Auditory hallucinations: cognitive processes, phenomenology and psychological treatment

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by

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Contents

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In this thesis a review of the literature relating to the cognitive processes, phenomenology and psychological treatment of auditory hallucinations is presented together with six studies which have attempted to further elucidate their nature and appropriate psychological treatement. The first four studies examined the cognitive processes associated with the phonological store and articulatory loop and its relation to inner speech in patients experiencing auditory hallucinations. Patients experiencing auditory hallucinations did not show deficits on these tasks suggesting 'normal' functioning of the phonological loop. The fifth study examined the nature of hallucinating patients' self-reports regarding the phenomenology, characteristics and variables which affect the occurence of their hallucinations. The results indicated that patients who indicated that they could exert control over their hallucinations were more likely to use relaxation and being alone as coping strategies. In addition there was a trend for those patients who could cope with their hallucinations to experience voices originating from inside their head (i.e. pseudo-hallucinations) and experience internal attributions regarding their cause. Finally, the development of a 'focusing' psychological treatment is described which was designed to address some of the cognitive abnormalities which are believed to contribute to the occurence of auditory hallucinations. In a study comparing this treatment to a treatment which employed only distraction approaches and a small waiting list control group, focusing and distraction approaches were found to significantly reduce the frequency of patients' auditory hallucinations and the disruption to life caused by them. No significant changes were observed with regard to the distress caused by their hallucinations or the patients' attributions regarding them.

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Chapter 1

Auditory hallucinations: An historical perspective

The word hallucination is derived from the Latin half-passive verb "allucinari" meaning "to wander in mind" (La Barre, 1975). It was first introduced into English in 1572 in a translation of the work of Lavater, in which the term was used to describe a variety of strange noises, omens and apparitions (Slade and Bentall, 1988). The authors of the Oxford Textbook of Psychiatry (1991) defined a hallucination as...

> **.... a percept experienced in the absence of an external stimulus to the sense organs, and with a similar quality to a true percept. A hallucination is experienced as originating in the outside world (or within one's own body) like a percept, and not within the mind like imagery.**
>
> (Gelder, Gath and Mayou, 1991)

Auditory hallucinations are often associated with a diagnosis of schizophrenia and are one of the most frequently reported symptoms of the disorder. In a survey carried out by the World Health Organisation in 1975, the frequency of auditory hallucinations in acute schizophrenia was found to be seventy four per cent (WHO, 1975). Other types of hallucination are much less common in schizophrenia and they are mainly reported in the visual, tactile and olfactory modalities. Auditory hallucinations may be experienced as noises such as bangs, whispers, whistles or voices. Voices may take the form of instructions to the person (second person auditory hallucinations), comments about the person (third person auditory hallucinations) or single words or phrases. There may be a number of different voices and sometimes they may repeat a person's thoughts. Some people hear their thoughts spoken out loud, either as they think them (gedankenlautwerden) or immediately afterwards (echo de la pensee; Gelder et al, 1991).

Although auditory hallucinations are observed frequently in schizophrenia they are sometimes associated with other pathologies such as chronic alcoholic hallucinosis or affective psychosis (Sims, 1988; Asaad and Shapiro, 1986), and are sometimes reported by people who are otherwise normal and who do not regard themselves as psychiatrically ill (Posey and Losch, 1983; Young, Bentall, Slade and Dewey, 1986; Barret and Etheridge, 1992; Romme and Escher, 1989). In a study carried out at the University of Liverpool students completed a questionnaire requiring them to indicate whether or not they had experienced hallucinatory or similar experiences. Approximately ten per cent of 'normal' students reported that they had heard a voice of someone when they knew no-one to be there (Young, Bentall, Slade and Dewey, 1986). In an innovative study by Romme and Escher (1989), people who heard voices were asked to contact researchers following an advertisement in the media. They discovered that approximately one third of the 450 people who contacted the researchers experienced hearing voices with which they were able to cope. A substantial number of the responders had no contact with psychiatric services and had not acquired any psychiatric diagnosis. Some found the experience of voices pleasant and others had developed explanations of the voices which aided their ability to cope with the experience e.g. spiritual, medical, supernatural, clairvoyant or psychological explanations.

From a historical perspective, there are references to the occurrence of hallucinatory experiences in the literature of a number of authors. The following review is partly based on that of Slade and Bentall (1988) who provided a very comprehensive overview of the history of auditory hallucinations. One author (Jaynes, 1979), in an analysis of the Iliad, proposed that the ancient Greeks had no concept of their own consciousness and therefore misattributed their thoughts to gods and spirits. Early Christian writers also wrote on the subject of hallucinatory experience. St Augustine of Hippo (AD 354-430) identified three levels of experience ranging from direct visual experience, to imagination and finally, to intellectual reasoning. Later, St Thomas Aquinas proposed that it was important to determine the origin of voices and visions, particularly whether they originated from God, the Devil or from other causes.

During the fifteenth and sixteenth century the church deemed that voices and visions were due to Satanic origin and that they had to be dealt with through punishment. Kramer and Sprenger's 1489 book Malleus Maleficarum (The Hammer of the Witches; Sprenger, 1971) was commissioned by the Pope and advocated torture and death for people suspected of witchcraft or under satanic influences. Their criteria regarding the recognition of these people are similar to those which would lead to the diagnosis of mental illness today (Slade and Bentall, 1988).

During the seventeenth and eighteenth centuries changes began to emerge in the conceptualisation of mental illness, so that people were recognised as being insane or 'lunatic' rather than being possessed by the Devil or by evil spirits. During the fifteenth and sixteenth century people suffering from mental illness were usually looked after by their families and friends, or in the case of paupers, were tolerated and sometimes supported by the parishes. From the 17th century the care of the mentally ill, as well as other people such as criminals and paupers, shifted towards care in private or public asylums (Scull, 1979). Initially this movement was mainly for the care of those people who were a danger to themselves or their community, therefore such care was a last resort. Over the following two centuries asylum care became more and more acceptable and the numbers incarcerated in them increased steadily during the eighteenth century and quickly during the nineteenth with the advent of government legislation requiring counties to set up public asylums in 1845. Around the start of the nineteenth century only a few thousand people were housed in asylums or 'madhouses', but towards the end of the century this had multiplied to 100,000 (Porter, 1987).

At the beginning of the 18th century only one public asylum existed, Bethlem, London, which was set up for the care of 'lunatics' and other socially deviant people in 1377. In 1731, the second public asylum was set up and this was followed by asylums in Manchester, York, Newcastle and Liverpool during the remainder of the century. Although most of these institutions did have medical practitioners attached to them, medical treatment was not established as essential for the care of 'lunatic'. The founder of a mental hospital in York (the Retreat) was a tea merchant, although there was a medical practitioner involved in the care of patients. A more lucrative side to the care of the mentally ill in England related to the private asylums which were set up during the eighteenth and nineteenth century. These asylums were paid for, usually by relatives, but also by parishes or benefactors to look after people whose family or community believed them to be 'insane'. Initially there was no government control over the management of these establishments, which led in some cases to abuse of the sufferers and to people being committed for reasons other than insanity. Many of these establishments did not have any medical practitioners attending on them and there was no requirement for them to do so. Despite this, medical involvement in the care of the mentally ill became more prominent so that many of the private as well as public asylums were managed by physicians. In 1774, the Act for regulating private madhouses first specified that individuals committed to private asylums must have certification from a physician. Over the following decades treatment of the mentally ill became increasingly seen as taking place in an asylum, so that by Victorian times asylums was the norm, whereas 100 years before it was relatively uncommon for the majority of sufferers. Scull (1979) has argued that this shift to institutional care was related not to developments in medical knowledge regarding mental illness but to the changes in social order and politics during these times. The establishment of institutions coincided with massive industrialisation in England and an increasing capitalist market economy. People who were not able or were unwilling to work were not tolerated therefore workhouses or institutions were set up to enforce people to conform with this philosophy. Those people who were deemed insane were not able to conform to this philosophy, therefore Scull (1979) argued that separate institutions for the insane were set up to prevent them from disrupting this work ethic. As a result of this, Scull argued that a medical profession (psychiatry) developed in order to justify the incarceration.

Although, medical treatments had little scientific grounding during this time, some of the private and public institutions were advocating cure of the mental illness rather than just providing asylum. Before 1730, the Bethlem hospital purported only to admit people who were 'curable' and many private asylums advertised their services in terms of cure rates and speed of recovery (Porter, 1987). 'Treatments' ranged from providing a quiet environment and a good diet to more medical treatments such as the use of opiates and electrical treatment.

Although specific treatments for symptoms such as auditory hallucinations and delusions were not widely adopted, discussion of the nature of the symptoms was occurring. There was debate regarding the nature of hallucinatory experience, where no distinction was made initially, between what was illusion and what was hallucination. Some authors believed that hallucinations were extremes of normal experience i.e. that there was a continuity between hallucinations and normal imagination (Hibbert, 1825), while others argued that hallucinations were a result of abnormality in the brain (Arnold, 1806). It was not until 1832, that the French physician Esquirol (Esquirol, 1832) made a distinction between hallucination and illusion. He proposed that an hallucination resided wholly in the mind and did not involve the stimulation of senses, whereas an illusion involved an excitation of all the senses which in turn caused a secondary reaction from the brain or mind.

Schizophrenia

The first descriptions of what is now called schizophrenia were made by Kraepelin in 1896, who proposed the concept of 'dementia praecox' (Kraepelin, 1896). This term was changed to 'schizophrenia', by Eugen Bleuler in 1911 (Bleuler, 1911), as he thought the term better described the syndrome (schiz = split, phrenia= mind, hence "split mind") that Kraepelin had described. These descriptive terms were in response to attempts to classify types of mental illness in terms of prognosis and course. Kraepelin attempted to distinguish dementia praecox from manic depressive psychosis on the basis of its poor prognosis. This categorical model is still widely accepted, particularly by the psychiatric profession (Sims, 1988), although there are a number of authors who have questioned the validity of this model of mental illness (Bentall, Jackson and Pilgrim, 1988; Pilgrim, 1990).

In the decades following Kraepelin, researchers and clinicians attempted to describe schizophrenia more rigorously in terms of its key components or symptoms. Schneider (1959, 1976) went on to describe a group of abnormal experiences that were pathognomic for schizophrenia if they occurred in clear consciousness and in the absence of any organic brain disease or injury. These symptoms were as follows: hearing thoughts spoken aloud, third person auditory hallucinations, auditory hallucinations as a commentary, somatic hallucinations, thought withdrawal or insertion, thought broadcasting, delusional perception and feelings or actions experienced as made or influenced by others.

The above symptoms are generally termed "positive symptoms". In the 1950's several researchers (Wing, 1959; Wing and Brown, 1970), when examining long stay patients in institutions, noticed visible deficits in behaviour in their patients e.g. emotional blunting, slowness of speech or movement, poverty of speech, lack of motivation and poor use of non-verbal language. These symptoms have now become known as "negative symptoms" of schizophrenia. In the present day the diagnosis of schizophrenia has become more systematic following the development of classification systems such as DSM III-R (APA, 1987). This type of classification has attempted to define symptoms more precisely and standardise the diagnostic process for determining the presence of mental illness. Structured psychiatric interviews, such as the Present State Examination (Wing et al, 1974) have been developed to assist clinicians and researchers to elicit standardised information from patients which can then easily be classified into well-defined diagnostic categories, such as schizophrenia.

As can be seen from the above review, auditory hallucinations have been reported for many hundreds of years and it is only relatively recently that they have been associated with the concept of schizophrenia.

Despite wide acceptance of Kraepelin's approach to mental disorder, considerable cultural differences exist in the experience of hallucinations in the extent to which they are reported by people who regard themselves as normal. Bourguignon (1970), in a review of the anthropological literature on 488 societies throughout the world, found that in sixty-two per cent of these societies hallucinations played an important part in ritual practices. These rituals tended to be related to trance-like states and communication with spirits and were seen to be a positive and welcomed part of their culture. There are also some observed differences in the modality of hallucinations reported to clinicians by patients in different parts of the world (Al-Issa, 1978). In particular, visual hallucinations are more commonly reported in undeveloped countries in comparison with developed countries (Sartorius et al, 1986). A study looking at 100 years of psychiatric records in Vienna (Leinz, 1964) revealed that visual hallucinations were more commonly reported during Victorian times as compared to more recent times.

In view of the diversity of situations, pathologies and cultures with which auditory hallucinations are associated it will be useful to examine in more detail the variables which have been shown to effect the experiencing of hallucinations. This is the topic of the next chapter.

Chapter 2

Variables which influence the occurrence of auditory hallucinations and personality variables

The following chapter reviews those variables which have been reported to influence the occurrence of auditory hallucinations and psychotic breakdown in general. Some of this refers to variables influencing relapse in schizophrenia, of which, as pointed out in Chapter 1, auditory hallucinations play a large part. This chapter is largely influenced by Slade (1976a), Slade and Bentall (1988) and Bentall (1990a, 1990b).

Many studies in the psychiatric literature have highlighted the effects of stress on psychotic breakdown. Studies have tended to concentrate on acute stressors such as life events or more chronic, continuous stress such as family environment.

Life events

The above term usually refers to those events which are traumatic and often occur suddenly, for example, death of a loved one or loss of a job. Brown and Birley (1968) retrospectively studied the occurrence of independent life events in fifty schizophrenics in the weeks preceding a relapse. They found that they experienced four times as many life events as a control sample of factory worker in the twelve weeks prior to their breakdowns. A World Health Organisation study (Day, Neilsen, Korten et al, 1987) studied 386 patients in nine centres around the world. Results suggested that life events tended to cluster in the three weeks preceding relapse. These findings were significant in six of the nine centres studied. A recent study by Van Os, Fahy, Bebbington et al (1994) followed up 59 patients for up to 42 months and found that 52 per cent had experienced a stressful life event in the three months immediately before onset of psychotic symptoms. This study suggests that although life events are important factors in relapse for some patients, there are other patients who relapse regardless of the occurrence of life events.

In a slightly different study examining stress related factors, Reese (1971) studied hallucinatory experiences in people who had recently become bereaved. The subjects in this study did not have a diagnosis of schizophrenia. He found that 13.3 per cent of his sample experienced hallucinations of their deceased relative in the months following their bereavement. Other authors have reported similar findings (Wells, 1980; Alroe and McIntyre, 1983; Day et al, 1987).

Visual hallucinations have also been reported in association with other traumatic stressful situations. Comer, Madow and Dixon (1967) reported the experience of two miners trapped in darkness for two days.

They experienced visual hallucinations which took the form of visions of doorways, stairs and the Pope. Siegel (1984) reported hallucinations in a group of hostage victims and found that eight people out of the thirty one for which there was information had suffered visual hallucinations, ranging from simple geometric shapes to complex memory images.

Chronic stress

There have also been a number of authors who have studied the effects of continuous stress, particularly that within the family. The concept of Expressed Emotion (EE) emerged from observations made in the 1950's by George Brown and his colleagues (Brown and Rutter, 1966). These authors found that patients who were discharged from mental hospitals to return to live with their parents or spouse were more likely to relapse than patients who were discharged to hostels or other home environments. They developed a structured family interview, The Camberwell Family interview (CFI; Brown and Rutter, 1966) which was designed to measure familial expressed emotion. The concept of EE as measured by the CFI is made up of a composite score relating to the following three elements: the number of critical comments made by members of the family, hostility and emotional overinvolvement (Brown, Birley and Wing, 1972). In a study of the close relatives of 101 schizophrenic patients, Brown et al (1972) found that those patients living with high EE relatives were more likely to relapse in the nine month follow-up period than those living with low EE relatives (58 versus 16 per cent).

This observation was replicated by Vaughn and Leff (1976) who combined their data with that obtained by Brown et al (1972) which gave a final sample of 128. Patients living with relatives rated as high EE were more likely to relapse in a nine month follow-up period compared to those living with low EE relatives. The relapse rate was further increased in those people who spent more than thirty-five hours in the presence of their high EE relatives and who did not comply with anti-psychotic medication, for at least one month out of the nine months studied. In patients with low EE relatives, discontinuing medication did not effect relapse rates, although in a two year follow-up of their subjects, Leff and Vaughn (1981) argued that medication could protect patients living in low EE environments from relapsing due to life events. It is possible that for patients with high EE relatives, medication is important in acting as a buffer against high levels of stress within the family.

A number of researchers have attempted to modify EE in families using education and cognitive-behavioural interventions. Results from these studies have demonstrated that changes from high to low EE can occur in families and that this does have a significant effect on subsequent relapse rates (Tarrier, Barrowclough, Vaughn et al, 1988; Leff, Kuipers, Berkowitz and Sturgeon, 1985; Hogarty, Anderson, Reiss et al, 1986). Although these studies do not directly relate to relapse in hallucinating patients it is likely that a substantial proportion of those studied will have experienced hallucinations as part of their illness (Sims, 1988).

Cognitive stressors and hallucinations

Stress can also be experienced when there is no obvious stressor such as high EE. The way in which events are perceived may contribute to the experience of distress. Seemingly innocuous events to one person may be perceived by another as extremely distressing. For example, it has been well documented that people suffering from depression often tend to interpret their world in a catastrophic way as compared to non-depressed individuals (Beck, 1976), therefore it is likely that similar processes occur in psychotic patients.

In a case report by Slade (1972), a patient who had a diagnosis of schizophrenia was experiencing auditory hallucinations which were triggered during periods of increased anxiety, particularly related to when the patient was at home in the presence of his father. It was also found that this increase in hallucinating also occurred when the patient was away from home and thinking about his father. The role of patients' interpretations of their hallucinations has been further studied by Chadwick and Birchwood (1994). They observed that patients' experiences of their hallucinations were mediated by the beliefs that they held regarding the voices, particularly relating to their malevolence, benevolence and omnipotence. Their beliefs regarding the voices were not always related to their content. For example, one patient experienced voices which superficially appeared to have a benevolent content, but the patient attributed malevolent characteristics to them, as he believed they originated from "evil witches" who intended to drive him mad.

Psychophysiological measures and hallucinations

A wide range of psychophysiological measures have been employed to investigate the relationship between stress and hallucinations. Early research was restricted largely to peripheral autonomic variables e.g. skin conductance and heart rate activity. For example, Allen and Agus (1968) reported a study where two patients who had a history of hallucinations, were encouraged to hyperventilate, which served to increase arousal of the autonomic nervous system. They found that hallucinations could be induced under these conditions.

Fonagy and Slade (1986) conducted a study with a hallucinating patient who was monitored during reported hallucinatory occurrences for; skin conductance, finger-pulse volume, respiration rate and heart rate. These measures were taken before onset of the reported hallucinations, during and for one minute following the cessation of the hallucinations. The results indicated that skin conductance increased steadily prior to onset, peaked shortly after the occurrence and slowly decreased to baseline measurements following cessation. A decrease in finger pulse volume was also seen slightly before onset. These results are consistent with arousal within the autonomic nervous system, but other measures provided conflicting evidence. Decreases were seen in heart and respiration rate which was not consistent with an increase in autonomic arousal. Similar results for skin conductance have been reported in a study by Cooklin, Sturgeon and Leff (1983). They studied fluctuations in skin conductance in fifteen hallucinators, who had a diagnosis of schizophrenia, and found a significant relationship between onset of hallucination and increases in spontaneous skin conductance fluctuation rate. It is possible that the behaviours required to indicate the onset of a hallucinatory experience could give rise to the increases in autonomic arousal reported in both studies, although Cooklin et al argued that this was unlikely as the behaviours were small compared to the types of postural movements which occurred frequently during recording. Cooklin et al also pointed out that it is difficult to distinguish between whether the hallucinatory experiences are a result or a cause of the increases in arousal. The hallucinations could be arousing in themselves, rather than the arousal causing the hallucinatory experience. It is possible that both interpretations are correct where an increase in arousal precedes the hallucination and then provokes additional arousal.

Suggestions

It has been reported that patients who experience hallucinations are more likely to respond to suggestions encouraging these experiences than normal subjects (Mintz and Alpert, 1972; Young, Bentall, Slade and Dewey, 1987). Barber and Calverley (1964) instructed a sample of secretaries to close their eyes and listen to a recording of the Bing

Crosby song "White Christmas" when in fact no record was played. Approximately five per cent of this sample reported that the record had been played.

Mintz and Alpert (1972), using the Barber et al "White Christmas" test, found that seventy-five per cent of individuals experiencing hallucinations reported hearing the record and ten per cent actually believed it had been played. This was significantly more than the "normal" control group. In a more recent study, Alpert (1985) compared groups of hallucinating and non-hallucinating patients who had been given a diagnosis of schizophrenia with hallucinating patients who had alcohol problems. They were given instructions to hear voices against a background of white noise. The hallucinating patients were more likely to report hearing voices than non-hallucinating patients, who did report experiences, but of a less complex nature such as simple sounds. Young, Bentall, Slade & Dewey (1987) observed the effects of auditory and visual suggestions on hallucinatory experiences and found that hallucinating subjects were more likely to report perceptual experiences consistent with suggestions they had been given. Interestingly, no difference was observed between the groups studied on psychometric measures of suggestibility.

Sarbin, Juhasz and Todd (1971) reported an experiment which does not provide support for the notion that hallucinators are more susceptible to suggestion than non-hallucinators or normal subjects. They gave groups of hallucinating and non-hallucinating patients and college students samples of distilled water and suggested that they contained varying levels of salt in them. The college students were more likely to report that they tasted salt than the other two groups and the hallucinating patients reported tasting salt least often. In a second experiment, the subjects were instructed to hear voices against a background of white noise. No significant differences were found within the three groups although a trend similar to the first experiment was observed. This finding is contradicted by a study by Margo, Hemsley and Slade (1981) who found that in a sample of seven hallucinating schizophrenics the frequency of hallucinations increased under conditions of white noise, a result which has recently been replicated by Gallagher, Dinan and Baker (1994).

Although there is some evidence that hallucinators are not influenced by suggestion to a greater extent than normal subjects, the evidence in support of this appears to be more substantive.

Subvocalisation

Some studies have indicated that auditory hallucinations tend to be associated with subvocalisation (eg. Gould, 1950; McGuigan, 1966; Inouye & Shimizu, 1970; Green & Preston, 1981). Subvocalisation is normally associated with inner speech which is usually referred to as verbal thinking. Subvocalisation is usually used to describe the movement of the speech muscles which accompany inner speech (Sokolov, 1972).

Green and Preston (1981) recorded and amplified a patient's subvocalisations using a throat microphone. The content of the vocalisations was speech which corresponded to the patient's report of the content of his hallucinations. Green & Kinsbourne (1989), in an attempt to further test the idea that hallucinations are equivalent to inner speech, asked patients to perform behaviours which would block subvocalisation. They were not able to demonstrate a significant reduction in the *frequency* of hallucination, although they found that humming (a task which blocks subvocalisation) significantly reduced the *duration* of hallucination. In an earlier study, Bick and Kinsbourne (1987) demonstrated that hallucinations could be reduced using a mouth opening procedure which blocked subvocalisation. They were also able to demonstrate that hypnotically induced hallucinations in 'normal' subjects could also be reduced in this way. In a replication of this study with 'normal' subjects, Levitt and Waldo (1991) found that the mouth opening procedure did not affect hypnotically induced hallucinations. Despite this, in support of subvocalisation being directly associated with auditory hallucinations, there is further evidence that auditory hallucinations tend to be blocked by concurrent verbal tasks such as reading or speaking (eg. Margo et al, 1981; James, 1983; Gallagher et al, 1994).

Margo et al (1981) conducted a study where hallucinating patients were required to report on their experiences of auditory hallucinations under nine different conditions. These were: white noise, listening to an interesting story, listening to a boring story, listening to pop music, listening to a passage in Afrikaans (which none of the patients understood), listening to irregular and regular electronic blips, reading out loud, a condition of sensory deprivation where the patient wore headphones and an eye cover, and finally a control condition. The results indicated that under conditions of white noise and sensory deprivation the duration, clarity and loudness of hallucinations increased while for all the other conditions these variables decreased. The reductions increased with the meaningfulness of the distraction material i.e. the boring passage reduced hallucinations less than the interesting passage, the Afrikaans passage reduced hallucinations less than both of these. Conditions which blocked subvocalisation were the most effective at reducing the occurrence of hallucinations i.e. reading, listening to meaningful speech.

Subvocalisation tasks are likely to reduce a patient's ability to analyse the content or meaning of their voices and their beliefs and attributions about them. This seems to be an important aspect of patients' reports of hallucinations (Chadwick and Birchwood, 1994). It is possible that auditory hallucinations are a form of inner speech which, if paired with a particular set of beliefs or cognitive schema, result in hallucinatory experiences which appear to originate externally from the individual's mind.

Further evidence which may shed light on the relationship between inner speech and auditory hallucinations comes from studies involving articulatory suppression in normal individuals. This involves repeating, usually meaningless, words while engaged in a verbal task such as reading (Baddeley and Lewis, 1981). Articulatory suppression interferes with serial recall span of short words and dissimilar sounding words (Baddeley, 1986). This phenomenon can be explained by assuming that immediate recall of these stimuli relies on the ability to rehearse them in the phonological store or loop (see Baddeley, 1990 for a further description of the role of the phonological store or loop in short term memory) using inner speech. Articulatory suppression disrupts this process hence reducing the recall of material in short term memory. If hallucinations are related to inner speech, it is likely that the phonological store or loop is also related in some way. Some of the implications of these findings will be explored in the following chapter.

Personality and predisposition to hallucinate

Finally, from a different perspective, a number of authors have attempted to examine whether predisposition in terms of performance on tests of personality could account for the development of hallucinations. A number of studies have been conducted comparing scores on personality tests in hallucinating and non-hallucinating patients.

Slade (1976c) investigated personality factors using the Eysenck Personality Inventory (EPI, Eysenck and Eysenck, 1973) in hallucinating and non-hallucinating psychiatric patients and a group of non-patient controls. He found no significant differences on the neuroticism or the extroversion dimensions of the scale although there were significant differences between all three groups on the psychoticism scale. The hallucinating patients scored higher on the psychoticism scale than the non-hallucinating patients who, in turn, scored higher than the controls. This was further investigated by Launay and Slade (1981) who compared the psychoticism scale of the EPI to scores on the Launay-Slade Hallucination scale, which measures a persons tendency to report hallucinatory experiences. They found a significant relationship between the two scales with an increase in reporting of hallucinatory experiences corresponding with higher psychoticism scores.

The EPI was slightly modified and re-published as the Eysenck Personality Questionnaire (EPQ, Eysenck and Eysenck, 1976) with some revision to the psychoticism scale. Ramanathan (1984a,b) used the EPQ with hallucinating patients and found a relationship between scores on the neuroticism scale and the amount to which hallucinations were reported to be interfering with patients' lives and how the hallucinations were coped with. In a later study Ramanathan (1986) found that high neuroticism scores were related to anxiety experienced before onset of voices, the anger expressed by the patient on hearing a voice and the degree of interference experienced in occupational and social activity as a result of the hallucinations. High scores on the neuroticism scale may therefore reflect the amount the person is disturbed or distressed by their hallucinatory experiences rather than a predisposition to hallucinate.

A more recent study by Young, Bentall, Slade, and Dewey (1986) looked at EPQ scores in 203 students from Liverpool University who also completed the Launay-Slade Hallucination Scale (LSHS). They found a significant positive correlation between the neuroticism scale on the EPQ and LSHS scores, but no correlation between the psychoticism scale and LSHS scores. These results contradict those reported by Slade (1976c), who found a relationship between the psychoticism scale and the LSHS. The studies are not directly comparable however, as the psychoticism scale from the EPQ used in the Young et al study had been substantially revised by its authors in 1976. The above study is consistent with the findings of Ramanathan (1984a,b; 1986) in that those who experienced and reported hallucinatory experiences scored more highly on the neuroticism scale of the EPQ. The findings reported by Ramanathan were attributed to the distress caused by the voices. It is not possible to know whether this was the case in the Young et al study as the LSHS does not assess the amount of distress caused by the hallucinations.

Claridge and Broks (1984) found a relationship between the EPQ and a schizotypy scale designed by the authors. They proposed that an individual who reports many schizoptypal characteristics may possess the kind of emotional instability reflected by the neuroticism scale on the EPQ. In a later study, Bentall, Claridge and Slade (1989) combined a number of schizotypy scales and the EPQ, to form the Combined Schizotypal Traits Questionnaire (CSTQ), and administered this to 180 'normal' subjects. Following a factor analysis of the data, the authors identified four factors relating to: positive psychotic symptomatology, negative psychotic symptomatology, social anxiety and cognitive disorganisation and a factor which appeared to relate to an asocial component of schizotypy. This final factor was mainly accounted for by the psychoticism scale from the EPQ. This study indicates that the relationship between scores on the EPQ and a tendency to hallucinate is by no means clear.

Barret and Etheridge (1994) have suggested that normal subjects who report auditory hallucinations also exhibit unstable emotional tendencies. They studied personality correlates on the Millon Clinical Multiaxial Inventory (MCMI, Millon, 1983) in 'normal' subjects who reported auditory hallucinations as measured by the authors Verbal Hallucination Questionnaire (Barret and Etheridge, 1992). They found that hallucinators scored higher on scales reflecting depressive and labile emotionality and social constraint and conformity.

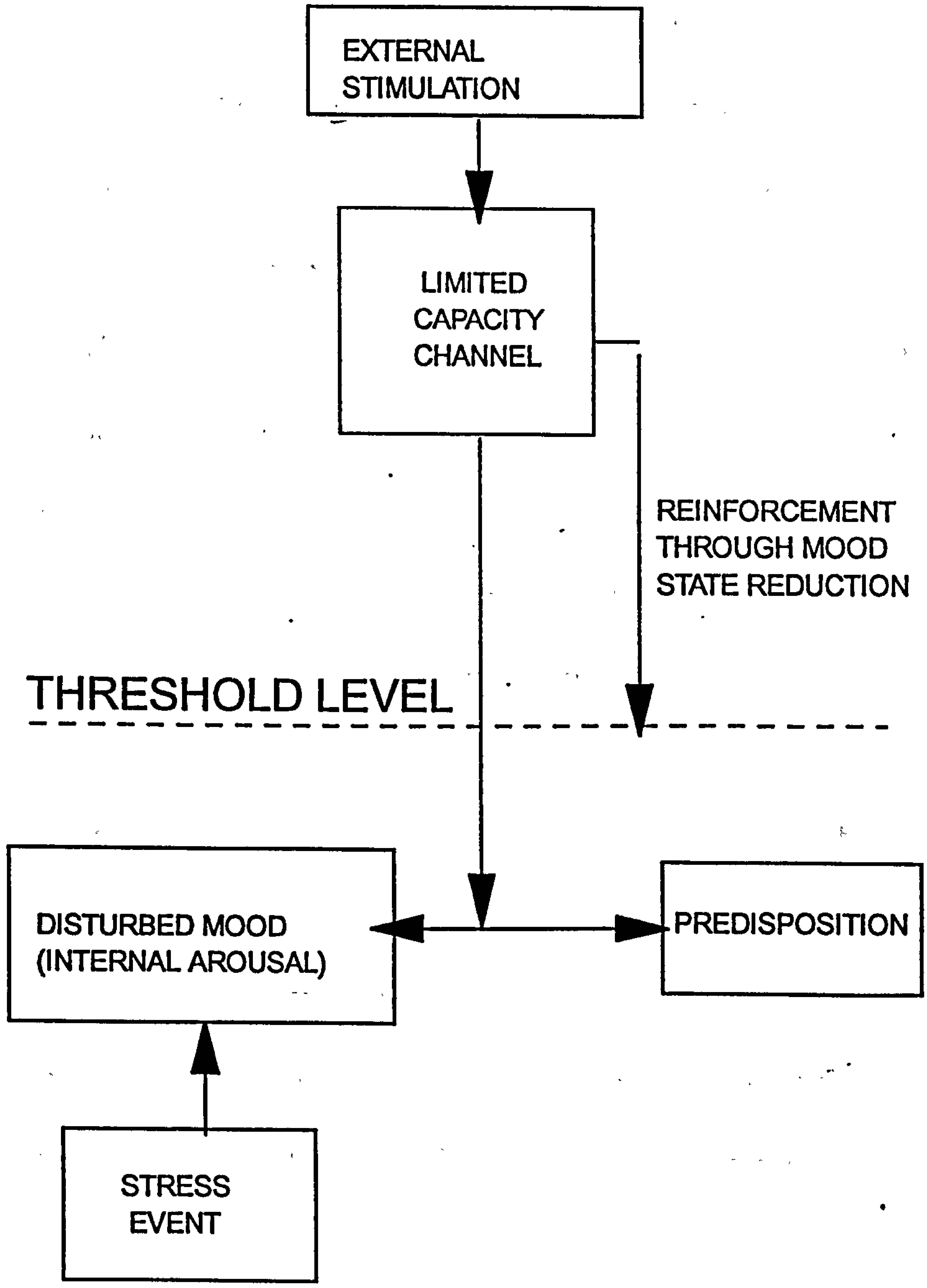
Other aspects of personality have been investigated by Slade and colleagues in hallucinating patients (Judkins and Slade, 1981). They argued that high scores on the psychoticism scale of the EPI reflected high responding on aggressive or paranoid items. This led them to investigate the relationship between aggression or hostility and auditory hallucinations. They administered the Hostility and Direction of Hostility Questionnaire (HDHQ: Caine, Fould and Hope, 1967) to twenty-six hallucinating patients with a diagnosis of schizophrenia and comparison groups of paranoid and non-paranoid non-hallucinating patients. The scale gives scores of total hostility and also scores for the direction of hostility i.e. a measure for whether the individual directs hostility towards him or herself (intrapunitiveness), or towards others (extrapunitiveness). Total hostility scores were higher for the hallucinating patients than for the combined non-hallucinating group, and those with unpleasant voices scored higher on total hostility than those with pleasant voices. In addition, differences were observed between direction of hostility and reported location of the hallucinations. For those with pseudo-hallucinations (i.e. those heard from inside the person's head), the direction of hostility tended to be intrapunitive. Given that differences were found within the hallucinating group in this study it seems that further studies in this area should pay attention to phenomenological differences in reported hallucinations when attempting to interpret results. These will be explored in Chapter 5 of this thesis.

A psychological formulation for hallucinations

In the light of some of the evidence presented above, Slade (1976a) proposed a formulation of hallucinations which would take into account those variables which have been shown to affect the occurrence of auditory hallucinations. This formulation is illustrated in Figure 1.

Slade (1976a) proposed that there could be several antecedents to hallucination onset, one of which was psychological stress. He proposed that a general disposition to experience hallucinations was necessary together with this stress. He suggested that, stress events lead to a disturbance of mood, characterised as a state of high internal arousal. This arousal may interact with an individual's predisposition to

Figure 1
A functional analysis of hallucinations
(Slade, 1976a)



hallucinate and trigger a hallucinatory experience into consciousness. In this model then, high predisposition and minimal stress may be sufficient to trigger a hallucinatory experience, whereas a high level of stress may be needed to trigger an experience in a mildly predisposed person. Slade also proposed that other factors may be involved, particularly the level of environmental stimulation. He assumed a limited capacity model of information processing suggesting that hallucinations gain access to consciousness at the expense of attendance on external sources of stimulation. This presumes then, that relevant external stimulation may block the experience of internally generated events such as hallucinations.

Finally, Slade also included reinforcement in his formulation, following observations that some patients reported improved mood subsequent to an hallucinatory episode. He argued that improvements in mood following hallucination may reinforce the experience thereby increasing the probability of its occurrence on future occasions. It could be predicted that this lowers an individual's threshold, hence increasing a person's predisposition to experience hallucinations. Following repeated reinforcements only mild stress may be necessary to trigger an hallucinatory episode.

Although the above model accounts for some of the factors associated with the occurrence of hallucinations, it fails to take into account factors such as suggestibility, cultural factors, beliefs and cognitive factors which have been shown to be associated with the occurrence of hallucinations. In addition, it has been shown that there may be cognitive deficits associated with hallucinations, which must also be taken into account in any comprehensive model of the phenomenon. In the following chapter cognitive processes associated with hallucinations and schizophrenia will be discussed in more detail.

Chapter 3

Cognitive processes and auditory hallucinations

Research has shown that there are a number of factors which are related to the development and onset of psychotic disorders. Biochemical, neuroanatomical, genetic as well as developmental and familial factors are known to play a part in psychotic experiences (see Kavanagh, 1992 for a review). The effect of these factors on the cognition of people suffering psychotic experiences has produced research in a wide variety of areas relating to cognitive processes, especially in relation to schizophrenia (Saccuzo and Braff, 1986; Neale, 1971; Harris, Benedict and Leek, 1990; Nuechterlein and Zaucha, 1990; Orzack and Kornetsky, 1966; Nuechterlein, 1983; Wykes, Katz, Sturt and Hemsley, 1992; Braff, 1989; Hemsley, 1993). It is not possible to provide a comprehensive review of the literature relating to cognitive and information processing deficits in schizophrenia here, although some authors have attempted to summarise the main findings (e.g. see Hemsley, 1994; Green, 1992).

Research into cognitive deficits in schizophrenia began during the early years of this century when Kraepelin (1913, 1919) distinguished between different types of attentional deficits in schizophrenia. He proposed that schizophrenia was usually characterised by deficits in active attention i.e. voluntary attention, but that in the later stages of the illness and in acute phases, passive or non-voluntary attention was affected. Later research has continued to implicate attentional deficits in schizophrenia, although part of the difficulty in carrying out this type of research has related to the finding that patients who have a diagnosis of schizophrenia perform poorly on a wide range of information processing tasks (Green, 1992) resulting in a lack of consensus about the nature of a specific deficit which accounts for all individuals who have the diagnosis. Part of the difficulty in carrying out research in this area relates to the lack of an agreed model of 'normal' cognitive functioning with which to compare patients with schizophrenia. In addition, the symptoms associated with schizophrenia are experiential and may involve many sub-systems which relate to perception or action and to the executive systems which control those perceptions (Shallice, 1988). This implies that identification of a specific deficit relating to all patients with a diagnosis of schizophrenia is unlikely at present.

Hemsley (1993, 1994), when reviewing current opinion on the nature of the cognitive impairment in schizophrenia, suggested that there may be a link between certain perceptual abnormalities in schizophrenia and a weakening of the inhibitory processes crucial to conscious attention. On the basis of his review, Hemsley (1993, 1994) has argued that many authors acknowledge "the important role of spatial and temporal regularities of past experience on the processing, and possibly awareness, of current sensory input" (Hemsley, 1993, p. 635). Hemsley concluded that schizophrenia could be viewed as a disturbance in the moment by moment integration of stored material (presumably in memory) with current sensory input. He argues that this results in ambiguous unstructured sensory input which may result in psychotic symptoms such as hallucinations. Hallucinations may then arise as a result of the intrusion of unexpected or unintended material from long-term memory which is interpreted as alien. Hemsley suggests that the observation that hallucinations are more likely to occur under conditions of sensory deprivation (Comer et al, 1967; Margo, Hemsley and Slade, 1981) i.e. when there is unstructured perceptual input, and the observation that hallucinations reduce in severity when patients are provided with structured perceptual input e.g. when they listen to a spoken passage (Margo, Hemsley and Slade, 1981; Gallagher, Dinan and Baker, 1994) provide some support for his model of schizophrenia and hallucinations.

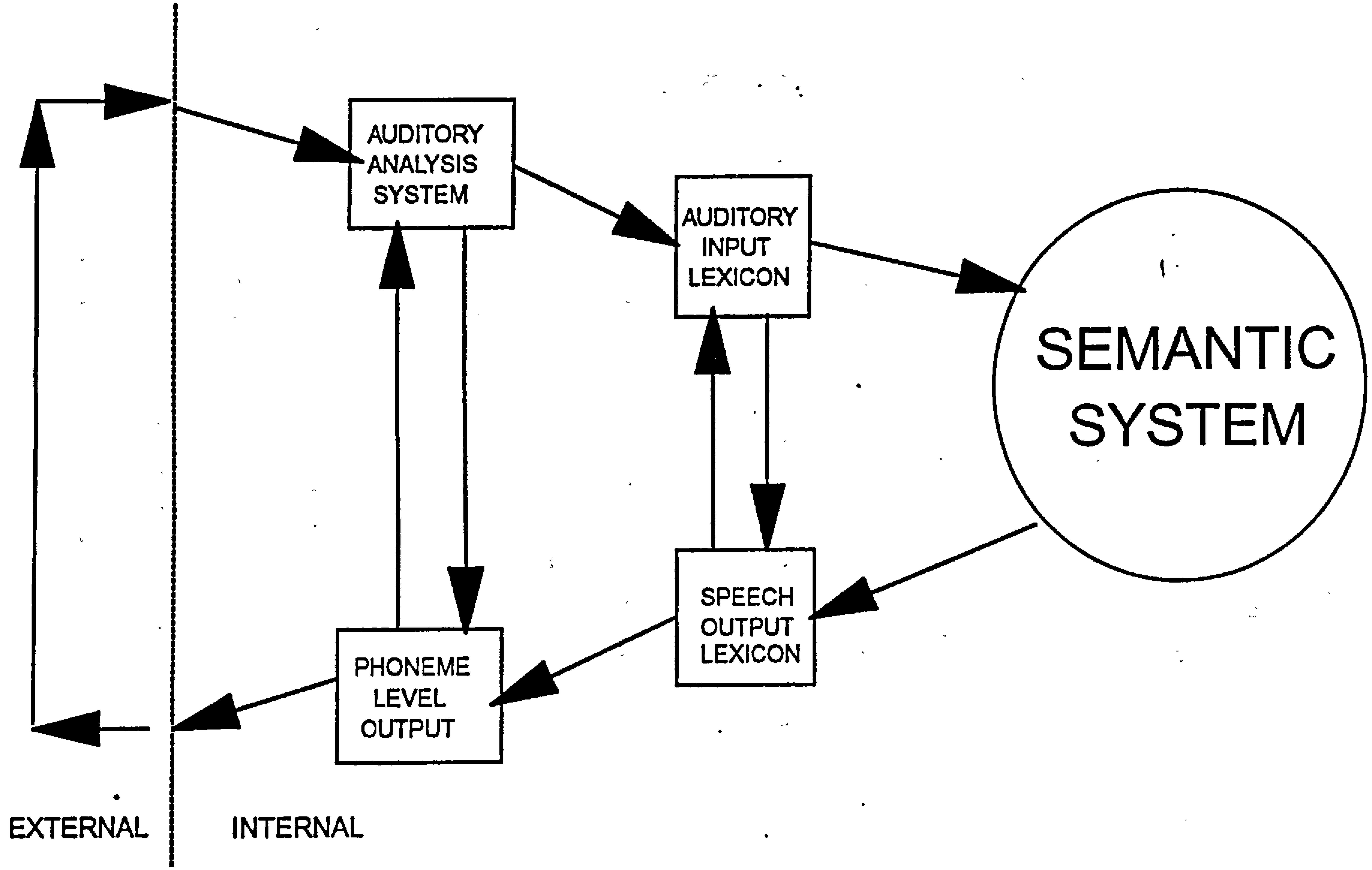
As a result of the wide range of information processing deficits found to occur in schizophrenia, a number of authors have attempted to concentrate on specific symptoms to provide accounts of the mechanisms which may determine their occurrence. With regard to auditory hallucinations a number of authors have suggested that these kinds of findings can be explained by supposing that hallucinatory experiences occur when private or mental events (perhaps inner speech) are misattributed to an external source. This kind of model has the advantage of explaining the apparent association between auditory hallucinations and subvocalisation, which is a concomitant of normal thinking (McGuigan, 1978). It also explains why verbal tasks, which block the stream of ongoing subvocal activity, tend to inhibit hallucinatory experiences (Margo et al, 1981; Gallagher et al, 1994). This sort of model also implies that it should be most difficult for hallucinators to distinguish between inner speech and external verbal stimuli under poor signal to noise conditions.

Although there is some consensus about this general model there is some debate regarding the mechanisms responsible for this kind of misattribution. Hoffman and colleagues (Hoffman, 1986; Hoffman and Rapaport, 1994) have suggested auditory hallucinations "reflect certain pathologically stored linguistic information in longer-term memory which disrupts language production processes and at times co-opts these processes by creating verbal messages which are consciously experienced as repeated, alien, unintended auditory images" (Hoffman and Rapaport, 1994, p. 256). Hoffman and Rapaport call these unintended messages "parasitic" memories and suggest that they may produce "messages" which are variants of ordinary inner speech. If inner speech in hallucinators is sometimes produced by parasitic memories then the resulting verbal imagery is likely to be experienced as alien and unintended. Hoffman and colleagues clearly associate auditory hallucinations with deficits in language or speech production and have found an association between hallucinations and thought disorder in a group of psychotic patients (Hoffman, 1986). Despite this, no consistent relationship has been observed between hallucinations and speech disorders (Slade & Bentall, 1988). Hoffman's account also implies that hallucinators should have difficulty in detecting errors in their own speech, but evidence from psycholinguistic studies have found that such deficits are not specifically evident in hallucinating patients (Leudar, Thomas and Johnston, 1992). In support of Hoffman's account, positron emission tomography studies with patients experiencing auditory hallucinations have suggested a link between this symptom and the areas of the brain associated with speech production (Cleghorn et al, 1992). In addition, Hoffman and Rapaport (1994) showed that patients who experienced auditory hallucinations performed significantly worse than 'normal' and psychiatric controls on an experiment aimed to assess speech tracking accuracy under uncertain conditions (with increasing levels of speech "babble" played simultaneously with target speech). In this experiment subjects had to "shadow " a voice on a tape with babble played simultaneously at increasing levels of loudness. The authors argue that the poorer performance in the hallucinating patients provides support for the parasitic memory model of voices.

In another approach, David (1994) attempted to account for auditory hallucinations, using a cognitive neuropsychological model of language input and output processes as described by Ellis and Young (1988; see Figure 2). The model assumes that thoughts originate and are understood by the semantic system. David proposes that an intended thought leaves the semantic system and follows the output path where it takes on a linguistic form in the speech output lexicon. The thought takes on a speech-like form at the phoneme level output stage and finally assumes an articulatory structure prior to speech. David assumes that auditory hallucinations arise due to a range of different faults within the system and that this accounts for the different forms they take (e.g. pseudo versus true hallucinations). For

Figure 2

A cognitive neuropsychological model of language perception and production (after Ellis and Young, 1988)



example, if thought output overflows from the speech output lexicon into the phoneme level output stage while there is a concurrent feed-forward failure between the input lexicon and auditory analysis system, there will be an inability to recognise the thought as internally generated or that the content is related to self. If the fault only occurs in feed-forward from the semantic system, then the thought would still be experienced as alien but it would be recognised as originating within internal personal space.

Another account of the mechanisms responsible for auditory hallucinations has been suggested by Frith (1987, 1992), who has argued that hallucinations reflect a deficit in an internal monitoring mechanism which results in a dissociation between willed or planned intentions and action. He proposed that, if hallucinations were associated with inner speech, then it is not the occurrence of inner speech which is the problem (as this is a feature of normal mental life) but that the patient is failing to recognise that this is self-initiated due to the deficit in an internal monitoring process. He also suggests that the problem of self-monitoring is an important factor in other positive symptoms e.g. delusions of control where the patient attributes his own actions as being under the control of some force other than himself. Some support for this model had been reported by

Frith and Done (1988) who found a lack of rapid error correction in a video-game task, which they interpreted as a failure of internal monitoring.

Bentall (1990a) has argued that a hallucinating individual's tendency to misattribute internal events to an external source also reflects a deficit in monitoring internal events. In addition though, Bentall argues that the deficit may be influenced by 'top-down processes' (patients' beliefs and expectations about what kinds of events are likely to occur). In support of this, the account explains why cultural differences in the experience of hallucinations are observed, because it is assumed that expectations about what kind of events are likely to be 'real' are related to cultural practices. Finally, his model also suggests that reinforcement processes (particularly anxiety-reduction) may facilitate the misclassification of certain kinds of internally-generated events (for example, negative thoughts about self and feared intentions) as externally-generated.

Bentall and his colleagues have carried out a number of studies in order to investigate the source monitoring skills of hallucinating patients. Bentall, Baker and Havers (1991) exposed patients experiencing either hallucinations or delusions and 'normal' controls to a 'reality monitoring' paradigm, in order to examine their ability to discriminate between internal and external events. Using a method adapted from the work of Johnson and Raye (1981), subjects were required to generate answers to simple clues (eg. 'Think of a dwelling beginning with H') and listen to a list of similar paired associates (eg. 'A type of footwear - shoe'). One week later, they were asked to identify the source of the items from a list containing the answers they had previously given to clues, the associates they had heard and new words. Both hallucinating and deluded patients were less accurate than the 'normal' controls when the total number of correct responses were observed. However, when particular types of errors were studied, the hallucinating patients, in comparison with the deluded patients, showed a greater tendency to misclassify the origin of their answers to clues as being the heard paired associates spoken by the experimenter. This was particularly the case when the answers required high cognitive effort (i.e. they were answers to difficult clues), a condition which normally facilitates accurate source monitoring (Johnson & Raye, 1981). Although this finding can be interpreted as evidence that hallucinators have a bias towards classifying perceived events as 'real' under conditions of uncertainty, it should be noted that the group differences observed were quite small.

A different reality monitoring procedure was used by Rankin and O'Carrol (submitted) who studied subjects scoring high or low on an hallucination questionnaire (the LSHS, Launay and Slade, 1981). They presented lists of paired associates and varied the times that the associates were recalled in subsequent tests. During recall, subjects were asked to imagine the words being spoken. Subsequently, subjects were asked to estimate the number of times each item had been presented to them. High scorers on the hallucination questionnaire (indicating a high tendency to report hallucinatory experiences) gave abnormally high estimates for items which had been recalled, indicating that they were mistaking their self-generated memories for presented items. The difference did not occur for items which were presented but not recalled.

Far clearer evidence of hallucinating patients' tendency to misattribute internally-generated events to external sources was obtained in an earlier study, using signal-detection methodology (Bentall & Slade, 1985). In the first experiment reported in their paper, the subjects were psychotic patients who either did or did not hallucinate whereas, in the second, the subjects were students who scored high or low on the LSHS measure of predisposition to hallucinate (Launay & Slade, 1981). In both experiments, the subjects were required to listen to brief episodes of white noise, half of which contained a recorded voice. By observing the pattern of correct detections of voices and false alarms it was possible to derive independent measures of perceptual sensitivity and bias towards believing that a voice had been presented. In both experiments, the hallucinating subjects did not differ from their respective controls on the measure of sensitivity but clear differences were observed on the measure of bias. These results have also recently been replicated by Rankin and O'Carroll (submitted) who found a high correlation between reality monitoring performance and signal detection performance in subjects who scored high on the LSHS but not for those who scored low on the questionnaire.

Results from these studies indicate that the factors which influence hallucinating patients' source monitoring deficits are still unclear. Bentall, Baker, Kaney and Bowen-Jones (submitted) have suggested that source monitoring may be affected by the content of the material being monitored, particularly if the material is inconsistent with the individuals self-concept. They carried out a reality monitoring procedure with groups of hallucinating, deluded and 'normal' subjects which involved positive and negative self-referent material. Subjects were asked to endorse forty negative personality trait items and forty positive trait items. Half of these were presented verbally by the experimenter and half in written form. Results indicated that all subject groups endorsed significantly more positive items than negative although the hallucinating patients endorsed significantly less positive items than the other groups. 'Normal' subjects were more accurate in determining the correct source of items than the other two groups and the hallucinating patients were not significantly poorer at source monitoring than the deluded patients. These results were not consistent with earlier results on source monitoring (Bentall et al, 1991; Rankin and O'Carroll, submitted). The authors suggest that these results may provide evidence for the model proposed by Frith (1992), where source monitoring deficits are associated with both hallucinations and delusions. Alternatively, detection of source monitoring deficits may depend on the type of procedure employed. This experiment required subjects to choose between items they had read and items which they heard. It could be argued that source monitoring deficits become more apparent when hallucinators are required to choose between spontaneously generated *thoughts* and heard stimuli. In addition, the source monitoring abnormalities observed in hallucinators by Bentall et al (1991) were restricted to high cognitive effort items, whereas it could be assumed that only minimal cognitive effort is required with items which are read.

The studies on the impact of suggestions on hallucinations reported in Chapter 2, further demonstrate the role of top-down processes in determining hallucinatory experiences. Replicating with some refinements the results of the study carried out by Mintz and Alpert (1972), Young, Bentall, Slade & Dewey (1987) observed the effects of auditory and visual suggestions on hallucinatory experiences. As already described, two experiments were carried out, one with hallucinating and non-hallucinating patients diagnosed as schizophrenic and one with students scoring high or low on the LSHS. In both experiments, the hallucinating subjects were more likely to report perceptual experiences consistent with the suggestions they had been given.

Taken together, these findings support the hypothesis that hallucinators have a tendency to misattribute internally-generated events to external sources, and indicate that this process is at least partially influenced by the hallucinators' beliefs and expectations. One implication of this account is that methods might be developed to help patients who are distressed by their voices to gradually reattribute those voices to themselves and to modify their beliefs and expectations. The work of Chadwick and Birchwood (1994) who attempted to alter patients' beliefs about their voices using cognitive therapy supports this view. Chapter 7 of this thesis describes the development and evaluation of such a treatment approach.

In the present chapter the author has attempted to review the literature relating to cognitive processes and hallucinations and to present some models which can account for the research evidence relating to them. In the following chapter the author has attempted to further explore the role of particular cognitive deficits in subjects experiencing auditory hallucinations in order to clarify the models outlined above.

Chapter 4

Cognitive studies of auditory hallucinations

In the following four studies possible cognitive deficits which might be specifically associated with hallucinations were investigated. As reported in Chapter 3, specific cognitive deficits relating to auditory hallucinations and other psychotic symptoms are extremely varied.

As auditory hallucinations have been shown to be associated with speech and auditory perception an attempt was made in this chapter to identify deficits in these areas. As outlined in the preceding chapter, although Hoffman (1986), Frith (1992) and Bentall (1990a) have proposed that auditory hallucinations are related, in some way, to inner speech their accounts of the exact mechanism which results in an auditory hallucination differ. Hoffman's (1986) model assumes the hallucinator has a deficit in speech production, although there is evidence that hallucinators do not show deficits in this area (Leudar et al, 1992). Alternatively, Bentall's (1990a) account, which assumes a deficit in source monitoring, predicts that an hallucinators' difficulties in identifying the correct origin of verbal material may be overly influenced by beliefs and expectations (top-down processes) and/or, that the inner speech of hallucinators is unusual in some way which makes it hard to distinguish it from external verbal material.

The proposed locus of inner speech in 'normal' subjects is the phonological store or articulatory loop described by Baddeley and colleagues with regard to short term memory (Baddeley, 1986; Salame and Baddeley, 1982). Baddeley and collegues explain short term memory phenomena in terms of two distinct sub-components:

1) A phonological input-store capable of representing speech for a brief period.

