of the research to the PARTICIPANT named herein (or to the lawful guardian of such patient) and have handed to the PARTICIPANT (or guardian) a copy of this Consent together with a PLAIN ENGLISH STATEMENT of aims and procedures of the experiment and any risks to the PARTICIPANT.

In my opinion the PARTICIPANT (or lawful guardian thereof) appears to understand and wishes to participate.

I undertake to the PARTICIPANT (or lawful guardian thereof) that the confidentiality of the PARTICIPANT and his or her records will be preserved at all times.

SIGNED: ...............................................................................................

DATE: ...............................................................................................

CONSENT OF PARTICIPANT AND GUARDIAN (if applicable)

The purpose of the above project has been fully explained to me and I have read and signed the attached PLAIN ENGLISH STATEMENT. I UNDERSTAND the aims and procedures of the experiment and any risks to myself which are involved and I REQUEST to participate on condition that I can withdraw my Consent at any time.

I agree to:

1. Psychopathology interview bi-monthly for 12 months Yes / No
2. Interviews about stress and coping bi-monthly for 12 months Yes / No

SIGNED: .............................................................................................

SIGNED: .............................................................................................

DATE: .............................................................................................

WITNESS OF PARTICIPANT’S SIGNATURE

I, .................................................................................................................................

of .................................................................................................................................

as an independent witness confirm that the aims and procedures of the experiment and any risks to the PARTICIPANT has been adequately explained to the PARTICIPANT whose signature I witness. In my opinion he/she appears to understand and wishes to participate.

Signed: .................................................. Date: ...........................................
Appendix E: Cox Regressions Including UHR Participants
With Complete Data Set Only
<table>
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<tr>
<th>Covariate</th>
<th>B</th>
<th>Wald</th>
<th>p-value</th>
<th>R</th>
<th>OR</th>
<th>CIL</th>
<th>CIU</th>
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Note. OR - Odds ratio; CIL - lower limit of 95% confidence interval for odds ratio; CIU - upper limit for 95% confidence interval for odds ratio.
Appendix F: Cox Regressions Including UHR Participants With Less Than 25% Data Missing Only
### Table F. Cox Regressions Including UHR Participants With Less Than 25% Data Missing Only

<table>
<thead>
<tr>
<th>Covariate</th>
<th>B</th>
<th>Wald</th>
<th>p -value</th>
<th>R</th>
<th>OR</th>
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**Note.** OR - Odds ratio; CIL - lower limit of 95% confidence interval for odds ratio; CIU - upper limit for 95% confidence interval for odds ratio.
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Author/s:
PHILLIPS, LISA JANE

Title:
A prospective study of the relationship between stress, coping and the onset of psychosis in a high risk group

Date:
2005-06

Citation:

Publication Status:
Unpublished

Persistent Link:
http://hdl.handle.net/11343/38942

File Description:
A prospective study of the relationship between stress, coping and the onset of psychosis in a high risk group

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