2) An articulatory process which can refresh the items in the phonological store before they fade.

Access to the phonological store is presumed to be automatic for information presented auditorily and this material is thought to be held for approximately 1-2 seconds before it fades. If the material can be rehearsed e.g. using inner speech, then the material can be held in memory for longer periods.

Assuming that people experiencing hallucinations have a deficit in their ability to distinguish speech which is generated from an external or internal source, then a disruption in an early stage of auditory perceptual processes (i.e. an abnormally functioning phonological store or loop) might make discrimination between externally and internally generated speech more difficult. A deficit in this stage of processing may mean that the hallucinator is not able to hold recently generated information which may lead to confusion in determining the origin of the stimulus. This may lead to the subject being forced to "guess" the origin in the light of other existing cues or evidence. According to Bentall's (1990a) model this would become worse under conditions of stress, or when there is a great deal of noise in the system. This may lead the hallucinator to assume that the stimulus is externally generated when they are not expecting an internal stimulus or when they are under stress.

The first three studies in this chapter were designed to examine the functioning of the phonological store or loop (the proposed locus for inner speech) in patients experiencing auditory hallucinations and the final study was an attempt to clarify a reality monitoring finding first demonstrated in hallucinators by Slade (1976c).

Study 1: The Conrad test

The first study in this chapter was based on the work of Conrad (1979), who studied inner speech in deaf and hearing children. In a series of studies, Conrad and his colleagues (Conrad, 1963; 1965; Conrad and Hull, 1964), showed that the performance of hearing subjects, when presented with words for immediate serial recall, depended on the phonemic similarity of the items presented. Items which were phonetically similar were more difficult to recall than items which were visually similar only. Conrad used these results as evidence that hearing subjects used a phonemic code (inner speech, which may occupy the phonological loop described by Baddeley, 1986) for immediate recall of items. He subsequently attempted to discover whether deaf children also used a phonemic code or whether deafness prevented the development of this cognitive strategy. Results indicated that most deaf children indeed did use inner speech despite having limited access to verbal material.

More recently, David and Lucas (1993) reported a single case study where the authors attempted to test the hypothesis that auditory hallucinations reflect excessive or autonomous activity of the phonological loop (the phonological store and its accompanying articulatory loop). David and Lucas (1993) compared a subject who was currently hallucinating at the time of testing with two other subjects who had hallucinated in the past but who were not currently hallucinating. They attempted to access the functioning of the phonological loop by testing for two effects known to reflect its operation in 'normal' subjects; the phonological confusion effect (i.e. that phonologically similar items are more difficult to remember in a serial recall task) and the word length effect (i.e. that short words are more easily remembered than long words because they can be rehearsed more effectively in the phonological loop). David and Lucas (1993) reported that the hallucinating subject in their study performed in a broadly 'normal' fashion compared to their control subjects. Despite this their study was limited by their single case design, in that it may be difficult to distinguish experimental effects from noise. The authors acknowledge this difficulty. In addition, although their control subjects were free from hallucinations at the time of testing it is possible that they still exhibited similar cognitive biases, due to an underlying cognitive deficit, as the hallucinating subject.

In the present study, Conrad's method of measuring phonological encoding (or inner speech) was used in order to investigate the cognitive processing involved in immediate recall of phonetic similar and dissimilar words in subjects who were experiencing auditory hallucinations, and to further explore the hypothesis that auditory hallucinations reflect abnormal inner speech (excessive or autonomous activity of the phonological loop, in the terminology employed by David and Lucas, 1993). The Conrad study involved subjects being shown a list of homophone or non-homophone words which they had to recall immediately following removal of the test items.

In the present study it was hypothesised that patients experiencing auditory hallucinations would demonstrate similar differences in their recall of homophones and non-homophones as normal subjects and psychiatric controls, indicating 'normal' functioning of the phonological store or loop.

<u>Subjects</u>

Sixteen patients with a DSM III-R (APA, 1987) diagnosis of schizophrenia and who were experiencing current auditory hallucinations for not less than 6 months were recruited from psychiatric services within Mersey Regional Health Authority. These subjects consisted of 11 males and 5 females with an average age of 40.8 years (s.d. = 12.2 years).

Eleven control subjects who also had a DSM III-R diagnosis of schizophrenia but had not experienced auditory hallucinations in the last 5 years were also recruited from local psychiatric services. These consisted of 7 males and 4 females with an average age of 42.2 years (s.d. = 10.1 years). A further 11 control subjects who had no psychiatric diagnosis and had never experienced auditory hallucinations were also recruited. They consisted of 7 males and 4 females with an average age of 37.6 years (s.d. = 7.5 years). No significant differences were observed between the groups for age ($F_{[2,35]} = 0.556$, $p = 0.579$). Subjects were matched for length of time in full-time education. Informed consent was obtained from all subjects before they took part in the study.

Apparatus

Two sets of white, A5 cards were prepared, a training and test set. The training set consisted of 24 cards each with between 1 and 5 words typed in bold capital type of 4mm, in the format shown in Figure 3. Training cards were used so that the subjects could become familiar with the test and the test-words. This means that the words were familiar to the subjects during the test phase and the test had the characteristics of a digit-span task, where the *order* of the words rather than the actual words was important.

Figure 3: Layout of cards for Conrad test

ZOO

SCREW

FEW

Sixteen words were taken from Conrad (1979), half which were homophones and half non-homophones. The words were: do, who, few, zoo, blue, true, screw, through (homophones) and bare, bean, door, furs, have, home, farm, lane (non-homophones). The non-homophones all looked similar, were all monosyllabic, of 4 letters, all beginning with an ascender and containing no other, no descenders and excluding the letter 'i'. The homophones were also all monosyllabic, had the same consonant-vowel form and varied in length. Each training card had a different set of words typed upon them. The first two cards had one word each (blue and door). Cards 3-6 had two words typed on them, cards 3 and 5 had homophones, cards 4 and 6 had non-homophones. Cards 7,8 and 9 each had 3 words typed on them. Cards 7 and 9 had homophones and card 8 had non-homophones. Cards 10 had 4 non- homophones, card 11 had 4 homophones. Cards 12 to 24 each had 5 words typed on them. On half of these homophones were typed, and on the other half non-homophones were typed. Words were not repeated on any one card and each appeared roughly an equal number of times in different serial positions.

The second set of 24 cards (test cards) used exactly the same words as the training set, but each card contained 6 of the words, either homophones or non-homophones. Twelve cards contained homophones, twelve contained non-homophones. Again no word appeared twice on a card and the words were arranged so that serial positions were varied.

Method

All subjects were given the following instructions:

> **You will be shown a series of cards, each card containing a short list of words. After each card has been shown to you for a few seconds and removed, please repeat the words in the order in which they appeared on the card.**

The experimenter then presented each training card, in the order outlined above, in the subjects line of vision. Each card was presented for 1.5 seconds times the number of words on the card i.e. for a card with 5 words the card was presented for 7.5 seconds. Homophone and non-homophone cards were presented alternately. The training phase allowed the subject to become familiar with the task and any deviations from the instructions were pointed out at this time. Following completion of the training phase subjects were exposed to each of the test cards for 9 seconds. Again homophone and non-homophone cards were presented alternately. The subject's responses to both the training and test phases were recorded by the experimenter on a score sheet. A response was only marked correct if it was repeated in the correct serial position.

Results

Percentage correct scores were calculated for each subject for homophones and non-homophones. Mean scores are shown in Table 1 for the 3 subject groups.

Table 1: Mean percent correct scores for hallucinating, non-hallucinating and normal subjects

Group	Homophones mean % correct	Non-homophones mean % correct
Hallucinators (n=16)	48.39 (s.d.=13.75)	60.49 (s.d.=18.07)
Non-hallucinators (n=11)	39.77 (s.d.=11.57)	45.72 (s.d.=15.96)
Control subjects (N=11)	58.96 (s.d.=13.06)	77.14 (s.d.=11.33)

As can be seen from Table 1, all subjects showed superior recall of the phonologically dissimilar lists of words, but the psychiatric patients, especially the non-hallucinating patients recalled less overall than normals. A two-way ANOVA (groups x list type) confirmed this, revealing significant main effects for both groups ($F [2,35] = 11.667$, $p < 0.0001$) and list type ($F [1,35] = 31.790$, $p < 0.0001$). The interaction between groups and list type failed to reach significance ($F [2,35] = 2.644$, $p = 0.0853$. Tukey HSD tests confirmed that the recall scores of the normal subjects were significantly superior to that of the two psychiatric groups ($p < 0.05$) but that the difference in recall scores between the two psychiatric groups was not significant.

Discussion

The results of this study are consistent with those of David and Lucas (1993). A normal phonological confusion effect was observed in the hallucinating patients, suggesting that in this group the phonological loop is operating normally, and that their hallucinatory experiences do not reflect abnormal functioning of this mechanism. David and Lucas suggest two alternative sources of hallucinators' experience: that other phonological mechanisms may be involved, or that these patients fail to regulate the contents of short-term memory appropriately, so that unwanted inputs are activated involuntarily (a view which would be consistent with Frith's model).

A single case study by Ellis, Young and Critchley (1989), in which a woman with bilateral cerebrovascular brain disease was observed to suffer from 'persistent inner speech subvocalisations' appears to be consistent with the second of David and Lucas's hypotheses; however in the Ellis et al report the woman retained the ability to label the voices as her own.

This latter observation suggests that, while it remains possible that disorders in the functioning or regulation of inner speech mechanisms are implicated in auditory hallucinations, such disorders are unlikely to be sufficient explanations of the hallucinator's failure to attribute self-generated verbal experiences to themselves. As Bentall (1990a) has suggested, it seems likely that some kind of dysfunction in the metacognitive processes involved in judging whether a perceived event is self or other generated ('source monitoring') must be present for an hallucination to occur.

In a second study, a further attempt was made to examine the role of the phonological loop in hallucinating as compared to non-hallucinating patients and 'normal' subjects.

Study 2: The unattended speech effect

If normal subjects are exposed to irrelevant speech whilst listening to digits simultaneously in the opposite ear then their ability to recall the digits in an immediate serial recall test is substantially reduced (Hanley and Broadbent, 1987). This effect has been termed the unattended speech effect (U.S.E.) and was first reported with visually presented stimuli (Salame and Baddeley, 1982). The fact that this effect occurs even for visually presented items indicates that it does not result from irrelevant speech affecting the perception of target digits.

Salame and Baddeley (1982) proposed that the phonological store or loop was the locus of the U.S.E. On this view, the irrelevant speech gains automatic access to the phonological store and causes interference to the numbers which have entered the store. Broadbent (1984) proposed an alternative account suggesting that the interference occurs because the subjects are not able to articulate the speech items effectively. Hanley and Broadbent (1987) studied the U.S.E. with university students in order to test the two above accounts. If target and unattended material is presented auditorily then Salame and Baddeley would argue that target items would gain automatic access to the phonological store and should consistently reduce recall even under conditions of articulatory suppression. Alternatively, if articulation of target items is the problem then auditory presentation of all items should make little overall difference and there should be no effect of irrelevant speech under conditions of articulatory suppression. Results suggested that the phonological store was the locus of the U.S.E. and that the effect was not a result of an inability to articulate the items, although the authors suggest that articulatory rehearsal could play a part.

With regard to hallucinations, an abnormal U.S.E. would occur if there was something unusual about the nature of the patient's inner speech or if their phonological store was operating abnormally. An abnormal U.S.E. should *not* occur if their reality monitoring deficits are due to top-down processes e.g beliefs and expectations or due to a faulty internal monitoring mechanism.

The following experiment was an attempt to further investigate the U.S.E. with patients who had diagnosis of schizophrenia and who were experiencing auditory hallucinations, with the hypothesis that hallucinators would show a 'normal' U.S.E. indicating that there is no disruption in the phonological store or articulatory loop. The design of the study was a replication of the Hanley and Broadbent (1987) study as this has been shown to elicit significant U.S.E.'s in 'normal' subjects.

Subjects

Twelve patients with a diagnosis of schizophrenia and who were experiencing current auditory hallucinations for not less than 6 months were recruited from psychiatric services within Mersey Regional Health Authority. These subjects were 8 men and 4 women and had an average age of 36.83 years (s.d. = 10.11 years). Twelve control subjects who also had a diagnosis of schizophrenia but had not experienced auditory hallucinations in the last five years were also recruited from local psychiatric services. These subjects consisted of 8 men and 4 women and had an average age of 42.17 years (s.d. = 9.61

years). A further 12 control subjects who had no psychiatric diagnosis and had never experienced auditory hallucinations were also recruited. These consisted of 7 men and 5 women with an average age of 39.75 years (s.d. = 9.44 years). A one way analysis of variance revealed that there was no significant difference between the groups on age ($F [2,35] = 0.905$, $p = 0.41$). Informed consent was obtained from all subjects to take part in the study. Some of these subjects were involved in the previous study.

<u>Apparatus</u>

A stereo cassette recorder with stereo headphones was used. An audio tape was prepared by the author exactly comparable to that used by Hanley and Broadbent (1987). Thirty lists of 6 numbers were recorded onto the left channel of the tape. The numbers were between 1 and 6 and were randomly chosen for each list. Each number occurred once in each list, and there was a gap of 1 second between each number. Between each list was a gap of 15 seconds. Three seconds before the onset of each list the word "ready" was recorded through the left channel. Fifteen sets of 6 words were randomly chosen from the following list: cat, gap, pad, bed, keg, pet, bit, kid, pig, cod, dog, top, bud, cup, tug and were recorded through the right channel of the tape, simultaneously with the numbers, on fifteen of the lists. This meant that fifteen trials comprised of digits alone and fifteen of digits plus words. The first 6 trials were practice trials and had three of each type. A score sheet, was provided which was numbered from 1 to 30 and had space for the subject to write the numbers heard during the trial. A pencil was also provided.

Method

Subjects were introduced to the test material and given the following instructions.

> **In this test you will be listening to a tape which has several lists of numbers on it. You have to listen to each list of numbers and afterwards write them down in exactly the same order as you heard them. With some of the lists you will hear words at the same time, but just concentrate on the numbers and ignore the words. There are some practice trials at the beginning of the tape. Write the numbers down in the space provided (subject is shown the response sheet). If you cannot remember a number just leave a space. Remember to write the numbers down in the order you heard them on the tape.**

Subjects were asked if they understood the instructions and any questions were answered. Following this the tape was switched on at the beginning of the lists of words and was not stopped until the end was reached unless the subject indicated they wished to stop during the practice trials. If this was the case any queries were responded to and the tape recommenced. At the end of the tape the subjects were thanked. Response sheets were scored by the experimenter in terms of proportion of correct answers overall and proportion of whole sequences produced accurately and in the correct serial position.

Results

The mean scores for number of correct sequences and mean number of items correct are shown in Table 2.

Table 2: Mean number of items correct and mean number of correct sequences for hallucinators, normal controls and non-hallucinating schizophrenics

	Mean no. of items correct		Mean % correct sequences	
Group	With irrelevant speech	Without irrelevant speech	With irrelevant speech	Without irrelevant speech
Hallucinating subjects (n=12)	4.72 (1.35)	4.83 (1.15)	53.48 (43.16)	61.78 (29.43)
Non-hallucinating controls (n=12)	4.90 (0.95)	4.91 (1.08)	59.69 (32.37)	59.72 (36.73)
Normal subjects (n=12)	5.65 (0.54)	5.74 (0.50)	85.41 (18.85)	90.28 (19.41)

A two way ANOVA (groups by condition) for mean number of items correct revealed a significant main effect for group (F [2,33] = 3.29, p = 0.05) but not for the presence or absence of speech. The interaction failed to reach significance. A two way ANOVA (groups by condition) for per cent correct sequences also revealed a significant main effect for group (F [2,33] = 4.17, p = 0.024) and a significant main effect for the presence or absence of speech (F [1,33] = 4.31, p = 0.046). The interaction failed to reach significance. Inspection of group means revealed that the normal subjects recalled a greater number of correct sequences overall than the patient groups, but that no USE was observed for any group. With regard to mean per cent correct sequences, the presence of speech reduced recall of the sequences for the 'normal' subjects and hallucinating patients, but not the non-hallucinating patients i.e. a USE was shown by 'normals' and hallucinators, but not non-hallucinators.

Discussion

As seen from the results, although the 'normal' subjects performed better overall with regard to the number of correctly recalled sequences and the mean number of digits recalled, none of the subject groups showed a U.S.E. for the mean number of items recalled. However, a U.S.E. was shown for the mean per cent correct sequences recalled by the 'normals' and the hallucinating patients.

These results are partially in contrast to the results of Hanley and Broadbent (1987) who found significant U.S.E. effects for both mean number of items recalled and per cent correct sequences recalled in 'normal' subjects. This discrepancy is difficult to explain as the experiment was an exact replication of their study and had an equal number of subjects. One possible difference may have been in the demographic characteristics of subjects. In their study, subjects were recruited from staff and students from Newcastle University, whereas the subjects in this study were generally recruited from non-professional backgrounds. It is also possible that the ages of these subjects were on average older than those taking part in Hanley and Broadbent's study. Another consideration is that five of the 'normal' subjects in this study scored 100% correct on all trials which is likely to have reduced the power of the effect seen in other subjects. It is possible that this test was too easy for these subjects and a more difficult test with a greater number of trials would have shown the effect for both methods of assessing accuracy.

The present results, therefore, do not support a deficit in the phonological store or articulatory loop in patients with auditory hallucinations, and are consistent with the findings of experiment one. Some caution must be used in the interpretation of the results due to differences found in the effect of unattended speech across the two measures, where a U.S.E. was found for normals and hallucinating subjects for one measure and for no groups in the other, and because the number of subjects in this study is small. Against this, Hanley and Broadbent (1987) also had small numbers and obtained significant findings.

Despite this caution, a U.S.E was found for hallucinating subjects on one measure, therefore it can tentatively be concluded that hallucinators perform 'normally' on this test which supports the view that hallucinators do not have a deficit in the part of speech processing which utilises the phonological store or loop. It is difficult to explain the findings from the non-hallucinating subjects who failed to demonstrate a U.S.E. using both methods of assessing accuracy.

Study 3: The Geiselman Test

The third study in this series further explored the primary processing of verbal material in hallucinating subjects. In a study designed to elicit the effect of situational context on primary and secondary rehearsal in normal subjects, Geiselman and Bjork (1980) found that situational factors (i.e. the sex of the person speaking items) were more important in determining the performance of subjects' recognition of items following primary rehearsal than secondary rehearsal. Primary rehearsal in this context referred to repeating the items (in this case 4 letter words), whereas secondary rehearsal involved instructing the subjects to imagine the speaker's voice and make meaningful associations between the words. Subjects were more able to recognise items repeated in the speakers voice than items which were repeated in a different sex voice under conditions of primary rehearsal. If subjects were allowed to imagine associations between the voice (secondary rehearsal) then the effect of changing the sex in a later recognition test was reduced. In a further experiment Geiselman and Bjork (1980) were able to show that secondary rehearsal did not exclude the use of situational factors in recognition memory but that they were less important for retrieval of an item. These experiments suggest that for items which are rehearsed, the situational context of their presentation is very important for later recognition.

If hallucinators have a deficit in their phonological store or loop, situational factors e.g. the origin or location in space attached to verbal material, may be less available as aids to recall than in normal subjects for primary rehearsal. If this is the case then hallucinators would show poorer recall of items which depend heavily on situational cues.

This study attempted to replicate Geiselman and Bjork's study with hallucinating and non-hallucinating patients and 'normal' subjects. Again, it was hypothesised that hallucinators would perform like 'normal' subjects on this task, supporting the results from the previous two studies that hallucinators do not have an abnormally functioning phonological store or loop.

<u>Subjects</u>

Fifteen patients with a diagnosis of schizophrenia and who were experiencing current auditory hallucinations for not less than 6 months were recruited from psychiatric services within Mersey Regional Health Authority. They consisted of 9 men and 6 women with a mean age of 40.73 years (s.d. = 11.91 years).

Twelve control subjects who also had a diagnosis of schizophrenia but had not experienced auditory hallucinations in the last five years were also recruited from local psychiatric services. They consisted of 8 men and 4 women with a mean age of 42.17 years (s.d. = 9.61). A further 11 control subjects who had no psychiatric diagnosis and had never experienced auditory hallucinations were also recruited. They consisted of 6 men and 5 women with a mean age of 40.64 years (s.d. = 8.46 years). Informed consent was obtained before they took part in the study. A one-way

ANOVA revealed there was no significant difference between age of the groups ($F [2,35] = 0.0843$, $p = 0.92$). Some of these subjects took part in the previous two studies.

Apparatus

One stereo cassette tape player and one set of stereo headphones was used in the experiment. A tape recording was prepared which consisted of a male voice and a female voice reading a passage from Einstein's Theory of Relativity (Einstein, 1920). The passage lasted for approximately 5 minutes for each speaker. The female voice preceded the male voice.

Sixty words were chosen which were matched for frequency in the English language according to the Thorndike-Lorge word count (Thorndike and Lorge, 1944). The words were recorded onto the tape directly after the passages in the following manner. Half of the words were read by the male voice heard earlier on the tape and half were read by the female voice, alternating throughout the word list. The words were recorded at the rate of one per second.

A further sixty words were then chosen for the test phase of the study. The whole group of 120 words were then recorded onto the tape, half in the female voice and half in the male voice, alternating as before at a rate of one per five seconds. Thirty of the original words were repeated in the opposite voice to that used during the presentation phase; i.e. if a word had originally been presented in a female voice it was subsequently presented in a male voice. The other 30 words were read in the original voice. The new words were half presented in the female voice and half in the male voice. A response sheet was prepared with all 120 words listed and a space requiring a yes or no response after each word.

Method

Subjects were introduced to the test materials. The first part of the tape was used to familiarise the subjects to the voices of the two speakers, and subjects were given the following instructions in this part of the experiment.

> **Please listen to the two voices which you will hear on the tape. You are not expected to remember what the voices say, they are there just to familiarise yourself with the sound of the voices.**

The tape was then switched on and played to the end of the recording of both voices reading the passages. The tape recorder was then switched off and the following instructions were given to the subjects.

> **On the next part of the tape you will hear a number of words which are spoken in the same two voices which you have just heard. Listen carefully because I will be asking you to remember**

these words in the next part of the test.

The tape was then played to the end of he first list of 60 words and then stopped. The following instructions were then given to the subject.

> **In the next part of the test you will be hearing another list of words. In this list you will hear some of the words which have been played to you and some new ones which were not played earlier. Listen carefully to each word and reply "yes" if it was a word which you heard in the first list or "no" if it is a new word. There will be a short gap after each word for you to decide on your answer. If you are not sure whether it is a word which you have heard before try to make a guess for each one.**

During this part of the test the experimenter recorded the subjects' responses on the response sheet. At the end of this part of the test the tape was switched off and the subject was thanked for their participation.

Results

Table 3 shows the mean percentage correct scores for the 3 groups of subjects on male-male words, female to female words, male to female words, female to male words, male new words and female new words. Standard deviations are shown in brackets.

Table 3: Mean percent correct scores

	Male-male	Female-female	Male-female	Female-male	Male-new	Female-new
Hallucinators (n=15)	55.14 (16.38)	55.07 (17.36)	51.09 (23.45)	48.37 (19.89)	70.46 (21.69)	70.02 (20.81)
Non-hallucinators (n=12)	49.98 (22.10)	50.52 (26.42)	45.67 (17.06)	48.85 (15.14)	79.48 (13.36)	78.66 (10.77)
Normal subjects (n=11)	51.47 (17.90)	56.95 (15.00)	53.90 (20.98)	46.65 (15.20)	79.35 (14.97)	79.05 (16.06)

A two way ANOVA was carried out on male-male, male-female, female-female and female-male words by group. No significant main effects were found for group, sex-change or same-sex and the interaction also failed to reach significance, although the change in sex of words from female to male words was approaching significance ($F_{[1,35]} = 3.37$, $p = 0.075$).

Discussion

The results in this study do not support the findings of Geiselman and Bjork (1980). None of the subject groups showed significant differences on recognition of words when sex of voice was changed during the second presentation of items. In view of this, it is not possible to judge whether the hallucinating subjects have a deficit in the area of the phonological loop or store as compared to normal subjects. Alternatively, if these results are a correct representation of performance on this test it indicates that hallucinators performed in a similar way to non-hallucinators and normal control subjects and hence it is possible to conclude that hallucinators do not have an abnormality in the functioning of the phonological store or loop and the results do not contradict those of experiments 1 and 2. It is possible that if the number of subjects was increased that an effect may be observed as the change of sex in the female to male condition was approaching significance. It is also possible that the hallucinator's poorer recognition of 'new' words and their superior recognition of male-male words might indicate a greater tendency to say they had heard something previously as compared to the other two groups. This tentative observation might support the earlier observations of Bentall and Slade (1985).

Study 4: the verbal transformation effect

The final study in this chapter examined an auditory speech processing phenomenon which has been reported to show differences in performance between hallucinators and non-hallucinators.

The verbal transformation effect (VTE) was first demonstrated by Warren and Gregory (1958), who attempted to produce an auditory analogue of visual reversible figures i.e. figures which may be interpreted in more than one way. They used phonetically "reversible" words presented continuously over and over again. The results from this early experiment indicated that reorganisation of the presented speech sounds occurred, so that subjects who were exposed to a stimulus word, appeared to hear different words. Changes occurred in vowel and consonant sounds, sounds which were not actually present were heard and there was a failure to hear or recognise a sound which was actually present. In a later study, Warren (1968) found that the complexity of the stimuli had an effect on the transformations reported. The greatest amount of distortion occurred with simple two phoneme words as opposed to more complex words or sentences, and more repetitions were needed for transformations to take place for simple stimuli (i.e. simple stimuli had longer latency periods but high rates of transformation).

Warren and Warren (1966) also observed that the effect seemed to be associated with age of subjects, as older subjects (62-86 years) and young children (below the age of ten) showed resistance to the effect. They also observed differing styles of transformations. Young children showed transformations involving single phoneme changes, including nonsense words. Young adults rarely produced nonsense words as transformations even if the stimulus was a nonsense word.

With regard to psychotic patients, a study by Oswald (1962) reported that when playing loop tape presentations of sentences to patients undergoing apomorphine aversion therapy, the patients reported afterwards that the sentences were not always repetitions of material already presented, and some even reported having conversations with the loop tape. Slade (1976c) observed the similarities between the VTE reported by Warren and colleagues and the effect reported by Oswald. He conducted a VTE study with patients who had a diagnosis of schizophrenia experiencing auditory hallucinations, patients who were not experiencing hallucinations and a non-patient control group. Slade found that there were no significant differences between groups for the latency of the effect (number of seconds elapsed before first report of a transformation), number of changes heard or number of different words produced, but there were qualitative differences in the transformations between the groups. Hallucinating patients produced significantly fewer words with a strong phonetic relationship to the stimulus word and more words which had a weak phonetic relationship to the stimulus than the two control groups.

Two later studies (Place, 1980; Catts, Armstrong, Norcross and McConaghy, 1980) have found conflicting results with hallucinating subjects. Place (1980), in an unpublished study, found that hallucinators were less likely than controls to report that a transformation had taken place. Catts et al (1980) attempted to replicate these findings and also found that hallucinators reported transformations less often than controls subjects, although this failed to reach significance.

In an attempt to account for the VTE, Warren (1968) suggested that the effect reflected the brain's attempt to impose meaning on stimuli received out of context. Older subjects, he assumed would have more long-standing records of contextual meaning which would make them less susceptible to seeking alternative possibilities. Slade (1976c) proposed that as hallucinating subjects differed qualitatively in the VTE, in that they displayed more obscure transformations, then this indicated the effect was a result of poor reality testing in the hallucinated group.

Although the above account of the VTE may have some grounding it is possible that this effect involves an element of suggestion, in that subjects may not expect to hear the same word repeated over and over again and therefore presume that other words will be heard. Against this, a study by Natsoulas (1967) showed that even subjects who were instructed that the same word would be repeated over and over again, still reported a VTE. This effect was smaller than for subjects who were not given these instructions. In an earlier study, Taylor and Henning (1963) investigated instructional bias and the VTE. All subjects were informed that they would hear real changes, but one group were told that the changes would be English 'real' words and the other were told that they would hear English 'real' and 'nonsense' words. They found that both groups reported the same number of English words, but only the group who were instructed that they would hear nonsense words reported nonsense words. The authors proposed that this was as a result of perceptual suppression i.e. that the subjects did not perceive the nonsense words rather than response suppression i.e. that the nonsense words were perceived but not reported.

In the following experiment a replication of Slade's (1976c) study was conducted, adding in an extra variable of suggestion in order to further clarify the nature of the effect and its relationship to auditory hallucinations.

Subjects

Ten patients with a diagnosis of schizophrenia and who were experiencing current auditory hallucinations for not less than 6 months were recruited from psychiatric services within Mersey Regional

Health Authority. Their average age was 39.10 years (s.d. = 10.01 years) and they consisted of 7 men and 3 women. Twelve control subjects who also had a diagnosis of schizophrenia but had not experienced auditory hallucinations in the last five years were also recruited from local psychiatric services. Their average age was 43.92 years (s.d. = 8.66 years) and they consisted of 7 men and 5 women. A further 10 control subjects who had no psychiatric diagnosis and had never experienced auditory hallucinations were also recruited. Their average age was 39.40 years (s.d. = 6.90 years) and they consisted of 6 men and 4 women. A one-way analysis of variance (age by group) revealed that there were no significant differences between the groups on age ($F [2,31] = 1.10$, $p = 0.35$). Some of these subjects took part in the previous three studies. Informed consent was obtained from all subjects before taking part in the study.

Apparatus

One stereo cassette tape player with the facility to alter output to stereo headphones and one pair of stereo headphones were used. The cassette player was set either to hear sound only in the left or only in the right ear. A cassette tape was recorded with "tress" repeated every 0.5 seconds, in a clear female voice. The stimulus word was repeated 114 times in one minute and the recording was for 3 minutes. A hand-held mechanical press button counter was also used to record number of transformations heard.

Method

Each subject was approached separately and asked if they would be willing to take part in the study. No subject refused to take part. Subjects were then were asked to sit in a private, quiet room and were given either of the following instructions:

> **1. Please listen to the voice on the tape recorder. You will hear the word "tress" repeated over and over again. After a while the word may change to other words. If this happens I want you to press the counter. Press once each time the word changes. If you do not hear any words change, don't worry.**
>
> **2. Please listen to the voice on the tape recorder. You will hear the word "tress" repeated over and over again. After a while the word will change to other words. When this happens I want you to press the counter. Press once each time you hear the word change.**

The tape recorder was arranged so that sound would only go to either the right or left ear for each of the above conditions. The tape was then played for three minutes for the four conditions (left ear, with suggestion; left ear, without suggestion; right ear, with suggestion; right ear, without suggestion). The order of presentation was carefully arranged so that half of the subjects received suggestion first, and half received no-suggestion first. The order of presentation to the left and right ear was also counter-balanced. After each condition the experimenter altered the sound output of the recorder and pretended to wind the tape forwards to a different part of the tape. The number of presses made on the counter was recorded following each condition i.e. four measures for each subject. The experimenter also recorded the time lapse between the start of the tape and the subject's first press of the counter (time latency). At the end of each 3 minute presentation the experimenter asked the subject to recall the words which they had heard during the tape and these were recorded.

Results

Table 4 shows the mean actual and logged scores for the three subject groups for number of words heard, left and right ear, with and without suggestion. The time until first response (latency) was also recorded for each subject for each of the four conditions. Standard deviations are shown in brackets.

Table 4: Mean number of transformations and time before first transformation (latency)(standard deviations are shown in brackets)

	No. of transformations				Latency(secs)			
	Sugg		No sugg		Sugg		No Sugg	
	L	R	L	R	L	R	L	R
Hallucinators (n=10)	132.1 (96.3) 4.31	116.2 (100.0) 4.12	51.4 (61.1) 3.16	51.9 (44.6) 3.15	24.9 (54.8) 2.30	27.0 (54.4) 2.35	37.3 (59.2) 2.34	32.8 (56.5) 2.43
Non-hallucinators (n=12)	63.1 (75.4) 2.96	62.6 (66.6) 2.85	78.6 (91.3) 3.05	71.2 (93.8) 2.69	59.9 (75.5) 3.1	53.2 (77.2) 2.89	62.7 (72.6) 3.50	53.2 (77.2) 2.81
Normal subjects (n=10)	97.9 (74.7) 3.99	115.0 (105.8) 3.80	94.3 (99.1) 3.68	92.1 (89.3) 3.56	45.1 (57.0) 3.2	24.5 (54.8) 2.22	50.6 (62.3) 3.11	38.9 (61.6) 2.73

Five subjects did not show a VTE. These were, 1 hallucinator, 1 'normal' subject and 3 non-hallucinators. These subjects' latency scores were recorded as 180 seconds (as scored by Slade, 1976c). All of these subjects were in the age range 30-40 years. The hallucinator who did not show an effect was 37 years old.

As the means and standard deviations were almost equal this indicated that the data had a log-normal distribution therefore the means were converted into log values (with 1 added to compensate for zero scores). The logged means are shown underlined in Table 4. A two way analysis of variance was carried out for the number of transformations (group by condition). There was a significant main effect for suggestion with more transformations being produced for trials including suggestion (F [1,29] = 10.39, p = 0.003) and a significant interaction between suggestion and group (F [2,29] = 4.72, p = 0.017). There was no significant main effect for group, ear (left/right) or any other interactions. Inspection of the group means indicates that both the hallucinators and the normal subjects were affected similarly by suggestion whereas the non-hallucinating subjects were not.

A similar two way analysis of variance for logged time latency scores (group by condition) did not reveal a significant main effect for suggestion. There was an approaching significance main effect for ear (left ear versus right ear; F[1,29 = 3.54 p = 0.07). There was no significant main effect for group or any type of interaction. Inspection of group means for latency, indicate that there was a shorter time latency before a report of a transformation overall for the right ear compared to the left ear, regardless of the presence of suggestion. In addition, the hallucinators show a slightly different pattern of results from the other two groups. The non-hallucinating and normal subjects show a clear shorter latency in the right ear whereas the hallucinators show a shorter latency in the left ear. Again this does not reach statistical significance, although may be worthy of further investigation.

Content of transformations

As Slade (1976c) found qualitative differences between hallucinators and non-hallucinators in the quality of transformations, the words produced in this study were analysed similarly.

Transformations were grouped into simple words which closely resembled the stimulus "tress" (3 or 4 phonemes in common, i.e. strong transformations) and more complex or unusual words (0-2 phonemes in common i.e. weak transformations), based on the procedure used by Slade, (1976c). Table 5 illustrates the transformations produced by the three groups.

Table 5: Transformations produced by subjects

	STRONG	WEAK
1. Hallucinators:		
	Stress, rest, dress test, press, tread, chest stressed,stresses pest, dressed, caressed breath test, christ, christmas, crescent	chris, jason, josephine chase, chased, dread piss, chess, blood, cat, joseph
2. Non-hallucinators:		
	Dress, cress, tread, tess, chest, press, triss, stress, cursed, trist.	chris, ten, tray, kiss jason, train, chess.
3. Normal subjects:		
	Dress, stress, press, cress.	dread, piss, kiss, chris

As can be seen from Table 5, hallucinators produced a total of 16 different kinds of 'strong' transformations (3-4 phonemes in common with the stimulus word) and 11 'weak' transformations (0 and 2 phonemes in common with the stimulus word). Two of the words produced had no phonemes in common with the stimulus word (blood and cat). The non-hallucinating patients produced 10 strong transformations and 7 weak transformations. The 'normal' subjects produced 4 strong and 4 weak transformations. The non-hallucinating patients and 'normal' subjects did not produce any transformations which had no phonemes in common with the stimulus word.

The hallucinating subjects produced a greater range of transformations overall. The hallucinating subjects produced 27 transformation words overall as compared to 17 and 8 for the non-hallucinating and normal subjects respectively. In addition, the hallucinating subjects produced a much larger number of words with few phonemes in common with the stimulus word 'tress' as compared to the other 2 groups.

The proportion of words with a strong relationship to the stimulus word (3-4 phonemes in common) compared to number of words with a weak relationship to the stimulus word was calculated and is shown in Table 6.

Table 6: Percentage of words with strong or weak relationships to the stimulus word

	Hallucinators	Non-hallucinators	Normal subjects
3-4 phonemes (% of words produced)	59	59	50
0-2 phonemes (% of words produced)	41	41	50

As can be seen from Table 6 the hallucinators did not produce more words with a weak relationship to the stimulus word than the other two groups.

Discussion

All subject groups showed a VTE, indicating that this effect is not idiosyncratic to any of the subject groups. Despite this there were a number of subjects who did not show a VTE at all. These subjects were in the age range of 30 to 40 years and were by no means the oldest subjects in any of the groups. Results in this study did not support the observations of Warren and Warren (1966), that the VTE diminishes as the subjects become older. A striking result from these data was that the transformation effect (as rated by number of transformations produced) was strongly determined by suggestion in two of the experimental groups, 'normal' controls and hallucinating subjects, but not in the non-hallucinating subjects. This result is difficult to explain, as it would indicate that the hallucinating subjects were performing 'normally' whereas the non-hallucinators were performing 'abnormally'. Conversely, time latency was not affected by suggestion in all three groups. The time latency was greater for the right ear overall, although the hallucinators showed a slightly shorter time latency in the left ear, while the normals and non-hallucinators showed a shorter time latency in the right ear. This result indicates that hallucinators show a more rapid tendency to report transformations in the left ear as opposed to the right ear than the other groups. Despite this observation, these data were not statistically significant and should therefore be interpreted with caution.

When the variety and content of transformations was examined there appeared to be some differences between the groups, with hallucinators producing a far larger range of responses than the other groups. The 'normal' subjects produced the least variety of words. When the proportion of simple and complex transformations were examined the hallucinators did not produce more words with a weak relationship to the stimulus than the other groups. This contradicts Slade's (1976c) study, as he found that the experimental groups differed on the proportion of weak and strong words produced. Slade reported that the hallucinators produced roughly equal numbers of weak and strong transformations whereas, for the 'normal' subjects and non-hallucinating psychiatric controls, only thirty per cent of transformations had a weak relationship to the stimulus word. Slade interpreted his results in terms of a reality monitoring deficit in the hallucinating subjects. This account was based on Warren's (1968) proposal that the VTE results from a search by the subjects to apply meaning to an improbable situation. Processing of words in sentences does not solely rely on the phonetic characteristics of the word, but relies also on the context and grammatical structure of the sentence. In the VTE task, where the same word is repeated over and over again, no context is available for the subject to make use of when applying meaning to the perceived word. Warren (1968) proposed that this results in a continued reorganisation of the word without any confirmation from context, producing transformations of the stimulus word. Slade proposed that hallucinating subjects produced more words with a weak relationship to the stimulus word because they failed to test their initial perceptions accurately with the original stimulus i.e. the hallucinators made more incorrect identifications of the stimulus word as not only have they no access to contextual cues but they also have a reality monitoring deficit. The variety and number of transformations produced in this study support this view i.e. the hallucinators may be inaccurately checking their perceptions with the stimulus leading to a greater range of transformations. For non-hallucinating and 'normal' subjects in Slade's study this search for meaning appeared to be limited to highly probable words i.e. those which had a high phonetic similarity to the stimulus word.

Conclusions

Results from all of the above studies do not provide any support for hallucinators having a deficit in speech or auditory processing and suggest that their phonological store or articulatory loop perform as effectively as psychiatric patients who do not suffer from auditory hallucinations. Both psychiatric groups performed more poorly than the 'normal' control subjects in the first three studies in terms of the quality (but not quantity) of responses. This could provide some support for Frith's (1992) model that reality monitoring deficits account for other positive psychotic symptoms as well as auditory hallucinations (the control psychiatric patients were generally experiencing delusions) i.e. the poorer performance of both groups of psychiatric patients in these studies reflects a deficit which contributes to a general reality monitoring deficit. Alternatively the poor performance in psychiatric patients could be explained by their poorer concentration and attentional capacities rather than a specific deficit.

The observation that non-hallucinating patients did not show a U.S.E. in Study 2 is difficult to explain but suggests that further investigation of this phenomena is warranted. In addition, the findings regarding suggestion effects for non-hallucinating patients in Study 4 are also difficult to explain and require further investigation.

With regard to hallucinating patients, the only study which showed differences between them and the other groups was the V.T.E. study. The findings that hallucinators produce more obscure words has been attributed to poor reality monitoring skills, but the observation that hallucinators are likely to report transformations more rapidly than the other groups under certain conditions (i.e. the left ear) is difficult to interpret. This also warrants further investigation.

These data suggest that if auditory hallucinations are a result of inner speech being mis-classified as originating from an external source, the mechanism responsible for this mis-classification is not a faulty phonological store or loop and the reality monitoring deficits must be attributable to other cognitive processes. These results support both Frith's and Bentall's model which suggest that hallucinators should have a broadly 'normally' functioning phonological loop. Bentall suggests that the reality monitoring deficit is related to top-down processes i.e a higher order process such as that relating to beliefs and expectation about the origin of a stimulus. This suggests that if beliefs regarding voices can be modified that this should reduce the severity of the hallucination. There is some evidence to support this (Chadwick and Birchwood, 1994) and it will be further explored in Chapter seven which describes a treatment designed to improve hallucinators' reality monitoring skills and to explore and modify patients' beliefs about the nature of their experiences.

Chapter 5

Phenomenology of auditory hallucinations

Hallucinations usually occur in four main modalities: auditory, visual, olfactory and tactile. As reported in Chapter 1 they are often associated with the diagnosis of schizophrenia but are also present in many other organic and functional psychiatric disorders, as well as occurring within the so called 'normal' population.

Auditory hallucinations are amongst the most frequent symptoms seen in patients diagnosed as suffering from schizophrenia and other forms of severe mental illness (Gelder et al, 1991). They can take the form of music, noises, single words, brief phrases and whole conversations. They may be pleasant and unobtrusive or they may cause great distress to the sufferer. The voices may give commands to the person, discuss them in the third person and comment on their actions (Gelder et al, 1991). Although the presence or absence of hallucinations has been much specified in structured psychiatric interviews such as the Present State Examination (Wing et al, 1974), very little has been reported regarding the phenomenology of hallucination i.e. the nature of the experiences which the sufferer reports.

The experiences of hallucinating patients has been studied by

Aggernaes (Aggernaes, 1972) who used a structured interview to collect data from 41 male patients with a diagnosis of schizophrenia. He described six qualities of sensations of which 'normal' people can be aware when they experience a sensation. These qualities were reported in 90 per cent of a series of hallucinations and are shown below (from Aggernaes, 1972):

1. Sensations are perceived by the sense organs as opposed to imagining the objects. Hallucinations are perceived as a sensation rather than imaginary thought or fantasy.

2. Sensations have behavioural relevance to the individual's emotions, needs or actions. Hallucinations have a similar behavioural relevance.

3. Sensations have a quality of existence i.e. the experiencer feels that the sensation would exist even if no-one was experiencing it at that time.

4. Sensations have the quality of objectivity so that the individual feels that the experience could be perceived in other modalities.

5. Sensations are experienced as independent, so that the experiencer does not attribute the experience to an unusual mental state.

6. Normal sensations are experienced as involuntary so that the experiencer feels it would be extremely difficult to alter or dismiss the experience.

A seventh quality of normal perceptions was also studied by Aggernaes. This was the quality of publicness, where the experiencer feels that other people would also be able to perceive the sensation. In two thirds of the hallucinators studied, the quality of publicness was not present.

In a recent study, Miller, O'Connor and DiPasquale (1993) attempted to examine 12 phenomenological factors associated with hallucinations, interviewing 50 patients admitted to an adult psychiatric facility who reported hallucinations in any modality according to DSM-III-R (APA, 1987) criteria for hallucinations. Although they found that the majority of subjects reported negative consequences of hallucinations, 52 per cent also reported that their hallucinations had some positive effects, and 12 per cent reported that they would like to continue hallucinating. Some of the reasons given for the positive effects related to relaxation, companionship, protectiveness and increased work performance. Miller et al also found that subjects who experienced olfactory hallucinations were more likely to value their hallucinations in comparison to those who hallucinated in other modalities. In addition, subjects who were able to predict the occurrence of their experiences by internal antecedents e.g. a type of mood or thought, were more likely to value their hallucinations. There did not appear to be any significant relationship between positive consequences of hallucinating and age, sex, occupation, marital status, duration of illness, length of hospital stay, or whether the subject was taking anti-psychotic medication. Surprisingly, when they interviewed patients following hospital treatment, Miller et al found that 56 per cent continued to experience hallucinations. This tended to be related to the subjects' perceptions of the voices prior to treatment, those who did not value their hallucinations being less likely to experience hallucinations following treatment.

In a recent study, Chadwick and Birchwood (1994) interviewed 26 hallucinating patients who had a diagnosis of schizophrenia or schizo-affective disorder. They conducted a semi-structured interview which covered: the content of the voices, the patients' beliefs about the voice's identity, power and purpose, the consequences of compliance with the voices' commands as well as behavioural and affective responses to the voices.

All voices were believed to be immensely powerful or omnipotent and patients reported evidence which contributed to this sense of omnipotence. Nineteen subjects reported additional symptoms (such as visual hallucinations) which contributed to the sense of omnipotence. Six subjects attributed a sense of control over themselves by the voices and eleven subjects were able to report events which they believed to occur as a result of the voices. They then interpreted these events as proof of the omnipotence of the voices. Patients were able to categorise their voices as either malevolent or benevolent based on their beliefs about the voice's identity and purpose. The categorisation was not always related to the content of the voice. For example, the reported content of the voice may have been pleasant, but the patient may have believed that the voice originated from a malevolent source.

Romme and Escher (in press) have studied the characteristics of auditory hallucinations in 288 subjects who had diagnoses of schizophrenia, affective disorder, dissociative disorder, personality disorder and subjects who have never received a psychiatric diagnosis but who experienced voices. They found that many of the qualities of the hallucinations in the patients with a diagnosis of schizophrenia did not differ significantly from those qualities reported in subjects with different diagnoses or in 'normal' subjects. For example, 47 per cent of the patients with a diagnosis of schizophrenia reported being able to communicate with their voices compared to 36 per cent of patients with affective disorder. Patients were more likely to be single, report less social support and be less likely to discuss their voices with other people than people experiencing voices who had not sought assistance from psychiatric services.

In order to investigate the qualities of voices further, Romme and Escher (in press) divided their subjects into those patients who coped well with their voices and those who had difficulties in coping. They found that patients who could cope with their voices: experienced themselves as stronger than the voices, experienced more positive than negative voices, experienced less voices which issued commands, set more limits on the voices, listened selectively to the voices, received more support from others and communicated more often with others about their voices.

The purpose of the present study was to assess the phenomenology of hallucinatory experiences reported by patients meeting the DSM-III-R (APA, 1987) criteria for schizophrenia. To this end, a semi-structured interview - the Hallucination Interview Schedule (HIS) - was developed for the purpose of assessing phenomenological variables previously identified as important in the published literature on hallucinations (see Appendix 1). Earlier drafts of the interview were developed by Bentall (unpublished) who identified a number of parameters of hallucinations which other structured interviews did not cover. The interview was also designed to yield data relevant to a cognitive-behavioural analysis of the factors associated with hallucinations. Earlier drafts of the interview were piloted on psychiatric patients in a New York veterans hospital and the version used in this study was the fifth revision based on data from the pilot interviews. The interview consisted of a number of sections addressing aspects such as the physical characteristics of hallucinatory experiences, beliefs, coping mechanisms and the events which improve or worsen hallucinatory experiences. For many of the variables, questions relate to the characteristics of hallucinations at the time of onset, when they were at their worst (peak), and also about the current characteristics of the experiences (present). The HIS is divided into four main sections separately addressing the four main hallucinatory modalities i.e. auditory, visual, olfactory and tactile, followed by sections on coping mechanisms and expectations from treatment. During piloting the interview was observed to take between 20 and 90 minutes.

As Miller et al (1993) found that patients could predict the occurrence of their hallucinations by internal antecedents such as mood, it was predicted, in this study, that a negative mood would be related to hallucinations becoming more severe (at least for hallucinations perceived as negative).

Based on evidence from earlier studies regarding coping and not coping with voices, it was also hypothesised that a feeling of some control over the voices might be associated with a number of variables. Firstly, it was hypothesised that a feeling of control over the voices would be related to a person's beliefs about the origins of the voices, with an internal (e.g. psychological, biological) origin being associated with a sense of control and an external origin (e.g. due to a conspiracy or technological cause) being associated with uncontrollable voices. Relating to this, patients who experience hallucinations which originate inside the head may feel more in control of their voices than people who experience them as originating from outside the mind. Furthermore it could also be hypothesised that having internal attributions about voices might be related to experiencing voices which originate from inside the head i.e. internal attributions are associated with internal voices.

It was also hypothesised that if patients are able to utilise coping strategies which reduce the severity of their voices, then this also would be related to a sense of control over the voices.

With regard to length of time experiencing voices, Slade (unpublished study) found that hallucinating patients who had been experiencing voices for more than 10 years were more likely to experience pleasant voices as well as unpleasant voices, compared to patients who had only been experiencing voices for three years or less. It was hypothesised that hallucinators in this study would also experience more pleasant voices if they had been experiencing voices for more then ten years.

Finally, earlier studies have found that psychotic patients develop their own coping strategies (Tarrier, 1987; Tarrier et al, 1993) and that these tended to be strategies which primarily involved distraction (such as attention switching, and distracting cognitive strategies) or anxiety reduction rather than focusing on the nature and content of the voices. It was hypothesised that the majority of subjects in this study would report that distraction helped them to cope better with their voices.

Subjects

Interviews were carried out with 55 subjects who had been referred to the Department of Clinical Psychology, University of Liverpool for psychological treatment for auditory hallucinations. The majority of referrals were from Consultant Psychiatrists although several referrals were received from nurses and one self-referral was made. Forty subjects (72.7%) were male and 15 were female (27.3%) and the average age of the population (n = 53, age unknown in two cases) was 40.64 years (s.d. = 11.56 years). Referrals were requested on the basis that subjects had been experiencing hallucinations for at least six months and had not responded significantly to neuroleptic medication, and that the voices were occurring approximately two to three times per week or more often. All subjects had a DSM III-R (APA, 1987) diagnosis of schizophrenia. Forty seven interviews were carried out by the author, three by Richard Bentall, Professor of Clinical Psychology, and five by Danny Reid, a Clinical Psychologist based at Ashworth Hospital, Merseyside. All interviewers were specialised in the area of psychosis and were experienced at interviewing patients with psychotic symptoms. Inter-rater reliability, based on the per cent agreement on four interviews was 0.98.

Results

Fifty five interviews were completed and have been used for the purposes of analysis. Data on all variables were recorded using SPSS/PC. Printouts of all the variables and their frequency distributions are given in Appendix 2.

Data on the time taken to conduct the interview was only available on 29 subjects and ranged between 20 and 127 minutes, with a median length of interview of 30 minutes.

Modality of hallucinations

Of the 55 subjects, all were experiencing hallucinations in the auditory modality (an inclusion criterion for the study), 31 (56.4%) were experiencing auditory hallucinations only. Seventeen experienced visual hallucinations, 10 (18.2%) experienced auditory and visual hallucinations together (the most common combination of hallucinatory experiences after auditory alone). Twelve patients were experiencing olfactory hallucinations and 9 experienced tactile hallucinations. Table 7 shows the full range of modalities in which hallucinations were experienced.

Table 7: Modalities in which hallucinations were experienced

Category	No. of subjects
auditory hallucinations only	31
auditory and visual hallucinations only	10
auditory and olfactory hallucinations only	2
auditory and tactile hallucinations only	2
auditory, visual and olfactory hallucinations only	3
auditory, tactile and olfactory hallucinations only	3
all modalities	4

Four subjects were experiencing hallucinations in all 4 modalities, 6 were experiencing hallucinations in 3 modalities, and 14 were experiencing hallucinations in 2 modalities. Subjects were also asked whether they experienced multi-modal hallucinations i.e. unitary hallucinatory experiences which occupied more than one sensory modality at a specific moment in time e.g. where a subject saw a vision of a person and heard that person talking to them. The majority of subjects (47) only experienced unimodal hallucinations, even if they experienced hallucinations in more than one modality. Two subjects were experiencing multimodal hallucinations and a further 6 reported that they experienced both multimodal and unimodal hallucinations. Due to the small numbers experiencing hallucinations in the non-auditory modalities, detailed phenomenological data on the following variables will be presented for auditory hallucinations only.

Length of time experiencing auditory hallucinations

Subjects reported hearing auditory hallucinations for an average of 13.48 years (s.d. = 9.74 years) with a range of 1 to 41 years.

Number of voices experienced

The subjects were asked how many different voices they were aware that they experienced. Results for this variable are shown in Table 8.

Table 8: Number of voices by number of subjects at onset, peak and present

	Number of subjects		
Number of voices	onset (n = 46)	peak (n = 55)	present (n = 55)
1	23	12	16
2	5	7	6
3	2	4	4
4	1	1	3
5	0	4	3
6	1	1	1
10	2	1	1
12	0	2	1
Many	12	15	17

As can be seen, there was considerable variance in the number of voices experienced. The data was bimodally distributed, with the categories of just 1 voice and many voices being most commonly endorsed for onset, at peak and at the time of interview. Experiencing only 1 voice was particularly common at onset. The category of 'many' was most commonly endorsed for the time of interview but not for peak as might have been expected if number of voices is related to severity.

Frequency of voices

Ratings for the frequency of voices, which were coded into a number of predetermined categories, by the patient, at the time of interview, ranged from less than weekly to continuous. Table 9 shows the frequency of endorsements in each category.

Table 9: Frequency of hearing voices at onset, peak and present

frequency of experiencing voices	onset (n = 51)	peak (n = 53)	present (n = 54)
less than weekly	5	1	3
less than daily	7	3	6
daily	8	3	12
hourly	4	2	5
intermittent	18	26	24
continuous	9	18	4
intermittent and continuous total	27	44	28

As can be seen from Table 9 the modal frequency category was intermittent, which was chosen when the subject was hearing voices almost continually but with occasional cessation for a few seconds or minutes. If the categories of intermittent and continuous are added together the frequency of endorsements is nearly twice as high when voices were at their worst than at onset or at the time of interview. It must be emphasised that this sample of frequency data was biased in that referrals were requested for subjects who were experiencing voices approximately 2-3 times per week.

Location and direction of experiencing voices

Subjects were asked to describe the apparent location of their voices i.e. whether they heard the voices inside or outside their heads and whether the voice appeared to come from a particular direction. The ratings were requested for onset, when voices were at their worst and for the time of the interview. Table 10 illustrates the results from this variable.

At the time of interview, only 10 subjects were experiencing voices which were coming from a particular direction (8 at onset, 7 at the peak time). If voices were experienced as outside the head they tended to come from all directions for the majority of subjects. The majority of subjects therefore experienced voices internally, externally from all directions or a combination of these two categories (45 subjects at the time of interview, 43 at onset and 46 at peak time). As can be seen there does not appear to be any relation between location of experience of the voice and severity.

Table 10: Location of voice experienced related to onset, peak and present

location of voice experienced	onset (n = 51)	peak (n = 53)	present (n = 55)
Internal only	16	13	14
External, left	2	2	3
External, right	0	0	1
External, front	2	1	1
External, back	2	1	1
External, all directions	18	22	16
Internal and external, left	0	0	0
Internal and external, right	0	1	1
Internal and external, front	1	1	2
Internal and external, back	1	1	1
Internal and external, all directions	9	11	15

Time of day

Data was collected on whether subjects were more likely to experience voices at a particular time of day. Thirty four subjects did not experience voices at a particular time of day, 21 subjects did. No data was collected on the particular times of day that the voices were experienced.

Factors which made the voices worse

Data was collected on a number of factors which might be expected to make the voices worse. These were being alone or with others, noisy or quiet conditions, light or dark conditions, being busy or bored, and being in a negative or positive mood. Table 11 shows numbers of subjects who reported that the above factors made their voices worse.

Table 11: Factors which made voices worse

Category	no. of subjects reporting this making the voices worse (n =54)
Being alone	33
Being with others	9
In noisy environment	12
In quiet environment	13
In a light environment	7
In a dark environment	9
Being busy	5
Being bored	19
Experiencing a negative mood	26
Experiencing a positive mood	4

As can be seen from Table 11, being alone, being bored and experiencing a negative mood are the most likely factors to make voices worse in this sample. Noisiness or lighting did not appear to be a significant problem for the majority of subjects.

Voices originating from an object

Of the 41 subjects who reported experiencing auditory hallucinations which originated from outside their head, twenty four subjects (total n = 52) reported that their voices originated from an object in their environment e.g. the walls, a plant, ceiling etc.

Sex of the voices

Sex of voices was recorded at onset of voices, when they were at their peak and at the time of interview. These data are shown in Table 12.

Table 12: Sex of voices at onset, peak and present

Sex	onset (n = 53)	peak (n = 52)	present (n = 54)
male	20	16	13
female	5	2	2
both sexes	26	33	38
neither male or female	2	1	1

In this sample, male or mixed sex voices were the most frequent. Mixed sex voices become more frequent over time and there appears to be a steady decrease in male only voices. Chi-squared tests revealed that sex of voice was not associated with sex of the experiencer (χ^2 [3.1] = 1.24, p = 0.74).

Loudness of voices

Subjects were asked to rate the loudness of their voices by comparing them to the loudness of the interviewer i.e. louder than the voice of the interviewer, about the same loudness, quieter than that of the interviewer, or of variable loudness.

Table 13: Loudness of voices at onset, peak and present

	onset (n = 51)	peak (n = 52)	present (n =53)
louder	13	21	16
as loud	12	11	12
quieter	21	14	17
variable	4	6	8

Table 13 indicates that loudness of the voices may be related to severity; at peak nearly half of the subjects reported their voices as louder than the interviewer's voice. Voices were rated most frequently as quieter than the interviewer's voice at the first onset of the voices. Only a small number of subjects rated their voices as variable in loudness.

Form of voices

Subjects rated the form of their voices including: whether the voices spoke directly to them, whether the voices told them what to do, whether the voices talked or commented about them, whether the voices described what they were doing, whether multiple voices talked amongst themselves, whether different voices talked about other voices and whether voices talked to anyone else. Again these ratings were taken for initial onset of the voices, when the voices were at their worst and at the time of interview.

Table 14: Form of voices

	onset (n = 51)	peak (n = 52)	present (n = 54)
voices talking to subject	30 (n = 52)	35 (n = 53)	37
voices giving instructions	32	37 (n = 53)	36
voices commenting about subject	28 (n = 50)	30 (n = 51)	34
voices describing subject's actions	12	16	17
voices talking to each other	19	22	22
voices talking about other voices	4	8	11
voices talking to other people	9	9	9

Voices which talked about other voices and voices which talked to other people were not frequently reported by the subjects. The most frequent form of voices were those which spoke directly to the subject (2nd person hallucinations), those which gave instructions to the subject (2nd person hallucinations) and those which commented about the subject (3rd person hallucinations). The form of the voice did not appear to change over time, with similar frequency distributions at onset, at peak and at time of interview.

Emotional content of the voices

Content of the voices was rated by the subjects as negative, positive, both or neither for 48 subjects at the time of interview. Ratings for pleasantness, unpleasantness, hostility and friendliness were made by 54 subjects at onset, at peak and at the time of interview. The frequency of these ratings are illustrated in Tables 15 and 16.

Table 15: Patients' interpretations of the content of their voices

Interpretation of voice content	frequency (n = 48)
Negative	21
Positive	2
Both negative and positive	24
Neither negative or positive	1

As can be seen from Table 15, the majority of subjects (45) had a negative interpretation or a mixed (negative and positive) interpretation of the content of their voices. Only 2 subjects reported an exclusively positive interpretation of their voices. This may reflect a problem of sample bias. As stated earlier, all subjects were referred for psychological treatment of their auditory hallucinations and it is therefore possible that people experiencing positive hallucinations may not be in touch with the services or be referred by them.

Table 16: Patient's description of their voices' emotional characteristics.

	onset (n = 54)	peak (n = 54)	present (n = 54)
pleasant voices	19	19	26
unpleasant voices	44	50	50
hostile voices	37 (n = 53)	44	43
friendly voices	24 (n = 53)	22	24

As can be seen from Table 16, a large proportion of subjects rated their voices as unpleasant and hostile. It should be noted that subjects could rate their voices as both unpleasant and pleasant and as both friendly and hostile. Voices were not rated as more hostile or unpleasant at peak compared to at the time of interview, although voices do appear to have been rated less frequently as hostile and unfriendly at initial onset.

Controllability of the voices

Subjects were asked whether they had any control over their voices. Thirty five subjects reported having no control, and 17 reported they had some control. Three subjects were not able to answer this question.

Attributions about the voices

Subjects were asked to describe the cause of their voices. These were categorised by the subject in conjunction with the interviewer into biological cause (e.g. illness, head injury), psychological cause (e.g. personal life event, unpleasant childhood), supernatural cause (e.g. witches, devils), conspiratorial cause (e.g. neighbours inflicting voices), technological cause (e.g. transmitters from the moon causing voices) and finally, as some subjects were not able to provide a cause for their voices, a don't know category was created. Table 17 shows the number of subjects who scored under each category. It should be noted that subjects may have more than one attribution or cause for their voices.

Table 17: Attributions regarding the cause of voices

attribution	frequency (n = 54)
biological	18
psychological	18
supernatural	8
conspiratorial	20
technological	0
don't know	4

As can be seen, the majority of subjects were able to decide upon an attribution for their voices. The most common attributions in this sample were biological, psychological and conspiratorial. Only 8 subjects reported a supernatural attribution and no subjects reported a technological attribution.

These attributions were categorised by the patients, in conjunction with the interviewer, into internal (biological or psychological), external (supernatural, conspiratorial, technological), or both internal and external attributions and these are illustrated in Table 18.

Table 18: Internality/externality of attributions

Attribution	frequency (n = 54)
internal	23
external	20
both internal and external	8
uncertain	3

As can be seen internal and external attributions were fairly equally spread in this sample. A small number of subjects had attributions which were classified as both external and internal (e.g. when subject gave a biological attribution such as illness which was further attributed to an outside influence, such as a conspiracy).

Emotional consequences of the voices

Subjects were asked whether the voices upset them in the following categories: never, sometimes or always, for onset of voices, when they were at their worst and at the time of interview. Table 19 shows the frequency of each response. As can be seen from Table 19 the majority of subjects scored in the categories of sometimes or always upset. Again, this finding may in part reflect the sampling biases already alluded to.

Table 19: Emotional response to voices

emotional consequences of the voices	onset (n = 49)	peak (n = 52)	present (n = 54)
never upset	7	4	4
sometimes upset	11	14	21
always upset	31	34	29

Coping strategies

Questions were asked about a number of coping strategies which have been previously reported in the literature (e.g. Tarrier, 1987). These included being alone or with others, distraction from the voices, focusing on the voices, obeying the voices' instructions, sleeping, taking exercise, eating, drinking, relaxing, abstaining from something and taking medication. Table 20 shows the frequency of subjects reporting each of the above coping strategies. As can be seen from Table 20 the most common coping mechanism was distraction from the voices, with over half the subjects choosing this approach.

Relaxing, sleeping and being with others were also rated frequently.

Table 20: Coping mechanisms reported by subjects

Coping mechanism	frequency (n = 47)
being alone	10
being with others	28
distracting self from voices	34
focusing on voices	2
obeying the voice's instructions	5
sleeping	26
exercising	10
eating	6
drinking	19
relaxing	21
abstaining from something	7
taking medication	27

Future expectations regarding the voices

Subjects were asked to make 3 ratings of their expectations about the future outcome regarding their voices on a scale from 0 to ten (0 indicating that they had no confidence at all and 10 indicating they had absolute confidence in the relevant outcome). First, subjects were asked to rate their expectations about whether they would be able to do something to overcome the voices in the future (an internal expectation). Second, subjects were asked to rate how confident they were that someone else would be able to help them with their voices in future (an external expectation). Third, subjects were asked to rate whether the voices would just go away on their own (a fatalistic expectation). Table 21 shows the mean ratings for all subjects for the three type of expectations.

Table 21: Expectations of outcome

Expectations	mean score (n = 46)
internal	4.5 (s.d. = 3.2)
external	5 (s.d. = 3.45) (n = 45)
fatalistic	3.9 (s.d. = 3.6)

As can be seen the average scores are approximately mid-way on the scale, indicating that, overall, subjects had some confidence that they might overcome their voices in some way in the future. Inspection of the raw data in Appendix 2 indicates that 10 subjects did not have any confidence that there was anything they could do which would help with the voices, although 36 subjects had some expectation that there was something they could do to help. Eight subjects did not think that anyone else would be able to help, although 37 had some expectations that other people would be able to help in the future. Fifteen had no expectation that the voices would just go away on their own, although 31 did have some expectations that the voices would go away on their own.

Associations between variables

Cross-tabulations were carried out on several categorial variables, and the following associations were noted which related to the hypotheses outlined in an earlier part of the chapter. Although a cluster analysis was considered the small number of subjects suggests that this would not be an effective way to analyse these data.

Controllability of voices

As predicted, having control over the voices tended to be associated with utilising some coping strategies. There was a significant association between individuals feeling that their voices were controllable and being with others as a coping strategy (χ^2 [2] = 9.23, p = 0.026).

Table 22: Relationship between control and coping strategies of being alone or being with others

	Being alone		Being with others		Neither or both	
	%	(n)	%	(n)	%	(n)
Voices controllable	70	(7)	25	(7)	4	(1)
Voices uncontrollable	30	(3)	75	(21)	96	(8)

Those patients who reported having control over the voices were more likely to use being alone as a coping mechanism than using being with others. Patients whose voices were perceived as uncontrollable were more likely to be with others as a coping strategy. Of the patients who either used both or neither strategy, all but one reported uncontrollable voices.

There was a significant relationship between control and using distraction or focusing coping strategies. These categories were based on questions which asked the experiencer to decide whether they used distraction techniques to cope better with their voices or whether they focused or concentrated on their voices in order to cope better (χ^2 [2] = 10.05, p = 0.018). Table 23 illustrates this relationship.

Table 23: Relationship between control and using distraction or focusing as coping strategies

	Distraction %	n	Focusing %	n	Neither or both %	n
Voices controllable	38	(13)	100	(2)	0	(0)
Voices uncontrollable	62	(21)	0	(0)	100	(11)

Although most of the subjects used distraction techniques, the two subjects who reported using focusing on the voices as a coping strategy viewed their voices to be controllable. Of the distracters, two-thirds had uncontrollable voices and one-third had controllable voices.

Finally, there was an association between control and using relaxation (χ^2 [1] = 1.899, p = 0.036) as a coping strategy. Table 24 illustrates the relationship.

Table 24: Relationship between control and using relaxation as a coping strategy

	Not using relaxation		Using relaxation	
	%	n	%	n
Voices controllable	14	(3)	48	(10)
Voices uncontrollable	86	(19)	52	(11)

As can be seen from Table 24, relaxation was used by a larger proportion of patients whose voices were controllable than those whose voices were uncontrollable. Patients with uncontrollable voices were much less likely to use relaxation than the patients with controllable voices.

Although analyses were carried out on other coping variables, control over the voices was not significantly associated with either being busy or bored, sleeping, exercise, eating or drinking as coping strategies. Interestingly, control over the voices was not related to whether the patients felt that taking medication helped (although all patients in this study were taking neuroleptic medication). It may be surmised then, that an individual's ability to utilise some coping strategies may be related to the perception of control over the voices.

There was an approaching significant association between control and internality and externality of the patients attributions about the origin of the voices, for those patients who had a solely internal or external attribution (χ^2 [1] = 3.48, p = 0.062). Table 25 illustrates this.

Table 25: Relationship between control and internality/externality of attributions

	Internal attribution		External attribution	
	%	n	%	n
Voices controllable	48	(10)	20	(4)
Voices uncontrollable	52	(11)	80	(16)

Those patients who had a solely external attribution were much more likely to have voices which they felt were uncontrollable, whereas those who had controllable voices were approximately equally divided between internal and external attributions.

Although location of origin of voices was not significantly associated with controllability, this was approaching significance when the groups were split into those who had purely internal or pseudo-hallucinations and those who had both external (true) and pseudo-hallucinations (χ^2 [1] = 3.02, p = 0.081). Table 26 illustrates this.

Table 26: Relationship between control and location of origin of voices

	Internal origin %	n	External and internal origin %	n
Voices controllable	54	(6)	27	(11)
Voices uncontrollable	46	(5)	73	(30)

As can be seen from Table 26, those patients who had external voices were more likely to feel that their voices were uncontrollable, whereas those patients who had voices of internal origin only were equally likely to have controllable or uncontrollable voices. There was no association between individuals having voices located internally and having an internal attribution about the voices.

In summary, the characteristics of the voices which were deemed controllable and those which are deemed uncontrollable did not differ on frequency, length of time hearing voices or unpleasantness of voices and control was not related to any type of mood making the voices worse. Utilising focusing strategies, using relaxation and having an internal attribution about voices are more likely to be associated with having controllable voices. In addition, pseudo-hallucinations may be more likely to be deemed as controllable than external and pseudo-hallucinations.

Length of time experiencing of voices

Duration of voices was re-coded into 3 categories: 1 to 3 years duration, 3-10 years duration, 11 years or more duration. Duration of experiencing voices was associated with having voices which the patient rated as pleasant (in addition to unpleasant voices in all but four cases). This was approaching significance (χ^2 [2] = 5.750, p = 0.056). Table 27 illustrates this association.

Table 27: Relationship between duration of voices and experiencing pleasant voices

Duration	No pleasant voices		Pleasant voices	
	%	n	%	n
1-3 years	26	(7)	4	(1)
3-10 years	30	(8)	27	(7)
11+ years	44	(12)	69	(18)

Longer duration of voices was associated with a higher probability of experiencing pleasant as well as unpleasant voices. Voices of short duration were more likely to be associated with unpleasant voices alone. This suggests that the longer an individual experiences the voices, either the voices become more pleasant in content or the individual interprets the content differently the longer they persist.

Conclusions

These results have shown the diversity of patients' experiences of auditory hallucinations and the many different variables which are associated with them. Most of the patients in this study had been experiencing voices for many years, had been treated unsuccessfully with neuroleptic medication and were experiencing negative hallucinations. Despite this there were a substantial number of patients who were also experiencing pleasant and friendly voices, confirming the observations made by Miller et al (1993), Chadwick and Birchwood (1994) and Romme and Escher (1989, in press). Having voices which were pleasant was related to duration of voices, where the longer the duration of voices the higher the likelihood of experiencing pleasant voices. Although it is not possible to determine the cause of this observation from these data, it is possible to speculate that an individuals' beliefs regarding the voices may change over time and this may result in some of the voices taking on a benevolent role in the person's life.

With regard to location that the patients experienced their voices, the majority were able to decide on a location but this was not specific to a particular (external) direction. The majority of patients experiencing external voices described them as coming from all directions rather than from the left or right side. The location of experiencing the voice was related to a feeling of control over the voices, with those who had solely internal voices being more likely to report having control over their voices than those who had voices which appeared to originate internally and externally. Similarly, with regard to internal and external attributions, there was a relationship between believing that the voices originated internally and control. The hypothesis that experiencing internally located voices would be related to an internal attribution about voices was not confirmed, therefore the development of beliefs regarding the origin of voices must be related to other factors.

Approximately one third of patients reported having control over their voices. There was no difference between these groups on frequency or duration of voices. The main differences related to the use of coping strategies, with control being associated with using relaxation, being alone and (tentatively), using focusing strategies. Location and attributions, as discussed above, were also important with regard to control. In addition to these data relating to control, a large number of patients reported that their hallucinations worsened as a result of a type of mood, particularly a negative mood.

Implications of these findings may be that teaching people to use particular coping strategies, increasing the likelihood of internal voices e.g. by teaching patients to reality monitor more effectively, providing strategies to deal with negative mood, as well as modifying patients' beliefs regarding the origin of voices may be important treatment strategies for increasing patients' control and reducing the severity of voices. An approach which attempts to address some of these issues in described in Chapter 7.

Chapter 6

Psychological treatments for auditory hallucinations

There is a wealth of literature on psychological treatments for auditory hallucinations. The majority of this is in the form of individual case studies or series of case studies. Many psychological approaches which have been used successfully with other disorders have also been tried with auditory hallucinations (see Tarrier, 1992 for a review).

Two laboratory studies reported by Lindsley (1959, 1963) introduced the idea that hallucinations could not be brought under some control using operant procedures. He conducted his studies in a 6 foot square chamber, containing a chair, a plunger and a reinforcement delivery tray. Lindsley suggested that high rates of vocalisation in chronic psychiatric patients usually indicated the presence of auditory hallucinations (providing the patient was not engaged in any other vocalisation activity, such as talking, singing, whistling). He attempted to modify the rate of vocalisation and hence hallucinatory experience using an operant procedure with candy as the reinforcer. He concluded that hallucinations, because of their psychotic nature, did not respond to reinforcement. Unfortunately despite over 30,000 hours of data collection there are a number of criticisms to his studies. Firstly, he seemed to take no account of candy eating rate during sessions, a behaviour which would surely affect recording of vocalisation. Secondly, he did not take account of other behaviours during recording which could have affected the measurement of vocalisation e.g. self-instructions or vigorous movements.

Despite these negative findings there have been reports of operant methods being used successfully with hallucinating patients. Nydegger (1972) reported a successful intervention with a 20 year old man who had a diagnosis of paranoid schizophrenia and was experiencing a number of symptoms, including auditory and visual hallucinations, social withdrawal and paranoid delusions. His voices became worse when he was involved in a conflict situation. His voices intervened during conflict, telling him what to do, hence removing any responsibility for him to resolve the conflict. The patient was encouraged to take responsibility for these decisions and to refer to his voices as thoughts. The patient's behaviour was reinforced using social approval by all staff involved. After two months no further hallucinations were reported and no displays of any behaviours associated with them were observed. A follow-up two years later indicated that the hallucinations had not recurred. These results again must be interpreted with caution. It is possible that the hallucinations were still present but that the patient had learnt not to report them.

This may be interpreted as a positive outcome still, although it may also reinforce an individual to not report distress when it occurs, hence not receiving the assistance needed in such circumstances.

Haynes and Geddy (1973) used a "time-out" procedure to treat a 45 year old woman with a diagnosis of schizophrenia who was suffering from auditory hallucinations. She was not able to report hallucinations verbally and the experimenters therefore defined hallucinatory experience as talking and mumbling to herself. Time-out was used whenever the patient appeared to be talking to herself in the absence of an identifiable stimulus. This involved removing the patient from her environment and placing her in an unfurnished room for 10 minutes. After 30 days of treatment her hallucinatory behaviour reduced from eighty per cent of the time to thirty per cent of the time. This study did not include a follow-up and again is vulnerable to the same criticisms as those made of the Nydegger (1972) study. It is perhaps not surprising that under these conditions the woman reduced her hallucinatory behaviour. This does not necessarily indicate that the actual hallucinations have reduced in frequency. Davis, Wallis, Liberman and Finch (1976) and Heron and De Armond (1978) both found that time-out procedures were useful for reducing hallucinatory behaviours such as talking to oneself.

Despite some of the criticisms outlined above it is clear that impressive results can be obtained using operant procedures on types of hallucinatory behaviour which could directly relate to experience of hallucinations. It is possible that operant procedures may be of value in patients who experience difficulty communicating their distress to others, which limits the use of other forms of management. It may also be useful in inpatient settings where nursing staff can reinforce particular behaviours as a matter of course in the absence of the manpower necessary to conduct more intense or lengthy therapies.

Counterstimulation techniques have been widely used with patients experiencing auditory hallucinations. These are based on the premise that the more a person is distracted from their hallucinations, the more likely the hallucinations are to extinguish.

Slade (1974), in a study with two hallucinating patients, required them to shadow material which was presented at different rates. The material included letters presented on paper which the subject had to repeat. Slade found that the greater the rate of presentation of material, the greater the reduction in hallucinations reported. Unfortunately the effects of counter-stimulation did not generalise to situations outside the laboratory, raising the possibility that counter-stimulation techniques may not necessarily have long-lasting effects.

A later study by Margo, Hemsley and Slade (1981) which was reported in more detail in an Chapter 2 included 10 conditions of environmental stimulation. In general, it was observed that sensory restriction and white noise increased the frequency, clarity and loudness of reported hallucinations whereas for all other conditions the frequency, clarity and loudness decreased. The reading aloud condition reduced the frequency of reported hallucination most, followed by listening to an interesting passage, listening to a boring passage, regular electronic blips, a passage in Afrikaans which none of the patients understood, and finally irregular electronic blips which reduced the frequency of hallucination least. The authors concluded that the reduction in severity of hallucination was greatest when the material was most meaningful. The reading condition which reduced experience of hallucinations most was a condition in which the muscles of vocalisation were being used overtly, and as sub-vocalisation is reported to be associated with auditory hallucinations, it is possible that this condition had additional counterstimulation benefits as compared with the other techniques used. These results have recently been replicated in a study involving 7 patients with a diagnosis of schizophrenia who were experiencing auditory hallucinations (Gallagher, Dinan and Baker, 1994).

Erickson and Gustafson (1968) hypothesised that auditory hallucinators are..

> "...responding to internal stimuli - that is to say they are interacting with themselves".

They also proposed that if hallucinators could be taught to use alternative ways to use their vocal chords that the voices would reduce. They asked patients to hum and/or gargle. They described two case studies in which this intervention blocked the voices initially, and eventually eliminated them completely. Similarly, Bick and Kinsbourne (1987) and Green and Kinsbourne (1989), described in more detail in Chapter 2, found that techniques which blocked subvocalisation reduced the severity of hallucinations.

James (1983) used alternative counter-stimulation techniques which he reported to be successful in reducing the frequency of hallucinations. His subject was required to point out and name objects in a room whenever he heard voices, and also to use ear-plugs (discussed in more detail below). Both approaches resulted in a reduction in auditory hallucinations.

The latter studies found that the effects of their counter-stimulation techniques generalised outside the therapy or laboratory session, unlike the earlier studies by Slade (1974) and Margo et al (1981). Two further studies have investigated the generalisability of these procedures. Alford and Turner (1976) studied a female patient who had suffered with auditory hallucinations for eight years. They utilised two experimental conditions preceded and followed by a baseline period. The first treatment involved what they called "social disruption" where the subject was engaged in conversation with the experimenter. The second involved electrical aversion therapy. The results indicated that, although both conditions produced a reduction in frequency of auditory hallucinations only in the aversion therapy condition did this effect generalise to the baseline period. In a later study, Turner, Hersen and Bellack (1977) found similar results. Counterstimulation procedures of social disruption and bell-ringing did not produce beneficial effects on hallucinations outside sessions, whereas electrical aversion therapy did. Unfortunately these two studies suffer from a methodological problem. In both studies the counterstimulation procedure preceded the aversion therapy, therefore it is possible that there may have been an order effect favouring aversion therapy. In addition, subjects were exposed to almost twice as much aversion therapy as counterstimulation, again perhaps biasing the study in favour of aversion therapy.

Feder (1982) reported a case of a patient with a three year history of intermittent auditory hallucinations. The patient was advised to use stereo headphones in conjunction with a radio when hearing voices. The patient reported a complete cessation of his voices while he wore the headphones but no change during the times he did not wear them.

Hustig, Tran, Hafner and Miller (1990) conducted a larger study on the effect of headphone music on persistent auditory hallucinations in ten patients with a diagnosis of schizophrenia. They allowed subjects to choose two tapes, one which they viewed as being relaxing, the other which they viewed as stimulating. They hypothesised that the relaxing music would have more effect on reducing the frequency of hallucinations than the stimulating music. Of the 10 subjects, one dropped out of the study because she found the effects of the stimulating tape unpleasant. Of the remaining 9 subjects, neither the relaxing or arousing tape influenced the frequency of hallucinations for the group overall. Three subjects reported a reduction in frequency of their hallucinations regardless of the type of music. Although analysis of group data did not show differences between the effects of the relaxing and arousing tape, the authors argued that inspection of individual data revealed a trend towards the relaxing tape being superior. A notable feature of this experiment was that the 5 subjects who reported a general improvement while listening to tapes experienced pleasant or innocuous hallucinations whereas the subject who dropped out of the study and the remaining subjects experienced unpleasant and/or hostile voices. The authors concluded that headphones with music could be useful for people who have only innocuous voices, rather than negative ones. This may be true but it is also the case that people who have innocuous voices are less likely to request help than those who have negative ones. The value of listening to tapes as a therapeutic tool must therefore be investigated further. Morley (1987), in a similar study investigating the effect of music through headphones on auditory hallucinations, obtained only temporary reductions in the severity of hallucinations.

In a more recent investigation by Nelson et al (1991), three counter-stimulation techniques were studied with twenty hallucinating patients. One of these techniques involved using a Sony walkman to listen to music through earphones. The results indicated that distraction techniques were useful for a proportion of the subjects, although only seven subjects reported long-term use of the Walkman. No indication of the impact of the techniques on the severity of hallucinations was reported.

It is apparent that counterstimulation techniques have some value in the management of auditory hallucinations although they may be limited to the time of their use and may not necessarily provide lasting benefits. They may be useful as a management tool for people with distressing voices which have not responded to other means of management, especially as they are simple to administer and can be used in a wide variety of settings with limited therapeutic input.

Green (1978) first proposed a theory discussed in a later paper (Green et al, 1980) to account for auditory hallucinations. The authors proposed that due to faulty connections between the two hemispheres of the brain, verbal activity in the non-dominant hemisphere was perceived as alien by the dominant hemisphere. They suggested that auditory hallucinations were a result of verbal information from the non-dominant (usually right) hemisphere being misinterpreted as coming from an alien source by the dominant (usually left) hemisphere. According to this theory a reduction in the auditory input to the non-dominant hemisphere and an increase in incompatible dominant hemisphere verbalizations should disrupt hallucinations. There have been a number of researchers who have used an ear-plug in order to reduce external auditory input in an attempt to bring about clinical changes in people suffering from auditory hallucinations.

Patients were required to put the ear-plug in their left ear as this information is processed within the non-dominant, usually right, hemisphere. Studies using this approach need to investigate a person's hemispheric dominance before proceeding (although this does not appear to have happened in practice). Results from these types of studies have been inconsistent. James (1983) reported that the use of an ear-plug in one ear had an immediate and significant impact on hallucination frequency. This improvement continued when the ear-plug was transferred to the opposite ear. This is not consistent with the theory proposed. At the same time as wearing ear-plugs, the subjects were asked to point and name objects in a room and it is possible that the counter-stimulation effects of this may have confounded James' results. Morley (1987), in addition to looking at the effects of distracting music, also asked his subject to wear an ear-plug in his left ear, which had no effect on his voices. Switching the ear-plug to his right ear produced an immediate drop in the clarity of the voices. The voices then changed in severity and the ear-plug was switched back to the left ear. The benefits continued. The plug was discontinued after a further two days at the subject's request and the voices had not recurred at one month follow-up. A further single case study produced results which were inconsistent with Green's theory.

Done, Frith, and Owens (1986) found that an ear-plug in the right ear produced a superior effect on the voices, in comparison to an ear-plug in the left ear. A study which is more consistent with the theory is one on a 37 year old female patient with a diagnosis of schizophrenia who was asked to use the ear plug in her left ear (Birchwood, 1986). This produced a reduction of the patient's voices to approximately half the baseline rate, 160 days following its introduction. Unfortunately Birchwood did not test the effects of the ear-plug in the right ear, and it is therefore unclear whether the effects were limited only to the left, providing no clear evidence in support of Green's theory.

There has been some evidence that thought-stopping, a technique which was developed by Wolpe (1973) to treat intrusive thoughts, can also be used as a treatment for auditory hallucinations (Samaan, 1975; Allen, Halperin and Friend; Lamontagne, Audet and Elie, 1983). The procedure involves several stages which take place between patient and therapist. The patient signals the onset of voices and the therapist responds by shouting "stop" repeatedly until the patient indicates that the voices have ceased. The therapist then can reduce the loudness of this command. Eventually the patient is meant to control the cessation of the voices by shouting at themselves initially, and then repeating the commands in imagination, which is a more socially acceptable way of managing the voices. Samaan (1975) reported a successful intervention with a 42 year old woman where a thought stopping procedure resulted in the complete eradication of her hallucinations which was continued at 20 month follow-up. A less successful intervention was that by Lamontagne, Audet and Elie (1983), who used thought stopping procedures with twenty patients who suffered from paranoid thoughts and auditory hallucinations. Subjects were allocated to either a chlorpromazine medication condition or a chlorpromazine plus thought stopping condition. The main finding was that the group receiving medication plus thought stopping showed greater improvement than the group receiving medication alone, although this was only significant with respect to paranoid thoughts, not hallucinations. Thought stopping has also been used with a man having distressing visual hallucinations associated with his memories of killing a soldier in Vietnam (Johnson, Gilmore and Shenoy, 1983). His frequent disturbing visions were of the soldier's bloody face. Thought stopping over a 4 month period produced a significant reduction in the frequency of visions but additional therapy was required to eradicate them completely. At 11 month follow-up no further visions were reported.

There are a number of studies where beneficial effects on auditory hallucinations have been seen using an approach based on aversive stimuli, including the ones already described earlier in this chapter (Alford and Turner, 1976; Turner et al, 1977). Weingartner (1971) carried out a study where patients suffering from auditory hallucinations were assigned to one of three groups: an electric shock group, a pseudo-shock group and a no-treatment control group. Subjects were asked to press a button on a shock box each time they heard voices. The pseudo-shock box was disconnected. All three groups showed a decrease in hallucination frequency, and the shock box did not produce bigger effects than the other two groups. The authors explained their results as occurring as a result of placebo effects.

Other work has been carried out by some authors using white noise as the aversive stimulus. This is an interesting aversive stimulus as it has been shown to increase the severity of hallucinations (Margo et al, 1981; Gallagher et al, 1994). Fonagy and Slade (1982) compared three conditions in hallucinating subjects: (i) they had a punishment condition where the white noise was presented immediately following the subject reporting cessation of their voices; (ii) a negative reinforcement condition when white noise was presented at onset of hallucinating and, finally (iii) a condition where white noise was presented at random intervals unrelated to voice onset or cessation. They found that there was a reduction in frequency of voices in all three conditions although more so in the first two conditions. The negative reinforcement condition appeared to be most effective. A further study involving a single case of a 42 year old woman was reported by Slade, Judkins, Clark and Fonagy, (1986) where treatment involved concurrent white noise. Total eradication of voices occurred which was maintained at 6 month follow-up. The results from these studies are confusing and would tend to confound evidence cited earlier which suggested that white noise increases the severity of hallucinations. It is possible that the loudness of the white noise used may well have some bearing on its effects. In the aversion studies the white noise was fixed at 80 decibels, which is much higher than that used in Margo, Hemsley and Slade's (1981) study. It is possible that white noise serves to affect hallucinations differently depending on loudness, paradigm and possibly individual differences (Alpert, 1985).

The studies reviewed above have, in general, utilised techniques which involve encouraging the subject to distract themselves or avoid the hallucinations. These types of approaches seem to have an important part to play in the management of hallucinatory experiences. The results of the studies described above have shown a diversity in their effects, indicating that although there are a large number of techniques which can be used, their effectiveness is variable. Further work in this area is needed in order to determine which techniques are most helpful to which patients.

Other authors have used techniques or treatments which have involved the individual focusing on the experience and associated situations, feelings or cognitions. Studies using focusing approaches are those which have involved a powerful requirement for the subject to focus on their hallucinatory experiences.

A method which meets this criterion has been reported by Rutner and Bugle (1969), who encouraged a woman to record her experience of auditory hallucinations. This had the effect of reducing the frequency of her voices and this was followed up by the recording chart being displayed publicly, allowing staff to positively reinforce her improvement. A total elimination of voices was observed using this combination of focusing and reinforcement.

Self-monitoring was also emphasised as a focusing approach in a later study. Reybee and Kinch (1973), who called their approach "focusing", treated two men diagnosed as suffering from chronic schizophrenia who were experiencing auditory hallucinations. Initially the subjects were required to monitor their voices retrospectively at several intervals during the day. No change in hallucination frequency was noted in these two subjects. It was only when the subjects were asked to concurrently monitor their voices during laboratory sessions that reductions in hallucination frequency were seen.

Systematic desensitisation has also been used in the treatment of hallucinations and involves a type of focusing on the voices. Studies which have employed systematic desensitisation have usually concentrated on the aspects of the voices which cause anxiety or distress. For example, in a study by Slade (1972) this approach was used with a male patient who had auditory hallucinations. It was observed that the man's voices became worse when either in the presence of his father, or when thinking unpleasant thoughts about his father. Slade's approach utilised graded exposure to the patients' thoughts about his father. This approach was successful in reducing the man's voices. Unfortunately, although the voices did not reoccur at follow-up, the patient was re-admitted to hospital suffering from depression. It is possible that the depression was an underlying feature of his illness which had been masked by the voices. Exposure of this depression may well have helped the patient to correctly identify the source of his illness which could then be appropriately treated. Alternatively, the patients' auditory hallucinations may have had an important role in the his life, so that removal of them resulted in a type of grief reaction.

A further focusing approach was described by Greene (1978). He suggested that the experience of auditory hallucinations involved the least personal responsibility on the part of the sufferer and the most responsibility on external control. He described this as a form of avoidance and emphasised that focusing on the voices was the only way to overcome hallucinatory experiences. He proposed that patients be educated about the nature of their experiences i.e. informed that they are internally generated and represent "talking to oneself". Patients in Greene's study were encouraged to refer to their voices in the first person singular i.e. that the voices were their own thoughts. Greene (1978) reported a successful use of this technique with two female patients, both of whom reported that their voices had disappeared once they had fully accepted and implemented the first person singular approach. An approach which shows some similarities to the work of Greene has been described by Fowler and Morley (1989), who reported a study with five individuals who were hearing voices. Their subjects were encouraged to bring on and then dismiss their hallucinations in order to facilitate re-attribution of the voices from external to internal sources i.e. to demonstrate that the voices were under their own control rather than that of an external source. They also utilised some distraction techniques concurrently. Only one subject benefited significantly from this approach, although others showed some reduction in voice frequency.

A case study outlined in a report by Tarrier, Harwood, Yusupoff et al (1990), involved some elements of a focusing approach. Their approach (Coping Strategy Enhancement) was targeted at a number of different psychotic symptoms of which auditory hallucinations were one. They treated a 26 year old man who was experiencing thought broadcast, persecutory delusions, delusions of reference and auditory and visual hallucinations. He experienced more severe symptoms when he was out of the house especially in the presence of other people. His usual coping strategies were social withdrawal and avoidance, which had not been successful. The patient was instructed to label his symptoms as being illness-related and to switch his attention to a positive image. This was coupled with anxiety management to deal with the anxiety associated with social situations. Distraction techniques were also used in order to modify some of the other symptoms. In a later report, Tarrier et al (1993) described a controlled study comparing the effectiveness of Coping Strategy Enhancement and a problem solving treatment with a waiting list control group. Twenty seven patients who were experiencing hallucinations or delusions were randomly assigned to one of the three groups. The Coping Strategy Enhancement group were taught to monitor symptoms and effective coping strategies were targeted and refined to encourage optimum use for the patient. Cognitive strategies such as self-instruction, reality testing, attention switching and narrowing and behavioural strategies such as increasing activities as well as relaxation techniques were also utilised as part of this approach. Problem solving treatment involved teaching a cognitive plan for problem solving to the patients, who were asked to target difficult situations and implement specific strategies to deal with them. Symptoms were not targeted directly as in Coping Strategy Enhancement. Tarrier et al found that teaching problem solving strategies and coping strategy enhancement to patients experiencing persistent psychotic symptoms was effective at reducing some symptoms compared to the control group, particularly anxiety and delusions. No significant treatment benefits were observed overall on hallucinations. Coping Strategy Enhancement was superior to problem solving particularly for delusions. It is possible that the instrument used to measure change in hallucinations in this study, the KGV, (Kraviecka, Goldberg and Vaughn scale, 1977), was not sensitive enough to pick up changes on hallucinations as it allows the rater to make only two judgements about the severity of true hallucinations i.e. raters score whether hallucinations have been present in the last week, infrequently or frequently. It is possible that more sensitive instruments may have shown a significant change.

Fowler (1992) described a comprehensive approach in the treatment of long-term psychosis in general as opposed to therapy for hallucinations in particular. He emphasised a cognitive approach which aimed to maximise engagement, to be flexible in the length and timing of sessions and to reduce distress in sessions. It also aimed to provide information regarding the nature of the individual's condition and medication and emphasised short and long-term goal setting as well as strategies for avoiding future relapse. In a trial involving 19 patients, Fowler found clear improvements amongst those with residual positive symptoms and those with accompanying affective problems, although very little change was observed for patients with just negative symptoms. Following on from this work Fowler and his colleagues (Fowler et al, in press, Kuipers et al, in press), have gone on to further develop this approach. They described the main aims as: reducing distress from psychotic symptoms, increasing an individual's knowledge and motivation towards their disorder, and reducing dysfunctional emotions and behaviour. Techniques which they used during therapy included some of those already mentioned above as well as goal setting and overcoming hopelessness, together with modification of dysfunctional beliefs and patients' assumptions regarding themselves. In a trial designed to test the efficacy of their approach, 11 patients completed therapy and 7 acted as waiting list controls. Patients received an average of 16 sessions over approximately 6 months. Results indicated that decreases in psychotic symptoms could be achieved using their approach.

In a recent report by Chadwick and Birchwood (in press) the authors pointed out that there is a diversity in the way people react to their hallucinations, so that voices are not always seen as a problem by the individual. They proposed that an individual's response to hallucinations must be mediated by psychological processes. As a result of this, they proposed that approaches to treatment should concentrate on the feelings, thoughts and behaviours of the experiencer. In a earlier paper, discussed in Chapter 5 (Chadwick and Birchwood, 1994), 26 people who were hearing voices were interviewed in order to assess their behavioural, cognitive and affective responses to their voices. A large proportion of subjects believed their voices to be powerful or omnipotent and were able to recount evidence which supported this belief. In addition subjects were able to categorise their voices as malevolent or benevolent. This was in many cases associated with the content of the voices, although a small number of subjects believed them to have benevolent intentions, even when voices had malevolent content. Alternatively, a small number of subjects believed the voices to have malevolent intentions even when the content was benevolent. Behavioural responses to voices included three categories: engagement, resistance and indifference. Affective responses included anger, anxiety, depression, calm and reassurance. On the basis of this evidence, Chadwick and Birchwood argued that a cognitive therapy for voices would be possible where treatment was directed towards the beliefs about the voices, in order to reduce the associated distress and behaviour. In their approach they identified the core beliefs associated with the voices and the evidence used to support them. Standard cognitive techniques were then used to dispute the veracity of these beliefs (see Chadwick and Lowe, 1990 for a description of this approach). Their final goals in therapy were to give a meaning to the voices, and to conceptualise them as self-generated while exploring the personal significance of the voices in terms of their content and the individual's history.

Conclusions

The range of psychological approaches utilised in the treatment of auditory hallucinations is diverse. Many contemporary researchers have combined reportedly successful techniques together to produce a comprehensive package of treatment for individuals with other symptoms as well as auditory hallucinations. Although many successful reports have been published there are a number of problems which have yet to be resolved before it can be concluded that there is a successful psychological strategy for managing auditory hallucinations. Many of the studies have used small numbers of subjects with control groups which have not been matched for therapist's time. It is possible that positive results have been achieved because experimental subjects have received a greater amount of time with one particular person. The studies reported also have fairly short follow-up periods, and it is therefore difficult to tell whether the approaches described are producing long-term benefits for subjects compared to standard psychiatric care. Finally, many of the reported studies have utilised a combination of different theoretical approaches to management of hallucinations. Distraction and focusing techniques have been used simultaneously making it difficult to determine what particular aspects of therapy have produced beneficial effects on symptoms. In the pilot study outlined in the following chapter the author has attempted to address two of these problems.

Chapter 7

Focusing versus distraction approaches in the psychological treatment of auditory hallucinations

The aims of this study were to compare two different theoretical approaches to the management of auditory hallucinations in a group of patients with a comparison waiting list control group. Slade and Bentall (1988) pointed out that psychological treatments for auditory hallucinations tended to fall into two main approaches: (i) those which emphasised focusing on the hallucinations and associated experiences and (ii) those which emphasised distraction or avoidance of the hallucinations. As it has been suggested that hallucinations may arise because of a faulty monitoring process which results in internally generated verbal material being attributed to an alien source (Bentall, 1990a; Frith, 1992), it may be hypothesised that focusing on the experience may reduce the likelihood that a misattribution may occur. In addition, if reality monitoring skills improve through focusing on the hallucinations then this approach may be more likely to produce continued or long-term benefits. If beliefs and expectations about the origin and content of verbal material are also important factors when an individual determines whether a stimulus is internally generated, then a focusing approach which attempts to explore and modify these beliefs should affect the severity of the hallucinations for the better.

In this study a focusing treatment was compared to a distraction treatment and a waiting list control group for patients who had a diagnosis of schizophrenia and who were experiencing persistent auditory hallucinations. It was hypothesised that, although both experimental treatments would demonstrate a significant effect on the severity of hallucinations in the short-term, only focusing would demonstrate lasting benefits, as only this treatment addressed the cognitive processes thought to underly auditory hallucinations.

<u>Subjects</u>

Subjects were recruited from throughout the Mersey Regional Health Authority. A letter was sent to Consultant Psychiatrists within the region and to the academic Department of Psychiatry at Liverpool University, requesting referrals for psychological treatment for patients in their care who were suffering from auditory hallucinations, which had been persistent for 6 months or more, had not responded significantly to neuroleptic medication and which were experienced at least two to three times per week. It was also requested that potential patients had a diagnosis of schizophrenia and that, in the event that a patient was accepted for treatment, medication would be kept stable for the period of treatment and for a follow-up period of six months.

Sixty three referrals were received and of these, 56 met the referral criteria outlined above and went onto an assessment phase.

Method

Potential subjects were asked to attend for an initial appointment either in the Department of Clinical Psychology, University of Liverpool, the Department of Psychology, Whiston Hospital, the Department of Psychology, Fazakerley Hospital, or for some patients who were unable to attend an out-patient appointment, arrangements were made for them to be seen at their home. Patients were given an explanation of the purpose of the appointment and their verbal consent. to take part in an assessment was obtained. The initial assessment consisted of the following:

1. The Present State Examination, ninth edition (Wing et al, 1974).
2. A hallucination assessment which was developed for this project, the Hallucination Interview Schedule, described in Chapter 5 (see Appendix 1)
3. The National Adult Reading Test (Nelson, 1982)

The assessment interviews were conducted by one experimenter (either Gillian Haddock, Richard Bentall or Danny Reid) for each patient. Patients were also asked to complete the Rosenberg Self-esteem scale (Rosenberg, 1965) in their own homes.

Following assessment, which took between one and three sessions, patients who met the inclusion criteria were asked to take part in the treatment study. They were informed that they would receive between eighteen and twenty sessions of therapy with a clinical psychologist who was attempting to develop new ways of helping people who experienced voices, which did not involve medication. Patients were informed that they would complete various monitoring assessments throughout treatment. Patients who were willing to take part were asked to give written consent and to agree that their medication should be kept stable throughout treatment and follow-up. Patients were then randomly assigned to either a distraction treatment group or a focusing treatment group. Twenty six people were assigned to one of the two groups. The following eight referrals to the study were then assigned to a waiting list control group.

The two treatments had the following in common. Each consisted of 18 to 20 weekly sessions which lasted approximately one hour. At the beginning of each session patients were requested to complete a Hospital Anxiety and Depression scale (HAD, Zigmond and Snaith, 1983) and a version of the Personal Questionnaire Rapid Scaling technique (PQRST, Mulhall, 1978). The PQRST symptom statements were chosen by the author to provide an assessment of the following areas: frequency of voices over the past week, the distress caused by the voices, the disruption to life caused by the voices and the amount to which patients believed the voices to be their own thoughts. In addition, patients in both groups were asked to complete a daily hallucination diary, before going to bed each night. They were asked to rate frequency, loudness, distress and hostility of the voices on a scale from one to nine, as well as write a brief account of their daily activities (see Appendix 3).

Session 1, for both treatment groups, involved thoroughly introducing the patient to the assessment measures and allowing them sufficient time to become familiar with them. This session also served to give the patient a thorough rationale and description of the approach being used. This was a useful session for deepening of rapport and addressing any questions which the patient had. Following session one the treatment sessions were quite different. An outline of the treatment procedures is given below:

1. Distraction approach

The assumption behind this approach was that the more the patient could distract themselves from their voices the better. The treatment consisted of a combination of a number of distraction or counterstimulation techniques, which were outlined in the previous chapter, plus others which were especially designed for the study. Patients were asked to use a technique for one week and review progress the following week. They were introduced to the techniques in the following order.

a. Personal stereo 'therapy' (Feder, 1982; Morley, 1987; Hustig et al, 1990; Nelson et al, 1991).

This involved patients being provided with a personal stereo with which they could listen to the radio or play a cassette. Patients were asked to listen to music through headphones each time they heard their voices or, if their voices were continuous, to use the stereo at identified times during the day or night. Patients were asked to record after each use how effective the stereo had been at distracting them from their voices on a scale from zero to ten, where a score of ten indicated that the voices had been blocked out completely and a score of zero indicated that the voices had not been blocked out at all.

Following a period of listening to music through headphones, patients were asked to spend the following week listening to different material. This was usually talking programs on Radio 4, based on the rationale that these would be more meaningful and hence would be more effective at distracting the patient from their voices (Margo et al, 1981; Gallagher et al, 1994). Patients again were asked to rate out of ten how effective the talking programmes were at distracting them from their voices each time they used the technique. At the beginning of the subsequent sessions the usefulness of these approaches was discussed with the patient together with any problems encountered with their implementation. Problem solving exercises were employed to aid the implementation of techniques if necessary.

b. Reading, mental arithmetic and mental games (Margo et al; Gallagher et al; James, 1983; Nelson et al, 1991)

These approaches were introduced in subsequent weeks. Patients were required to select reading material and to set aside time each day to record how much the reading distracted them from their voices. The reading phase was planned in two stages: the first involved silent reading and the second involved reading out loud. Mental arithmetic tasks were also set in consultation with the patient so that techniques appropriate to their functioning could be chosen. Mental games were also chosen by the patient. These involved mental imagery tasks, word games or naming objects in a room. Some patients also chose to use written puzzles such as crosswords of puzzle books. Again, patients were asked to record how effective the technique was at distracting them from their voices on a scale from zero to ten. They were discussed in the same way as for the personal stereo.

c. Activity scheduling

Using records from the hallucination diary individual programs were developed to increase the patients' range of behaviours which most distracted them from their voices. Recording sheets similar to those traditionally used for activity scheduling with depressed patients (Williams, 1993) were used to plan activities and to rate the effect on their hallucinations. In this way patients could fine-tune their schedules to increase those things which they found gave most relief from their hallucinations. In this phase, time was sometimes spent on helping patients to do activities which they found distracting but which they also found anxiety provoking. Programmes designed to desensitize people to these situations were also devised. By the end of the distraction treatment it was hoped that patients would have a repertoire of behaviours which they knew would distract them from their voices. They were then encouraged to use a combination of techniques which were most appropriate to their lives (e.g. one patient used reading aloud as a method of distraction, but when he was outside in the street he used his personal stereo, as this was more socially acceptable and allowed him to get on with other activities. Another patient found that planning a range of activities using activity scheduling was most effective). The final sessions were spent reviewing progress and planning for the future. Emphasis was placed on continued use of all the procedures employed. Time was spent on planning how the patients' could continue to incorporate these into their lives, and how the person could continue to develop and improve upon their distraction techniques. If possible links were made with other professionals involved in the care of patients' so that they could encourage and reinforce continued use of the techniques. See case study 1 at the end of this section for a description of a patient treated using a distraction approach.

2. Focusing approach (e.g. Reybee and Kinch, 1973; Fowler and Morley, 1989; Chadwick and Birchwood, 1994)

This approach has been briefly described elsewhere (Haddock, Bentall and Slade, 1993; Bentall, Haddock and Slade, 1994). The emphasis was on a strong requirement for the patient to focus on their voices. The approach was a combination of some of the techniques mentioned in the literature and other focusing techniques newly identified in this study. The amount of time spent on particular strategies varied from patient to patient depending on how comfortable they felt with each stage. Patients gradually exposed themselves to the physical characteristics, content, meanings, related thoughts and beliefs about their voices. A graded approach was planned so that desensitisation to the anxiety caused by the voices could take place. For some patients, the anxiety associated with their voices was greater than others and there was therefore no set time for moving on to later stages. The stages outlined below were worked on with all patients. The approach involved the particular order laid out here but at times there were jumps from one stage to another and back again depending on the nature of particular patients' experiences.

a. Physical characteristics of the voices.

This involved focusing on and discussing physical characteristics of the voices such as: the number of voices, their loudness, their tone, their accent, their sex and their location. Patients were asked to concurrently focus on their voices, by spending time within the session specifically on this. For example, patients were asked to focus on the location of the voice or voices for one minute. If the patient had more than one voice they were asked to just focus on one at a time. A record of the nature of the voices was then kept during sessions, especially relating to changes in the phenomenology of the voices between or within sessions. Patients were also asked to identify a particular time at home when they could do a focusing exercise and write down characteristics of the voice on a particular occasion. This was then reviewed and discussed at the start of the next session.

b. Content of the voices

When patients became comfortable with focusing on the physical characteristics of the voices, they were asked to focus during and between sessions on the content of the voice. This involved recording exactly what was said, usually aided by shadowing the voice. In sessions the patient either concurrently recorded the content of the voice or repeated it out loud for the therapist to record. Patients were generally asked to record for short periods during the session. The rest of the session was then spent on examining the content.

c. Related thoughts

This phase followed quite closely on from b. and involved examining the relationship between the patient's thoughts and the content of their voices (i.e. which thoughts resulted from the experience of hearing a voice and which preceded this experience). This also involved examining any related feelings such as depression, anxiety, anger or fear. In some cases, monitoring of related thoughts and feelings was introduced using a combination of voice and thought diaries. Patients were encouraged to change and examine their antecedent or resulting thoughts and feelings to assess the effect on their voices.

d. Meaning of the voices

This phase involved an attempt to attribute some meaning to the content or the experience of the voice. This would necessarily involve addressing a patient's belief system relating to the voice and if appropriate to help the patient to modify their beliefs using cognitive techniques (see Chadwick and Lowe, 1990 for a description of this type of approach).

Following collection of this material a formulation of the meaning and function of the voices was developed between the therapist and patient, using data from all the monitoring material. For some patients the actual process of doing this was therapeutic in itself, whereas for others it allowed identification of areas where changes could be made. For example, a number of patients became aware that the voices themselves were not the most distressing experience, but rather it was the feelings and thoughts which resulted from the voices which caused distress. This enabled patients to address these more appropriate areas in therapy. For others it was useful to treat the voices as intrusive thoughts and to introduce techniques aimed to alleviate these. Alternatively, some patients were able to identify aspects of their environment which contributed to the distress caused by the voices. For example, some patients recognised that the content of their voices reflected the worries they had in general life and that they could use the content of the voices to help them to make changes in their life as a result. One patient recognised that her voices increased following a row with her husband; focusing on the content helped her to become aware that her voices were saying the things which she was feeling and thinking about her husband, but was at the time not able to express. Identification of this as a problem helped her to decide to intervene by attempting to improve the communication between her and her husband and to resolve some of the issues which were causing bad feeling. In some cases a formulation included the re-attribution of the voices to self i.e. the process of concurrent self-monitoring and focusing allowed patients to correctly identify the voices as originating from themselves. Before this interpretation was presented to a patient, the potential effect on their mental state was assessed by the therapist. For example, if re-attribution of voices to self would have been resisted or detrimental to the patient, a slightly different rationale was given. This rationale involved allowing the patient to accept the voices as being externally generated but acknowledged that the antecedent and resulting thoughts and feelings were internally generated and that the patient could exert control and change over these. In the example described above, of a woman whose voices reflected conflict with her husband, the patient did not accept that the voices were internally generated. She continued to believe that the voices originated from the Devil but was able to acknowledge that her reactions to this and the content of the voices were closely related to her current worries and concerns. She was able to acknowledge that, if she could change her thoughts and feelings in response to the voices, this would have a positive effect on the content of her voices. In other cases patients were able to re-attribute the voices to themselves (see case study 2 at the end of this section, showing the progress of focusing therapy, also Haddock, Bentall and Slade, 1993).

The final sessions were treated as a review and plan for the future. Patients were encouraged to take records of the work which they had completed in therapy and to use it to help them plan continued work in the future. The emphasis, as with the distraction approach, was that for the benefits to continue, focusing on the voices and their meaning also had to continue. If appropriate, meetings were set up with referrers and other key workers involved with the patient so that the rationale and progress made with the patient could be reinforced.

Reports were sent to referring agents at the end of the assessment stage for both treatments informing referrers that the patient had been accepted into the study and reminding them that medication should be kept stable throughout treatment and follow-up. At the end of treatment further reports were sent to the referring agent with a summary of progress made as well as information which would help them to reinforce the progress made.

Control group

Patients allocated to the waiting list control group were assessed using the exact same pre-assessments as the clinical groups. These patients were informed as to the nature of the control group and were asked to give written consent in the same way as other patients. As these patients were referred for treatment they were asked if they would wish to be considered for treatment after the end of the main study. A number of the patients requested this. Control patients were re-assessed 4-6 months following pre-assessment.

Post-assessment

At the end of treatment and approximately 6-9 months later experimental patients were re-assessed by a blind rater (usually RPB or DR) on the following measures. Patients in the control condition were reassessed using the same measures.

1. The Present state examination, ninth edition (Wing et al, 1974)

2. The Hallucination Interview Schedule (HIS)

3. The Rosenberg Self-esteem Scale (Rosenberg, 1965; administered at the end of treatment for the experimental patients only).

Patients were also asked to complete diary sheets for seven days, an HAD (Zigmond and Snaith, 1983) and the PQRST scale (Mulhall, 1978). Control patients were asked to complete the same assessments approximately 4-6 months after the pre-assessment (except the HAD and Rosenberg Self-esteem questionnaire). No six month follow-up assessment of control patients was performed because some of these patients wished to be considered for treatment as soon as possible.

The following two case studies illustrate the implementation of the two treatment approaches.

Case study 1: FL (distraction)

FL was a 47 year old man who lived alone. He was first admitted to hospital in 1974 suffering from depression and was given a diagnosis of schizophrenia in 1977. He had been experiencing auditory hallucinations for fifteen years. These had become more severe in the two years prior to referral to the study following the death of his mother. He was referred by his Consultant Psychiatrist.

FL was unemployed and lived in a flat with his brother, who was also unemployed. He had regular contact with a nephew from whom he gained a lot of support. FL was receiving neuroleptic medication (Flupenthixol decanoate, 80mgs. weekly).

Prior to treatment FL was assessed using the Present State Examination (Wing et al, 1974) and the HIS (see Chapter 5). He also completed a Rosenberg Self-esteem questionnaire (Rosenberg, 1965). Assessment revealed that he experienced hallucinations in the auditory and visual modalities. He experienced voices which appeared to originate from outside his head and which occurred almost continually. He occasionally experienced visual hallucinations from which his voices sometimes appeared to originate. The content of his voices was both positive and negative, and he was able to describe four voices, one of which was good and three which were bad. The good voice he called 'Sam' and FL saw a clear image of Sam several times a day. The voices did not occur at any particular time of day and became worse when he was alone and when he was tired or upset. The voices spoke to him directly, commented about his actions, described what he was doing and sometimes talked to each other. He was unsure about the cause of his voices, although he believed that 'Sam' was part of himself and originated from God. The other voices were related to a conspiracy and usually upset him. 'Sam' spoke to him in a pleasant supportive voice, while the negative voices encouraged him to harm himself, criticised him and tried to mislead him. Although he valued his positive voice, he said he would prefer to have no voices as he considered them to be unnatural.

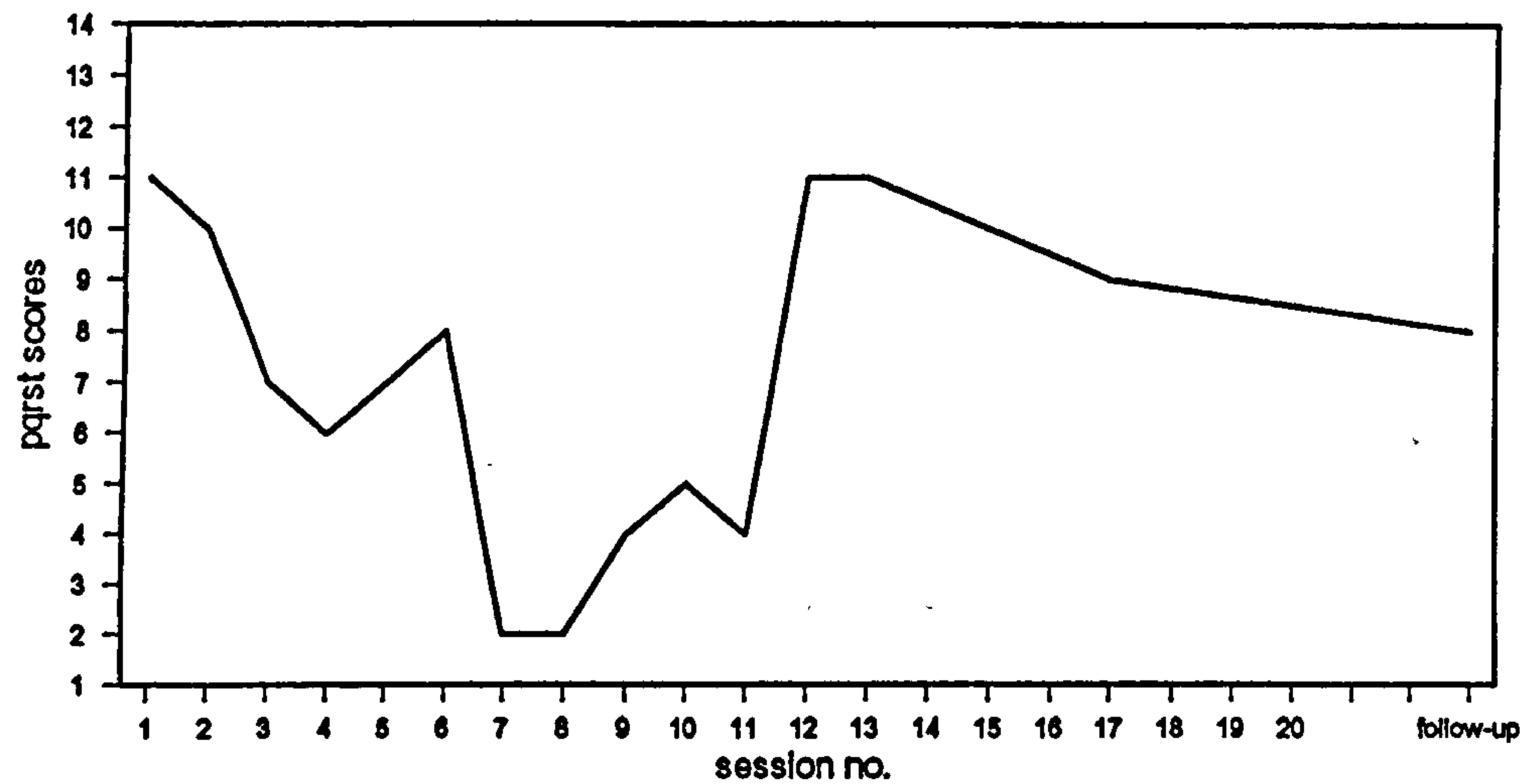
FL was treated over twenty sessions by the present author using a distraction approach as described above. He was asked to complete a weekly PQRST (Mulhall, 1978) and HAD (Zigmond and Snaith, 1983) at the start of every session. This usually took him approximately ten minutes. He was also asked to complete a daily hallucination diary (see Appendix 3) before going to bed each night.

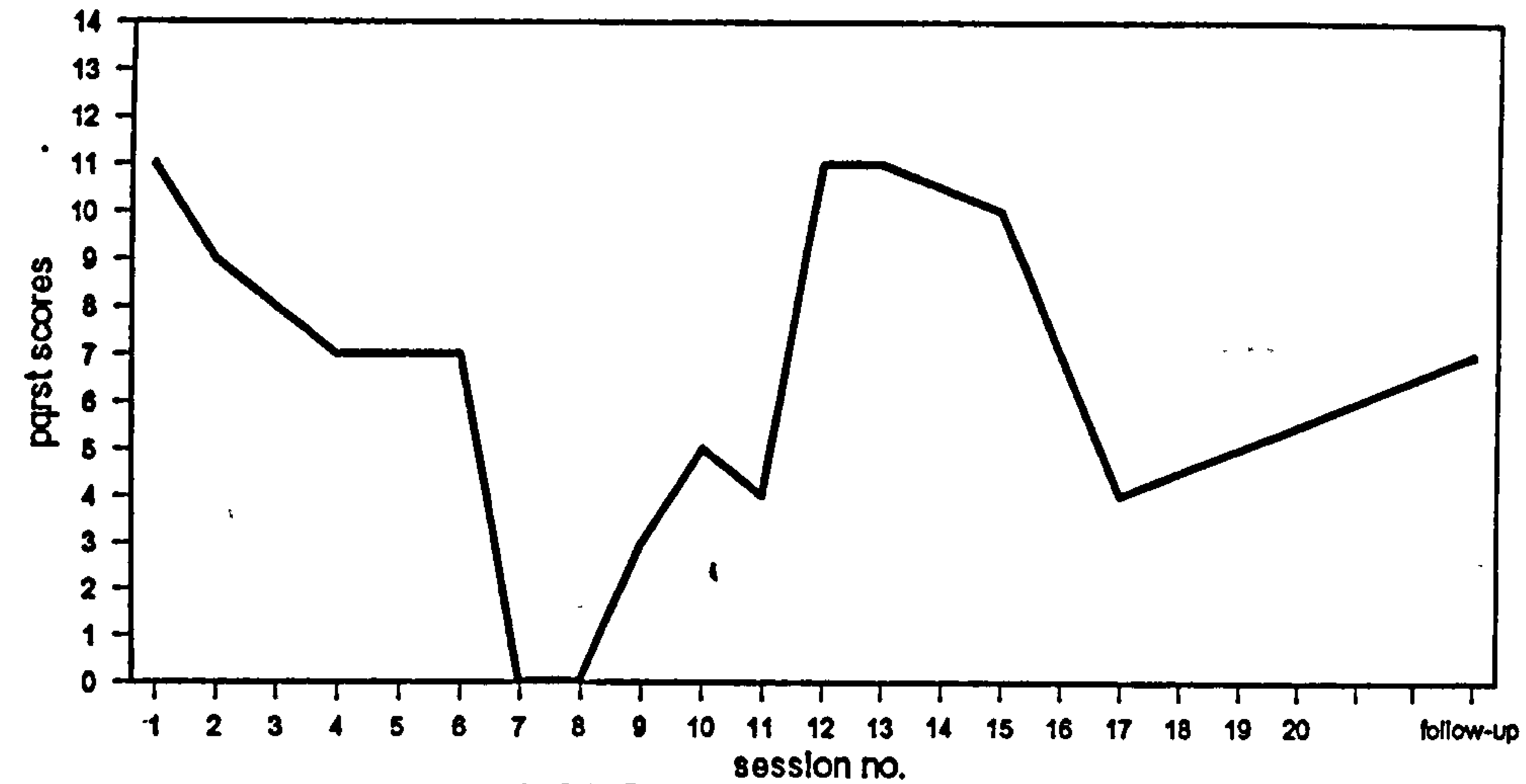
FL accepted the rationale for the approach and was keen to attempt the distraction techniques. Initially FL used a personal stereo to distract himself by listening to music. After the first week he reported that while using the personal stereo the severity of his voices reduced. He then progressed to listening to talking programmes on the radio. He was asked to identify specific talking programmes which he would listen to between sessions. He was asked to rate out of ten how effective the personal stereo was at distracting him from his voices. FL also reported that he had not gone to bed on two nights during the week because the voices frightened him at night. It was suggested that he use his personal stereo when he was in bed until he dropped off to sleep. He thought this was a good idea and came up with the idea of connecting his personal stereo to the mains electricity supply (rather than using batteries) so that if he dropped off to sleep and left it switched on, the batteries would not run out. He continued to gain some benefit while listening to the personal stereo but he found that the talking programmes were boring and distracted him less well than listening to music. For the following week he agreed to listen to a number of plays on the radio which he enjoyed and at other times to listen to music.

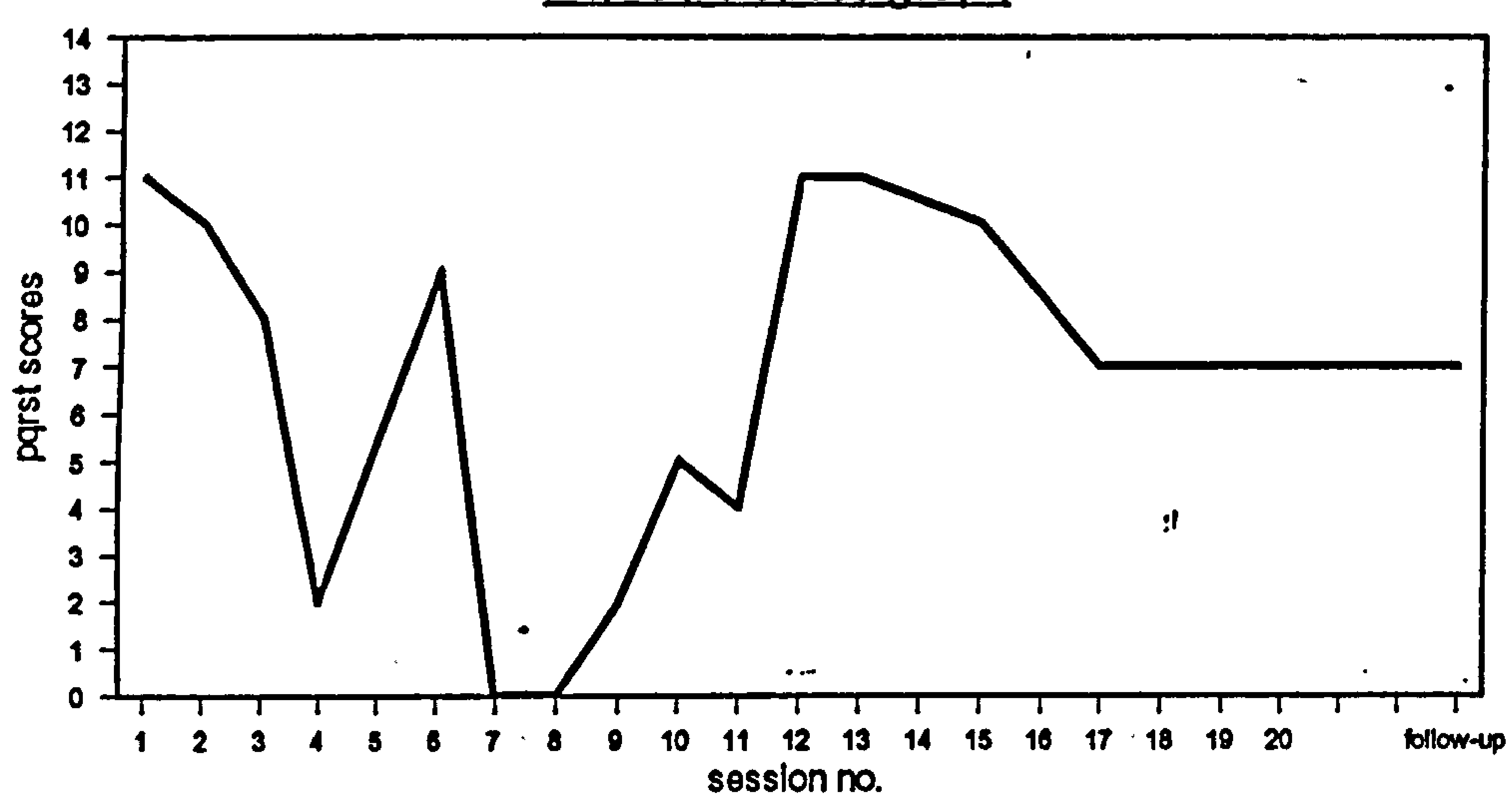
During this time FL came up with a number of activities which he wished to use as distraction techniques. He bought an exercise bike and started to exercise daily and found that this, in conjunction with his personal stereo helped him to get to sleep at night. He also expressed a wish to begin bird-watching, particularly on Saturday, as this was the most difficult day of the week. He reported feeling anxious much of the time and decided to cut out caffeine from his diet in order to control this. At this point, FL requested further help with regard to his anxiety, therefore he was instructed in relaxation and breathing techniques and provided with a tape which he could use with his personal stereo.

Later sessions focused on encouraging FL to continue to use the strategies which had been successful at reducing the severity of his voices and introducing new distraction techniques. At session six, mental arithmetic was introduced as a distraction technique and FL came up with the strategy of counting in three's and seven's. He also continued to find exercise a good strategy and took up swimming several times a week. At this point the severity of FL's voices had reduced in severity (session 6 to 11, see Figures 4 and 5). He reported that the good voice had become more pleasant and the bad voices had become more neutral in their content and occurred less frequently. During this period he continued to implement all of the above techniques and added reading to self and out loud. He exercised daily and carried out relaxation exercises as well as using specific distraction techniques. Following session eleven, when he missed two appointments, his voices suddenly became much more severe. This was just before Christmas and was a time he had found difficult since the death of his mother (this was only the second Christmas since her death). He reported feeling very depressed and the voices were encouraging him to harm himself. He did not wish to kill himself but was frightened that the voices would push him into it (FL had previously made several attempts to harm himself following instructions from his voices). He acknowledged that it had been a

Figure 4: PQRST graphs (FL)







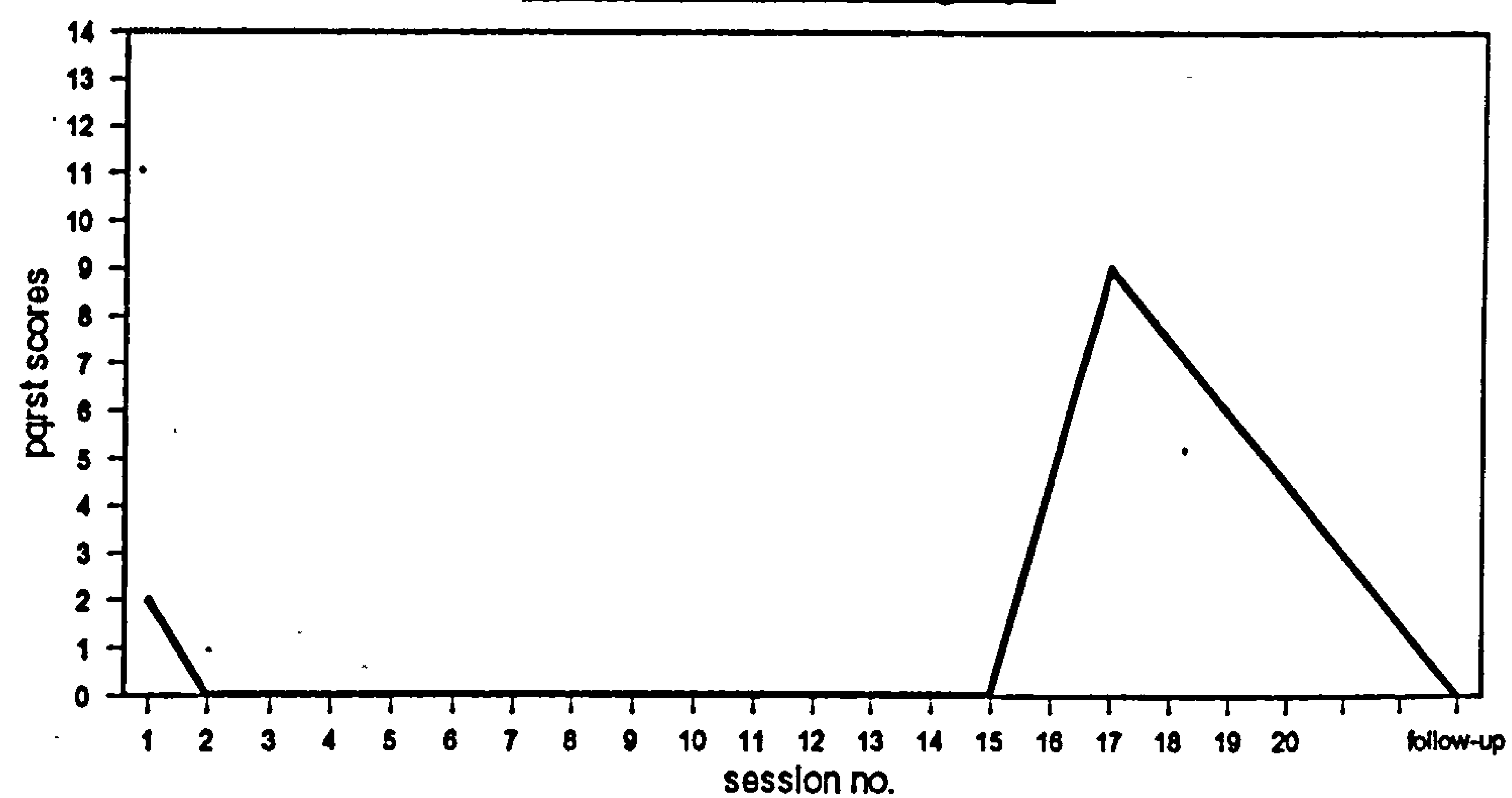


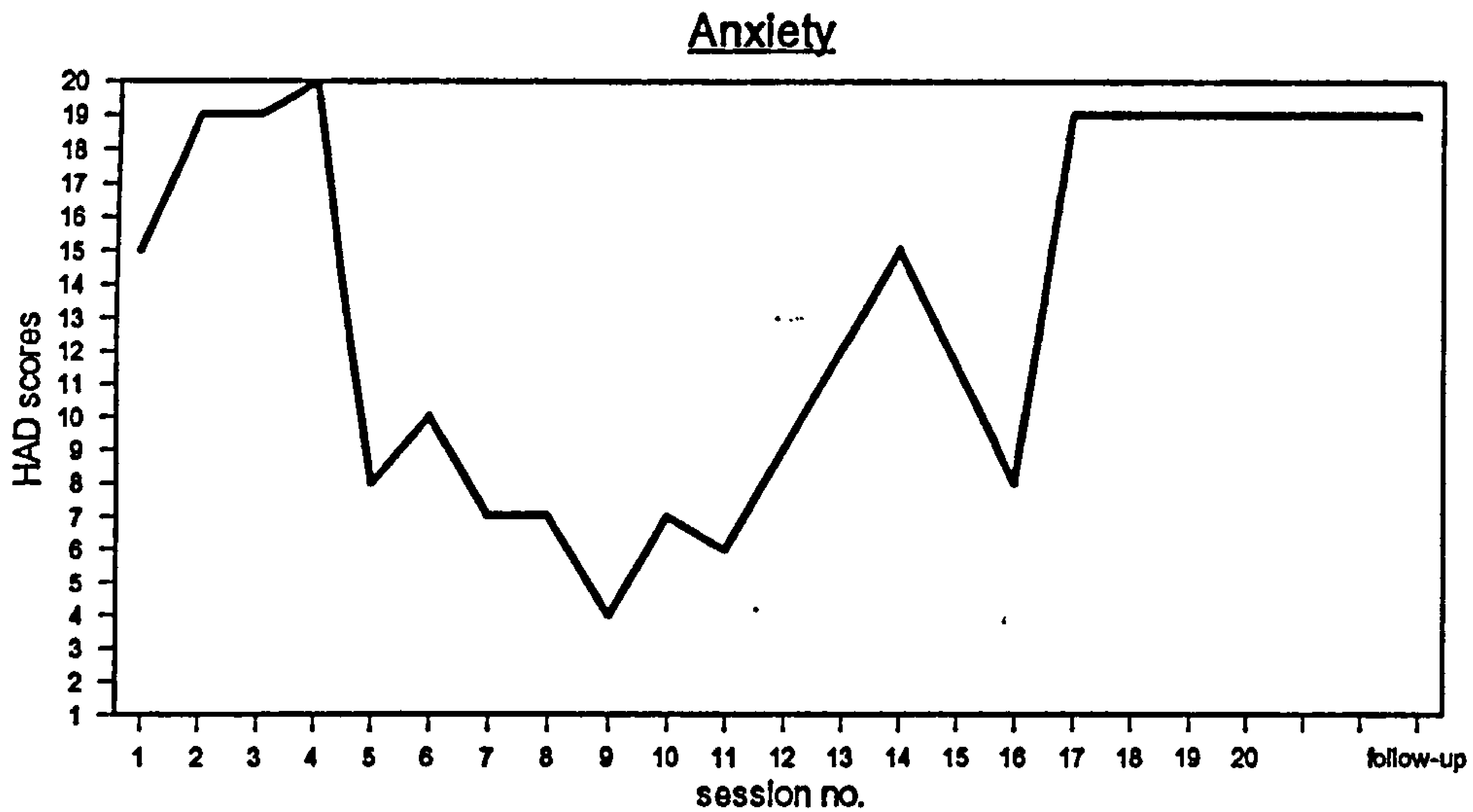
Figure 5: Diary ratings (FL)

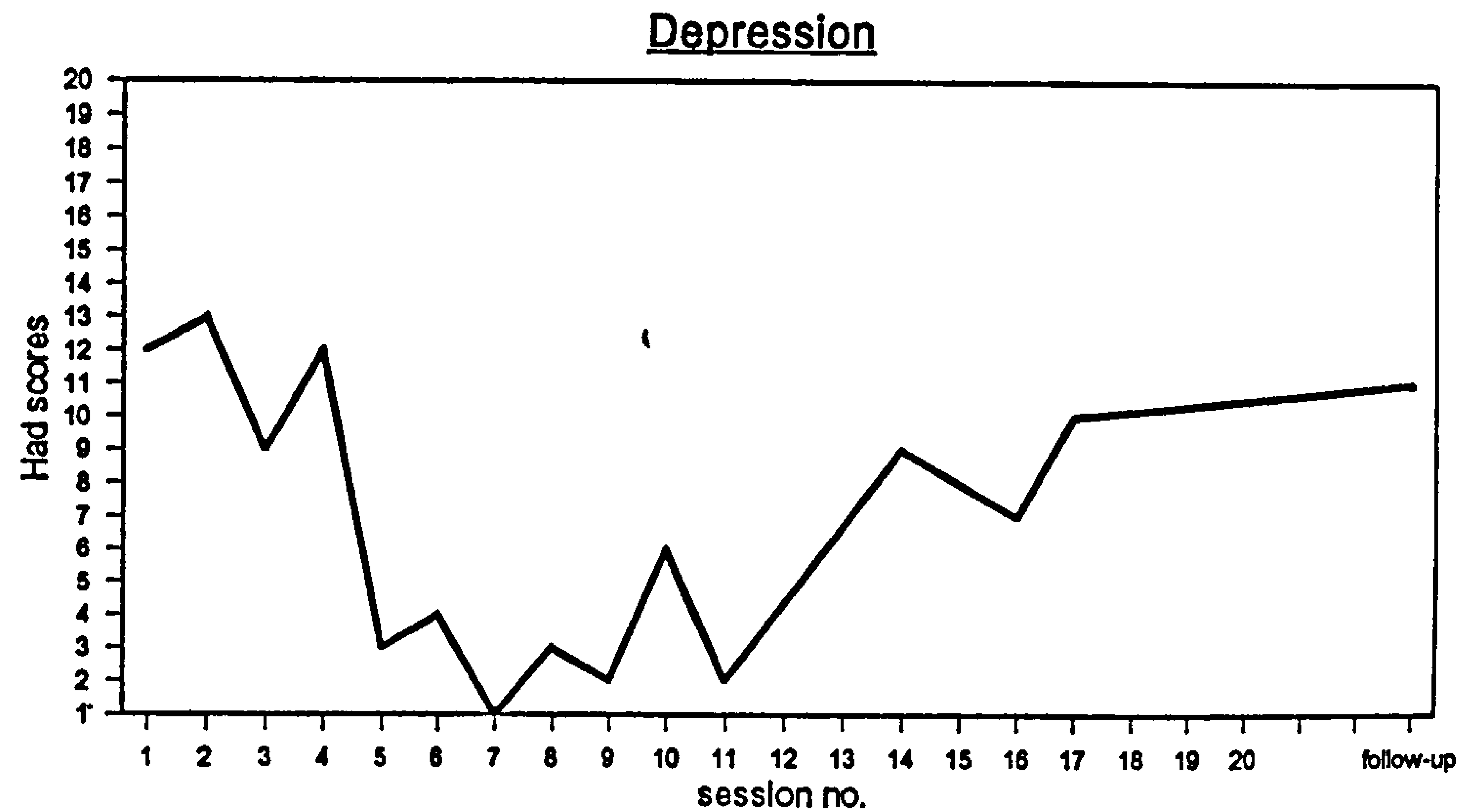
difficult time for him and was able to link the increase in his voices and depression to the time of year and the death of his mother. During this time he discontinued all his new activities and distraction techniques. Although he did not feel optimistic about returning to therapy, he was willing to return to all the activities he had found useful before Christmas. After three sessions, he gradually built up his repertoire of distraction techniques and increased those activities which were most effective at reducing the severity of his voices. This resulted in FL's voices becoming less severe again. He rated swimming and his Walkman as being moderately distracting (i.e. 5 out of 10, where 0 was no distraction at all, and 10 was complete distraction). He continued to use these techniques although he became depressed again quite soon. He took an overdose and was admitted to hospital. Examination of the circumstances surrounding this revealed that it was partly in response to his brother getting a girlfriend who he was spending most of his time with. In the final two sessions, following his discharge from hospital, the time was spent on reviewing the progress he had made and planning how these could be implemented into his life. He re-started his exercise regimes, started practising relaxation and reduced his caffeine intake again. The following summarise the benefits which FL and the therapist believed resulted from the treatment: Silent reading and reading out loud blocked out the voices and helped to pass the time. Listening to music either through the personal stereo or on music videos blocked out the voices particularly at night, passed time and helped to relax him. Swimming mainly helped by passing time but also helped to relax him and block out his voices. Holidays and thinking about possible holidays helped him to think more positively about the future, passed time and helped to relax him. On the basis of these observations the following plans were agreed with him:

1. To swim 3-4 times per week.
2. To read at specific times out loud when voices were most distressing.
3. To use his personal stereo and listen to music videos when voices were distressing.
4. To continue with relaxation and breathing techniques in order to control anxiety.
5. To continue drinking decaffeinated coffee and tea.
6. To take part in trips and holidays organised by the Day Hospital.
7. To practise going on buses with a view to trips to the countryside.

FL undoubtably benefited from the distraction approach when he was able to utilise the techniques. There was a reduction in all aspects of his voices, anxiety and depression (see Figures 4, 5 and 6) during the phase when he was using a range of distraction and anxiety management techniques. Although the benefits could be attributed solely to anxiety management FL's feedback indicated that the combination of approaches produced most effects. Despite this there were periods when the frequency of his voices and the associated distress became so severe that he required a short spell in hospital. It appeared that these incidents were related to stressful life events, and following a degree of resolution of these he was able to resume his coping strategies and achieve a reduction in the severity of his voices. As can be seen from Figure 4, PQRST scores in the final sessions of therapy began to decline again and the frequency of his voices and distress continued to decrease at follow-up. The diary ratings showed a similar picture, although there was no follow-up data as FL did not wish to complete the diaries (Figure 5). FL scored high on both anxiety and depression on the HAD initially and this decreased during the early part of treatment. An increase was seen during his hospitalisation for both measures and only depression began to reduce towards the end of treatment. Depression showed a slight increase at follow-up but this did not reach pre-treatment levels (Figure 6). No changes were observed in measures of self-esteem. FL scored zero at

Figure 6: Anxiety and depression (FL)





the beginning of treatment and zero at the end of treatment (the lowest score possible).

This case study indicates that distraction approaches may be useful in the management of auditory hallucinations, although the benefits only appeared to be helpful when the individual was able to use them. When going through a period of increased stress due to life events FL was not able to put his techniques into practice. Follow-up indicated that FL was continuing to use some of the techniques which he had found useful in therapy and he was continuing to achieve benefits from this. He reported that the cue of receiving an appointment for follow-up encouraged him to re-start some approaches. His Community Psychiatric Nurse (who was informed of FL's end of treatment plan) was encouraging him to continue to use the techniques. In view of this it is possible that distraction approaches may have a useful place in treatment if the they are supported with continued reinforcement and encouragement from staff.

Case study 2: BT (focusing)

This case study has already been reported in an earlier publication (Haddock et al, 1993). BT was a 45 year old man who lived alone. His first experience with psychiatric services was in 1972 when he was admitted to a psychiatric ward and given a diagnosis of schizophrenia. He had had ten admissions to hospital before being referred for psychological treatment of his auditory hallucinations.

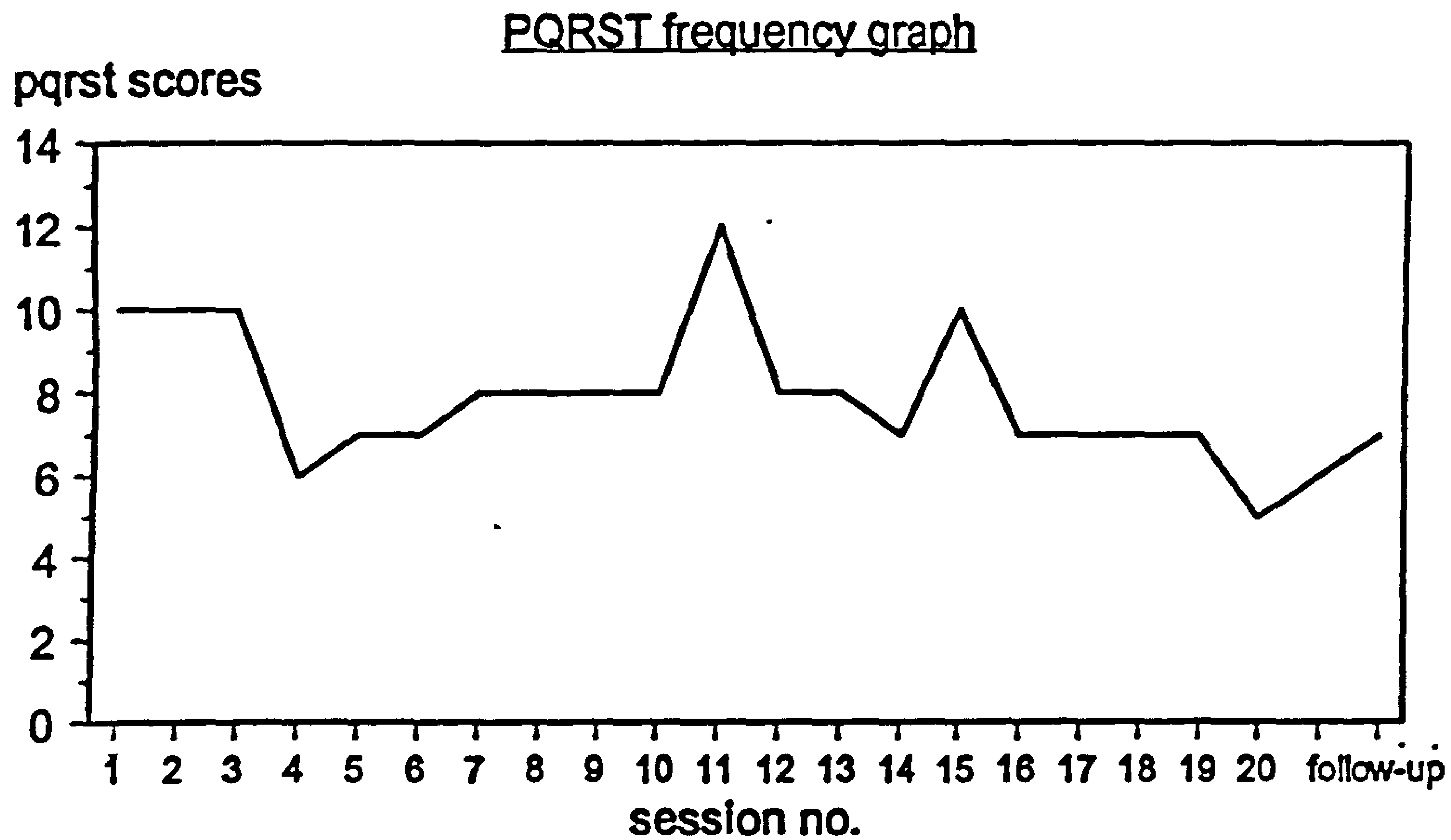
BT had worked in a bakery and as a labourer but had not been employed since the early 1970's. Although he lived alone he had some contact with his family (a sister and a brother) who lived locally. He had never been married. BT was receiving neuroleptic medication (Clopixol, 600mg, weekly and Procyclidine, 5mg, three times per day); by arrangement with his Consultant Psychiatrist this was maintained at a stable level throughout treatment and follow-up.

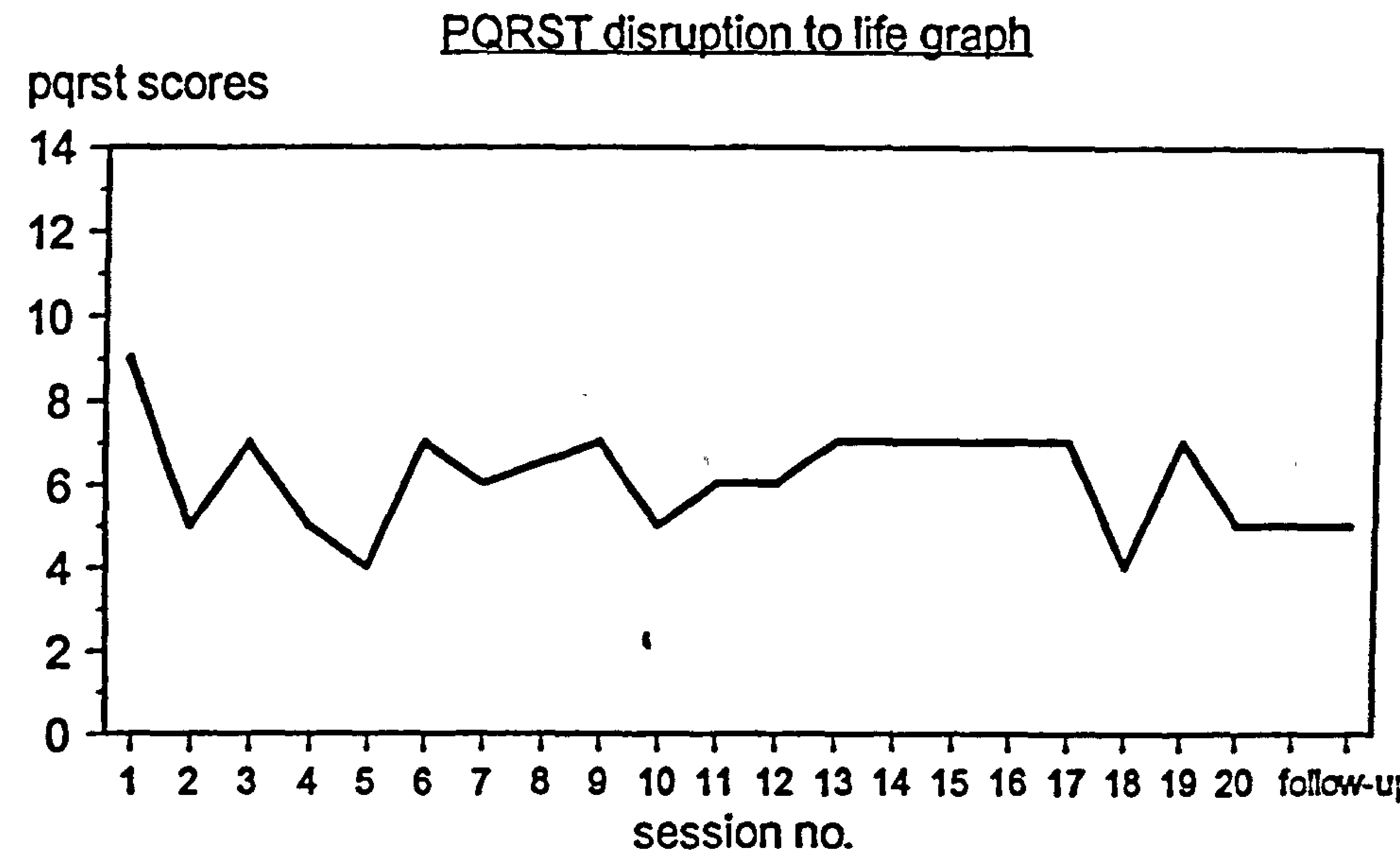
Prior to treatment, BT was assessed using the Present State Examination (Wing et al, 1974), the HIS and the Rosenberg Self-Esteem Questionnaire (Rosenberg, 1965). These assessments revealed that he was experiencing hallucinations only in the auditory modality. He experienced both male and female, second and third person voices which occurred continuously and which appeared to emanate from various external sources including; passers-by, television, radio, running water, cars and other machinery. The voices were worst when he was with other people, when it was noisy and when he was feeling depressed. The content of the voices was both positive (e.g. "You're okay, you'll be all right") and negative (e.g. "You're a bastard, we want you dead"). BT was unsure about the cause of his voices. He sometimes believed that they were caused by other people who were conspiring against him but at other times he believed that they were the result of bad experiences from his past. He was particularly concerned about an incident during early adulthood when he had sexual intercourse with a fourteen year old girl. He felt extremely guilty about this incident and often believed that the voices were caused by other people who wished to punish him for it.

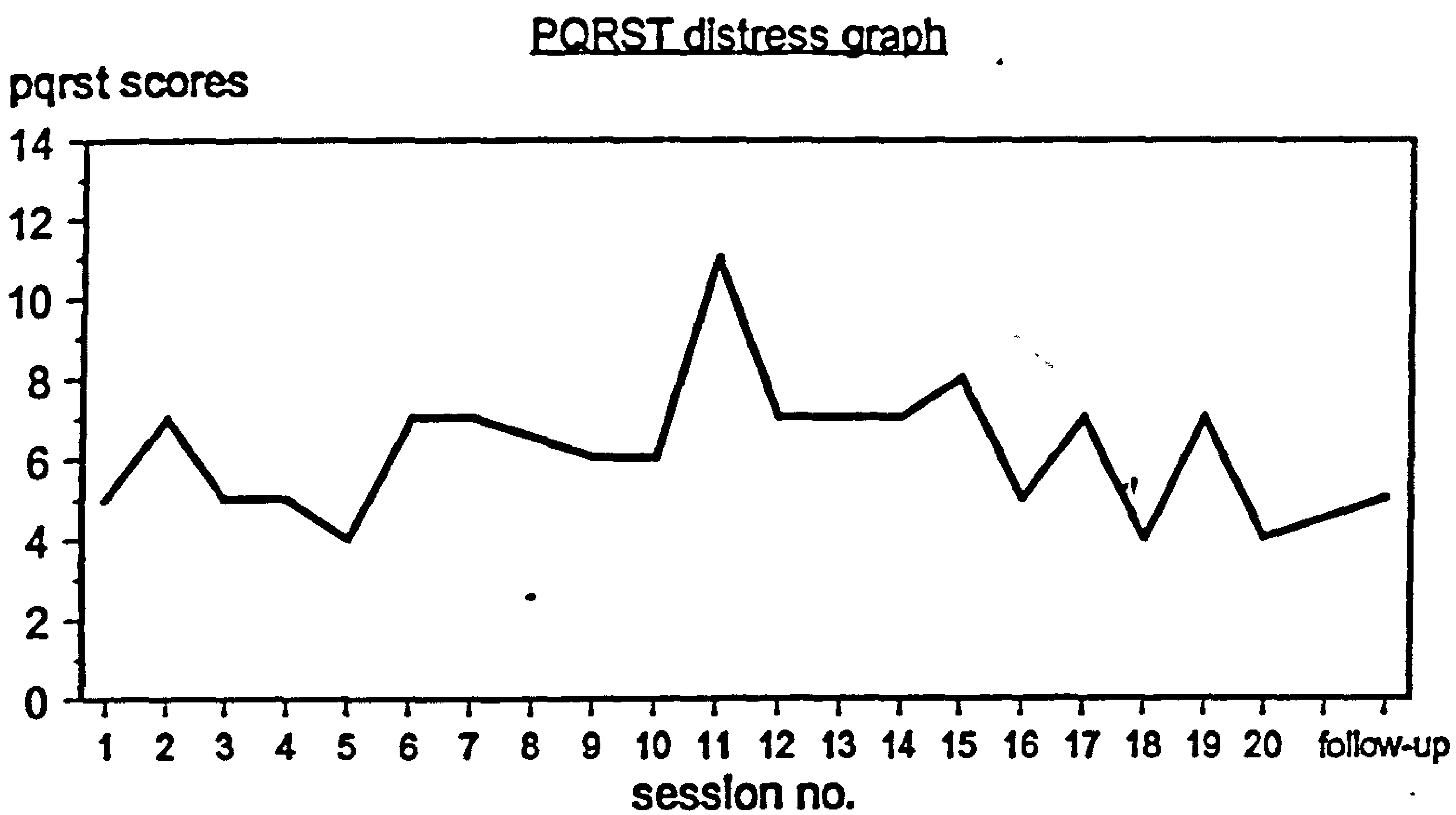
BT was treated over twenty sessions by the present author using a focusing approach as described above. He was asked to complete a weekly PQRST (Mulhall, 1978) and HAD (Zigmond and Snaith, 1983) at the start of every session. This usually took him approximately ten minutes. He was also asked to complete a daily hallucination diary (see Appendix 3) before going to bed each night.

By recording the voices between sessions and focusing in detail on them during sessions the therapist was able to clarify BT's experiences. It became apparent that the voices varied and tended to divide into three distinct types: external voices which originated from no particular direction, external voices which originated from people or machinery, and finally, voices which originated from inside his head which he re-attributed as being negative thoughts. Clarifying these distinctions allowed BT to record the characteristics of each of these separately and allowed him, in conjunction with the therapist, to explore their meaning and function. The external voices which did not appear to originate from a particular source were usually quiet and seemed to come from far away. As can be seen from Figure 7 and 8 the frequency and duration of these voices according to weekly averages of daily diary ratings and PQRST scores decreased during treatment. In addition, the content of these voices was initially mostly hostile and this changed to only pleasant or neutral content in the latter part of treatment as rated by the diary scores. The second type of voices were those which originated from people or machinery. When asked to focus on these experiences during sessions it became clear that BT was actually hearing something real when these occurred. This was often mumbled voices from adjacent rooms or noise coming from machinery, such as a lawn mower which sometimes went past the room where therapy was taking place. BT was often unclear about the content of these experiences. For example, he would report that "I thought I heard them say fuck off". It became apparent that most of his reports of voices originating from people or machinery were preceded by "I think they said....". It was hypothesised that these phenomena reflected BT's misinterpretation of actual auditory events. In order to test out this hypothesis, BT was

Figure 7: PQRST graphs (BT)







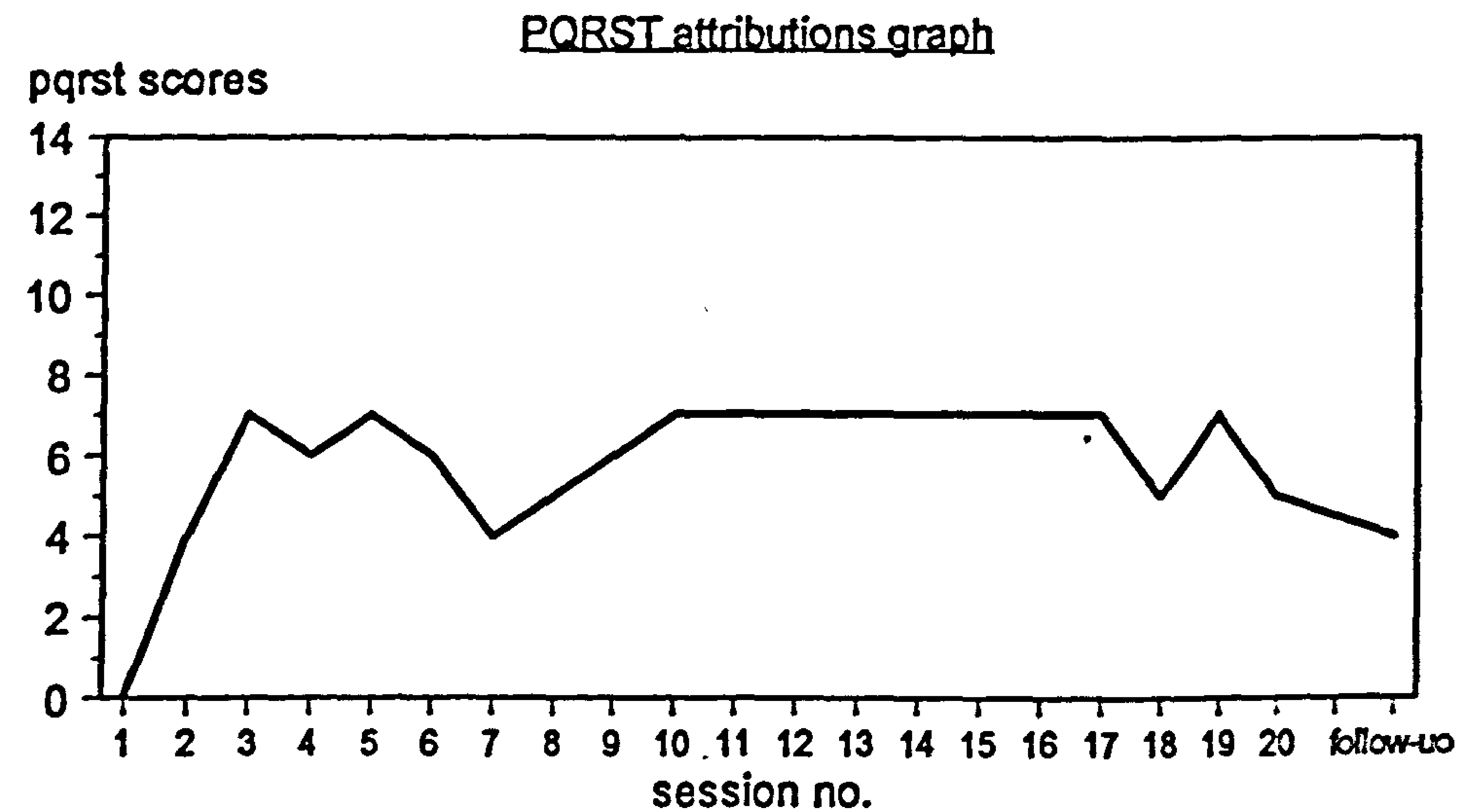


Figure 8: Average weekly diary rating (BT)

presented with this account of the experiences and asked to record them while concurrently generating alternative explanations or interpretations, such as "There are people talking in the room next door, but they are not necessarily talking about me, and I can't hear exactly what they are saying". BT was able to do this and found that it gave him some control over these experiences, resulting in their gradual reduction, although not total elimination.

Finally, focusing allowed BT to explore experiences which he described as originating from inside his head which were intrusive sexual thoughts about religious figures. As he was an extremely religious man (he was brought up and continued to practice as a Roman Catholic), BT found these experiences very distressing. He found it difficult to record the content of these as he felt ashamed of them but was able to discuss them and their relationship to his religious beliefs. In addition, his partial delusion that other people could hear his thoughts whilst he was in church made them even more distressing. BT found that using techniques which attempted to modify these thoughts were useful in reducing their occurrence and reduced his belief that other people could hear them and the distress that this caused. Time was also spent exploring BT's guilt regarding his earlier sexual experience and its relationship to his current worries and concerns. At the end of treatment BT completed a Rosenberg Self-esteem questionnaire and was contacted for follow-up six months after treatment ended. At follow-up BT completed a PQRST, HAD, Rosenberg self-esteem questionnaire and diary sheets for one week.

As can be seen from Figure 7 showing PQRST ratings of frequency, distress and disruption to life caused by the voices, there was a decrease in these measures during treatment. At follow-up the decreases in frequency and disruption to life caused by the voices were maintained. There was a slight increase in distress as rated by the PQRST at follow-up but this did not reach pre-treatment levels. In addition, there was an increase in the amount to which BT believed his voices to be his own thoughts which had decreased at follow-up, but not to pre-treatment levels. The diary ratings in Figure 8 show a similar picture, with reductions seen in duration of voices, loudness of voices, hostility of voices and distressfulness of the voices. Unlike the PQRST ratings, there was an increase in all these ratings at follow-up, although ratings of distressfulness of voices and their hostility did not reach pre-treatment levels. Although it is difficult to speculate why there were increases at follow-up for the diary ratings only, it is possible that these reflected slightly different aspects of the voices than those rated by the PQRST. The distress and disruption to life ratings on the PQRST reflected the effect that the voices had on BT, whereas the diary ratings reflected the quality of the voices i.e. the distressfulness of the voices and their hostility. It is possible that negative qualities of the voices increased at follow-up but this did not have an equivalent effect on BT's response to them. Inspection of the data on anxiety and depression shown in Figure 9 shows some support for this. Anxiety and depression both decreased during treatment and although there was a slight increase in depression at follow-up (which did not exceed pre-treatment levels) the reduction in anxiety was maintained. Self-esteem scores are also shown in Figure 9. These ratings were taken before the start of treatment, at the end of treatment and at follow-up. During treatment there was an increase in self-esteem. Unfortunately, at follow-up there was a decrease in self-esteem to the pre-treatment level. This may be related to the slight increase in depression which was also seen.

This case study highlighted the variability in the auditory hallucinations experienced by patients. By focusing on the voices, it is possible to identify the correct nature of the experience and to allow appropriate re-attribution of the experiences to self, if this is appropriate. In the case of BT, he was able to correctly identify the source of his intrusive sexual thoughts and the 'voices' which he

Figure 9: Anxiety, depression and self-esteem ratings (BT)

believed to be originating from external sources. This resulted in a decrease in the severity of the voices and a reduction in his anxiety and depression. Although all these benefits were not maintained at follow-up, it is clear that for a patient who had previously gained no significant effects from traditional approaches to the management of his hallucinations, that important changes were achieved. It is likely that BT would have benefited from continued support and reinforcement of the progress made during therapy in order to maintain the gains he achieved. BT had little contact with other services, apart from a rare appointment with his Consultant Psychiatrist, therefore he had no-one who could help him to continue with the techniques. A longer follow-up would indicate how much the benefits have been maintained.

Results

Sixty three referrals were made to the Department of Clinical Psychology, University of Liverpool between October 1990 and October 1992. Referrals were mainly from Consultant Psychiatrists although there was one self referral and a small number from Community Psychiatric Nurses. If a patient was not referred by a Consultant Psychiatrist then the responsible medical officer was contacted for his/her agreement with the referral. Of these, 56 people were assessed using the test battery outlined in the method section and seven people were excluded for the following reasons: one person was no longer hallucinating at time of appointment, three patients' voices were pleasant, two people refused to take part in assessment and one person died between time of referral and assessment.

Thirty-four patients were allocated to a treatment or control group following assessment. Twenty-two patients were not assigned to a group for the following reasons: voices were pleasant or not thought to be a problem, frequency of voices did not reach criteria for study, patient was unwilling to take part, patient was not able to complete assessment.

Of the 26 patients who were assigned to a treatment group, six discontinued during treatment (three distracters and three focusers). The following reasons for discontinuation were observed: ill health (one focuser), worsening of symptoms (one distracter, one focuser), perceived the approach was not helping (one focuser), unable to complete forms and successfully take part in sessions due to other psychotic phenomena (one distracter), unexplained (one distracter). Of the eight control patients, two patients were withdrawn as their Consultant Psychiatrist changed their medication to Clozapine between pre- and post-assessment and one patient did not wish to be contacted for post-assessment.

All patients who were assigned to treatment or control groups had a DSM III-R (APA, 1987) diagnosis of schizophrenia confirmed by referring or responsible psychiatrists and by classification based on their PSE data (Wing et al, 1974). Seven patients were inpatients and the rest were outpatients. Of the focusers, eight were male and three female and of the distracters, six were male, three were female. Control patients were five males.

The average age of the focusing group was 36.36 years (s.d. = 8.79 years) with an average length of voice history of 15.18 years (s.d. = 8.95 years). The average age of the distraction group was 45.56 years (s.d. = 11.79 years) with an average length of voice history of 14.78 years (s.d. = 10.88 years). The average age of the control group was 38.7 years (s.d. = 9.50 years) with an average length of voice history of 13.63 years (s.d.= 13.29 years). Two one way analyses of variance were carried out (age by group and length of hearing voices by group) which revealed no significant differences between the groups ($F [2, 25] = 2.11$, $p = 0.14$; $F [2, 25] = 0.05$, $p = 0.95$). A one way analysis of variance was also carried out on National Adult Reading Test error scores (Nelson, 1982). This revealed no significant differences between the groups ($F [2,19] = 2.515$, $p = 0.107$).

Treatment intervention

Graphs showing weekly PQRST scores for amount which voices occurred, disruption to life, distress and belief in voices being own thoughts and weekly HAD scores for anxiety and depression are shown in Appendix 4 for all patients who completed therapy (except FL and BT). One distraction subject had reading difficulties and was not able to complete a weekly PQRST, HAD or diary sheets. Details of her progress were made by verbal estimate and therefore have not been included in the group means or used in statistical analysis.

Figures 10 to 16 summarise data from the 3 groups. Figures 10 to 13 show the mean PQRST ratings for amount to which the voices occurred, disruption caused by the voices, distress caused by the voices and the amount to which the voices were believed to be thoughts at pre- and post-treatment points and follow-up. No follow-up data were available for the control patients. Note that a downward slant of the graph for the first three measures indicates a decrease in the frequency, distress and disruption of voices and an upward slant of the attributions graph indicates an increase in belief that the voices were thoughts.

Figure 14 shows average weekly diary scores of: duration, loudness, hostility and distressfulness of the voices for the

Figure 10: Frequency ratings pre- and post intervention and follow-up

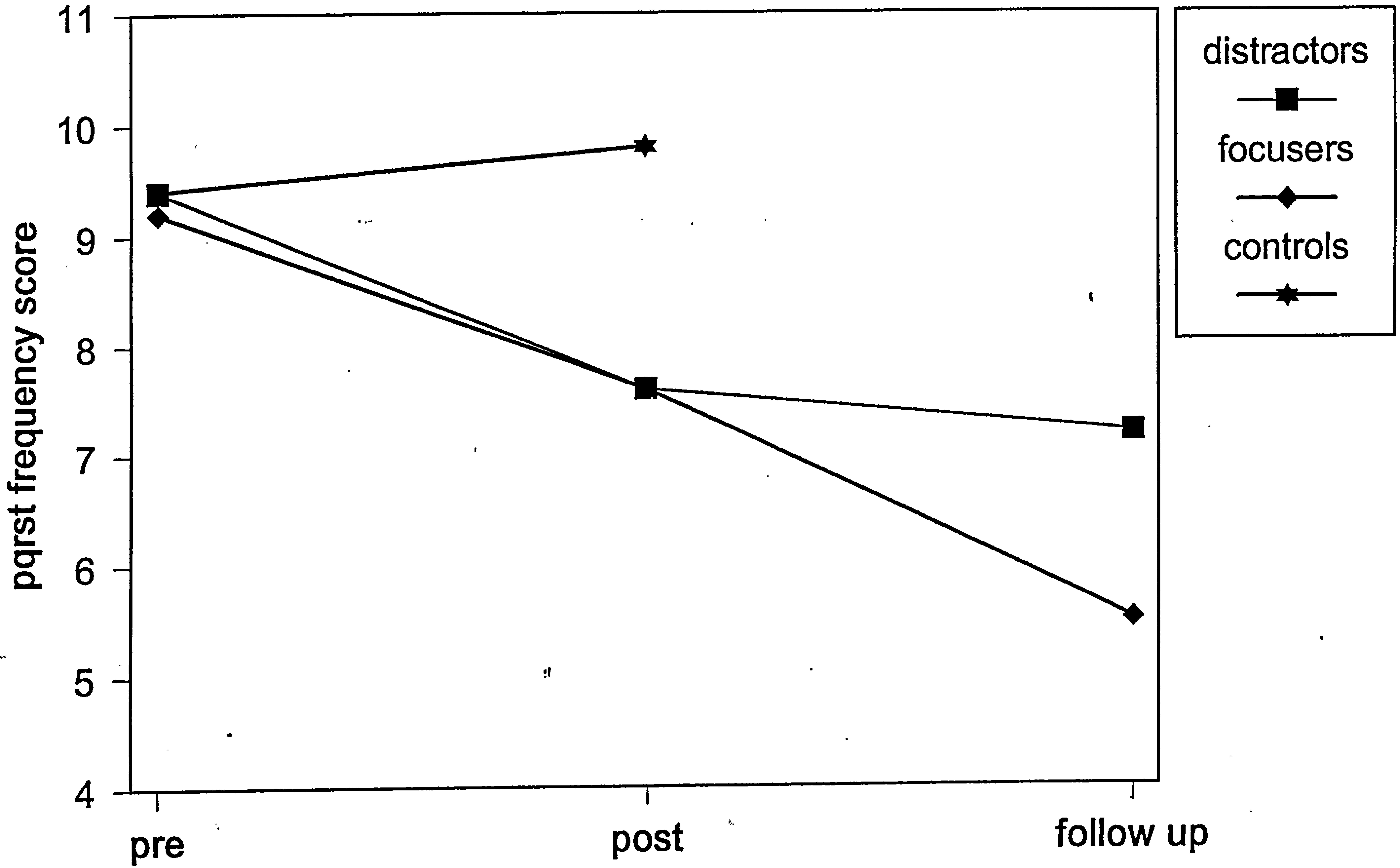


Figure 11: Disruption to life pre- and post-intervention and follow-up

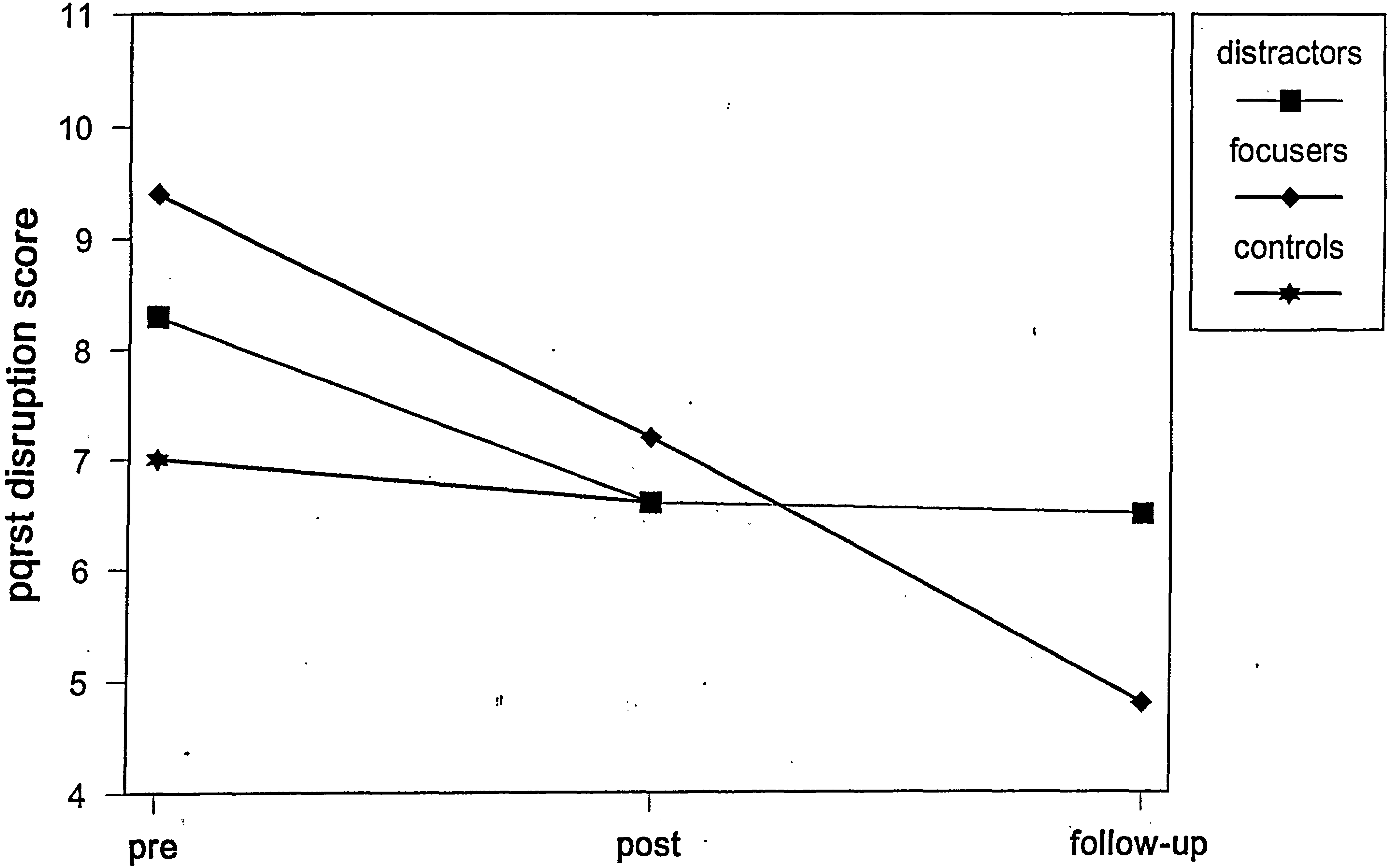


Figure 12: Distress scores pre- and post-intervention and follow-up

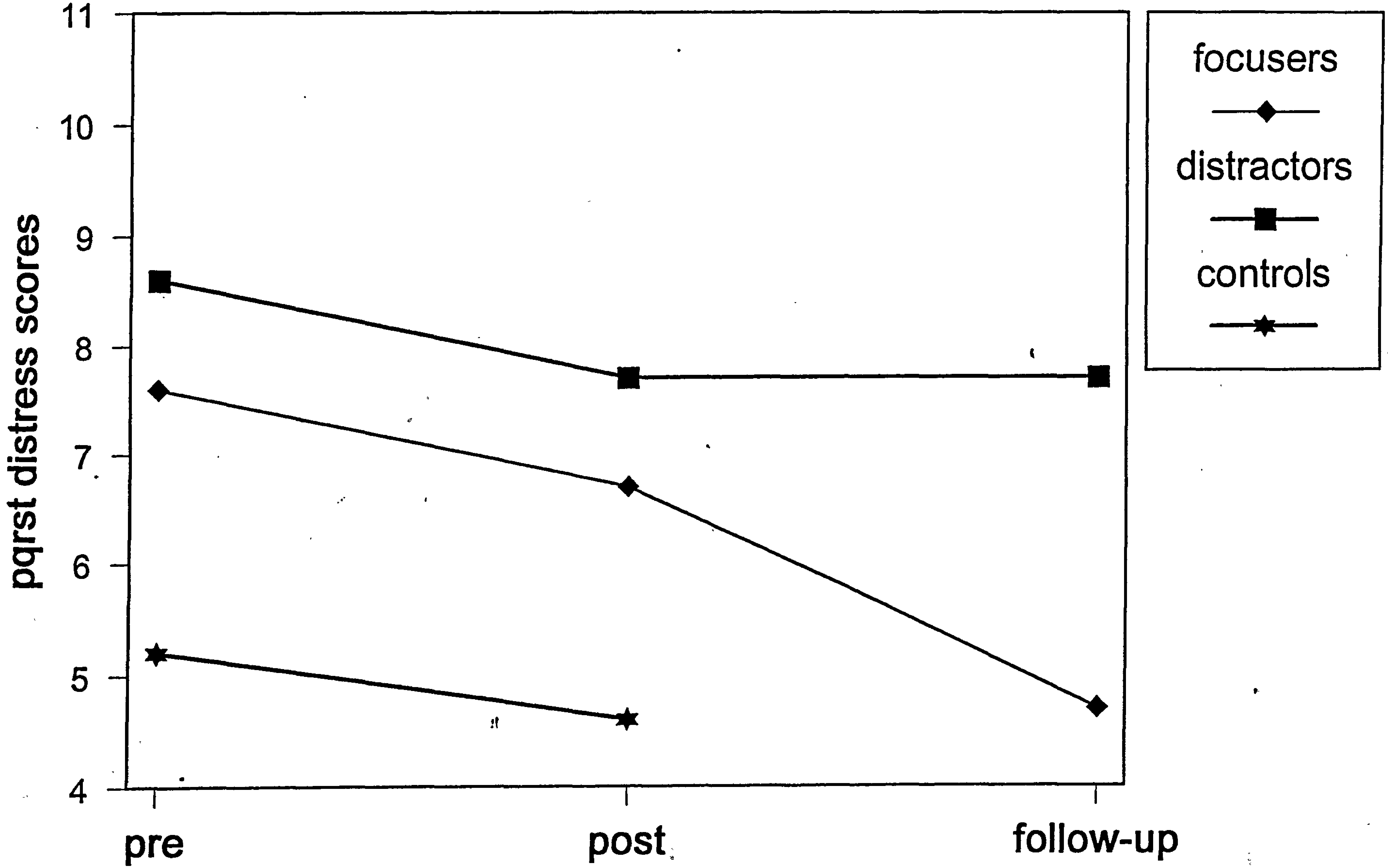


Figure 13: Attribution scores pre- and post-intervention and follow-up

experimental patients at pre- and post-treatment and follow-up, and for pre- and post-treatment for the control group. As outlined in the method section, session 1 in both experimental conditions was used mainly for development of rapport and engagement rather than direct intervention therefore diary ratings for weeks 1 and 2 for all patients were averaged to provide a baseline or pre-intervention score. Similarly the final two sessions were used for consolidation and planning for the future and therefore the end of treatment means for the experimental groups were an average of the final two sessions. The graphs also include follow-up (between 6 and 9 months after the end of the intervention) averages. These ratings were not averaged over two weeks but represent ratings by the patients for one week. The graphs illustrating the means for the control patients represent only one week of ratings for the first assessment and follow-up scores which were carried out between 4 and 6 months following the first assessment.

PQRST Ratings

1. Focusing treatment (n=11):

As can be seen from Figures 10 to 13 showing PQRST ratings, patients taking part in the focusing condition showed a reduction in frequency of voices, disruption to life and distress caused by the voices at post-assessment and at follow-up. There was a slight increase in the patients' tendency to believe the voices were their own thoughts. Some of the patients were not able to be included in the follow-up data as three patients refused to return for assessment and two patients refused to complete these questionnaires. Inspection of the group means at follow-up reveals a continued decrease in amount of time spent hallucinating. Although the number assessed at follow-up makes use of formal statistics difficult, inspection of follow-up means shows that for those patients who were contacted at follow-up the benefits were maintained and had even increased. Interpretation of this is difficult though, as those who refused to be contacted at follow-up may have been experiencing hallucinations which had worsened since discontinuing therapy.

2. Distraction treatment (n=8):

Figures 10 to 13 also show that PQRST ratings decreased with regard to frequency of voices, disruption to life and distress caused by them for the patients who underwent distraction approaches. This was maintained at follow-up for those patients for which it was possible to assess. Two patients were not able to be contacted for follow-up as one had died between the end of treatment and post-treatment (of natural causes), and one patient refused to complete the questionnaires.

No changes were observed with regard to the amount the patients believed the voices to be their own thoughts.

3. Control group (n=5)

As can be seen from inspection of Figures 10 to 13, means for pre- and post intervention for the control patients did not differ on frequency, disruption and distress. There was an increase in the amount to which the patients believed their voices to be their own thoughts which is difficult to account for. As the number of patients who were able to be assessed at post-treatment in this group equalled five, it was not possible to carry out formal statistics on these data. One patient refused post-treatment assessment and two patients had to be withdrawn from the control group as they were prescribed Clozapine one month after the first assessment.

Analyses of variance were carried out on the PQRST mean scores for the experimental groups on the pre- and post-assessment data. Analyses were not carried out on follow-up data as the small numbers were not sufficient for formal statistics. With regard to frequency of voices, there was not a significant main effect for group (focusers or distracters), but there was a significant main effect for time of assessment (i.e. pre versus post treatment; $F[1,17] = 10.73$; $p = 0.004$). There was not a significant group by time interaction, indicating that both groups showed a similar response to treatment.

A similar pattern was seen for disruption to life caused by the voices. There was a significant main effect for time of assessment ($F[1,17] = 7.62$, $p = 0.013$) but not for group or the interaction between group and time. No significant main effects or interactions were observed for distress or attributions.

Diary ratings

Focusing and distraction treatment

Data from only eight focusing patients and only four distraction patients was available on pre- and post-treatment measures as several patients failed to return their diaries at the end of treatment. At follow-up, data on diary ratings were available for six focusers and three distracters. Figure 14 shows the group means for diary ratings. Formal statistics were not carried out on these data due to the small number of patients involved. Inspection of the group means show that for the distracters a slight increase in duration of voices, loudness of voices, and hostility occurred between pre- and post-treatment, while there was a slight decrease in the distressfulness of the voices. There was a reduction in the former three measures at follow-up. Again caution must be used when interpreting the follow-up data due to the small number who were able to be contacted and who completed

Figure 14: Average diary ratings pre-,post- and follow-up

diaries. A slightly different pattern was seen for the focusers, with a slight reduction in all four measures between pre- and post-assessment, which continued to reduce at follow-up for all but loudness, which increased slightly. The same caution should also be applied to these data.

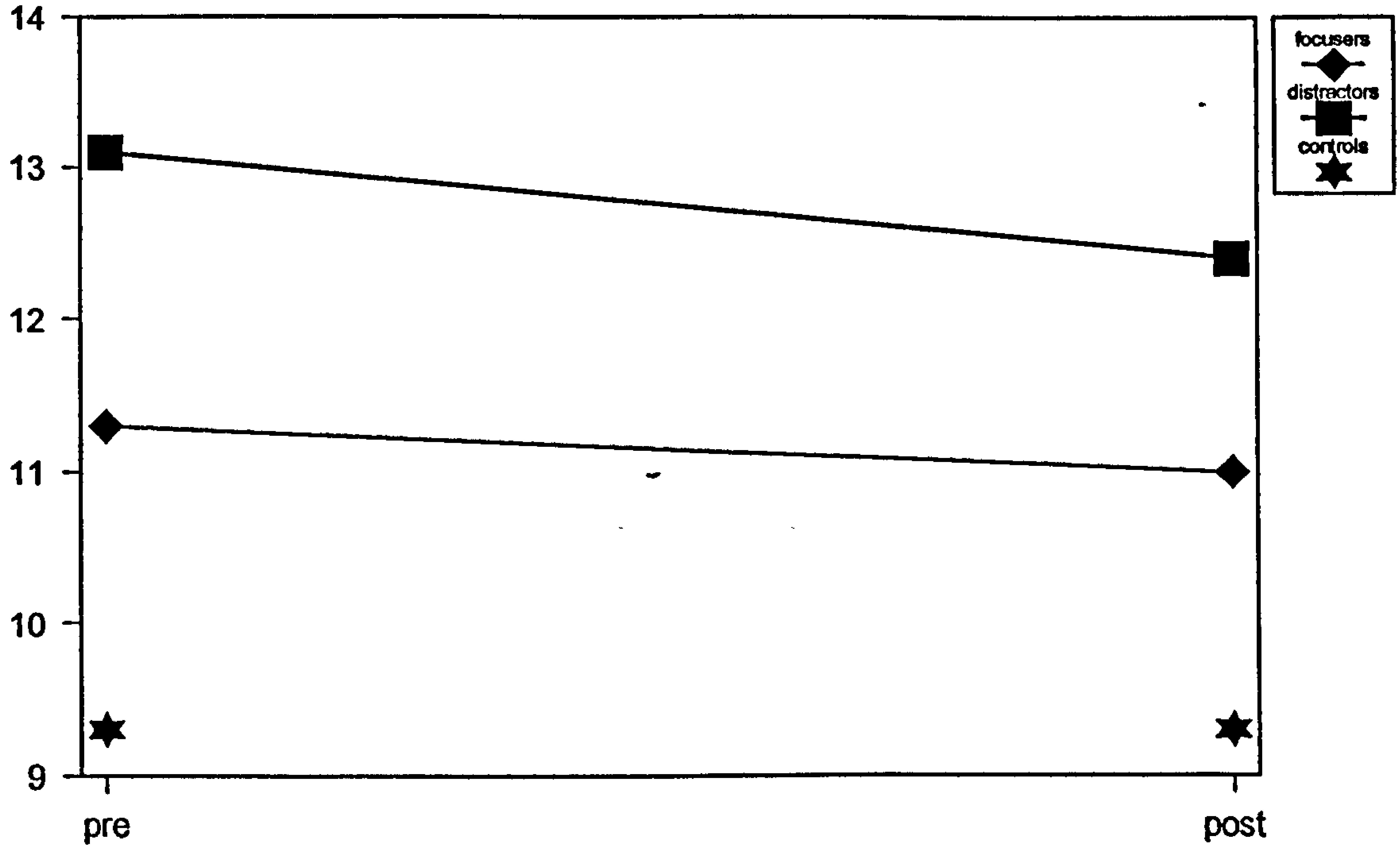
Anxiety and Depression

As outlined above anxiety and depression were monitored weekly for the experimental patients. Figure 15 shows mean HAD scores for the experimental groups at pre- and post-treatment and at pre-treatment for four control patients. As can be seen from Figure 15, anxiety and depression decreased slightly between pre- and post-treatment. The changes in anxiety and depression were not significant and there were no significant differences in pre-treatment levels of anxiety and depression between the two experimental groups.

Self-esteem

As can be seen from Figure 16, scores on self-esteem varied according to the experimental group, with distracters having a lower mean self-esteem score post-treatment and focusers having a higher self-esteem score. An analysis of variance (group by condition) for pre- and post-treatment scores showed a significant interaction between pre- and post-treatment scores and group ($F_{[1,11]} = 4.85$, $p = 0.05$) but no

Figure 15: Anxiety pre- post and follow-up



Depression pre- post- and follow-up

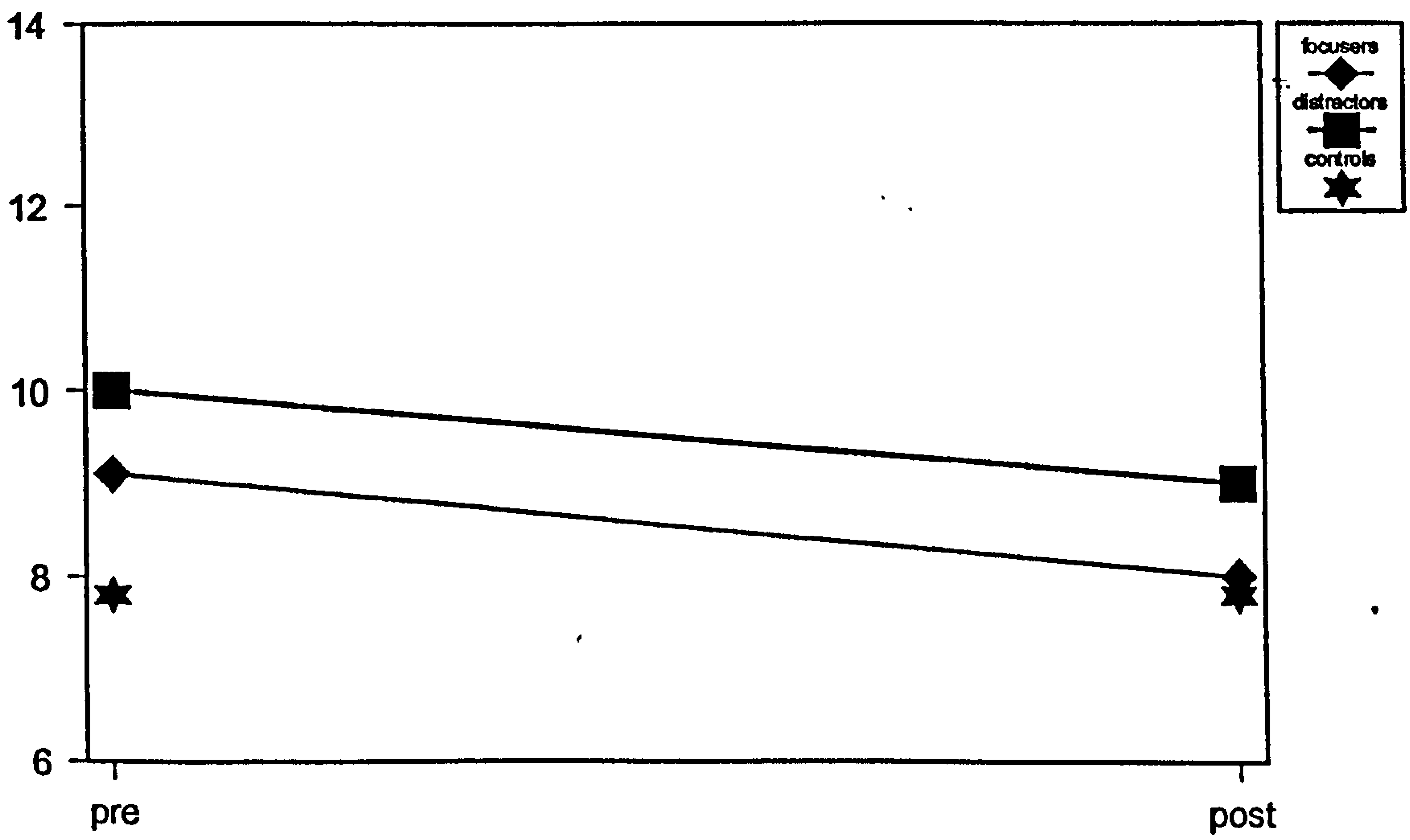
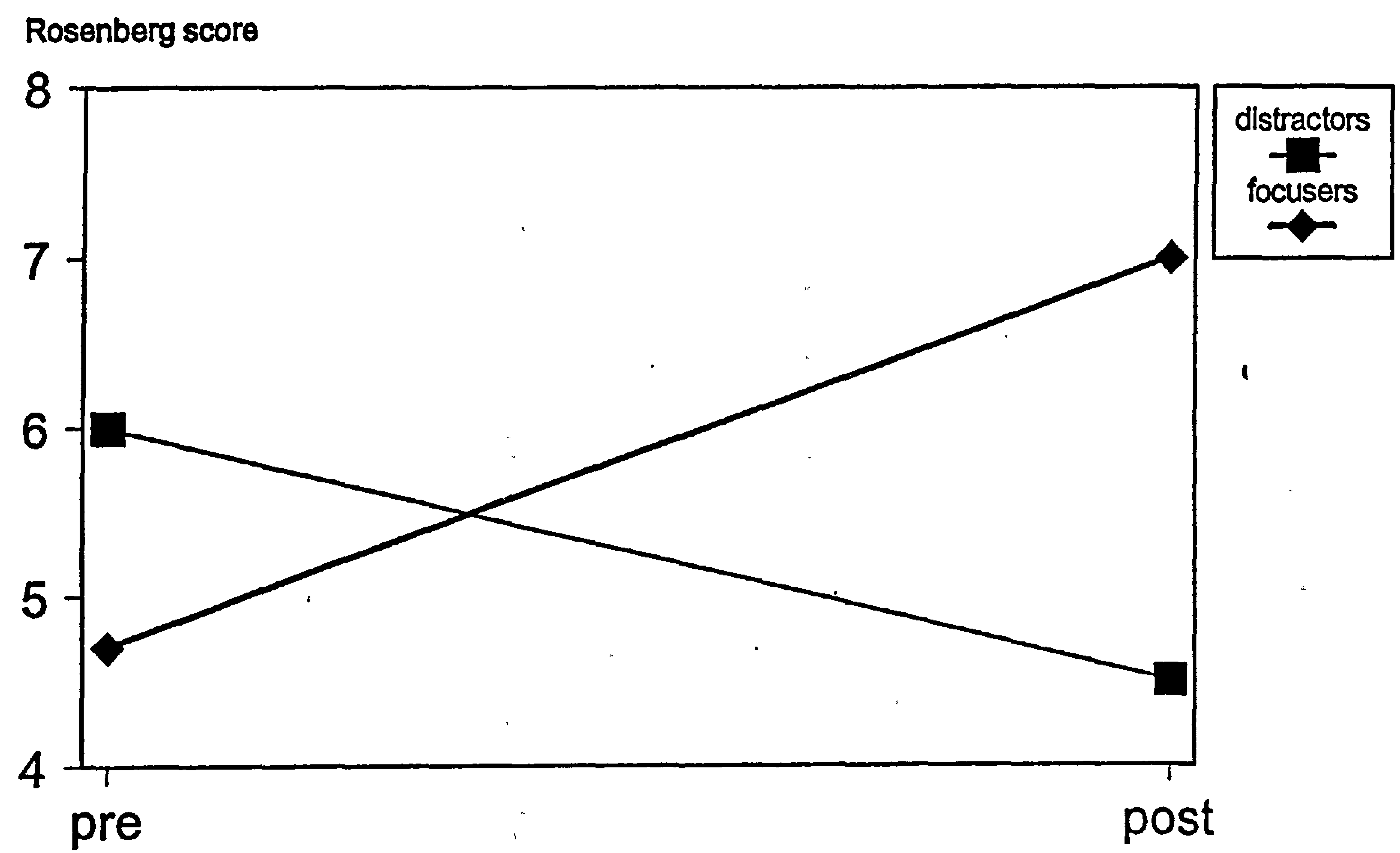


Figure 16 showing self-esteem scores pre- and post-intervention



significant group or pre/post difference overall. Insufficient data on self-esteem for control groups was collected at post-assessment to be included in the above analysis but the pre-intervention mean for the control group (5.25) was comparable to the pre-treatment means for the experimental groups.

Individual case data

In order that individual responses to treatment can be illustrated the following tables show individual changes in PQRST scores between pre- and post-treatment for the three groups. A "+"indicates a reduction in frequency, disruption and distress, an "=" indicates no change and a "-" indicates an increase in severity on these measures. For attributions a "+" indicates an increase in the amount to which the patient believed the voices to be their own thoughts and a "-" indicates a reduction in this belief. Where available, follow-up changes are also illustrated in brackets (changes between pre-treatment scores and follow-up scores).

Table 28: Patients who completed focusing treatment

patient	frequency		disruption		distress		attributions	
1. PS	=		+		+		-	
2. JT	+		+		+		+	
3. JH	+	(+)	+	(+)	=	(+)	+	(+)
4. TM	+	(+)	+	(+)	-	(-)	-	(-)
5. BT	+	(+)	+	(+)	=	(+)	-	(-)
6. SB	-	(=)	-	(-)	+	(+)	+	(+)
7. RH	+	(=)	+	(+)	+	(+)	+	(+)
8. HB	+	(-)	+	(+)	+	(+)	=	(=)
9. DD	+		-		-		-	
10. LP	+		=		=		-	
11. DL	=		+		+		=	

As can be seen from Table 28, eight focusers showed reductions in the frequency of their hallucinations, two showed no change and only one subject experienced an increase in their hallucinations. The two patients who showed no change in frequency showed a reduction in the amount of distress and disruption to life as a result of their voices. The increase in frequency following treatment for SB was only one point on the PQRST scale and despite this increase he showed a reduction in the distress associated with his hallucinations. Eight focusers experienced a reduction in the amount of disruption caused by the voices, one patient experienced no change and two patients experienced an increase (SB and DD, 4 points and 1 point respectively). Six patients experienced a reduction in distress following treatment, three experienced no change and two subjects experienced an increase in the distress caused by the voices (DD and TM, 2 points and 1 point respectively). The changes in attributions seen by this group were variable, with four patients experiencing an increase in the amount to which they believed their voices to be their own thoughts, five experiencing a decrease and three experiencing no change. Changes in attributions did not appear to be associated with changes in frequency, disruption or distress.

For those patients where follow-up data were available, only 1 patient showed an increase in frequency of hallucinations (of 1 point) compared to pre-treatment levels. All other improvements were maintained or did not exceed pre-treatment levels. A similar picture is seen for distress and disruption, where all improvements are maintained for those patients who showed improvements. The amount to which the patients believed their voices to be their own thoughts did not appear to change at follow-up as compared to the changes observed at the end of treatment.

Table 29: Patients who completed distraction treatment

patient	frequency		disruption		distress		attributions	
1. VR	+		+		+		-	
2. WR	=	(=)	=	(=)	=	(=)	=	(=)
3. SS	=		=		=		=	
4. PG	+	(+)	+	(+)	+	(+)	-	(=)
5. JM	+	(-)	+	(-)	+	(-)	-	(-)
6. HW	-	(+)	+	(+)	-	(-)	+	(+)
7. AH	+	(+)	-	(+)	-	(+)	+	(-)
8. FL	+	(+)	+	(+)	+	(+)	+	(-)

As can be seen from Table 29, five distracters experienced a reduction in frequency of their voices, two experienced no change and one patient (HW) showed an increase in voice frequency (of three points). Despite this HW experienced a reduction in the amount of disruption caused by her voices although she experienced an increase in distress. Five patients experienced a reduction in the amount of disruption caused by the voices, two experienced no change and one (AH), experienced an increase of two points. Four patients experienced a reduction in distress caused by the voices, two experienced no change and two experienced an increase in distress (HW and AH; of 5 and 3 points respectively). With regard to attributions, three patients showed an increase in the amount to which they believed the voices to be their own thoughts, two experienced no change and three experienced a decrease in this belief. Again, changes in attributions did not appear to be related to frequency, disruption or distress.

For those patients where follow-up data were available, only 1 patient showed an increase in frequency of hallucinations (of 3 points) compared to pre-treatment levels. All other patient improvements were maintained or did not exceed pre-treatment levels. For one patient (HW), even though there was an increase in frequency of her hallucinations following treatment, at follow-up she experienced a decrease in the frequency of her hallucinations compared to pre-treatment levels. A similar picture is seen for distress and disruption, where all improvements are maintained for those patients who showed initial improvements.

With regard to disruption caused by the voices, all those patients who experienced a reduction in this measure continued to experience a reduction at follow-up, except for one patient (JM) who showed an increase. This may have been related to the increase in frequency and distress which he also experienced. One patient (AH) experienced a reduction in the disruption caused by her voices at follow-up even though she experienced an increase in this measure at the end of treatment. Distress ratings at follow-up indicated that two patients experienced an increase compared with pre-treatment levels and one patient experienced no change. At follow-up, again AH experienced a reduction in the distress caused by her voices although she experienced an increase at the end of treatment. Unlike the focusing group, the changes observed with regard to attributions at the end of treatment did not appear to be maintained for all of the patients at follow-up. Two patients experienced a decrease in the amount they believed the voices to be their own thoughts, even though they had experienced an increase on this measure at the end of treatment. One patient experienced a decrease in the amount he experienced his voices to be his own thoughts following treatment but this returned to pre-treatment levels at follow-up. Three patients experienced no change in their attributions between post-treatment and follow-up.

Table 30: Control patients

patient	frequency	disruption	distress	attributions
1. JH	+	-	+	+
2. PB	+	-	=	+
3. TD	+	+	+	-
4. TB	-	-	-	+
5. CB	=	+	=	+

As can be seen from Table 30, three control patients experienced a reduction in the frequency of their voices, one patient experienced an increase in frequency and one patient experienced no change. Two patients experienced a reduction in the disruption caused by the voices and three experienced an increase on this measure. Two patients experienced a reduction in the distress caused by the voices, two experienced no change and one experienced an increase in distress. With regard to attributions, four patients experienced an increase in the amount they believed their voices to be their own thoughts and only one experienced a decrease. Again, changes in attributions did not appear to be related to the other three measures.

Discussion

Results from this study indicated that both experimental treatments significantly affected frequency and disruption to life caused by the voices, but not distress caused by them or related anxiety and depression. The benefits appeared to be maintained at follow-up for the patients who were contactable.

As outlined in the descriptions of both experimental approaches, the two treatment approaches fundamentally differed in their theoretical orientation. Focusing involved a requirement to concentrate on the content and meaning of the voices and to accept voices as being part of, or related to the individual's own mind. Distraction required the individual to ignore the voices, and to concentrate on engaging in activities which made it more difficult to attend to the content and meaning of the voices. It could be hypothesised that focusing would increase the amount to which the individual believed the voices to be their own thoughts, although this was not the case as measured by the PQRST for either the focusing group or the distraction group. Interestingly the mean scores on this measure for the control groups indicated that they increased their beliefs regarding an internal origin for their voices, and this was the case for four out of the five control patients. This unexpected finding, which is difficult to explain, must cast some doubt on the validity of the PQRST to measure patient's attributions. Alternatively it could be argued that attributions regarding the origin of voices are extremely variable and fluctuate widely.

Reference to the cognitive models which have attempted to account for the mechanisms involved in hallucinations was made in Chapters three and four. The results of the treatment study provide some support for these models, as they assume that if cognitive factors can be manipulated that this will effect the occurrence of hallucinations. The results from this study suggest that hallucinations are amenable to change when the cognitive factors associated with them are changed.

The focusing approach was hypothesised to address the supposed reality monitoring deficit which has been suggested to underlie the experience of auditory hallucinations, in that it would help the individual to become more aware of the internal origin of voices and their relationship to internally generated cognitions and metacognitions. If this is the mechanism which accounts for hallucinations then the results from this study show some tentative support for it. Despite this, distraction also provided some reduction in severity of voices and it did not attempt to address the reality monitoring deficit. This appeared to be maintained at follow-up for a proportion of patients. Only long-term follow-up will address the issue of whether distraction approaches can produce long-lasting effects on hallucinations, although it is clear that the effects of distraction do generalise outside the treatment setting. One additional factor which was not addressed formally in this study relates to whether the distracters had continued to use the techniques following the end of therapy. It is likely that continued use would have affected the patients' ratings made at follow-up.

A further important consideration for future research relates to whether teaching patients a focusing approach does in fact improve their reality monitoring skills. Although the focusing approach in this study was designed to address the hypothesised reality monitoring deficit, there is no experimental evidence that the treatment does in fact change the hallucinators' reality monitoring skills. This will be an important question to address in future studies.

There was one difference between the groups which may contribute to longer term outcome. One of the most striking results of this study was that the treatments had different effects on self-esteem as measured by the Rosenberg Self-esteem questionnaire (Rosenberg, 1965). Self-esteem increased significantly in the focusing group compared to the distraction group. It is not clear what this difference can be attributed to. One speculative account could relate to the process of therapy. An important part of the focusing approach was to help the individual to explore the content of their experiences and to relate it to their current thoughts, concerns and life situation. In the distraction treatment the message which was given to the patients was that the content of the voices should not be attended to and that the more they distracted themselves or ignored the voices the better. During this study, it became clear that the content of the voices was important and related quite closely to the individual's concerns and worries. It is possible that distraction treatments, because of their failure to acknowledge this, made the distraction patients feel as though their concerns were not been attended to or that their concerns were unimportant. This may have contributed to a feeling of low self-esteem.

A feeling of low self-esteem is often associated with depression (Beck, 1976), therefore it is surprising that in this study an increase in depression was not seen to correspond with a decrease in low self-esteem for the distraction group. Depression did not change significantly throughout treatment. Although depression was not tackled directly in either of the two experimental groups, in the distraction condition, an approach which is commonly used in the treatment of depression (activity scheduling), was adapted for use with people who hallucinate. This may have had a protective effect against reduced self-esteem for the duration of treatment. In a group of patients who tend have a low self-esteem, any reduction should be viewed as clinically important, especially as low self-esteem is common in depression which in turn is a risk factor for suicide. Suicide is approximately ten times more likely to occur in individuals diagnosed as suffering from schizophrenia than in the normal population (Tarrier, 1987), therefore if a psychological treatment contributes to this risk it has potentially devastating consequences for the individual. It is possible that if activity scheduling had not been included in the distraction treatment the effects on self-esteem and depression may have been more deleterious to the individual.

A problem in further interpreting the results from both treatments is that they involved a combination of different approaches. It is not possible to discover whether a particular aspect contributed most to the effects on self-esteem or whether it was as a result of the approaches as a whole. Further research on both approaches is necessary to separate out the most effective elements of treatment.

As all the patients in this study had been hearing voices for a many years it is possible that if they had been offered a psychological treatment earlier in their voice history that the results may have been different. As examination of the individuals's beliefs surrounding the voices is an important part of the focusing approach, and other reported approaches (e.g. Chadwick and Birchwood, 1994), it could be speculated that if psychological explanations and treatment were offered when the individual first began to experience voices then focusing approaches may be more successful as systematisation of the beliefs surrounding the voices will have had less time to develop and may be more amenable to change. It is possible that if focusing was offered when the hallucinations first occurred that it may be a more powerful approach. Similarly, early implementation of distraction techniques may prevent the development of delusional or distressing beliefs about voices.

The results suggest that psychological treatments for people experiencing auditory hallucinations, who have a diagnosis of schizophrenia and who are taking maintenance neuroleptic medication can be effective. Psychological treatment, using both approaches, was demonstrated to produce significant effects on the frequency and disruption to life caused by the hallucinations, and this was also maintained during the short follow-up time over which data were collected. Although it was hypothesised that focusing would provide superior effects to the distraction approach because it addressed the reality monitoring deficits thought to underly hallucinations and the beliefs which are have been proposed to determine this deficit, it is not possible to conclude from this small sample that focusing is a superior treatment to distraction. Larger numbers of patients and a more comparable control group will be necessary to convincingly demonstrate that psychological treatments are effective and that one particular treatment is superior to another, both in the short and long-term.

Chapter 8

Discussion and conclusions

In this thesis the author has attempted to provide an account of the literature relating to the nature and psychological treatment of auditory hallucinations. As discussed in Chapter 1, auditory hallucinations are commonly associated with schizophrenia, although there is a growing literature which suggests that they also occur within the so-called 'normal' population of individuals who have no history or contact with psychiatric services. In many of these instances auditory hallucinations are not believed to be part of any type of psychopathology, but have become integrated into the person's everyday experience. Some people regard the experience to be a positive phenomenon, originating from a benign source and with positive content (Romme and Escher, in press). As a result of these observations it is not possible to consider auditory hallucinations just as part of a mental illness such as schizophrenia and it is possible to question whether theoretical accounts of the cause, aetiology and treatment of auditory hallucinations can be based just on research which has considered them as part of the overall entity of schizophrenia. There is growing support for the idea that research in these areas should focus on the individual symptoms of mental illness rather than studying individuals who are classified under one broad diagnostic category (Bentall, 1990a). The studies described here have attempted to examine cognitive processes and psychological treatments specifically relating to patients experiencing auditory hallucinations rather than to patients who have a diagnosis of schizophrenia.

A number of authors have attempted to provide models to account for the evidence relating to auditory hallucinations. Slade's (1976a) formulation is still important but does not account for the body of evidence which has accumulated over recent years. More recent accounts (e.g. Hoffman, 1986; Bentall, 1988, 1990a; Frith, 1992) have proposed that hallucinations occur because of a deficit in 'reality monitoring' i.e. the individual experiences reduced ability in determining whether a perceived event is internally or externally generated. Although there is some consensus in this account there is less agreement about the mechanisms responsible for this deficit, with some authors assuming that it results from abnormalities in speech production (Hoffman, 1986) and others assuming that the deficit is a result of faulty beliefs or expectations (Bentall, 1990a).

In a series of studies examining the role of the phonological store or loop in a small group of individuals experiencing auditory hallucinations, this author found no evidence for specific deficits in these cognitive processes in hallucinators as compared to psychiatric controls and 'normal' subjects (although the psychiatric patients performed more poorly overall than the normal subjects). Results from Study 4 (VTE) provided some support for the notion that hallucinators demonstrate poorer reality monitoring skills than other psychiatric patients and normal controls, if this is the mechanism which accounts for the effect.

Interestingly, it was the non-hallucinating patients who tended to perform differently from the hallucinating patients and normal subjects (on the VTE task and the USE task). These results, which are difficult to explain, may indicate that either the non-hallucinating patients in this study were unusual in some way, or that these tasks are picking up deficits which relate to other psychotic symptoms e.g. delusions. Further investigation of these types of deficits in non-hallucinating patients is warranted.

The results from the present cognitive studies suggest that cognitive processes relating to the phonological store or loop, which is thought to be the locus of inner speech in normals, functions relatively normally in hallucinators, therefore the cause of the reality monitoring deficit must be determined by other cognitive factors. There are a number of possible reasons which may account for this deficit which were discussed in more detail in Chapter 3. Frith (1992) has proposed that the misattribution results from a malfunctioning internal monitor which regulates inner speech, while other authors suggest that it results from deficits in speech and language production processes. Alternatively, Bentall and colleagues (Bentall, 1990a; Bentall et al, submitted) have argued that a number of cognitive biases (rather than cognitive deficits) could be implicated to produce reality monitoring deficits. For example, they have argued that the content of the material being processed may influence the misattribution process, although as yet they have not been able to produce much evidence to support this. Evidence has been found relating to cognitive biases in deluded patients. Patients experiencing paranoid beliefs have been shown to be more likely to attribute negative events to external sources than depressed or normal controls, but not positive events i.e. if negative events occur paranoid patients are more likely to blame other people, but if positive events occur they tend to assign them to themselves (Bentall, Kinderman, and Kaney, 1994). If hallucinators experience inner speech or intrusive negative thoughts, it is possible that this may be attributed to an external source if the material is distressing or if the material is inconsistent with the type of thoughts the individual expects to experience. In addition, if the hallucinator has beliefs which are incompatible with the content of the intrusive thought it is more likely that they will believe the voice to be originating from an external source. Once an misattribution has been made and reinforced through distress reduction or mood improvement, then the likelihood that a misattribution will occur in future is increased (Slade, 1976a, Bentall, 1990a). This account is highly speculative and warrants further investigation, although treatment approaches which have attempted to modify beliefs and expectations have been successful in reducing the severity of hallucinations (Chadwick and Birchwood, 1994). The results from this treatment study also provide some support for this account.

It is clear that cognitive models to explain the occurrence and maintenance of auditory hallucinations still have some way to go. The relative contribution of cognitive deficits and cognitive biases to the experience of auditory hallucinations is still unclear, although it is likely that their occurrence is the result of an interaction between these two types of processes. If a general model could be agreed upon, it is likely that more progress in developing effective treatment strategies will be made. One area which may help to clarify these issues might be to examine the relationship between intrusive thoughts in 'normal' subjects and auditory hallucinations, as it is clear that there are a number of similarities between the two types of experience. For example, intrusive thoughts are generally deemed to be uncontrollable, negative in content and to be unwanted. These characteristics are also commonly described by individuals experiencing auditory hallucinations (Chadwick and Birchwood, 1994).

When examining the phenomenology and factors which affected the experience of hallucinations in a sample of hallucinators referred for psychological treatment, it was clear that there was a wide variety in the quality and quantity of experiences. Results from this study indicated that behavioural and cognitive factors were important in determining the nature of hallucinatory experiences. Voices were clearly associated with mood, the majority of subjects reporting that voices became worse when they were in a negative mood. This was not related to the content of the voices, which supports the observations of Chadwick and Birchwood (1994) who found that content of hallucinations was not always related to a malevolent or benevolent belief in their origin. The observation that a feeling of control over voices was related to use of a number of coping strategies is encouraging, as it implies that patients could be taught to implement coping strategies aimed at increasing control over their voices. Research carried out by Tarrier and colleagues (Tarrier et al, 1990;

Tarrier et al, 1993) has demonstrated that teaching coping strategies to patients has an impact on psychotic symptoms, although this was demonstrated for delusions rather than hallucinations. A study which Tarrier and colleagues are currently carrying out at the University of Manchester, intends to demonstrate that teaching coping strategies and problem solving skills to patients over a longer time period than in their previous studies will lead to greater benefits in symptom reduction and the associated distress (Haddock, Sellwood, Yusupoff and Tarrier, in press). The other main observations relating to phenomenology were the almost significant associations observed between internality of voices, internal attributions and control over the voices. Again these observations have treatment implications in that, if patients can be trained to alter their beliefs regarding the origins of their voices, then an increase in control over them is likely to be observed. This was attempted in the treatment study reported in Chapter 7. Although no attempt was made to formally measure the control achieved by patients in either treatment group, changes in patients' beliefs about whether the voices were their own thoughts were variable. Further research needs to investigate the role of controllability and its relation to attributions regarding hallucinations.

In the final experiment of this thesis the author employed two theoretically contrasting psychological techniques to investigate the nature of effective treatments for reducing the frequency and impact of distressing auditory hallucinations. These treatments were based on a number of psychological treatments which had been observed to have some success at treating auditory hallucinations. The approaches tended to group into those which adopted a distraction approach to their treatment and those which adopted a focusing approach to the treatment. The focusing approach was hypothesised to have more impact on the severity of hallucinations in the long-term than distraction as the latter did not attempt to change the underlying deficit which Bentall (1990a), Frith (1992) and Hoffman (1986) proposed underly the experience of hallucinations.

Both approaches were successful at significantly reducing the amount of time spent hallucinating and the disruption they caused to the individuals life. Although not significant, there were also reductions in the distress caused by the voices for both groups. These changes were maintained at follow-up for the majority of measures.

These results support the idea that auditory hallucinations are amenable to psychological treatments, even in subjects who have a long history of voices and have been rigorously treated using neuroleptic medication. Despite this, it is possible that contact with a psychologist has produced the beneficial effect rather than the treatment itself producing changes in the person's hallucinatory experiences. This may have been the first time in the person's psychiatric career that a health professional listened to them discuss the nature and content (in the case of focusing) of their voices. Traditional psychiatric approaches usually focus on the phenomenology of the hallucinatory experience and discuss its management in terms of a biological illness which responds only to neuroleptic medication. Contact with a psychiatrist is usually on an infrequent basis and sessions are brief. In the absence of an equal contact control group it is impossible to be sure about whether increased contact produced the beneficial effects.

In addition, although in this study two different approaches to treatment were compared, we are still unsure which elements of the treatment were producing the reductions in severity demonstrated. It is likely that there were different elements of both approaches which affected the hallucinations. Activity scheduling may be an important aspect of distraction therefore a further study may be to utilise this technique as part of an overall focusing approach. In addition distraction techniques could be utilised in the context of 'handy' techniques that the person could use to have some symptom relief while still adopting the philosophy of investigating and focusing on the nature, content, meaning and related thoughts and beliefs of the sufferer.

Although focusing on the voices aimed to assist the individual to distinguish between externally or internally generated stimuli, it was not possible to determine whether this produced improvement in the reality monitoring deficit, or that this generalised outside the therapy situation. Indeed a number of subjects resisted reaching the conclusion that the voices were related to their own thoughts, and this belief was not imposed on them by the therapist. In these cases the therapist helped the individual to reach the conclusion that, even if the voices had an external origin, the way the person responded to the voices was internally generated and was amenable to change.

Although the treatments had direct effects on the hallucinations themselves, they also had effects on other measures. Anxiety and depression showed a trend to decrease over treatment although this was not significant. The mean scores for both groups at pre-treatment for anxiety and depression were above those required for 'caseness' according to the guidelines provided by the questionnaire's authors (Zigmond and Snaith, 1983) i.e. a score above 11 is considered to be pathological. Anxiety and depression were not treated specifically in either treatment group, although if they interfered with implementation of either approach, patients were given some assistance to help them to deal with the symptoms. The observation that almost all patients who took part in the study were considered to be anxious and depressed has important implications for the development of treatments in this area. Already some authors, (e.g. Fowler et al, in press and Kuipers et al, in press) have acknowledged the importance of including techniques to reduce depression and increase self-worth in any treatment package for people experiencing psychotic symptoms. It is likely that anxiety should also be an important focus for future treatment interventions.

Related to these measures are the results obtained for self-esteem, where significant differences were observed between the groups. Focusers showed an increase in self-esteem following treatment where distracters showed a decrease. Unfortunately data on self-esteem was not collected at follow-up therefore it is not possible to know whether the benefits for the focusing group were maintained.

Although results from these studies are promising and support the notion that psychological treatments may have an important contribution to make in the treatment of individuals suffering from persistent auditory hallucinations despite neuroleptic medication, there are still important areas regarding the nature of auditory hallucinations and their psychological treatment which were not addressed in these studies.

A number of authors have assumed that auditory hallucinations result from a reality monitoring deficit, but it is unclear whether this deficit is a vulnerability factor which is inherited or acquired due to biological or organic phenomena or whether the deficit develops over time due to psychological experiences throughout early life. At present we are not able to answer this. It is possible that the deficit is a result of a number of different mechanisms, which vary from individual to individual. This may account for the wide divergence in the nature of people's hallucinatory experience and the different emotional reactions to, and interpretations of them. It is clear that people's beliefs regarding the nature and origin of their voices are an important determining factor in their occurrence and acceptance by the sufferer, and it is also clear that voices have a positive and beneficial effect for some people. It is possible that an individual's beliefs regarding the occurrence of voices will effect the probability that they will experience them in the future. The beliefs of individuals at the onset of hallucinations has not been studied in great detail, but it is likely that this type of study would give us vital information regarding the development of people's beliefs about their voices.

We also do not know whether psychological treatments would be more effective if they were delivered when the voices first began. If beliefs regarding the voices are an important maintaining factor, then intervention to challenge these beliefs at an early stage in their development is likely to have more impact as the individual has had less time to incorporate the beliefs into their lives over a long period.

Likewise we do not know what impact psychological treatments would have if they were delivered without neuroleptic medication. If we consider neuroleptic treatment as a form of distraction technique where individuals are encouraged to see their voices as illness related and that the content is meaningless and irrelevant, then results from this thesis suggest that this will result in a decrease in self-esteem. If a decrease in self-esteem results in depression (which is a possibility) then this is likely to increase the likelihood of hallucinations in the future, especially as in this study it was observed that hallucinations are reported to become worse when in a negative mood, for a substantial number of patients. Studies examining treatment of hallucinations in patients not receiving neuroleptic medication are few. A recent case study (Morrison, 1994) was able to demonstrate a reduction in severity of voices which was maintained over a short follow-up period in a woman who had been experiencing persistent and distressing auditory hallucinations but who had refused neuroleptic medication. Again, a larger controlled study designed to examine treatments in non-medicated patients is warranted.

Finally, studies on psychological techniques in the treatment of psychotic symptoms are in their infancy, and there have not been any well-controlled studies assessing their efficacy. To demonstrate convincingly that these approaches produce effects which significantly effect the lives of the sufferer means that the number of subjects included in the studies needs to be increased and a contact control group should be included to account for any contact-time effects.

An ideal follow-up study of this pilot would be to combine both treatments, adopting a focusing philosophy on individuals who have just begun to hallucinate. It may also be beneficial to increase the number of sessions offered and include long-term follow-up assessments to measure whether benefits continue following treatment.

Despite the above criticisms of this study it is clear that any benefits to people who have such distressing psychotic symptoms which have been present for so many years may be clinically important. If they are to be offered as routine to sufferers presenting to mental health services, they must be demonstrated to be costeffective as well as clinically effective. This also has implications for who will carry out this type of approach. Psychologists are few and far between in health services and only a small proportion work with people who have psychotic symptoms. One important aspect of the future research will be to demonstrate which aspects of these approaches can be carried out by other health professionals as part of an overall mental health service. It has already been demonstrated that Community Psychiatric Nurses (CPN's) can be trained to carry out behavioural family management interventions with high expressed emotion families which have reduced relapse in the family member who has a diagnosis of schizophrenia (Brooker et al, 1991). A current study being carried out at the University of Manchester and the Institute of Psychiatry is attempting to train CPN's in a combination of approaches relating to the psychological management of psychosis. The training involves family management approaches, individual symptom management and case management. The aim of the training is to provide CPN's with skills to reduce relapse and reduce the severity and impact of persistent symptoms. Initial data suggest that CPN's can be trained in these methods and that this does have a beneficial effect on patients' symptoms (Haddock et al, in press).

In summary, psychological treatments for auditory hallucinations have been demonstrated to be effective, but if are going to be widely available as standard alternatives or complements to neuroleptic treatment their efficacy has to be demonstrated in large controlled studies, the essential elements of the treatments have to be described and elucidated and the ability to train professionals in their use must be demonstrated.

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Appendices

Appendix 1

HALLUCINATION INTERVIEW SCHEDULE (HIS)

HIS: Structured Hallucination Interview

Name: Age: Rater:

Sex: Diagnosis:

This interview schedule is designed to elicit phenomenological data about abnormal sensory experiences. Instructions to the interviewer are indicated by square [ ] brackets. Questions should be asked as indicated (although minor variations of question form are permitted) unless instructions suggest progression to later questions. Indented questions preceded by a hyphen are however, optional, and should be used to clarify the respondent's answers to the main questions.

Responses should be recorded verbatim where appropriate and/or checked off using the boxes provided.
Particularly unusual comments and/or failure to answer a question clearly should be noted in the margin.
For many questions, answers can be sought for the present time, the time when the hallucinations were at their worst (the peak time) and when the hallucinations were first experienced (the onset). Where appropriate, three scoring boxes are supplied. For some purposes, the interviewers will only wish to seek present responses, in which case questions pertaining to the peak and onset periods may be omitted

Record start time: ____________________

Initial instructions

1. [To follow directly from brief warm-up/introduction]

"I am particularly interested in any unusual experiences you may have had, particularly anything unusual which you may have heard, seen, smelt or felt. Perhaps you can tell me whether you have heard, seen, smelt or felt anything which you have found disturbing or difficult to explain."

-"Tell me more"
-"What was it like?"
-"Could anyone else hear/see/smell/feel it?"
-"Was anything else unusual happening at the time?"

SCORE: NONE [ ] AUDITORY [ ] VISUAL [ ]. OLFACTORY [ ]TACTILE[ ]MULTIMODAL [ ] (MODALITIES =)

[NB: It will be helpful at this stage if the interviewer can establish the modalities of any hallucinatory experiences. However, the respondent should not as this stage be pressured into giving too much detail and it is possible to proceed without achieving clear answers at this point in the interview. Responses should only be scored as multimodal if the experiences are occurring in two modalities at the same time. For example, seeing a person and at the same time hearing and seeing them speak would be scored as multimodal (visual-auditory); seeing a person one day and hearing a hallucinated voice the next would be scored as auditory and visual hallucinations.]

RECORD RESPONDENTS VERBATIM DESCRIPTION:

ANOMALOUS AUDITORY EXPERIENCES

2. Types of auditory experience:

"I would now like to ask you specifically about any unusual sounds you might have heard either in the past or recently, for example, any sounds or voices that you cannot account for?"

-"What do they sound like?"

-"Are they just noises, or are there voices as well?"

-"Can other people hear them?"

-"Are there any other unusual things that you have heard?"

SCORE:

	ONSET	PAST	PRESENT
NONE	[ ]	[ ]	[ ]
AUDITORY DISTORTIONS	[ ]	[ ]	[ ]
SIMPLE NOISES	[ ]	[ ]	[ ]
MUSIC	[ ]	[ ]	[ ]
VOICES	[ ]	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

[If no voices past or present, then proceed directly to 14 below]

"Do/did you see, smell or feel anything unusual at the same time?"

-"Was this true when you first heard something?"
-"Was this true when your voices were at their worst?"

SCORE:	ONSET	PEAK	PRESENT
UNIMODAL	[ ]	[ ]	[ ]
MULTIMODAL	[ ]	[ ]	[ ]
BOTH	[ ]	[ ]	[ ]

[NB: Interviewer should cross-check for consistency with question 1.]

3. Duration of voices:

"Could you tell me how long you have been/you were hearing your voices for?"

-"How old were you when they started?"

-"How old were you when they stopped?"

-"Did they stop for any length of time after starting, only to come back again later?"

SCORE: **STOP AGE/DATE [if any] = -**
START AGE/DATE =______
TOTAL DURATION =
EPISODE NUMBER [ ]

4. Number of voices:

"Did you hear/have you been hearing one voice or more than one?"

-"How many?"

-"Has this always been the case?"

-"When was it different?"

SCORE:	**ONSET**	**PEAK**	
PRESENT			
NUMBER OF VOICES (M = MANY)	[ ]	[ ]	[ ]

5. Frequency of voices:

"How often did you hear/have you heard your voice(s)?"

-"Less often than once a day?"
-"Every day?"
-"More than everyday?"
-"Every hour?"
-"All the time?"
-"Did/do they vary from moment to moment?"
-"Can/could you tell when they stop and start?"
-"Has this always been the case?"
-"How has it changed over time?"

SCORE:	**ONSET**	**PEAK**	
PRESENT			
LESS THAN WEEKLY	[ ]	[ ]	[ ]
LESS THAN DAILY	[ ]	[ ]	[ ]
DAILY	[ ]	[ ]	[ ]
HOURLY	[ ]	[ ]	[ ]
INTERMITTENT	[ ]	[ ]	[ ]
CONTINUOUS	[ ]	[ ]	[ ]

[NB: Score intermittent for voices which are almost continuous but which the patient experiences as stopping and starting from moment to moment, or minute to minute.]

NOTE IF SOME VOICES ARE MORE FREQUENT THAN OTHERS:

6. Location of voices:

"Did/do you hear the voice(s) inside your head or outside?"
-"Where outside?"
-"Did they/do they sound like they are on any particular side of you?"
-"Did they/do they appear to be coming from any particular direction?"
-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
INSIDE	[ ]	[ ]	[ ]
EXTERNAL, LEFT	[ ]	[ ]	[ ]
RIGHT	[ ]	[ ]	[ ]
FRONT	[ ]	[ ]	[ ]
BEHIND	[ ]	[ ]	[ ]
ALL DIRECTIONS	[ ]	[ ]	[ ]

7. Circumstances of voices:

"Did/do your voice(s) occur at any particular time of day?"

SCORE: NO TIME OF DAY [ ] PARTICULAR TIME [ ]

"Have you noticed it/them occurring more under any particular circumstances?"

-"Was/were/is/are/they worse when:
-you were other people or when you were/are alone?
-there were/are a lot of noisy things happening or when things were/are quiet?
-you were/are in the light or dark?
-you were/are busy or bored?
-you were/are in a particular mood, e.g. when you were/are anxious or depressed?

-Did/does it/they seem to be coming from any particular object or set of objects?"

SCORE: ALONE [ ]WITH OTHERS [ ]
NEITHER PARTICULARLY[ ]
NOISE [ ] QUIET [ ]NEITHER PARTICULARLY[ ]
LIGHT [ ] DARK [ ]NEITHER PARTICULARLY[ ]
BUSY [ ] BORED [ ]NEITHER PARTICULARLY[ ]
NEGATIVE MOOD [ ] (=)
POSITIVE MOOD [ ] (=)
PARTICULAR OBJECT [ ] NO PARTICULAR OBJECT [ ]

8. Sensory characteristics of the voice(s).

"Was/were/is/are the voice(s) female or male?"

-"Has this changed over time?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
MALE	[ ]	[ ]	[ ]
FEMALE	[ ]	[ ]	[ ]
BOTH	[ ]	[ ]	[ ]
NEITHER	[ ]	[ ]	[ ]

"How loud was/were/is/are the voice(s)?"

-"Louder than my voice?"
-"As loud as me speaking now?"
-"Quieter than my voice?"
-"So quiet that you found/find it/ them difficult to hear?"
-"How has this changed over time?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
LOUDER	[ ]	[ ]	[ ]
AS LOUD	[ ]	[ ]	[ ]
QUIETER	[ ]	[ ]	[ ]
VARIABLE	[ ]	[ ]	[ ]

9. Form of the voices:

"Did/does/do the voice(s)...

	ONSET	**PEAK**	**PRESENT**
TALK TO YOU OR ADDRESS YOU DIRECTLY	[ ]	[ ]	[ ]
TELL YOU WHAT TO DO	[ ]	[ ]	[ ]
TALK OR COMMENT ABOUT YOU IN ANY WAY	[ ]	[ ]	[ ]
DESCRIBE WHAT YOU ARE DOING	[ ]	[ ]	[ ]
TALK AMONGST THEMSELVES (MULTIPLE ONLY)	[ ]	[ ]	[ ]
TALK ABOUT EACH OTHER	[ ]	[ ]	[ ]
TRY TO TALK TO ANYONE ELSE	[ ]	[ ]	[ ]

(WHO =

RECORD RESPONDENTS VERBATIM DESCRIPTION:

10. Content of voices:

"It would be helpful to know something about what the voice(s) said/say."

-"Did/does/do the voice(s) remind you of anything or anyone you know?"

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

"Was/were/is/are the voice(s) pleasant or unpleasant?"

-"Was/were/are/is it/they friendly or hostile?"
-"Did/does it/do/ they say good or bad things about/to you?"
-"How has this changed over time?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
PLEASANT	[ ]	[ ]	[ ]
UNPLEASANT	[ ]	[ ]	[ ]
FRIENDLY	[ ]	[ ]	[ ]
HOSTILE	[ ]	[ ]	[ ]

(NB: Voices can be scored as both pleasant and unpleasant and/or friendly and hostile if they are reported as such)

11. Controllability of voices:

"I'd like to know whether you think you had/have any control over the voice(s)?"

-"Do you think you could do anything about them?"

SCORE: CONTROLLABLE [ ] UNCONTROLLABLE [ ]

12. Attributions about voices:

"What do you think caused/causes the voice(s)?"

-"Was/is it something to do with you, or was/is it someone or something else which is responsible?"
-"Do you think they/it could be the result of some kind of illness which you have been suffering from?"

SCORE: BIOLOGICAL	[ ]	**PSYCHOLOGICAL**	[ ]
SUPERNATURAL	[ ]	**CONSPIRACY**	[ ]
TECHNOLOGICAL	[ ]	**DON'T KNOW**	[ ]
OTHER	[ ]		

SCORE ALSO:INTERNAL [ ] EXTERNAL [ ] UNCERTAIN [ ]

(NB: An internal attribution is scored when the respondent clearly locates the cause of his/her experiences as within the self, e.g. as caused by illness or psychological conflicts etc. An external attribution is scored when the respondent identifies a clear external cause of the voices e.g. external stressors, the police, evil forces etc.)

RECORD RESPONDENT'S VERBATIM COMMENTS:

13. Emotional consequences of voices:

"Did/does/do the voice(s) upset you when you heard/hear it/them?"

-"How has this changed over time?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
NEVER	[ ]	[ ]	[ ]
SOMETIMES	[ ]	[ ]	[ ]
ALWAYS	[ ]	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM COMMENTS IF INFORMATIVE:

ANOMALOUS VISUAL EXPERIENCES

14. Types of visual experience:

"I would now like to ask you specifically about things you see or have seen either now or in the past, which has been worrying or difficult to explain"

-"What did/does it look like?"
-"Were/are you awake or asleep at the time?"
-"Can other people see it/them?"

SCORE:	PAST	PRESENT
NONE	[ ]	[ ]
FLASHES/DISTORTIONS	[ ]	[ ]
ILLUSIONS	[ ]	[ ]
HYPNAGOGIC EXPERIENCES	[ ]	[ ]
HYPNOPOMPIC EXPERIENCES	[ ]	[ ]
VISIONS	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

(NB: respondents frequently report anomalous visual experiences that occur during nighttime. It is important to check whether these experiences are dreams, occur during periods of wakefulness at night, or occur during the transition between wakefulness and sleep or sleep and wakefulness. Experiences should only be scored as visions if the respondent is clearly awake at the time. They should be scored as hypnagogic if occurring between the transition to sleep and hypnopompic if occurring during the transition to wakefulness. As it is often difficult to distinguish between these possibilities any uncertainty should be noted. If no visions then proceed directly to 24.)

"Do/did you see, smell or feel anything unusual at the same time?"
-"Was this true when you first heard something?"
-"Was this true when your voices were at their worst?"

SCORE:	ONSET	PEAK	PRESENT
UNIMODAL	[ ]	[ ]	[ ]
MULTIMODAL	[ ]	[ ]	[ ]
BOTH	[ ]	[ ]	[ ]

15. Duration of visions:

"Could you tell me how long you have been/you were seeing these things for?"

-"How old were you when they started?"

-"How old were you when they stopped?"

-"Did they stop for any length of time after starting, only to come back again later?"

SCORE:	**STOP AGE/DATE [if any]**	= -
	START AGE/DATE	=______
	TOTAL DURATION	=
	EPISODE NUMBER	[ ]

16. Number of visions:

"Did you see/do you see just one particular thing or were/are there many things which you saw/see?"

-"How many?"

-"Has this always been the case?"

-"When was it different?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
NUMBER OF VISIONS (M = MANY)	[ ]	[ ]	[ ]

17. Frequency of visions:

"How often did you see/have you seen these visions?"

-"Less often than once a day?"
-"Every day?"
-"More than everyday?"
-"Every hour?"
-"All the time?"
-"Did/do they vary from moment to moment?"
-"Can/could you tell when they stop and start?"
-"Has this always been the case?"
-"How has it changed over time?"

SCORE:	ONSET	PEAK	PRESENT
LESS THAN WEEKLY	[ ]	[ ]	[ ]
LESS THAN DAILY	[ ]	[ ]	[ ]
DAILY	[ ]	[ ]	[ ]
HOURLY	[ ]	[ ]	[ ]
INTERMITTENT	[ ]	[ ]	[ ]
CONTINUOUS	[ ]	[ ]	[ ]

[NB: Score intermittent for visions which are almost continuous but which the patient experiences as stopping and starting from moment to moment, or minute to minute.]

NOTE IF SOME VISIONS ARE MORE FREQUENT THAN OTHERS:

18. Circumstances of visions:

"Did/do your visions occur at any particular time of day?"

SCORE: NO TIME OF DAY [ ] PARTICULAR TIME [ ]

"Have you noticed it/them occurring more under any particular circumstances?"

-"Was/were/is/are/they worse when:
-you were other people or when you were/are alone?
-there were/are a lot of noisy things happening or when things were/are quiet?
-you were/are in the light or dark?
-you were/are busy or bored?
-you were/are in a particular mood, e.g. when you were/are anxious or depressed?

-Did/does it/they seem to be coming from any particular object or set of objects?"

SCORE: ALONE [ ]WITH OTHERS [ ]
NEITHER PARTICULARLY[ ]
NOISE [ ] QUIET [ ] NEITHER PARTICULARLY[ ]
LIGHT [ ] DARK [ ] NEITHER PARTICULARLY[ ]
BUSY [ ] BORED [ ] NEITHER PARTICULARLY[ ]
NEGATIVE MOOD [ ] (=)
POSITIVE MOOD [ ] (=)
PARTICULAR OBJECT [ ] NO PARTICULAR OBJECT [ ]

19. Sensory characteristics of the visions:

"Were/are the things that you saw/see clear and distinct or not so clear and distinct?"

-"Were/are they solid?"
-"Could/can you seen through them?"
-"Were/are they as clear and distinct as me sitting here now?"
-"Did/do they appear in any way fuzzy at all?"
-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
SOLID	[ ]	[ ]	[ ]
TRANSLUCENT	[ ]	[ ]	[ ]
DISTINCT	[ ]	[ ]	[ ]
FUZZY	[ ]	[ ]	[ ]

20. Content of visions:

[These questions may be omitted if sufficient details have already been obtained from previous questions]

"It would be helpful to know something about what the visions are/were like."

-"Did/does/do the visions remind you of anything or anyone you know?"

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

"Was/were/is/are the visions pleasant or unpleasant?"

-"Was/were/are/is it/they friendly or hostile?"
-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
PLEASANT	[ ]	[ ]	[ ]
UNPLEASANT	[ ]	[ ]	[ ]
FRIENDLY	[ ]	[ ]	[ ]
HOSTILE	[ ]	[ ]	[ ]

(NB: Visions can be scored as both pleasant and unpleasant and/or friendly and hostile if they are reported as such)

21. Controllability of voices:

"I'd like to know whether you think you had/have any control over these experiences?"

-"Do you think you could do anything about it/them?"

SCORE: CONTROLLABLE [ ] UNCONTROLLABLE [ ]

22. Attributions about visions:

"What do you think caused/causes the visions?"

-"Was/is it something to do with you, or was/is it someone or something else which is responsible?"
-"Do you think they/it could be the result of some kind of illness which you have been suffering from?"

SCORE: BIOLOGICAL	**[ ]**	**PSYCHOLOGICAL**	**[ ]**
SUPERNATURAL	**[ ]**	**CONSPIRACY**	**[ ]**
TECHNOLOGICAL	**[ ]**	**DONT KNOW**	**[ ]**
OTHER	**[ ]**		

SCORE ALSO:INTERNAL [ ] EXTERNAL [ ] UNCERTAIN [ ]

(NB: An internal attribution is scored when the respondent clearly locates the cause of his/her experiences as within the self, e.g. as caused by illness or psychological conflicts etc. An external attribution is scored when the respondent identifies a clear external cause e.g. external stressors, the police, evil forces etc.)

RECORD RESPONDENT'S VERBATIM COMMENTS:

23. Emotional consequences of visions:

"Did/does/do the visions upset you when you see/saw them?"

-"How has this changed over time?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
NEVER	[ ]	[ ]	[ ]
SOMETIMES	[ ]	[ ]	[ ]
ALWAYS	[ ]	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM COMMENTS IF INFORMATIVE:

ANOMALOUS OLFACTORY EXPERIENCES

24. Types of olfactory experience:

"I would now like to ask whether you experience or have experienced any strange smells or stinks that you have found it difficult to account for?"

-"What were/are they like?"

-"Do you think other people could/can smell them?"

SCORE:

	PAST	PRESENT
NONE	[ ]	[ ]
OLFACTORY HALLUCINATIONS	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

[If no olfactory hallucinations past or present, then proceed directly to 33 below]

"Do/did you see, smell or feel anything unusual at the same time?"

-"Was this true when you first noticed the smells?"

-"Was this true when the smells were/are at their worst?"

SCORE:	ONSET	PEAK	PRESENT
UNIMODAL	[ ]	[ ]	[ ]
MULTIMODAL	[ ]	[ ]	[ ]
BOTH	[ ]	[ ]	[ ]

[NB: Interviewer should cross-check for consistency with question 1.]

25. Duration of smells:

"Could you tell me how long you have been/ you were experiencing these smells for?"

-"How old were you when they started?"
-"How old were you when they stopped?"
-"Did they stop for any length of time after starting, only to come back again later?"

SCORE:	**STOP AGE/DATE [if any]**	**= -**
	START AGE/DATE	**=______**
	TOTAL DURATION	**=**
	EPISODE NUMBER	**[ ]**

26. Number of smells:

"Did you notice/have you noticed only one particular smell or more than one?"

-"How many?"
-"Has this always been the case?"
-"When was it different?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
NUMBER OF SMELLS (M = MANY)	**[ ]**	**[ ]**	**[ ]**

27. Frequency of smells:

"How often did you notice/have you noticed the smells?"

-"Less often than once a day?"
-"Every day?"
-"More than everyday?"
-"Every hour?"
-"All the time?"
-"Did/do they vary from moment to moment?"
-"Can/could you tell when they stop and start?"
-"Has this always been the case?"
-"How has it changed over time?"

SCORE:	ONSET	PEAK	PRESENT
LESS THAN WEEKLY	[ ]	[ ]	[ ]
LESS THAN DAILY	[ ]	[ ]	[ ]
DAILY	[ ]	[ ]	[ ]
HOURLY	[ ]	[ ]	[ ]
INTERMITTENT	[ ]	[ ]	[ ]
CONTINUOUS	[ ]	[ ]	[ ]

[NB: Score intermittent for smells which are almost continuous but which the patient experiences as stopping and starting from moment to moment, or minute to minute.]

NOTE IF SOME SMELLS ARE MORE FREQUENT THAN OTHERS:

29. Sensory characteristics of the smells:

"How clear and distinct were the smells?"

-"As clear and distinct as the smell of cooking before a meal?"

-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
STRONGER	[ ]	[ ]	[ ]
AS STRONG	[ ]	[ ]	[ ]
LESS STRONG	[ ]	[ ]	[ ]
DIFFICULT TO SMELL	[ ]	[ ]	[ ]

[The following questions may be omitted if sufficient details have already been obtained from previous questions]

"It would be helpful to know more about what the smells were/are like."

-"Did/do the smells remind you of anything or anyone you know?"

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

"Was/were/is/are the smells pleasant or unpleasant?"

-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
PLEASANT	[ ]	[ ]	[ ]
UNPLEASANT	[ ]	[ ]	[ ]

(NB: Smells can be scored as both pleasant and unpleasant if they are reported as such)

30. Controllability of smells:

"I'd like to know whether you think you had/have any control over the smells?"

-"Do you think you could do anything about them?"

SCORE: CONTROLLABLE [ ] UNCONTROLLABLE [ ]

31. Attributions about smells:

"What do you think caused/causes the smells?"

-"Was/is it something to do with you, or was/is it someone or something else which is responsible?"

-"Do you think they/it could be the result of some kind of illness which you have been suffering from?"

SCORE: BIOLOGICAL	**[ ]**	**PSYCHOLOGICAL**	**[ ]**
SUPERNATURAL	**[ ]**	**CONSPIRACY**	**[ ]**
TECHNOLOGICAL	**[ ]**	**DONT KNOW**	**[ ]**
OTHER	**[ ]**		

SCORE ALSO:INTERNAL [ ] EXTERNAL [ ] UNCERTAIN [ ]

(NB: An internal attribution is scored when the respondent clearly locates the cause of his/her experiences as within the self, e.g. as caused by illness or psychological conflicts etc. An external attribution is scored when the respondent identifies a clear external cause e.g. external stressors, the police, evil forces etc.)

RECORD RESPONDENT'S VERBATIM COMMENTS:

32. Emotional consequences of smells:

"Did/do you get upset when you notice the smells?"

-"How has this changed over time?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
NEVER	[ ]	[ ]	[ ]
SOMETIMES	[ ]	[ ]	[ ]
ALWAYS	[ ]	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM COMMENTS IF INFORMATIVE:

ANOMALOUS TACTILE EXPERIENCES

32. Types of tactile experience:

"I'd like to finish by asking you whether you have felt anything odd touching you, such as something or someone touching or interfering with your body in some way, when there was no-one or nothing there to account for it?"

-"What do/did they feel like?"
-"Does anyone you know have similar experiences?"
-"Has anyone been able to explain these experiences to you?"

SCORE:

	PAST	PRESENT
NONE	[ ]	[ ]
SIMPLE SENSATIONS	[ ]	[ ]
TACTILE HALLUCINATIONS	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

[If no tactile hallucinations past or present, then proceed directly to 33 below]

"Do/did you see, smell or feel anything unusual at the same time?"

-"Was this true when you first noticed the smells?"

-"Was this true when the smells were/are at their worst?"

SCORE:	ONSET	PEAK	PRESENT
UNIMODAL	[ ]	[ ]	[ ]
MULTIMODAL	[ ]	[ ]	[ ]
BOTH	[ ]	[ ]	[ ]

[NB: Interviewer should cross-check for consistency with question 1.]

34. Duration of tactile experiences:

"Could you tell me how long you have been/you were experiencing these touches for?"

-"How old were you when they started?"
-"How old were you when they stopped?"
-"Did they stop for any length of time after starting, only to come back again later?"

SCORE: **STOP AGE/DATE [if any] = -**
START AGE/DATE =______
TOTAL DURATION =
EPISODE NUMBER [ ]

35. Number of tactile experiences:

"Did/do you feel one particular thing or were/are there many different kinds of things?"

-"How many?"
-"Has this always been the case?"
-"When was it different?"

SCORE:	**ONSET**	**PEAK**	**PRESENT**
NUMBER OF EXPERIENCES (M = MANY)	**[ ]**	**[ ]**	**[ ]**

36. Frequency of tactile experiences:

"How often have you had/do you have these experiences?"

-"Less often than once a day?"
-"Every day?"
-"More than everyday?"
-"Every hour?"
-"All the time?"
-"Did/do they vary from moment to moment?"
-"Can/could you tell when they stop and start?"
-"Has this always been the case?"
-"How has it changed over time?"

SCORE:	ONSET	PEAK	PRESENT
LESS THAN WEEKLY	[ ]	[ ]	[ ]
LESS THAN DAILY	[ ]	[ ]	[ ]
DAILY	[ ]	[ ]	[ ]
HOURLY	[ ]	[ ]	[ ]
INTERMITTENT	[ ]	[ ]	[ ]
CONTINUOUS	[ ]	[ ]	[ ]

[NB: Score intermittent for experiences which are almost continuous but which the patient experiences as stopping and starting from moment to moment, or minute to minute.]

NOTE IF SOME EXPERIENCES ARE MORE FREQUENT THAN OTHERS:

37. Circumstances of tactile experiences:

"Did/do they occur at any particular time of day?"

SCORE: NO TIME OF DAY [ ] PARTICULAR TIME [ ]

"Have you noticed it/them occurring more under any particular circumstances?"

-"Was/were/is/are/they worse when:
-you were other people or when you were/are alone?
-there were/are a lot of noisy things happening or when things were/are quiet?
-you were/are in the light or dark?
-you were/are busy or bored?
-you were/are in a particular mood, e.g. when you were/are anxious or depressed?

-Did/does it/they seem to be coming from any particular object or set of objects?"

SCORE: ALONE [ ]WITH OTHERS [ ]
NEITHER PARTICULARLY [ ]
NOISE [ ] QUIET [ ]NEITHER PARTICULARLY[ ]
LIGHT [ ] DARK [ ]NEITHER PARTICULARLY[ ]
BUSY [ ] BORED [ ]NEITHER PARTICULARLY[ ]
NEGATIVE MOOD [ ] (=)
POSITIVE MOOD [ ] (=)
PARTICULAR OBJECT [ ] NO PARTICULAR OBJECT [ ]

38. Sensory characteristics and content of the tactile experiences:

"When these experiences happened/happen were/are they clear and distinct?"

-"As distinct as someone actually touching you?"
-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
MORE DISTINCT	[ ]	[ ]	[ ]
AS DISTINCT	[ ]	[ ]	[ ]
LESS DISTINCT	[ ]	[ ]	[ ]
DIFFICULT TO FEEL	[ ]	[ ]	[ ]

[The following questions may be omitted if sufficient details have already been obtained from previous questions]

"Could you tell me in detail what it is that you feel was/is happening to you when you had/have these experiences?"

-"Are these things similar to anything that someone has done to you in the past?"
-"Did/does/do they remind you of anything or anyone you know?"

RECORD RESPONDENT'S VERBATIM DESCRIPTION:

"Are/were these things, when they happened/happen, pleasant or unpleasant?"
-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
PLEASANT	[ ]	[ ]	[ ]
UNPLEASANT	[ ]	[ ]	[ ]

(NB: Experiences can be scored as both pleasant and unpleasant if they are reported as such)

39. Controllability of voices:

"I'd like to know whether you think you had/have any control over these experiences?"

-"Do you think you could do anything about them?"

SCORE: CONTROLLABLE [ ] UNCONTROLLABLE [ ]

40. Attributions about touches:

"What do you think caused/causes these experiences?"

-"Was/is it something to do with you, or was/is it someone or something else which is responsible?"
-"Do you think they/it could be the result of some kind of illness which you have been suffering from?"

SCORE: BIOLOGICAL	**[ ]**	**PSYCHOLOGICAL**	**[ ]**
SUPERNATURAL	**[ ]**	**CONSPIRACY**	**[ ]**
TECHNOLOGICAL	**[ ]**	**DON'T KNOW**	**[ ]**
OTHER	**[ ]**		

SCORE ALSO:INTERNAL [ ] EXTERNAL [ ] UNCERTAIN [ ]

(NB: An internal attribution is scored when the respondent clearly locates the cause of his/her experiences as within the self, e.g. as caused by illness or psychological conflicts etc. An external attribution is scored when the respondent identifies a clear external cause e.g. external stressors, the police, evil forces etc.)

RECORD RESPONDENT'S VERBATIM COMMENTS:

32. Emotional consequences of tactile experiences:

"Did/do you get upset when you had/have these experiences?"

-"How has this changed over time?"

SCORE:	ONSET	PEAK	PRESENT
NEVER	[ ]	[ ]	[ ]
SOMETIMES	[ ]	[ ]	[ ]
ALWAYS	[ ]	[ ]	[ ]

RECORD RESPONDENT'S VERBATIM COMMENTS IF INFORMATIVE:

COPING STRATEGIES AND SELF-EFFICACY EXPECTATIONS

42. Methods of coping:

[Proceed to 44 if no anomalous perceptions recorded]

"We've talked about some strange experiences which you have been having. What I'd like to know is how you have learned to cope with these experiences. I'd particularly like to know whether there is anything that you've found that helps you when you have these kinds of experience."

-"Does it help to be alone or with other people?"
-"Does it help to do something?"
-"Does it help to try and distract yourself, listen to some thing or watch something?"
-"Does it help to focus on your experiences?"
-"Does it help to do what your experiences tell you to do?"
-"Does it help to relax, go to sleep or do some kind of exercise?"
-"Does it help to eat or drink something?"
-"Does it help to avoid any particular kind of food or drink?"
-"Does taking medication help?"

SCORE: ALONE [ ] WITH OTHERS [ ]
DISTRACTION [ ] FOCUSING [ ]
OBEY EXPERIENCES [ ]
SLEEP [ ] RELAXATION [ ] EXERCISE [ ]
EAT [ ] DRINK [ ] ABSTAIN FROM [ ]
(FROM =)
MEDICATION [ ]

RECORD RESPONDENT'S VERBATIM COMMENTS:

43. Efficacy expectations:

"Do you think you will be able to cope better with these experiences in the future? Can you tell me how confident you are of this on a scale from 0 to 10, where 0 means that you are sure you will not cope better in the future, 5 means that you might cope better and 10 indicates that you are completely sure that you will cope better."
[NB: Explain several times if necessary]

YES [ ] NO [ ] (RATING =)

"How confident are you that some one else might be able to help you to overcome these experiences in the future? Can you rate your confidence on a scale from 0 to 10, where 0 means that you are not confident at all that others will be able to help, 5 means you have some hope that they will be able to help and 10 indicates that you are completely confident that someone will be able to help you."

YES [ ] NO [ ] (RATING =)

"Do you think it is likely that these experiences will just go away on their own? Could you tell me how likely this is to happen on a scale from 0 to 10, where 0 means that you are sure you will always have these experiences and that they will never go away, 5 means that you think there is some chance that they will just go away on their own and 10 indicates that you are sure they will eventually go away?"

YES [ ] NO [ ] (RATING =)

RECORD RESPONDENT'S VERBATIM COMMENTS:

RESPONDENT'S THEORY OF MIND

[Optional section, which may be omitted if desired. If omitted go to 46]

44. Respondent's concepts of mind:

[For questions see longer version of HIS form]

SCORE: RELIGIOUS DUALIST [ ] OTHER DUALIST [ ]
MONIST [ ] SCIENTIFIC MONIST [ ]
UNCLEAR [ ]

45. Dissociative experiences:

[NB: the following questions must be given in the order indicated and, if a dissociative experience is reported, a record should be made of the point during questioning at which the experience is reported by a respondent.]

"Have you ever had the feeling that your mind consists of two or more separate parts, as if there is some part of you which has somehow split off from the rest of you?"

> -"For example, some people sometimes feel that some part of themselves, such as their unconscious or some other part of their mind has somehow split off from their real selves, and that strange experiences have something to do with that. What do you think?
>
> -"Have you ever had the feeling that you are more than one person?"
>
> -"Do you think this could be the reason that you've had these strange experiences?"

SCORE: NO DISSOCIATIVE EXPERIENCE [ ]
DISSOCIATIVE EXPERIENCE UNRELATED TO HALLUCINATIONS [ ]
DISSOCIATE EXPERIENCE RELATED TO HALLUCINATIONS [ ]
MULTIPLE PERSONALITY [ ]

[NB: it should be noted that there is considerable scientific evidence that reports of multiple personality can be elicited by suggestions given to highly suggestible individuals. Multiple personality should only be scored if the respondent clearly articulates the idea of another personality inhabiting his or her body.]

RECORD RESPONDENT'S VERBATIM COMMENTS:

46. End of interview:

"Do you think there is anything that we have missed out? Is there anything you would like to add?"

[Thank patient]

INTERVIEW SUMMARY

RECORD TIME INTERVIEW ENDS:

Respondents co-operativeness: SCORE: HIGH [ ]
MODERATE [ ]
POOR [ ]

Respondent's understanding: SCORE: GOOD [ ]
MODERATE [ ]
POOR [ ]

Record total interview time: SCORE: DURATION = minutes.

Appendix 2

Frequency distributions for HIS variables

Appendix 2

```
SPSS/PC+ The Statistical Package for IBM PC                      8/31/94

GET /FILE 'his.mod'.
The SPSS/PC+ system file is read from
    file his.mod

The file was created on  2/20/94 at 15:55:43
and is titled SPSS/PC+ System File Written by Data Entry II

The SPSS/PC+ system file contains
     55 cases, each consisting of
     99 variables (including system variables).
     99 variables will be used in this session.
-----------------------------------------------------------------------
--------
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This procedure was completed at 13:56:17
-----------------------------------------------------------------------
--------
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FREQUENCIES /VARIABLES ALL.

***** Memory allows a total of  12695 Values, accumulated across all
Variables.
      There also may be up to    1587 Value Labels for each Variable.

-----------------------------------------------------------------------
--------
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```

SUBJECT subject no.

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	1.8	1.8	1.8
	2	1	1.8	1.8	3.6
	3	1	1.8	1.8	5.5
	4	1	1.8	1.8	7.3
	5	1	1.8	1.8	9.1
	6	1	1.8	1.8	10.9
	7	1	1.8	1.8	12.7
	8	1	1.8	1.8	14.5
	9	1	1.8	1.8	16.4
	10	1	1.8	1.8	18.2
	11	1	1.8	1.8	20.0
	12	1	1.8	1.8	21.8
	13	1	1.8	1.8	23.6
	14	1	1.8	1.8	25.5
	15	1	1.8	1.8	27.3
	16	1	1.8	1.8	29.1
	17	1	1.8	1.8	30.9

SUBJECT subject no.

	18	1	1.8	1.8	32.7
	19	1	1.8	1.8	34.5
	20	1	1.8	1.8	36.4
	21	1	1.8	1.8	38.2
	22	1	1.8	1.8	40.0
	23	1	1.8	1.8	41.8
	24	1	1.8	1.8	43.6
	25	1	1.8	1.8	45.5
	26	1	1.8	1.8	47.3
	27	1	1.8	1.8	49.1
	28	1	1.8	1.8	50.9
	29	1	1.8	1.8	52.7
	30	1	1.8	1.8	54.5
	31	1	1.8	1.8	56.4
	32	1	1.8	1.8	58.2
	33	1	1.8	1.8	60.0
	34	1	1.8	1.8	61.8
	35	1	1.8	1.8	63.6
	36	1	1.8	1.8	65.5
	37	1	1.8	1.8	67.3
	38	1	1.8	1.8	69.1

SUBJECT subject no.

39	1	1.8	1.8	70.9
40	1	1.8	1.8	72.7
41	1	1.8	1.8	74.5
42	1	1.8	1.8	76.4
43	1	1.8	1.8	78.2
44	1	1.8	1.8	80.0
45	1	1.8	1.8	81.8
46	1	1.8	1.8	83.6
47	1	1.8	1.8	85.5
48	1	1.8	1.8	87.3
49	1	1.8	1.8	89.1
50	1	1.8	1.8	90.9
51	1	1.8	1.8	92.7
52	1	1.8	1.8	94.5
53	1	1.8	1.8	96.4
54	1	1.8	1.8	98.2
55	1	1.8	1.8	100.0
Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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AGE age

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	20	1	1.8	1.9	1.9
	21	3	5.5	5.7	7.5
	22	1	1.8	1.9	9.4
	24	1	1.8	1.9	11.3
	25	1	1.8	1.9	13.2
	27	1	1.8	1.9	15.1
	28	1	1.8	1.9	17.0
	29	1	1.8	1.9	18.9
	30	2	3.6	3.8	22.6
	31	1	1.8	1.9	24.5
	32	1	1.8	1.9	26.4
	33	1	1.8	1.9	28.3
	35	1	1.8	1.9	30.2
	36	3	5.5	5.7	35.8
	37	1	1.8	1.9	37.7
	39	2	3.6	3.8	41.5
	42	6	10.9	11.3	52.8

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AGE age

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	43	3	5.5	5.7	58.5
	44	5	9.1	9.4	67.9
	45	3	5.5	5.7	73.6
	47	3	5.5	5.7	79.2
	48	1	1.8	1.9	81.1
	49	1	1.8	1.9	83.0
	50	1	1.8	1.9	84.9
	56	1	1.8	1.9	86.8
	58	2	3.6	3.8	90.6
	59	2	3.6	3.8	94.3
	60	1	1.8	1.9	96.2
	64	2	3.6	3.8	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

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SEX sex

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	40	72.7	72.7	72.7
	2	15	27.3	27.3	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

RATER rater (GH/RPB)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	47	85.5	85.5	85.5
	2	3	5.5	5.5	90.9
	3	5	9.1	9.1	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

LENGTH length of interview (mins)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	20	3	5.5	10.3	10.3
	21	1	1.8	3.4	13.8
	30	7	12.7	24.1	37.9
	31	1	1.8	3.4	41.4
	35	5	9.1	17.2	58.6
	40	2	3.6	6.9	65.5
	41	1	1.8	3.4	69.0
	45	3	5.5	10.3	79.3
	47	1	1.8	3.4	82.8
	60	2	3.6	6.9	89.7
	69	1	1.8	3.4	93.1
	120	1	1.8	3.4	96.6
	127	1	1.8	3.4	100.0
	.	26	47.3	Missing	
	Total	55	100.0	100.0	

LENGTH length of interview (mins)

Valid cases 29 Missing cases 26

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TYPE type of hallucinations

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	31	56.4	56.4	56.4
	6	4	7.3	7.3	63.6
	7	10	18.2	18.2	81.8
	8	2	3.6	3.6	85.5
	9	2	3.6	3.6	89.1
	13	3	5.5	5.5	94.5
	14	3	5.5	5.5	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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MODES number of modalities

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	31	56.4	56.4	56.4
	2	15	27.3	27.3	83.6
	3	5	9.1	9.1	92.7
	4	4	7.3	7.3	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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ATYPE type of auditory experiences (past)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	4	1	1.8	1.8	1.8
	5	54	98.2	98.2	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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ATYPE1 type of auditory experiences (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	5	55	100.0	100.0	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

MODE1 multimodality (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	45	81.8	84.9	84.9
	2	4	7.3	7.5	92.5
	3	4	7.3	7.5	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

MODE2 multimodality (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	44	80.0	81.5	81.5
	2	4	7.3	7.4	88.9
	3	6	10.9	11.1	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

MODE3 multimodality (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	47	85.5	85.5	85.5
	2	2	3.6	3.6	89.1
	3	6	10.9	10.9	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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DURATION duration of voices (no. of years)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	1.8	1.9	1.9
	2	2	3.6	3.7	5.6
	3	5	9.1	9.3	14.8
	4	5	9.1	9.3	24.1
	5	3	5.5	5.6	29.6
	6	1	1.8	1.9	31.5
	7	2	3.6	3.7	35.2
	8	1	1.8	1.9	37.0
	9	1	1.8	1.9	38.9
	10	2	3.6	3.7	42.6
	11	4	7.3	7.4	50.0
	12	2	3.6	3.7	53.7
	13	1	1.8	1.9	55.6
	14	2	3.6	3.7	59.3
	15	5	9.1	9.3	68.5
	16	1	1.8	1.9	70.4
	17	1	1.8	1.9	72.2

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DURATION duration of voices (no. of years)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	19	1	1.8	1.9	74.1
	20	1	1.8	1.9	75.9
	22	2	3.6	3.7	79.6
	23	2	3.6	3.7	83.3
	24	3	5.5	5.6	88.9
	29	1	1.8	1.9	90.7
	30	1	1.8	1.9	92.6
	31	2	3.6	3.7	96.3
	36	1	1.8	1.9	98.1
	41	1	1.8	1.9	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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NUMBER1 number of voices (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	23	41.8	50.0	50.0
	2	5	9.1	10.9	60.9
	3	2	3.6	4.3	65.2
	4	1	1.8	2.2	67.4
	6	1	1.8	2.2	69.6
	10	2	3.6	4.3	73.9
	20	12	21.8	26.1	100.0
	.	9	16.4	Missing	
	Total	55	100.0	100.0	

Valid cases 46 Missing cases 9

NUMBER2 number of voices (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	12	21.8	25.5	25.5
	2	7	12.7	14.9	40.4
	3	4	7.3	8.5	48.9
	4	1	1.8	2.1	51.1
	5	4	7.3	8.5	59.6
	6	1	1.8	2.1	61.7
	10	1	1.8	2.1	63.8
	12	2	3.6	4.3	68.1
	20	15	27.3	31.9	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

NUMBER3 number of voices (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	16	29.1	30.8	30.8
	2	6	10.9	11.5	42.3
	3	4	7.3	7.7	50.0
	4	3	5.5	5.8	55.8
	5	3	5.5	5.8	61.5
	6	1	1.8	1.9	63.5
	10	1	1.8	1.9	65.4
	12	1	1.8	1.9	67.3
	20	17	30.9	32.7	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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FREQ1 frequency of voices (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	5	9.1	9.8	9.8
	2	7	12.7	13.7	23.5
	3	8	14.5	15.7	39.2
	4	4	7.3	7.8	47.1
	5	18	32.7	35.3	82.4
	6	9	16.4	17.6	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

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FREQ2 frequency of voices (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	1.8	1.9	1.9
	2	3	5.5	5.7	7.5
	3	3	5.5	5.7	13.2
	4	2	3.6	3.8	17.0
	5	26	47.3	49.1	66.0
	6	18	32.7	34.0	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

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FREQ3 frequency of voices (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	3	5.5	5.6	5.6
	2	6	10.9	11.1	16.7
	3	12	21.8	22.2	38.9
	4	5	9.1	9.3	48.1
	5	24	43.6	44.4	92.6
	6	4	7.3	7.4	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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LOCATE1 location (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	16	29.1	31.4	31.4
	2	2	3.6	3.9	35.3
	4	2	3.6	3.9	39.2
	5	2	3.6	3.9	43.1
	6	18	32.7	35.3	78.4
	9	1	1.8	2.0	80.4
	10	1	1.8	2.0	82.4
	11	9	16.4	17.6	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases
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LOCATE2 location (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	24.5	24.5
	2	2	3.6	3.8	28.3
	4	1	1.8	1.9	30.2
	5	1	1.8	1.9	32.1
	6	22	40.0	41.5	73.6
	8	1	1.8	1.9	75.5
	9	1	1.8	1.9	77.4
	10	1	1.8	1.9	79.2
	11	11	20.0	20.8	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

LOCATE3 location (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	14	25.5	25.5	25.5
	2	3	5.5	5.5	30.9
	3	1	1.8	1.8	32.7
	4	1	1.8	1.8	34.5
	5	1	1.8	1.8	36.4
	6	16	29.1	29.1	65.5
	8	1	1.8	1.8	67.3
	9	2	3.6	3.6	70.9
	10	1	1.8	1.8	72.7
	11	15	27.3	27.3	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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TIME time of day

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	1	1.8	1.8	1.8
	1	33	60.0	60.0	61.8
	2	21	38.2	38.2	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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ALONE alone/others/neither

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	33	60.0	61.1	61.1
	2	9	16.4	16.7	77.8
	3	12	21.8	22.2	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

NOISE noise/quiet/neither

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	12	21.8	22.2	22.2
	2	13	23.6	24.1	46.3
	3	29	52.7	53.7	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

LIGHT light/dark/neither

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	13.0	13.0
	2	9	16.4	16.7	29.6
	3	38	69.1	70.4	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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BUSY busy/bored/neither

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	5	9.1	9.3	9.3
	2	19	34.5	35.2	44.4
	3	30	54.5	55.6	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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MOOD negative/positive

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	26	47.3	48.1	48.1
	2	4	7.3	7.4	55.6
	3	22	40.0	40.7	96.3
	4	2	3.6	3.7	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

OBJECT object origin

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	24	43.6	46.2	46.2
	2	28	50.9	53.8	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

SENSORY1 sensory (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	20	36.4	37.7	37.7
	2	5	9.1	9.4	47.2
	3	26	47.3	49.1	96.2
	4	2	3.6	3.8	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

SENSORY2 senory (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	16	29.1	30.8	30.8
	2	2	3.6	3.8	34.6
	3	33	60.0	63.5	98.1
	4	1	1.8	1.9	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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SENSORY3 sensory (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	24.1	24.1
	2	2	3.6	3.7	27.8
	3	38	69.1	70.4	98.1
	4	1	1.8	1.9	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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LOUD1 loudness (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	25.5	25.5
	2	12	21.8	23.5	49.0
	3	21	38.2	41.2	90.2
	4	5	9.1	9.8	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

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LOUD2 loudness (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	21	38.2	40.4	40.4
	2	11	20.0	21.2	61.5
	3	14	25.5	26.9	88.5
	4	6	10.9	11.5	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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LOUD3 loudness (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	16	29.1	30.2	30.2
	2	12	21.8	22.6	52.8
	3	17	30.9	32.1	84.9
	4	8	14.5	15.1	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

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TALK1 voices talk to (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	22	40.0	42.3	42.3
	1	30	54.5	57.7	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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TALK2 talk to (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	18	32.7	34.0	34.0
	1	35	63.6	66.0	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

TALK3 talk to (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	17	30.9	31.5	31.5
	1	37	67.3	68.5	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

TELL1 tell what to do (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	19	34.5	37.3	37.3
	1	32	58.2	62.7	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

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TELL2 tell what to do (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	16	29.1	30.2	30.2
	1	37	67.3	69.8	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

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TELL3 tell what to do (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	18	32.7	33.3	33.3
	1	36	65.5	66.7	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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COMMENT1 comment about them (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	22	40.0	44.0	44.0
	1	28	50.9	56.0	100.0
	.	5	9.1	Missing	
	Total	55	100.0	100.0	

Valid cases 50 Missing cases 5

COMMENT2 comment about them (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	21	38.2	41.2	41.2
	1	30	54.5	58.8	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

COMMENT3 comment about them (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	20	36.4	37.0	37.0
	1	34	61.8	63.0	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

DESCRIB1 describe (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	39	70.9	76.5	76.5
	1	12	21.8	23.5	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

DESCRIB2 describe (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	36	65.5	69.2	69.2
	1	16	29.1	30.8	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

DESCRIB3 describe (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	37	67.3	68.5	68.5
	1	17	30.9	31.5	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

OTHER1 talk to each other (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	32	58.2	62.7	62.7
	1	19	34.5	37.3	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

OTHER2 talk to each other (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	30	54.5	57.7	57.7
	1	22	40.0	42.3	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

OTHER3 talk to each other (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	29	52.7	53.7	53.7
	1	25	45.5	46.3	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

ABOUT1 talk about each other (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	47	85.5	92.2	92.2
	1	4	7.3	7.8	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

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ABOUT2 talk about each other (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	44	80.0	84.6	84.6
	1	8	14.5	15.4	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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ABOUT3 talk about each other (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	43	78.2	79.6	79.6
	1	11	20.0	20.4	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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ANYONE1 talk to anyone else (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	42	76.4	82.4	82.4
	1	9	16.4	17.6	100.0
	.	4	7.3	Missing	
	Total	55	100.0	100.0	

Valid cases 51 Missing cases 4

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SPSS/PC+

ANYONE2 talk to anyone else (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	43	78.2	82.7	82.7
	1	9	16.4	17.3	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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SPSS/PC+

ANYONE3 talk to anyone else (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	45	81.8	83.3	83.3
	1	9	16.4	16.7	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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SPSS/PC+

CONTENT content neg/pos/both/neither

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	21	38.2	43.8	43.8
	2	2	3.6	4.2	47.9
	3	24	43.6	50.0	97.9
	4	1	1.8	2.1	100.0
	.	7	12.7	Missing	
	Total	55	100.0	100.0	

Valid cases 48 Missing cases 7

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SPSS/PC+

PLEAS1 pleasant (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	31	56.4	57.4	57.4
	1	23	41.8	42.6	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

PLEAS2 pleasant (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	35	63.6	64.8	64.8
	1	19	34.5	35.2	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

PLEAS3 pleasant (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	28	50.9	51.9	51.9
	1	26	47.3	48.1	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

UNPLE1 unleasant (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	10	18.2	18.5	18.5
	1	44	80.0	81.5	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

UNPLE2 unpleasant (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	4	7.3	7.4	7.4
	1	50	90.9	92.6	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

UNPLE3 unpleasant (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	4	7.3	7.4	7.4
	1	50	90.9	92.6	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

FRIEND1 friendly (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	29	52.7	54.7	54.7
	1	24	43.6	45.3	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

FRIEN2 friendly (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	32	58.2	59.3	59.3
	1	22	40.0	40.7	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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FRIEN3 friendly (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	30	54.5	55.6	55.6
	1	24	43.6	44.4	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1
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HOST1 hostlity (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	16	29.1	30.2	30.2
	1	37	67.3	69.8	100.0
	.	2	3.6	Missing	
	Total	55	100.0	100.0	

Valid cases 53 Missing cases 2

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HOST2 hostility (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	10	18.2	18.5	18.5
	1	44	80.0	81.5	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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HOST3 hostility (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	11	20.0	20.4	20.4
	1	43	78.2	79.6	100.0

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

CONTROL controllability of voices

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	17	30.9	32.7	32.7
	2	35	63.6	67.3	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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BIOLOGY attributions/biology

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	36	65.5	66.7	66.7
	1	18	32.7	33.3	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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PSYCHO attributions/psychological

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	36	65.5	66.7	66.7
	1	18	32.7	33.3	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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SUPER attributions/supernatural

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	46	83.6	85.2	85.2
	1	8	14.5	14.8	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

CONSPIRE attributions/conspiracy

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	34	61.8	63.0	63.0
	1	20	36.4	37.0	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

TECHNO attributions/technological

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	54	98.2	100.0	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

NOTKNOW attributions/don't know

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	50	90.9	92.6	92.6
	1	4	7.3	7.4	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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A.OTHER attributions/other

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	54	98.2	100.0	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

INTEXT internality/externality of attributions

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	23	41.8	42.6	42.6
	2	20	36.4	37.0	79.6
	3	3	5.5	5.6	85.2
	4	8	14.5	14.8	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

CONSEQ1 consequences (onset)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	14.3	14.3
	2	11	20.0	22.4	36.7
	3	31	56.4	63.3	100.0
	.	6	10.9	Missing	
	Total	55	100.0	100.0	

Valid cases 49 Missing cases 6

CONSEQ2 consequences (peak)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	4	7.3	7.7	7.7
	2	14	25.5	26.9	34.6
	3	34	61.8	65.4	100.0
	.	3	5.5	Missing	
	Total	55	100.0	100.0	

Valid cases 52 Missing cases 3

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CONSEQ3 consequences (present)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	4	7.3	7.4	7.4
	2	21	38.2	38.9	46.3
	3	29	52.7	53.7	100.0
	.	1	1.8	Missing	
	Total	55	100.0	100.0	

Valid cases 54 Missing cases 1

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COPE1 alone/others

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	21.3	21.3
	2	28	50.9	59.6	80.9
	3	2	3.6	4.3	85.1
	4	7	12.7	14.9	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

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COPE2 distract/focus

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	34	61.8	72.3	72.3
	2	2	3.6	4.3	76.6
	3	7	12.7	14.9	91.5

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	4	4	7.3	8.5	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

COPE3 obey experiences

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	42	76.4	89.4	89.4
	1	5	9.1	10.6	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

COPE4 sleep

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	21	38.2	44.7	44.7
	1	26	47.3	55.3	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

COPE6 exercise

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	37	67.3	78.7	78.7
	1	10	18.2	21.3	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

COPE7 eat

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	41	74.5	87.2	87.2
	1	6	10.9	12.8	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

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COPE8 drink

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	28	50.9	59.6	59.6
	1	19	34.5	40.4	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

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COPE9 abstention

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	40	72.7	85.1	85.1
	1	7	12.7	14.9	100.0
	.	8	14.5	Missing	
	Total	55	100.0	100.0	

Valid cases 47 Missing cases 8

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COPE10 medication

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	19	34.5	41.3	41.3
	1	27	49.1	58.7	100.0
	.	9	16.4	Missing	
	Total	55	100.0	100.0	

Valid cases 46 Missing cases 9

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EXPECT1 expectations/internal

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	10	18.2	21.7	21.7
	1	2	3.6	4.3	26.1
	2	1	1.8	2.2	28.3
	3	2	3.6	4.3	32.6
	4	3	5.5	6.5	39.1
	5	14	25.5	30.4	69.6
	6	1	1.8	2.2	71.7
	7	6	10.9	13.0	84.8
	8	2	3.6	4.3	89.1
	9	1	1.8	2.2	91.3
	10	4	7.3	8.7	100.0
	.	9	16.4	Missing	
	Total	55	100.0	100.0	

Valid cases 46 Missing cases 9

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EXPECT2 expectations/external

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	8	14.5	17.8	17.8
	1	2	3.6	4.4	22.2
	2	3	5.5	6.7	28.9
	3	3	5.5	6.7	35.6
	4	2	3.6	4.4	40.0
	5	9	16.4	20.0	60.0
	7	3	5.5	6.7	66.7
	8	7	12.7	15.6	82.2
	9	2	3.6	4.4	86.7
	10	6	10.9	13.3	100.0
	.	10	18.2	Missing	
	Total	55	100.0	100.0	

Valid cases 45 Missing cases 10

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EXPECT3 expectations/none

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	15	27.3	32.6	32.6
	2	5	9.1	10.9	43.5
	3	2	3.6	4.3	47.8
	4	1	1.8	2.2	50.0
	5	12	21.8	26.1	76.1
	7	1	1.8	2.2	78.3
	8	2	3.6	4.3	82.6
	9	3	5.5	6.5	89.1
	10	5	9.1	10.9	100.0
	.	9	16.4	Missing	
	Total	55	100.0	100.0	

Valid cases 46 Missing cases 9

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LOC.EXT present

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.	55	100.0	Missing	
	Total	55	100.0	100.0	

Valid cases 0 Missing cases 55

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GROUP treatment group

Value Label	Value	Frequency	Percent	Percent	Percent
		2	3.6	3.6	3.6
	c	7	12.7	12.7	16.4
	d	10	18.2	18.2	34.5
	f	9	16.4	16.4	50.9
	n	27	49.1	49.1	100.0
	Total	55	100.0	100.0	

Valid cases 55 Missing cases 0

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COPE5 relaxation

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	22	40.0	51.2	51.2
	1	21	38.2	48.8	100.0
	.	12	21.8	Missing	
	Total	55	100.0	100.0	

Valid cases 43 Missing cases 12

Appendix 3

Voice diary

Appendix 3

Day: **Date:** **Time completed:**

1. **Have you heard your voices at all today?** YES/NO

If yes, then

2. **How much have you heard the voices?**

FOR A SHORT TIME	1	2	3	4	5	6	7	8	9	ALL DAY LONG

3. **How loud have the voices been?**

MOSTLY VERY FAINT	1	2	3	4	5	6	7	8	9	MOSTLY VERY LOUD

4. **Have the voices been mostly hostile or mostly friendly?**

MOSTLY FRIENDLY	1	2	3	4	5	6	7	8	9	MOSTLY HOSTILE

5. **How distressing have the voices been?**

MOSLY VERY PLEASANT	1	2	3	4	5	6	7	8	9	MOSTLY VERY DISTRESSING

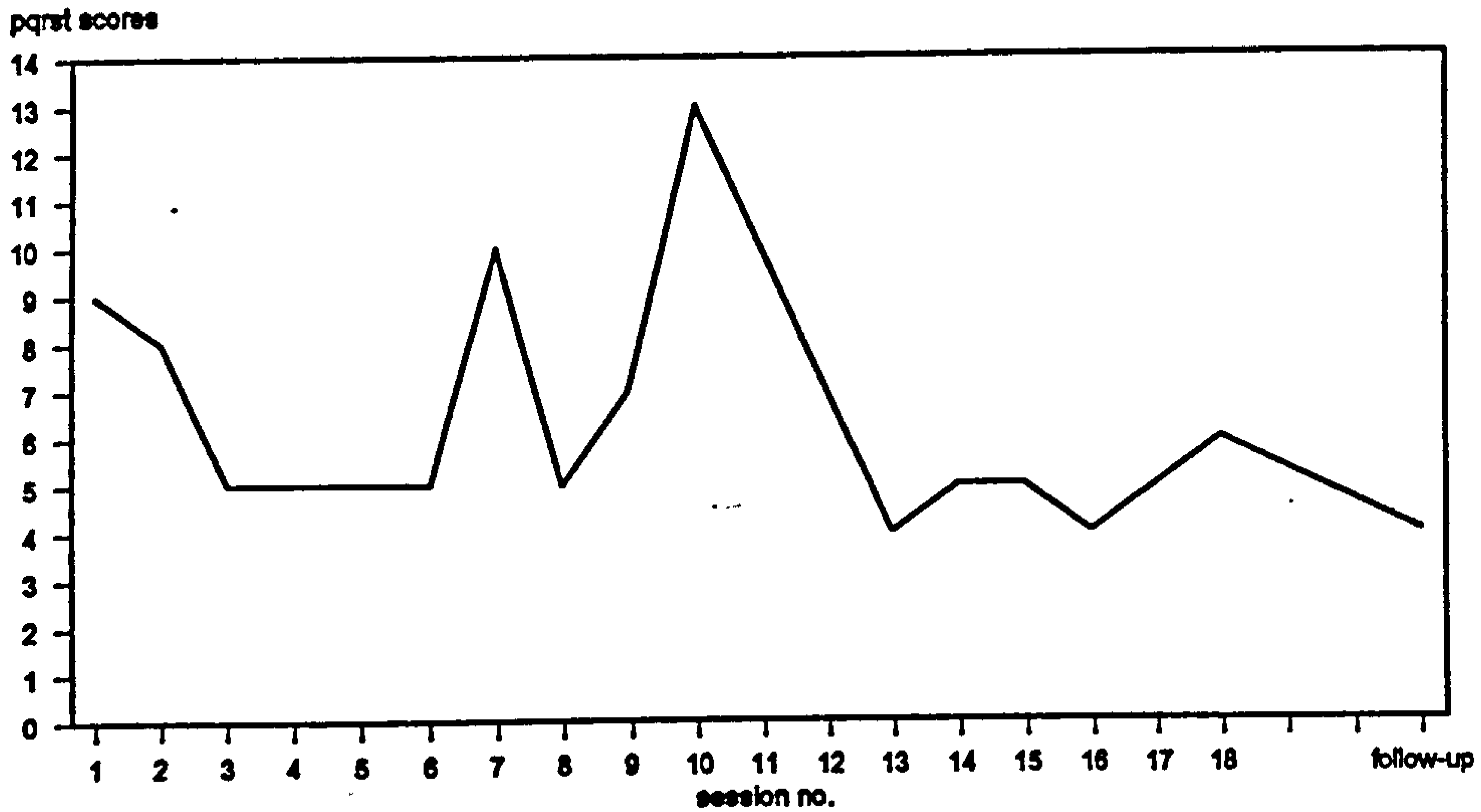
6. **What did you do today?**

Appendix 4

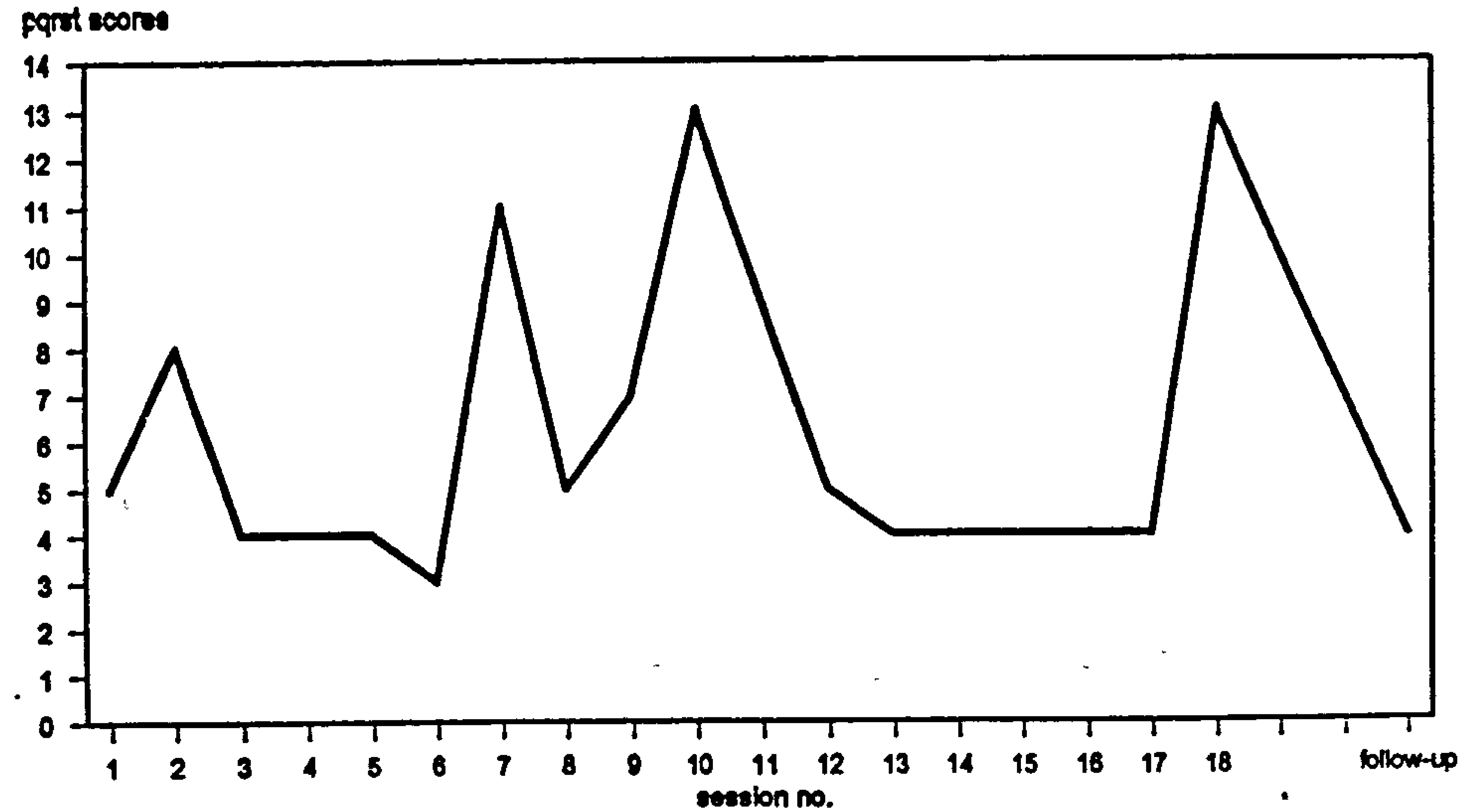
Graphs showing PQRST and HAD ratings for individuals who took part in treatment study

AH: PQRST graphs

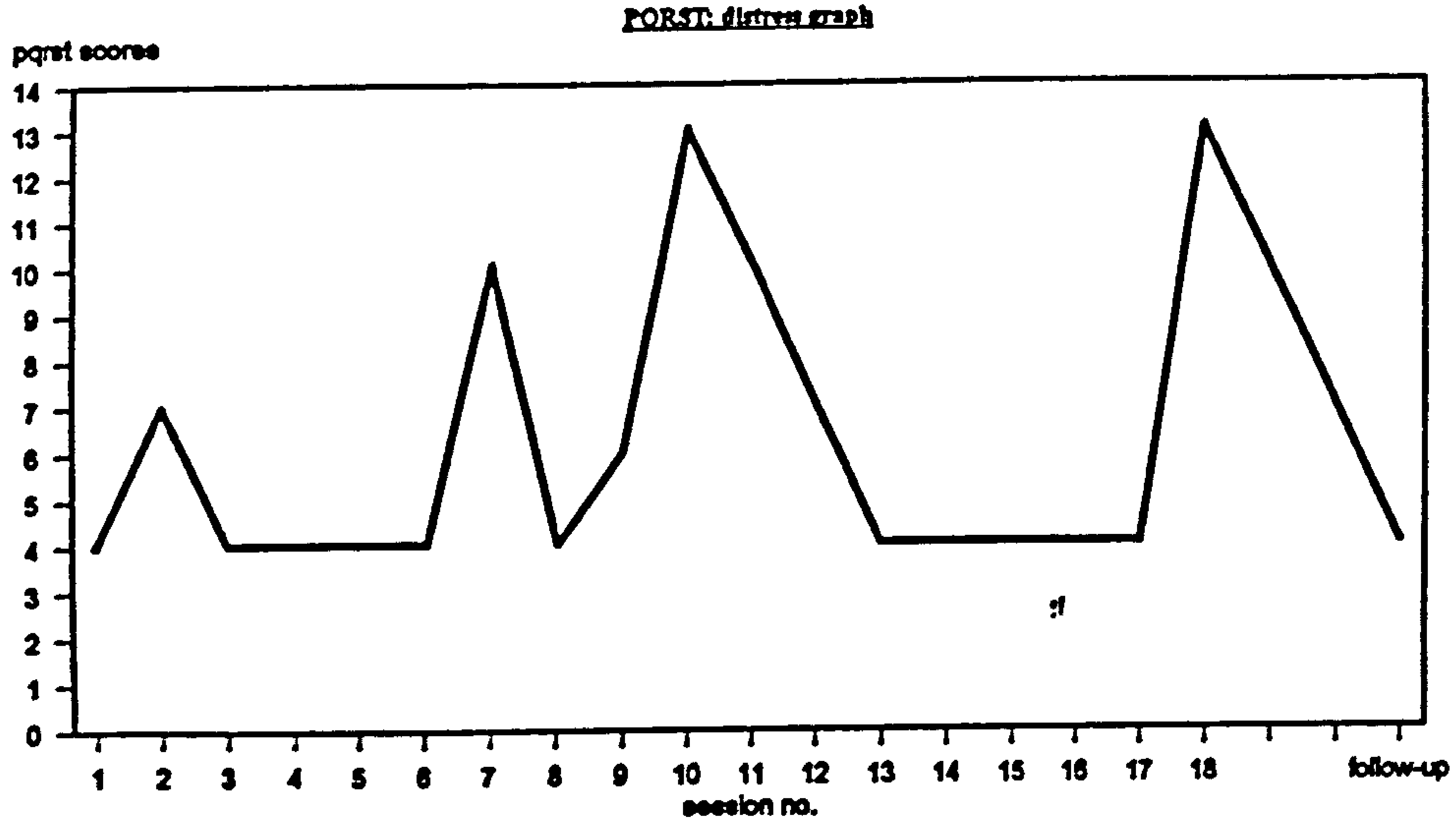
PQRST: frequency graph



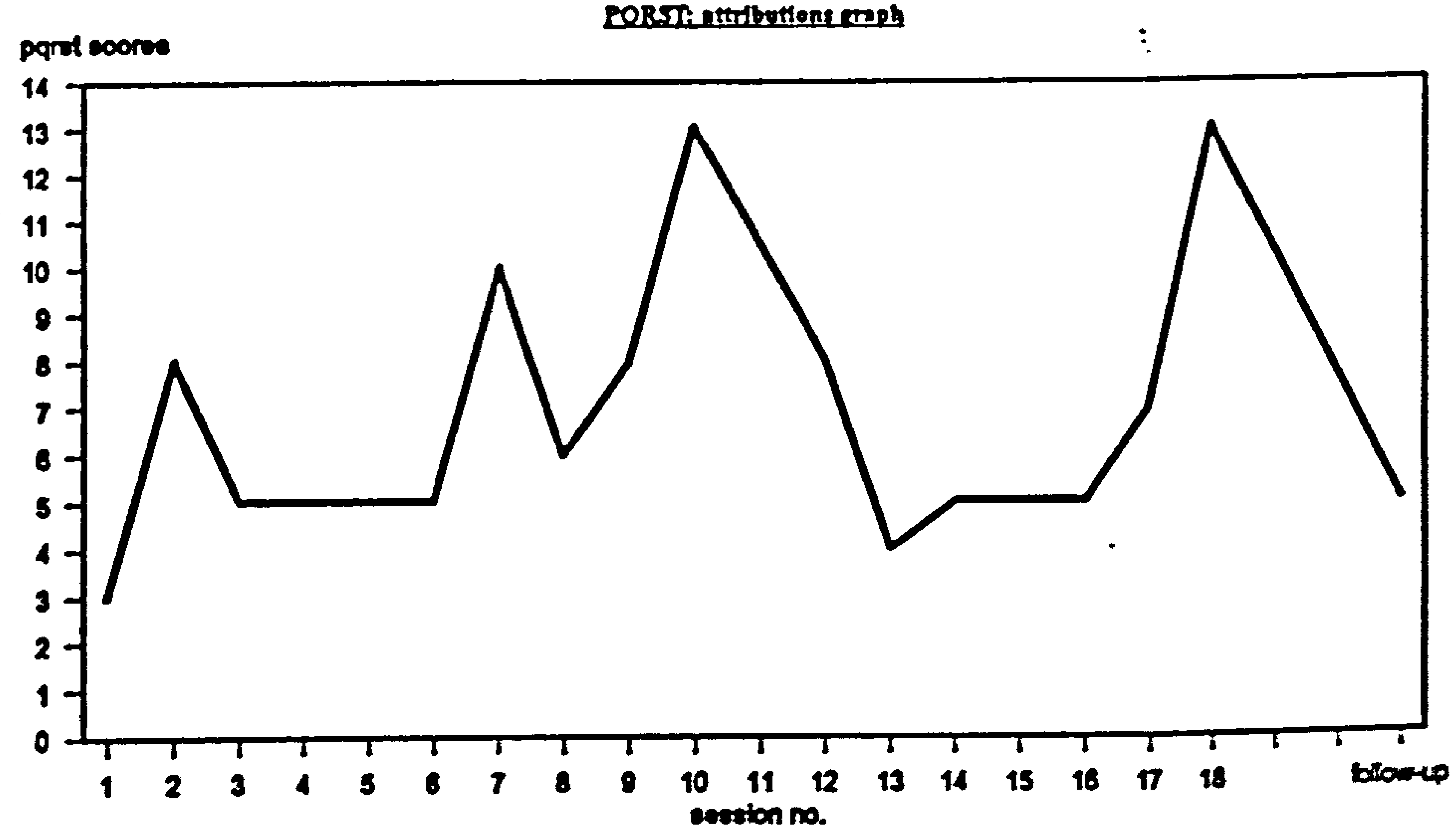
PQRST: disruption graph



PQRST: distress graph

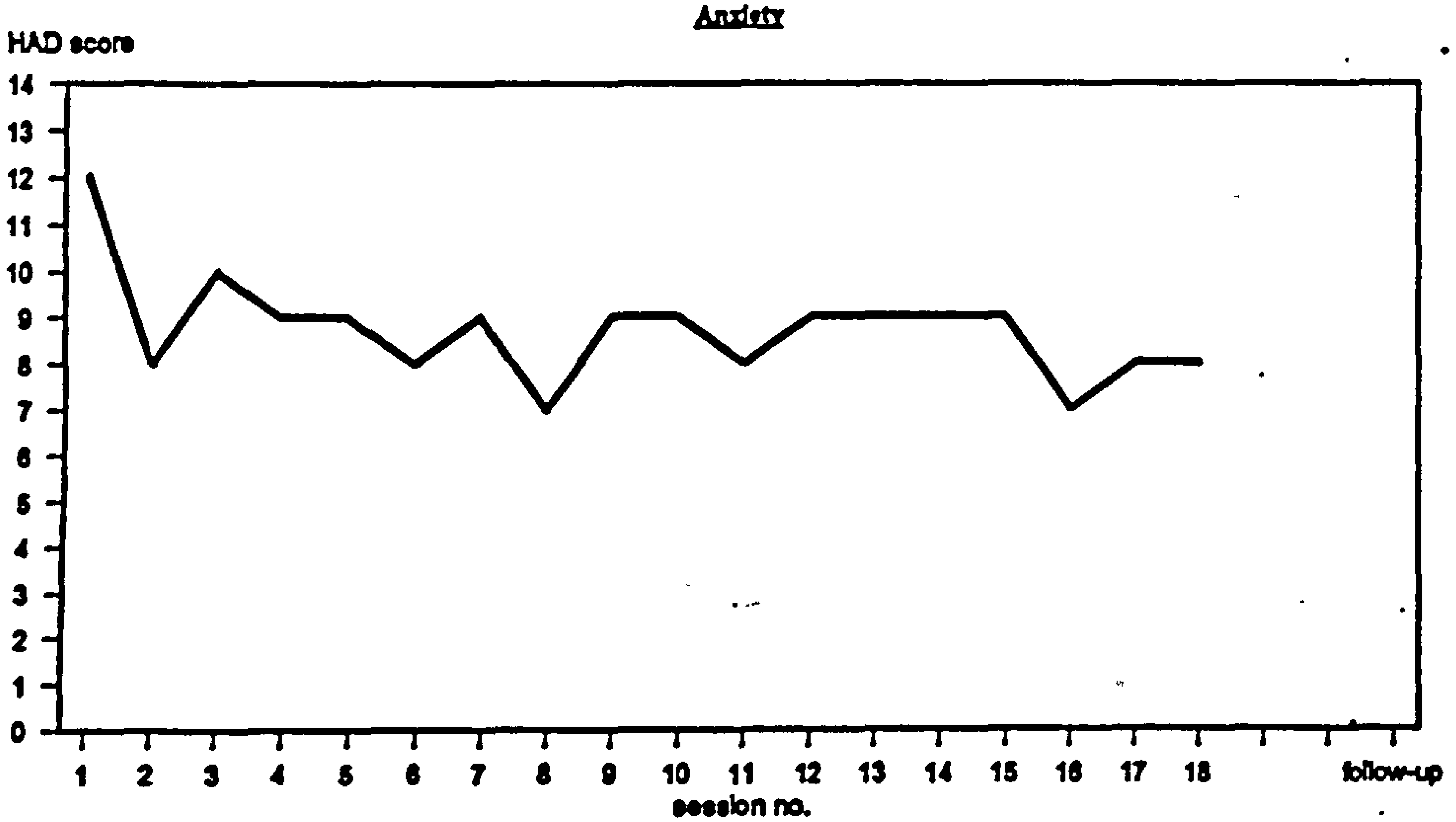


PQRST: attributions graph

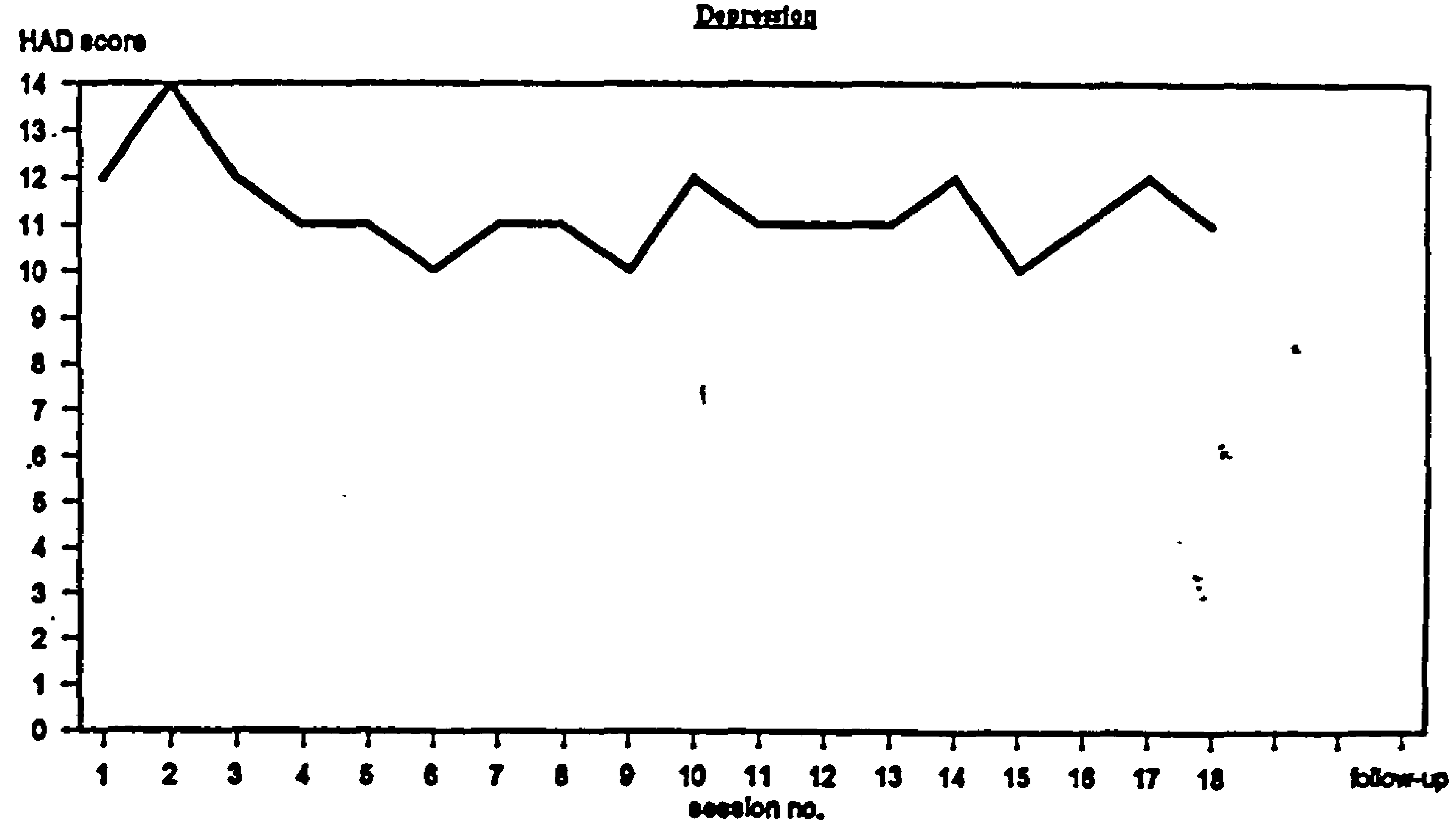


AH: Anxiety and depression graphs

Anxiety

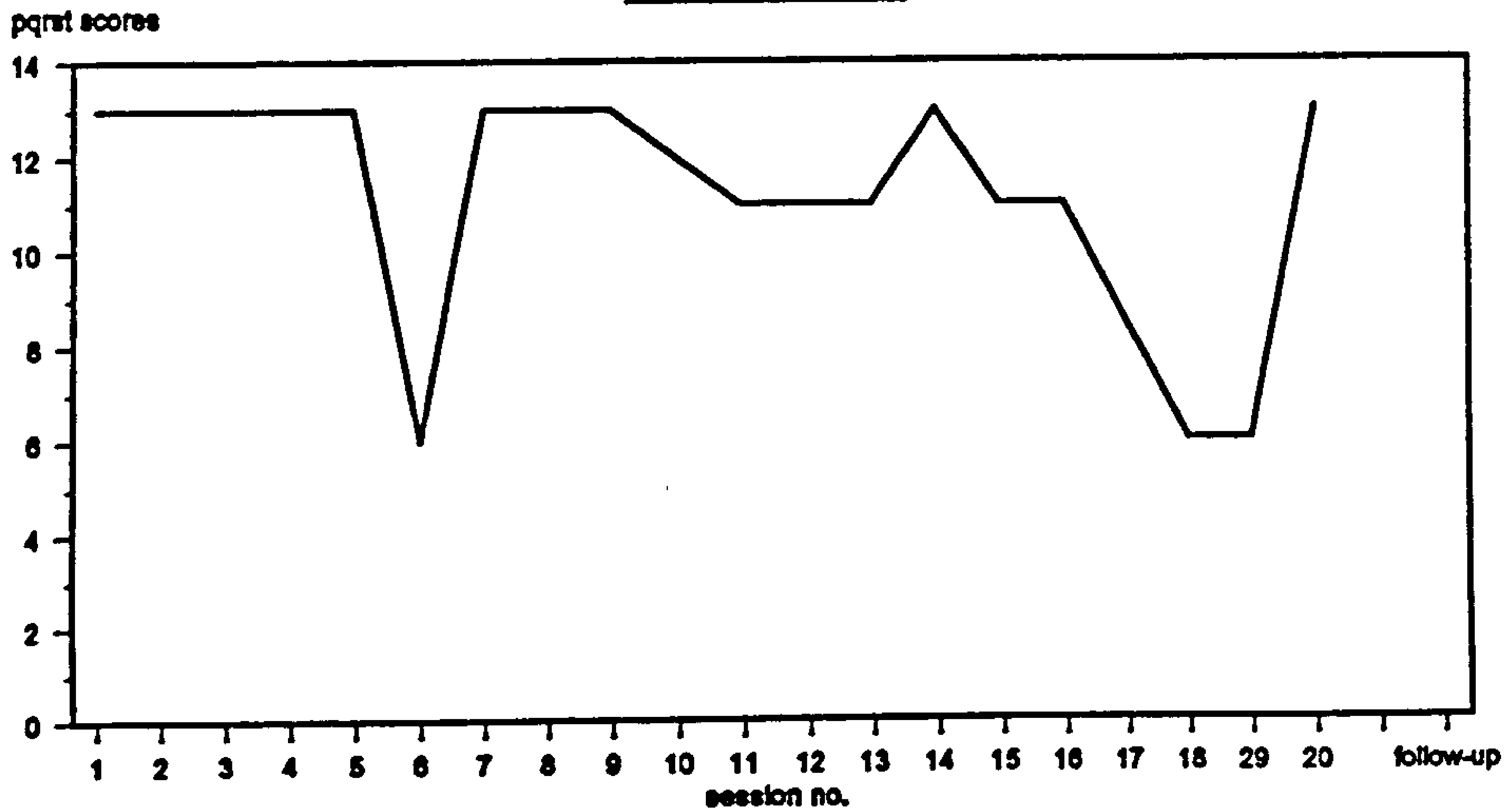


Depression

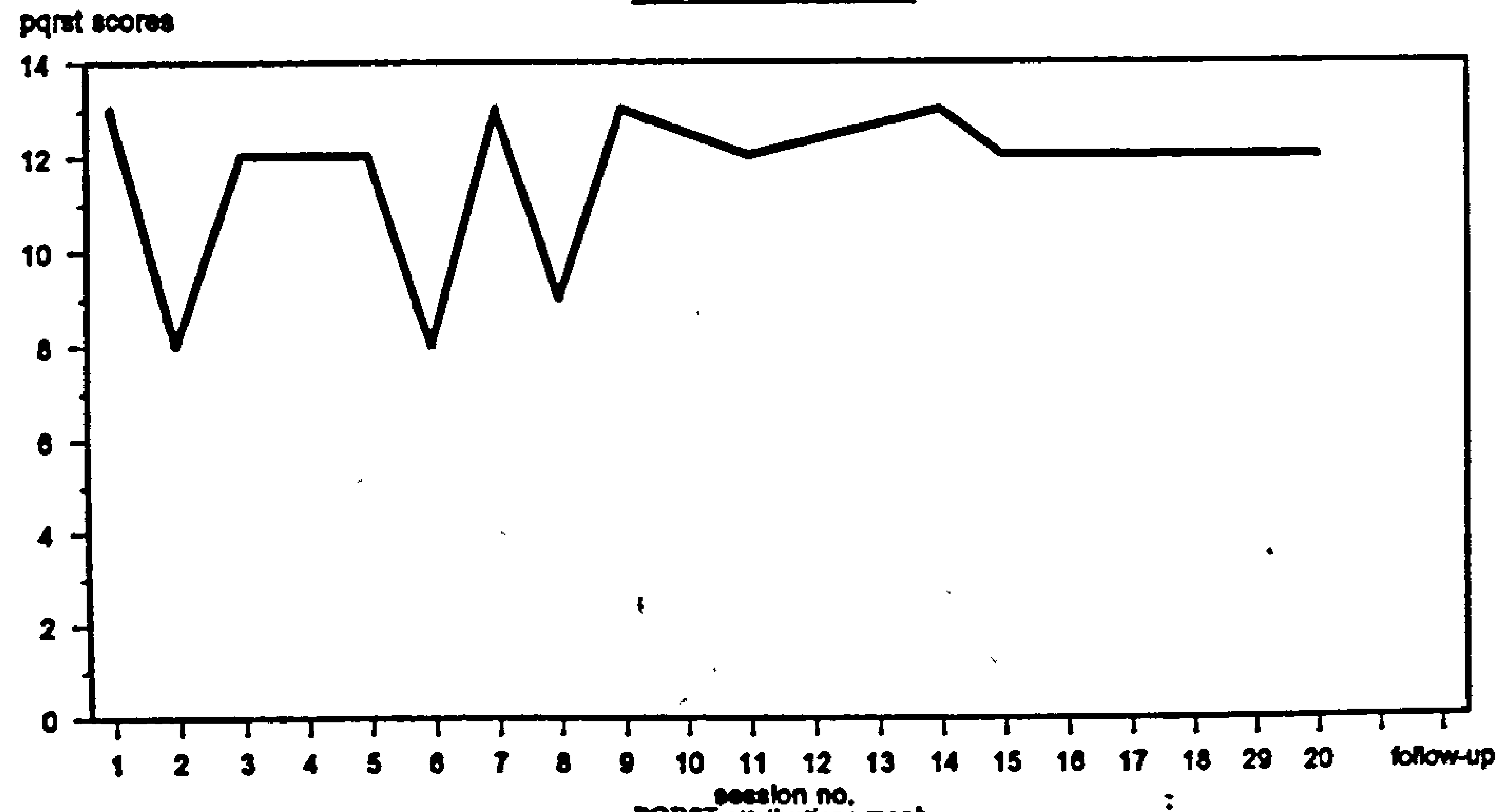


DD: PQRST graphs

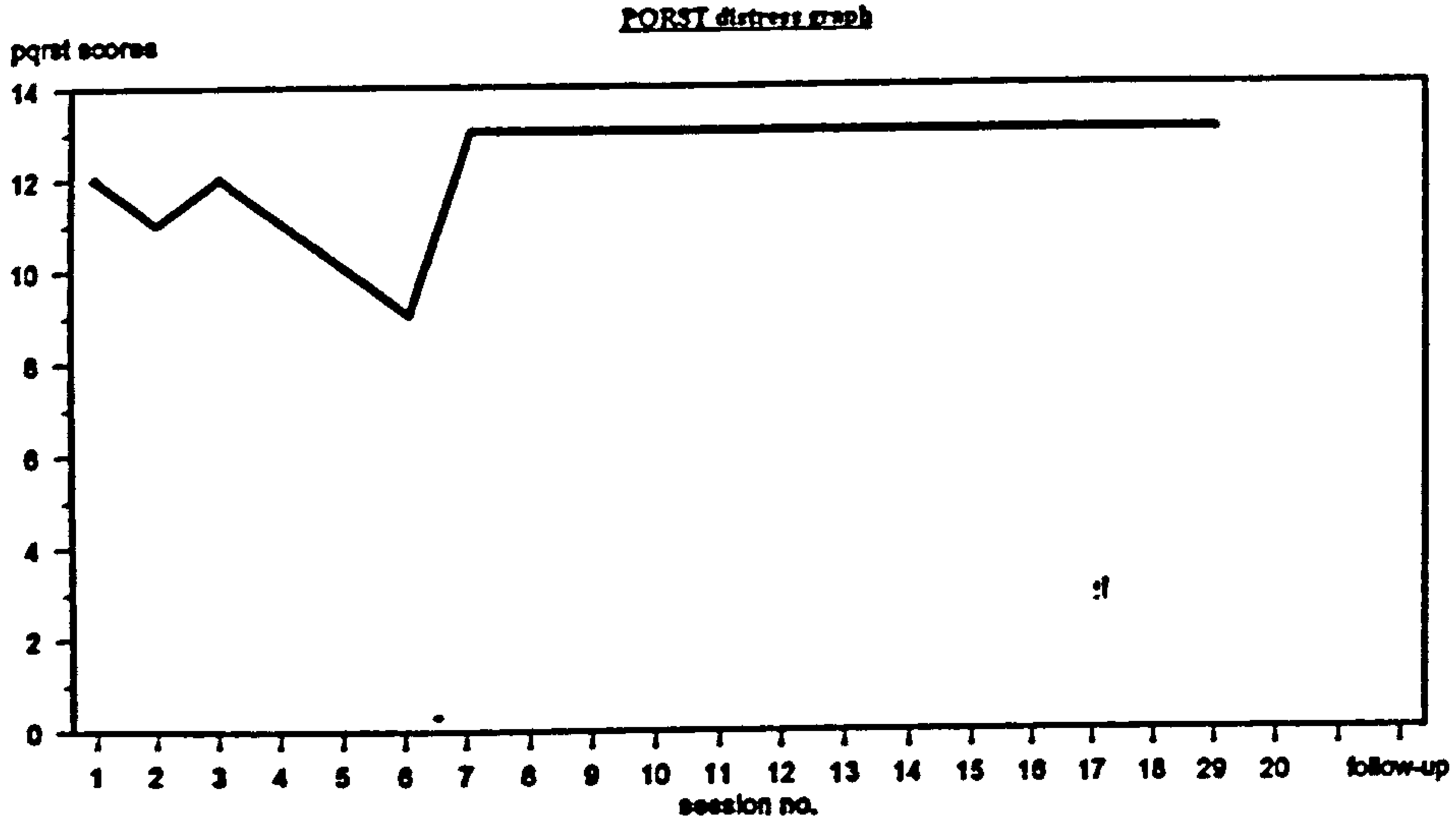
PQRST frequency graph



PQRST disruption graph

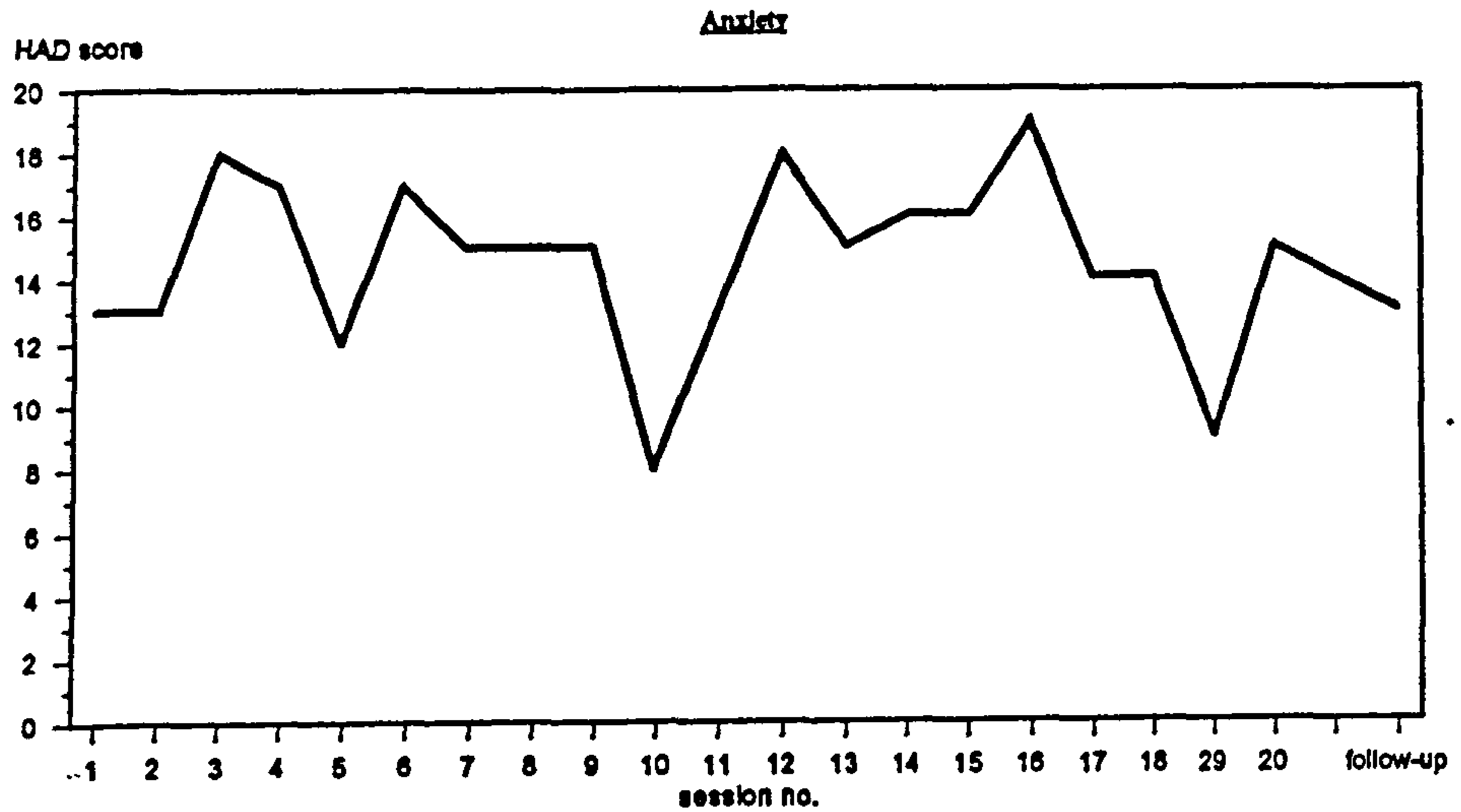


PQRST distress graph



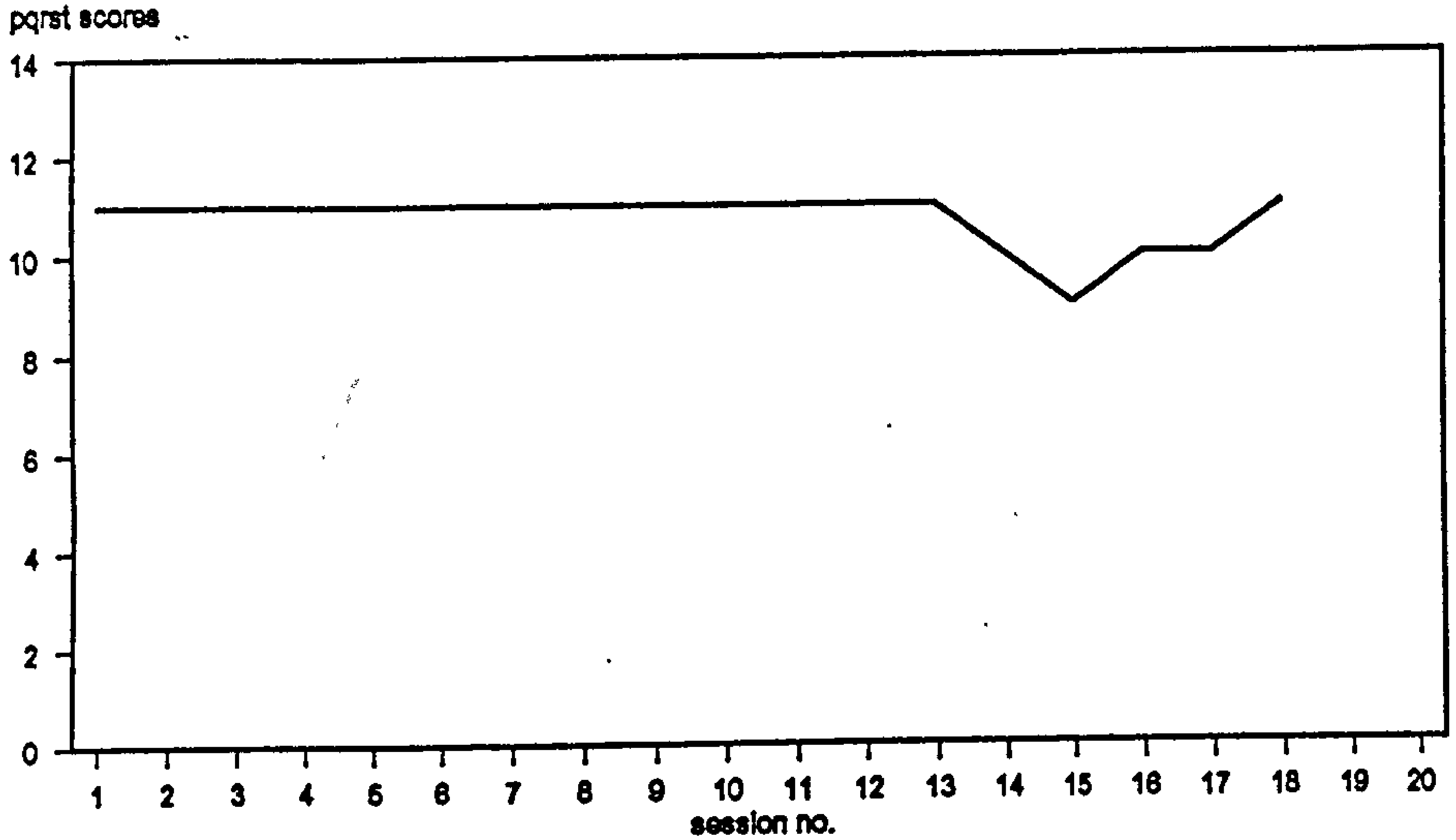
PQRST attributions graph

DD: Anxiety and depression graphs

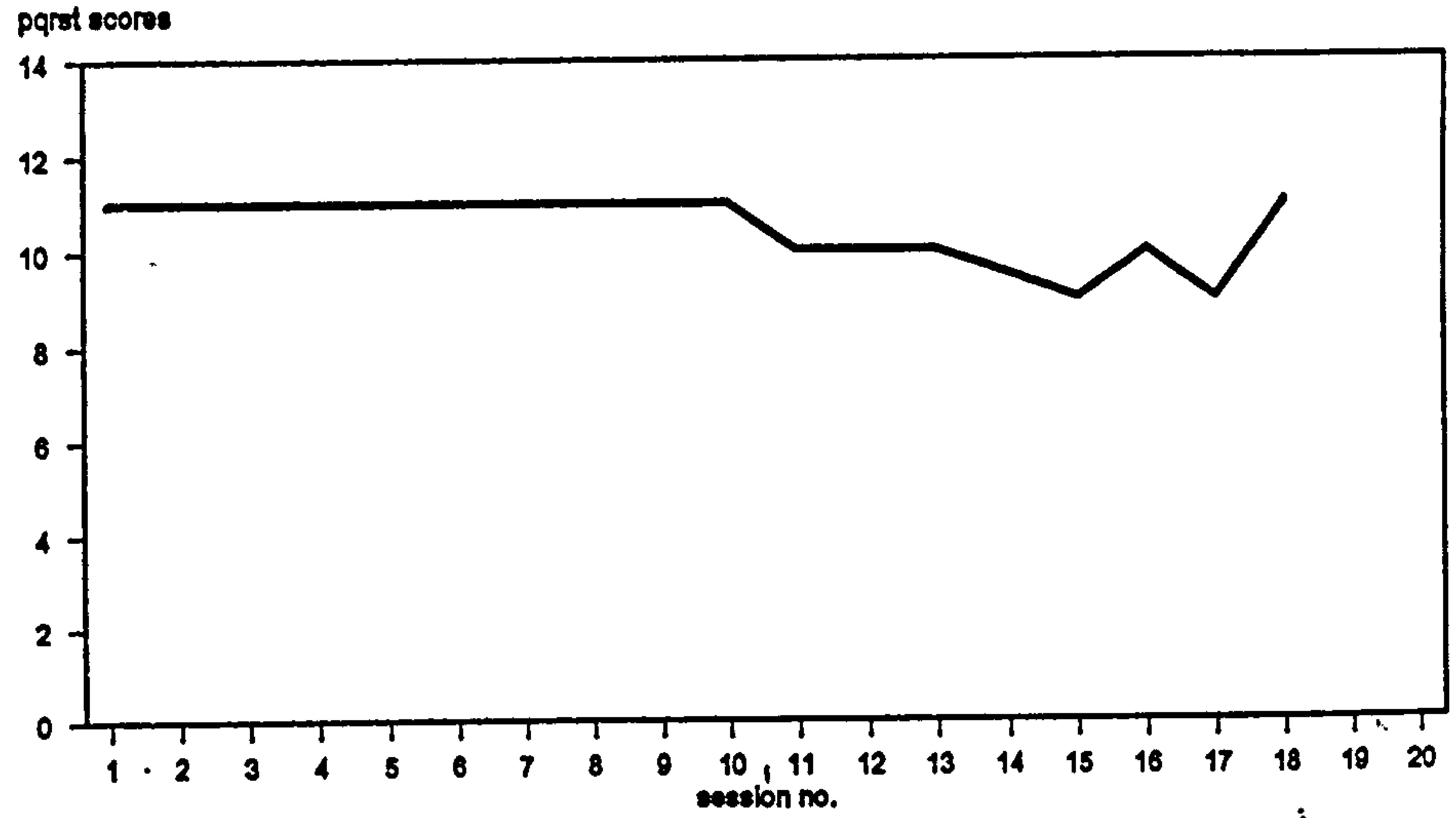


DL: PQRST graphs

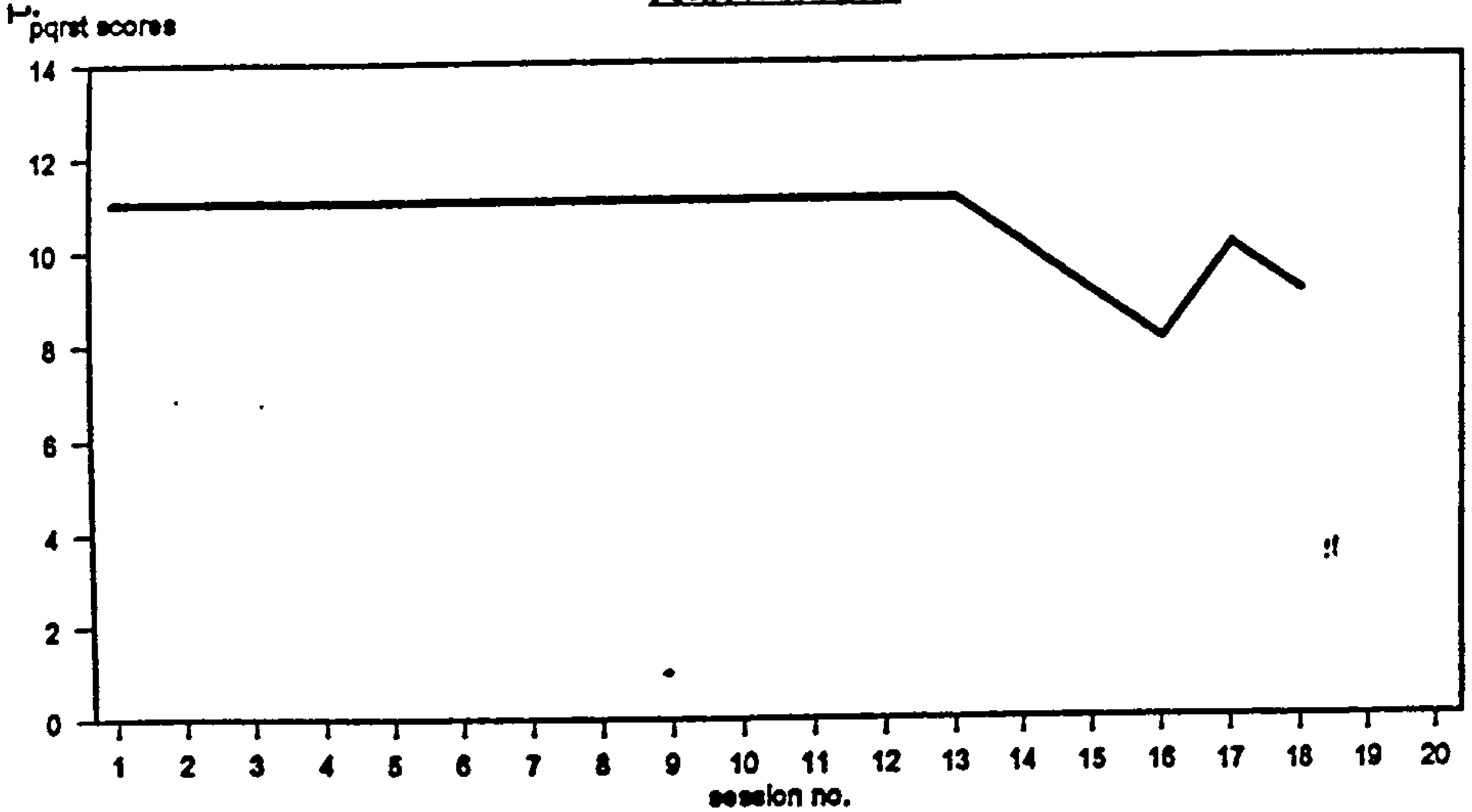
PQRST frequency graph



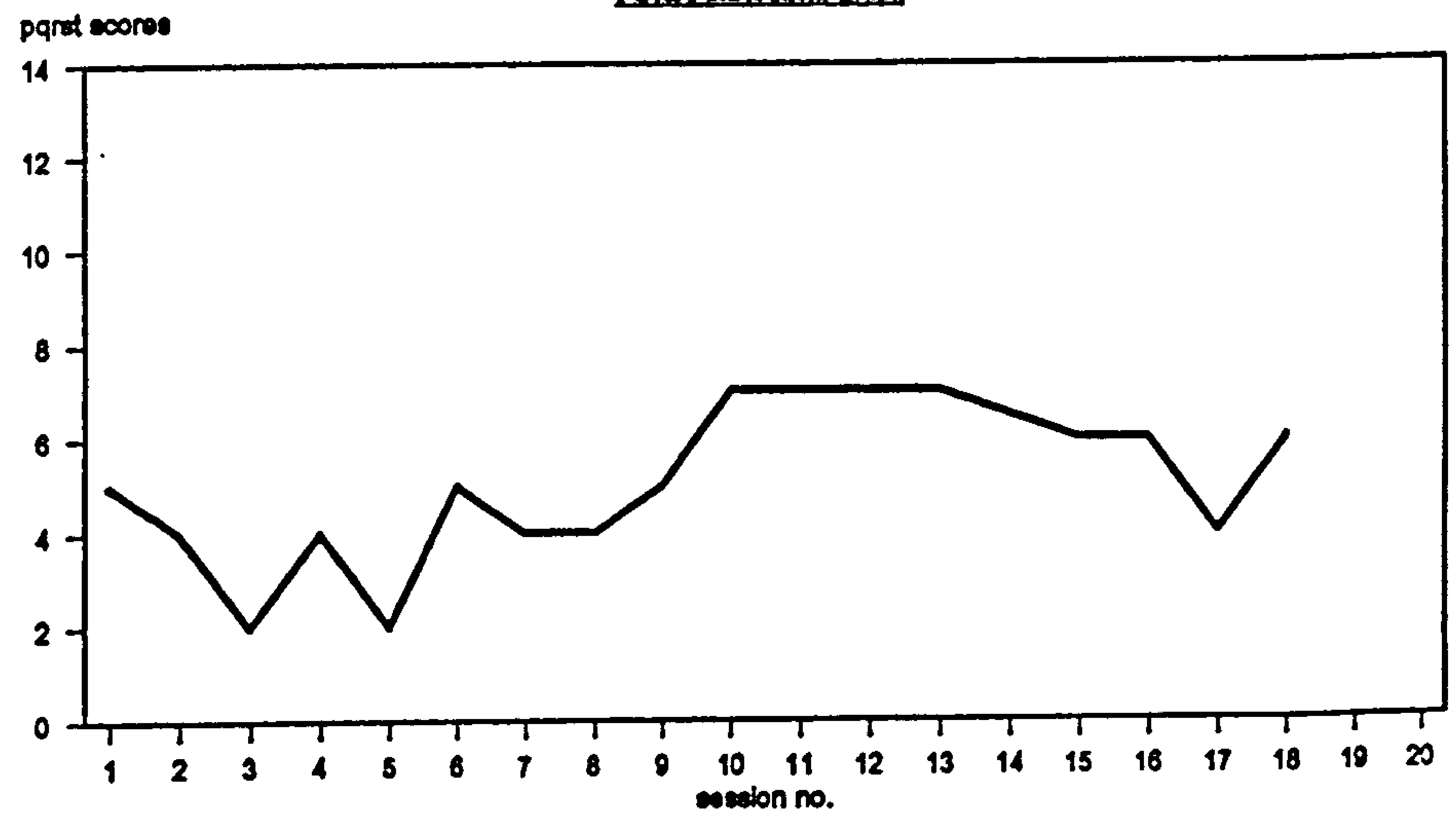
PQRST disruption to life graph



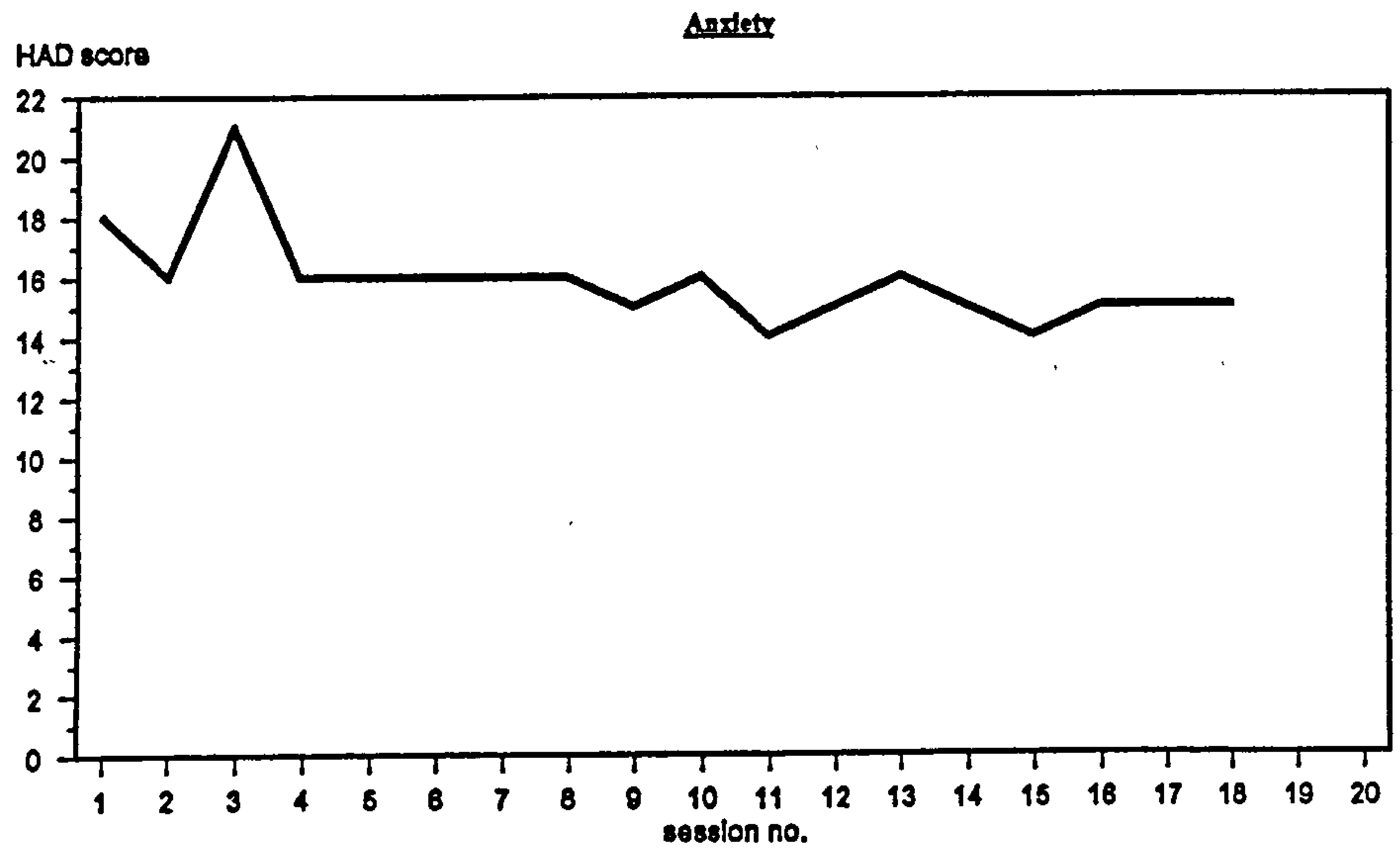
PQRST distress graph

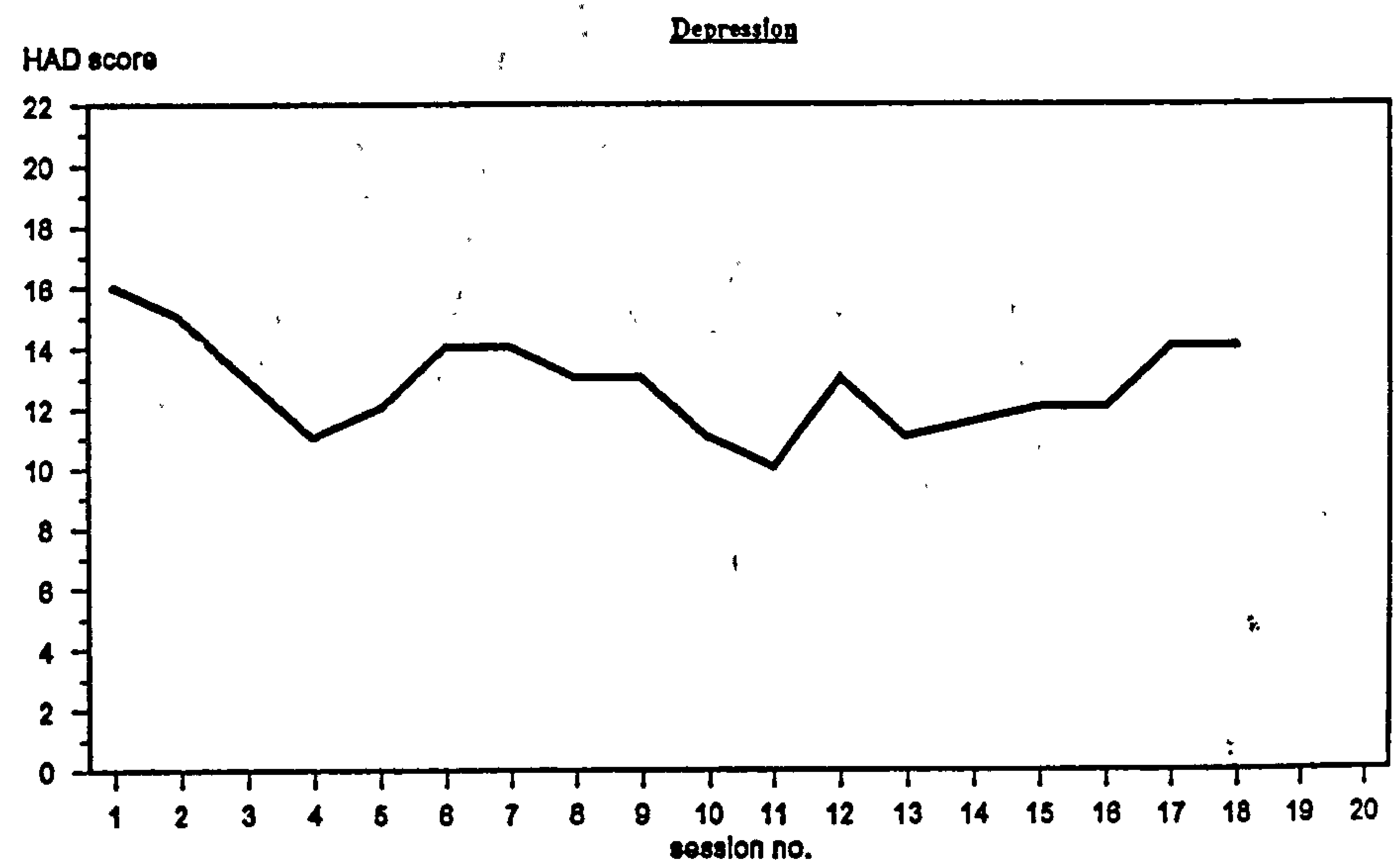


PQRST attributions graph



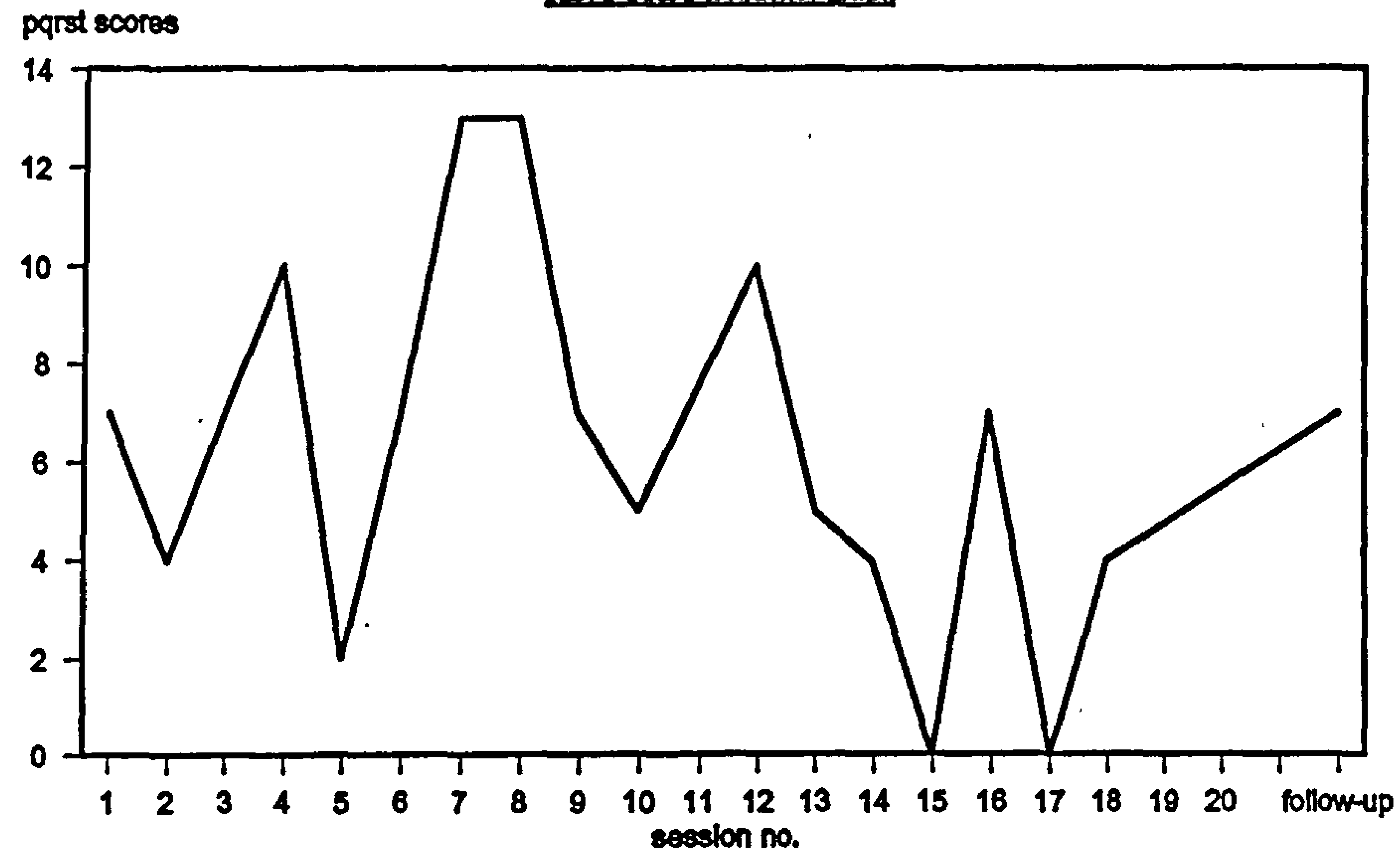
DL: Anxiety and depression graphs



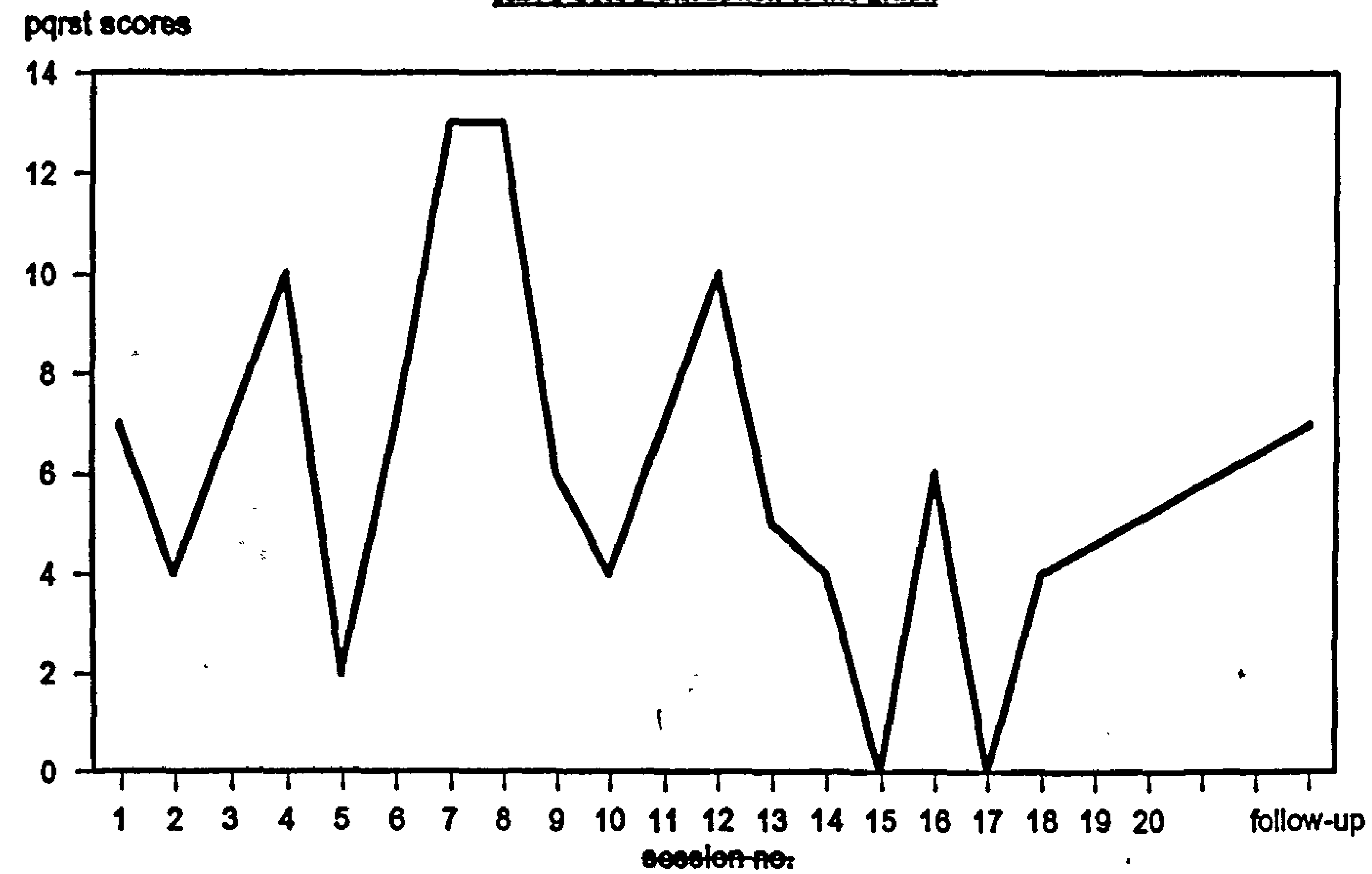


HB: PQRST graphs

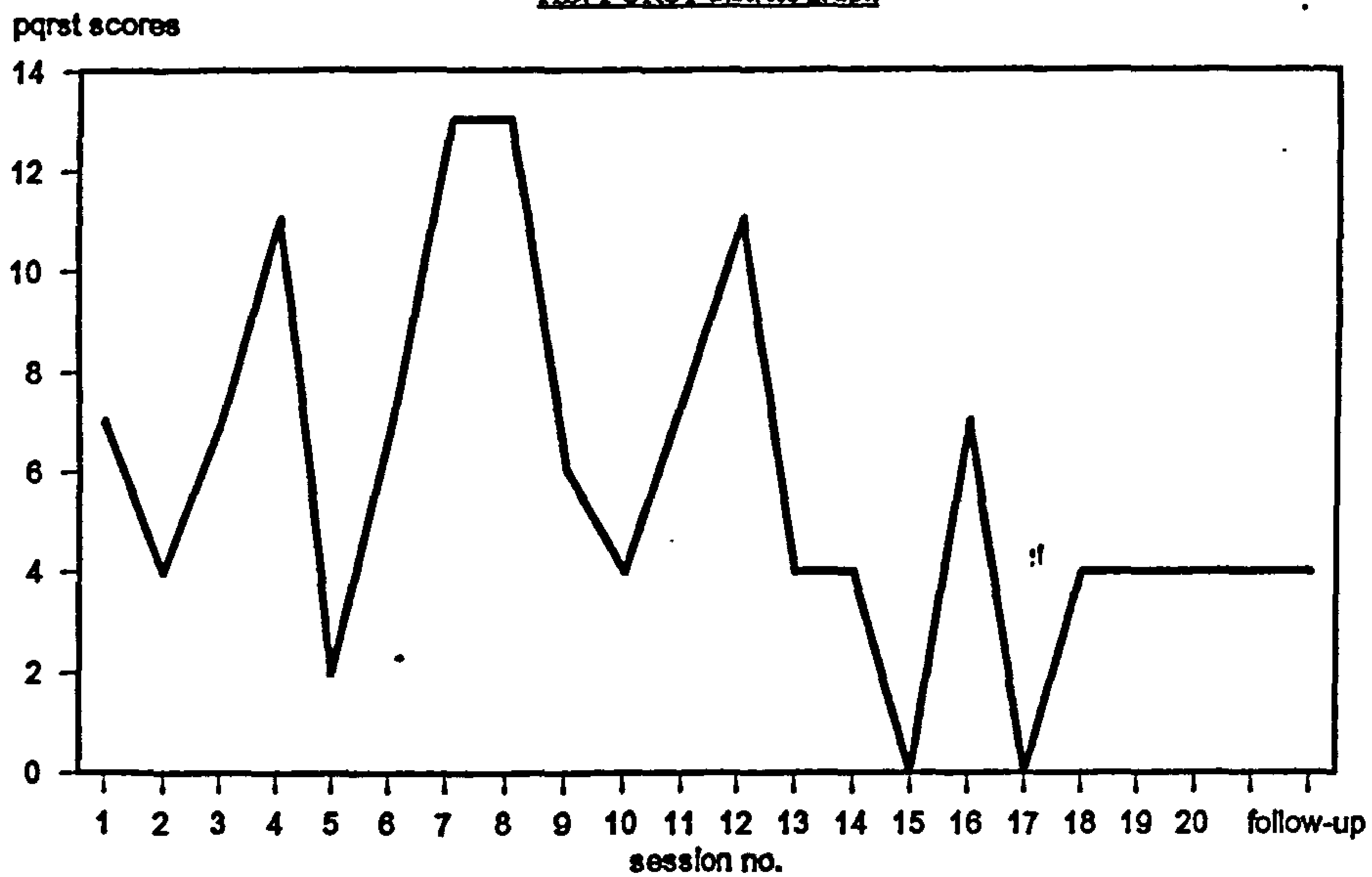
HB: PQRST frequency graph



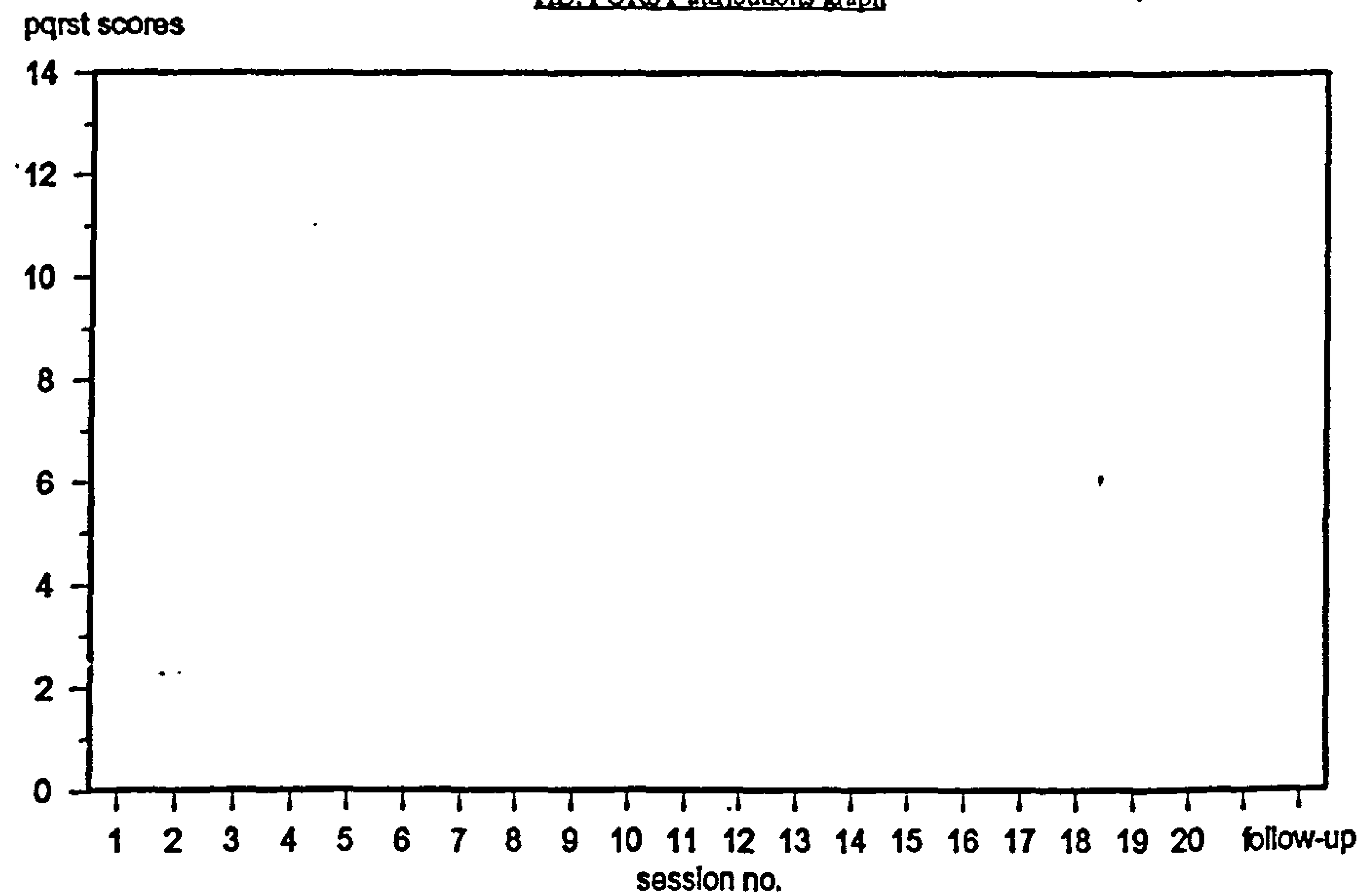
HB: PQRST disruption to life graph



HB: PQRST distress graph

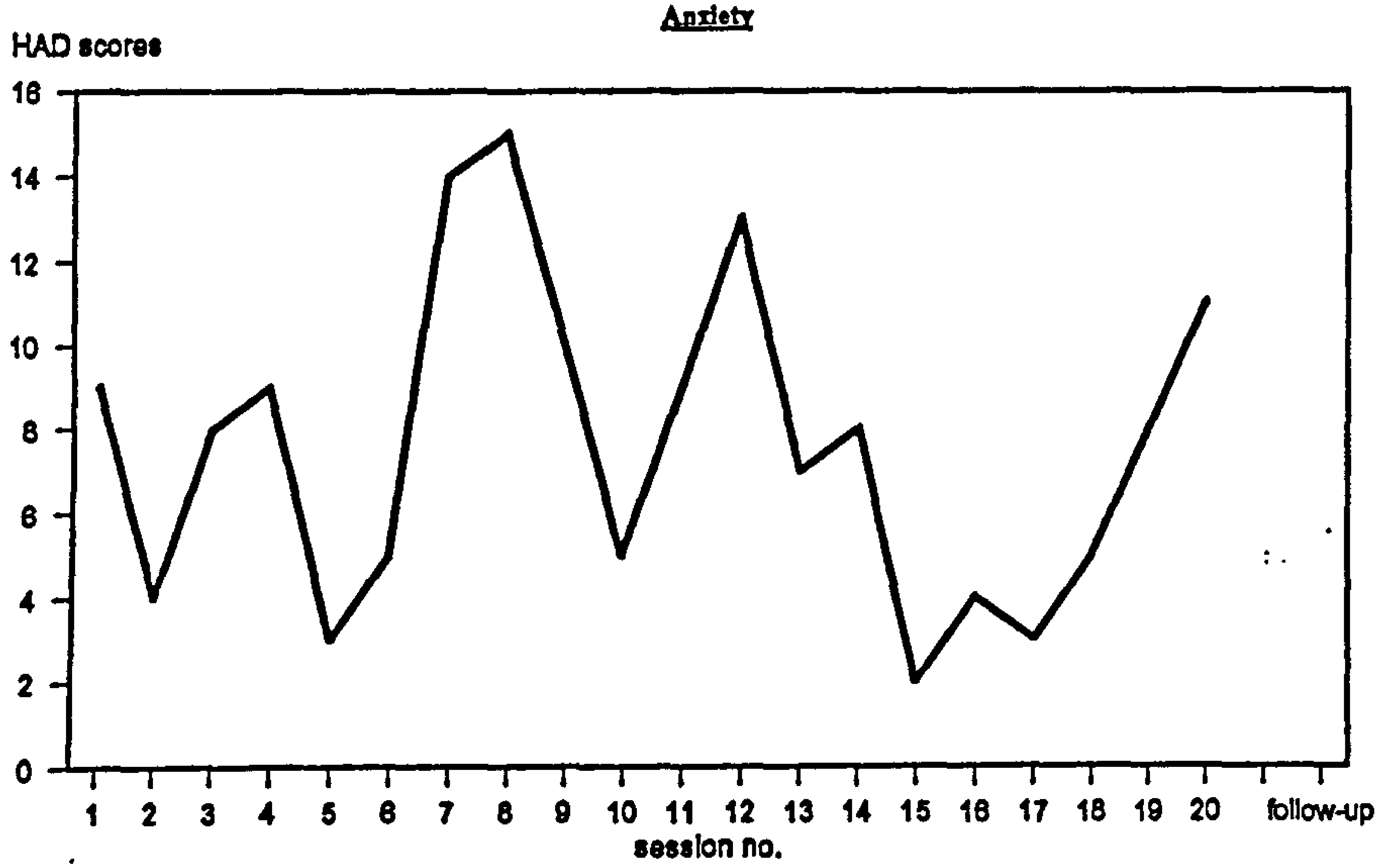


HB: PQRST attributions graph

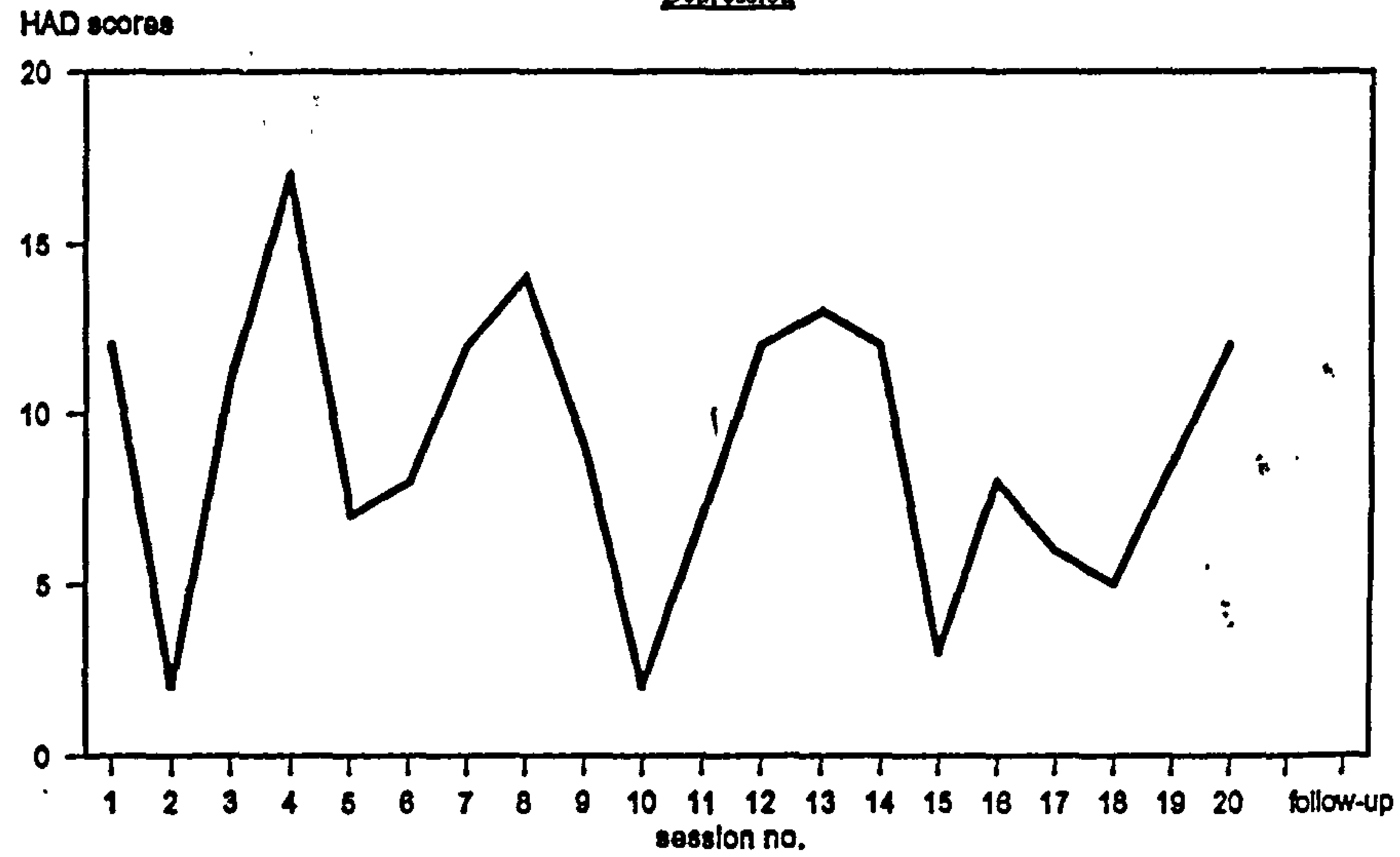


HB: Anxiety and depression graphs

Anxiety

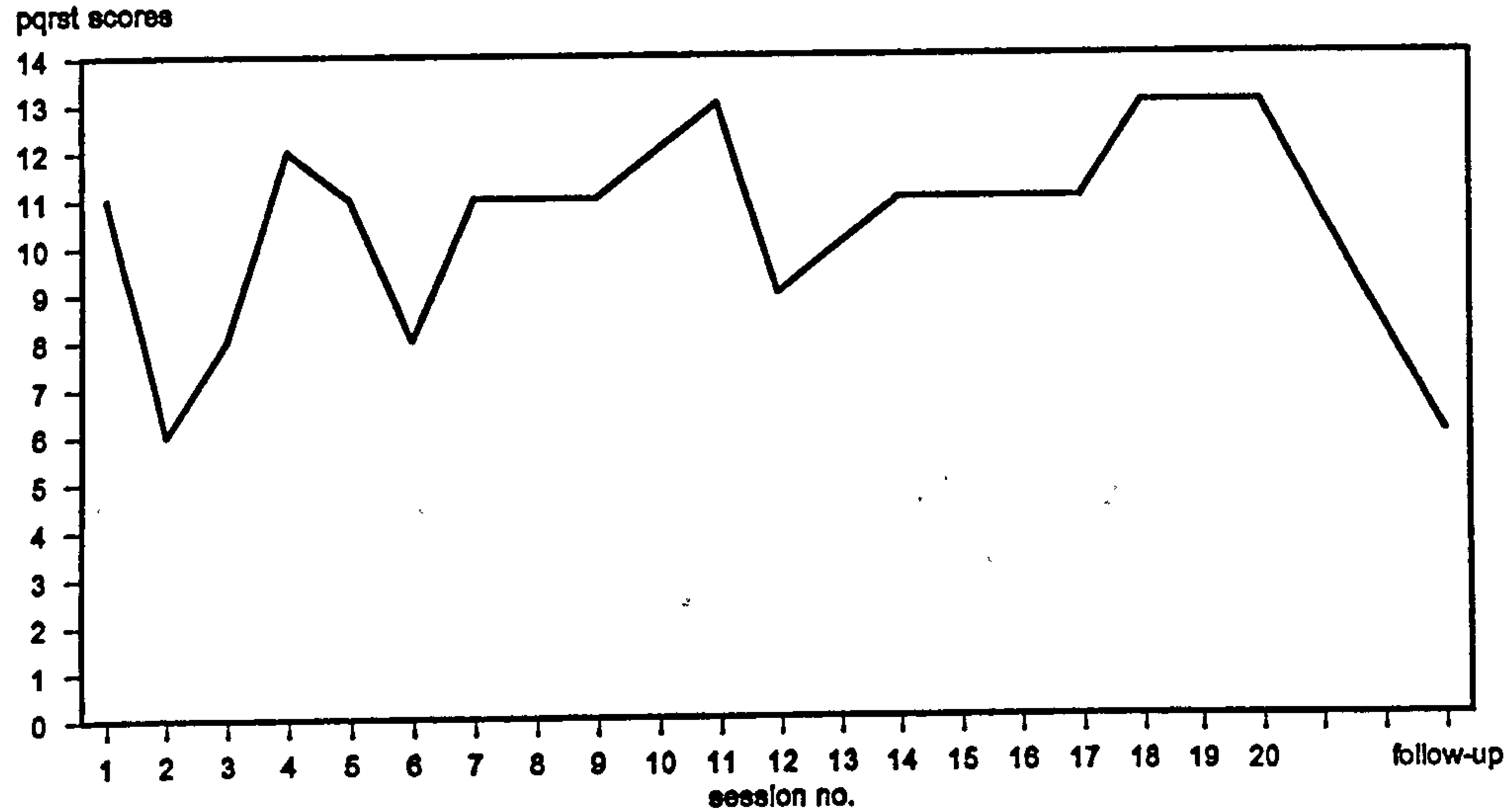


Depression

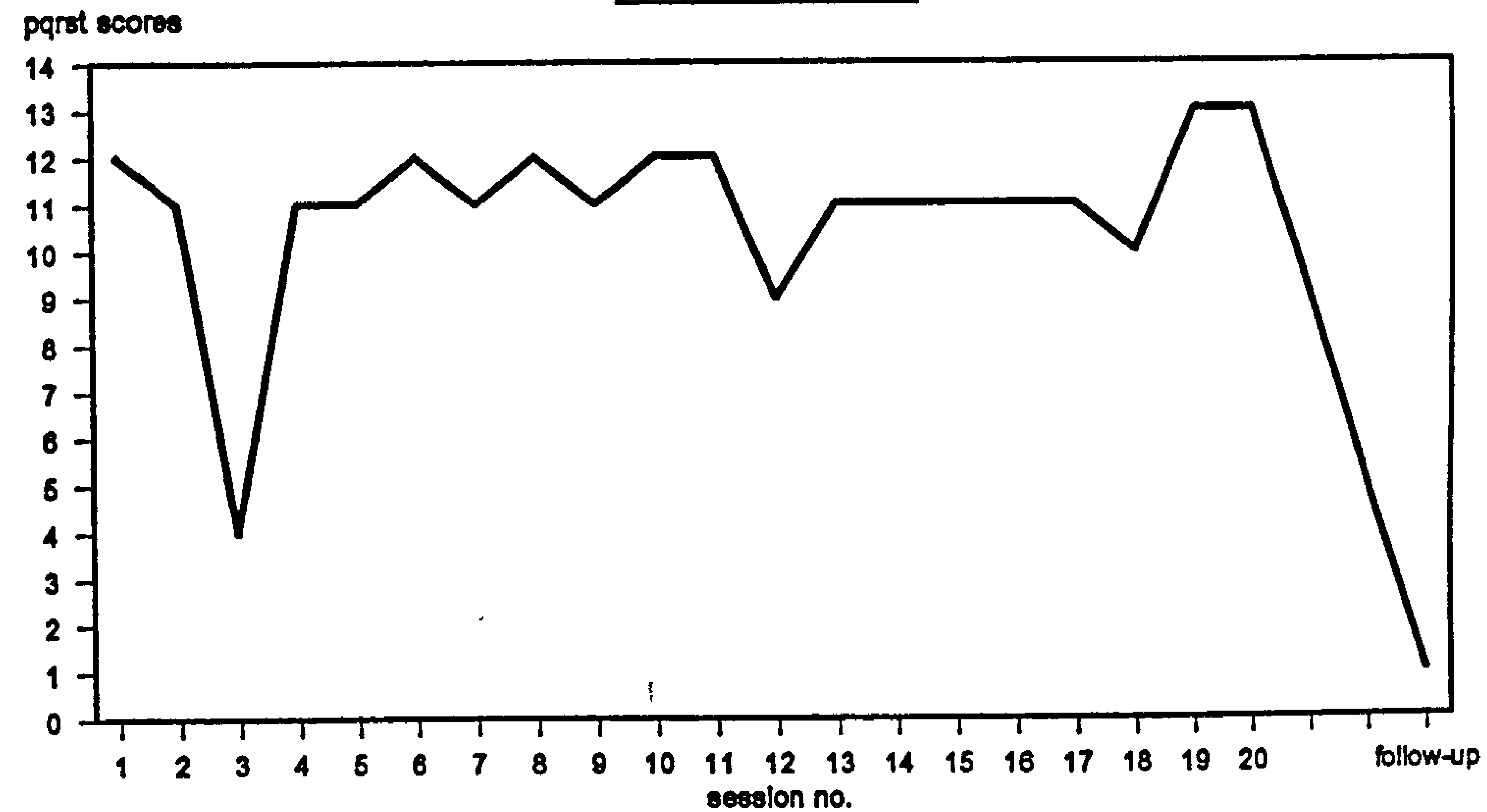


HW: PQRST graphs

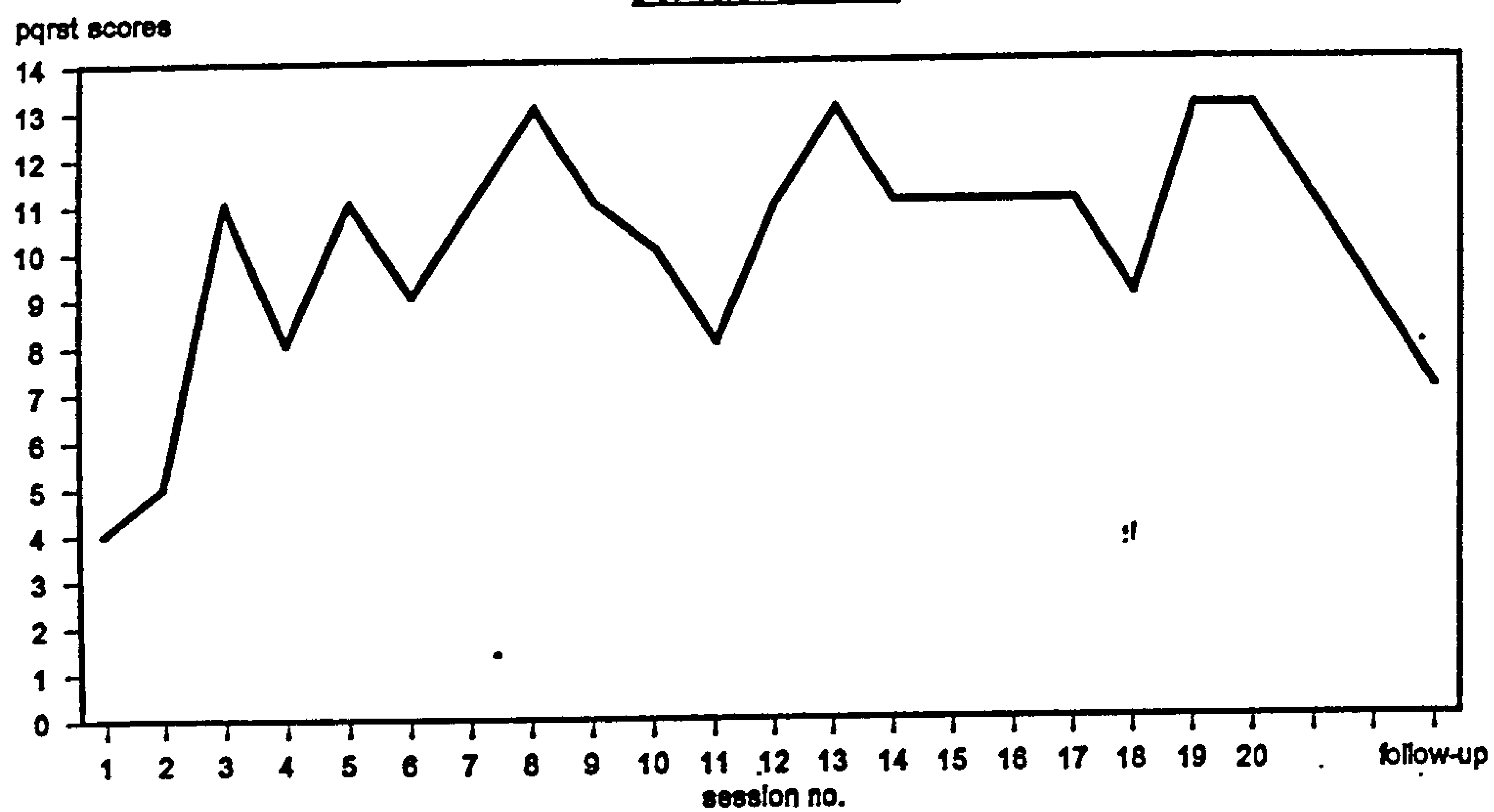
PQRST: frequency graph



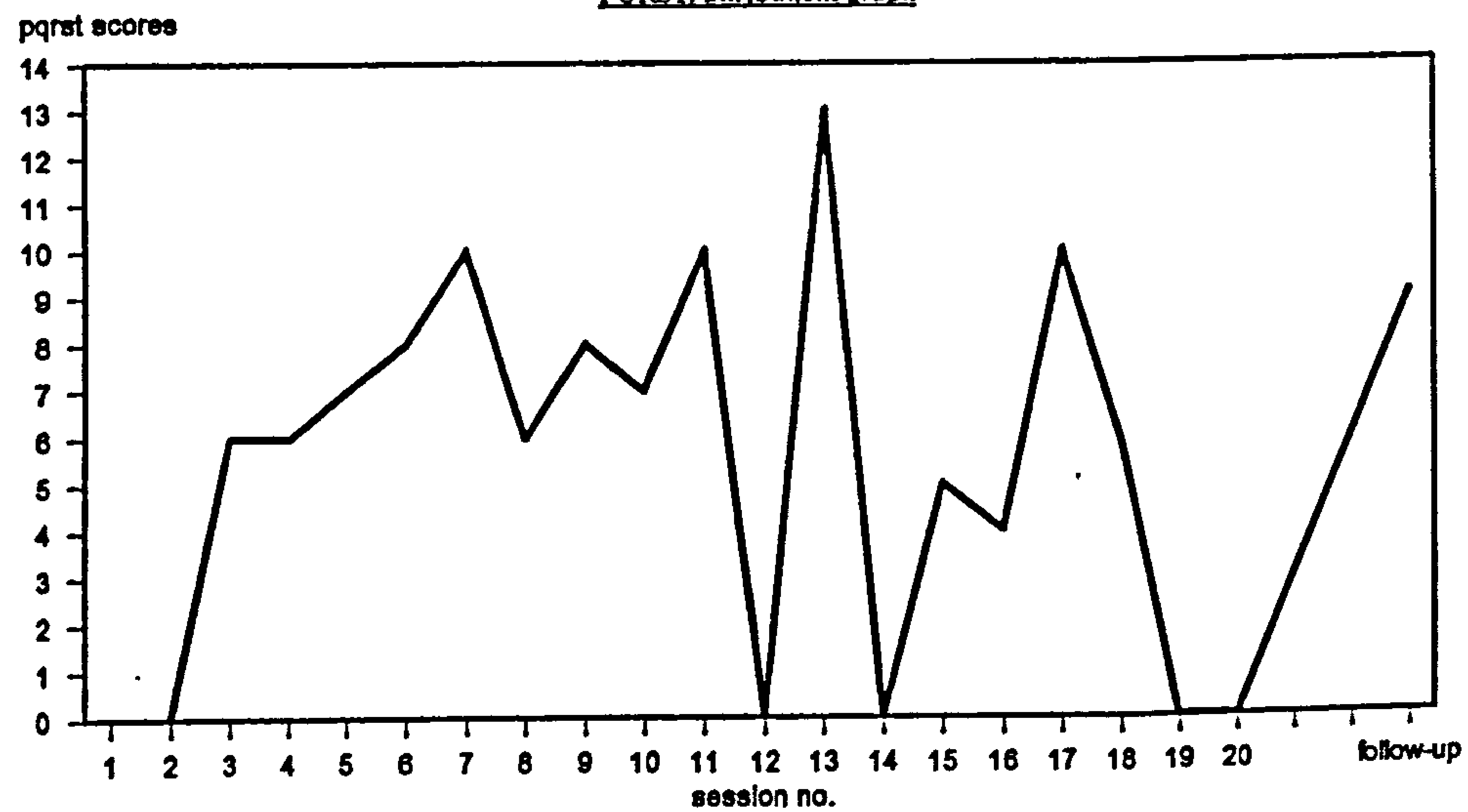
PQRST: disruption graph



PQRST: distress graph

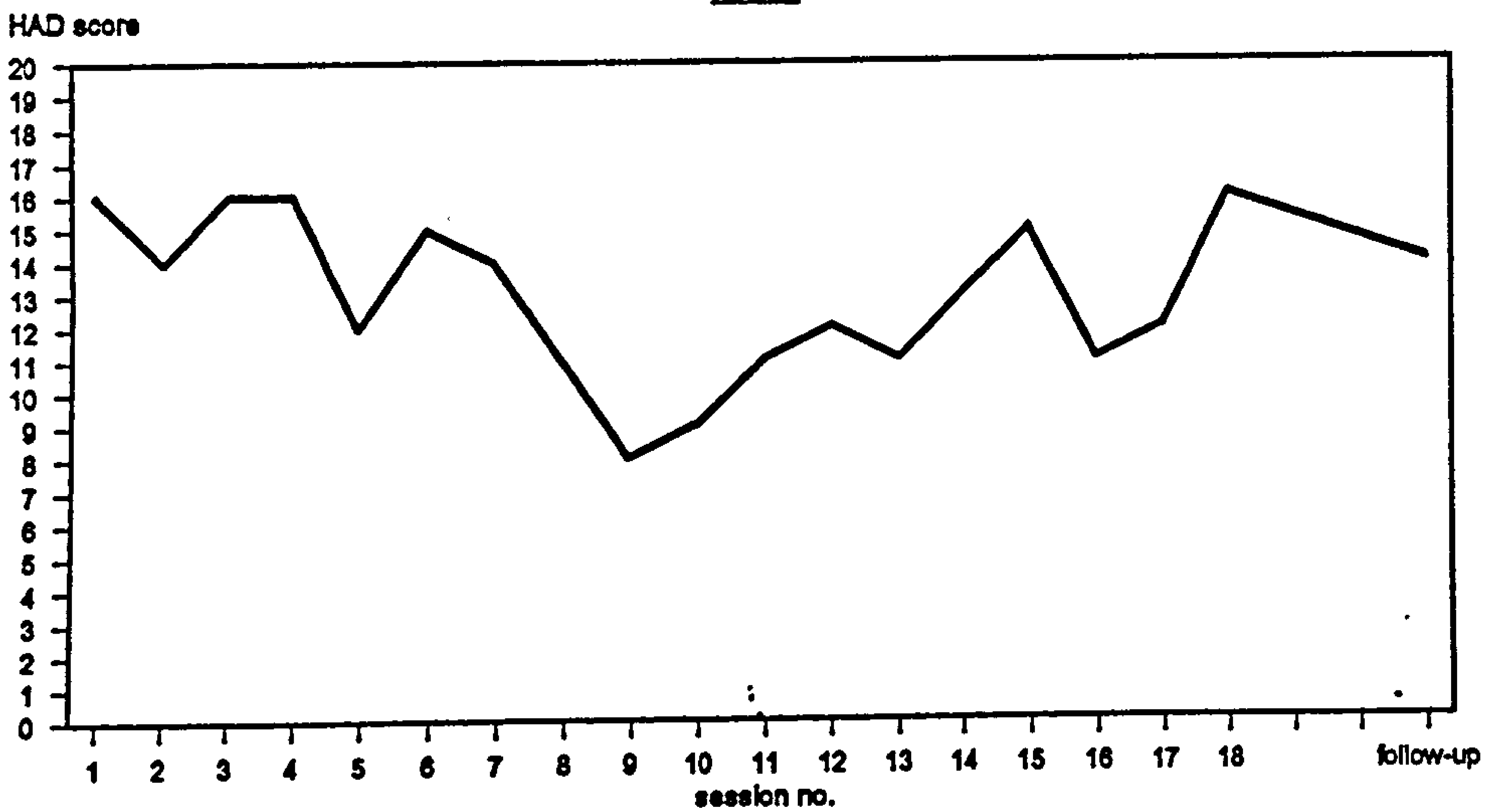


PQRST: attributions graph

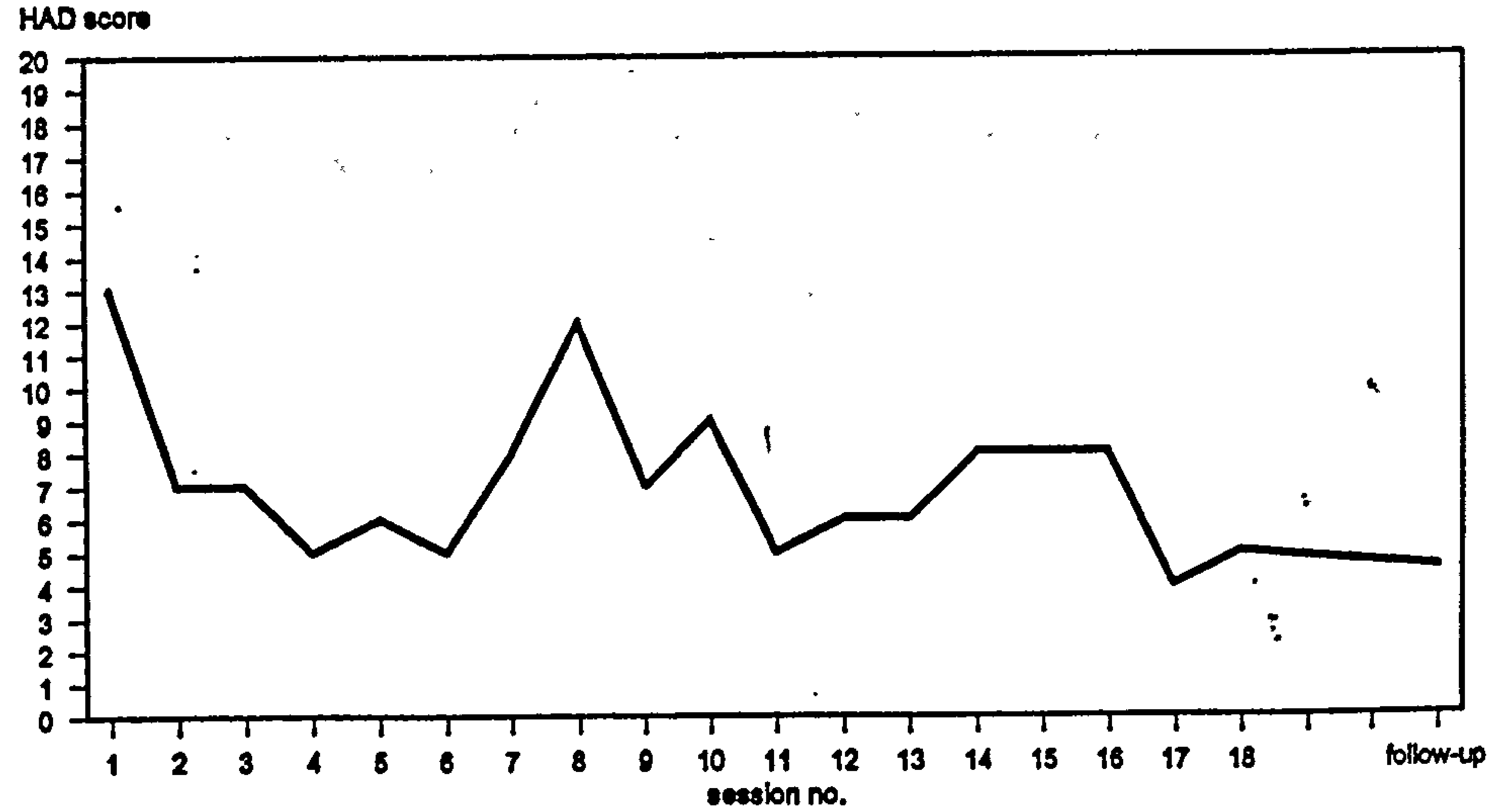


HW: Anxiety and depression graphs

Anxiety

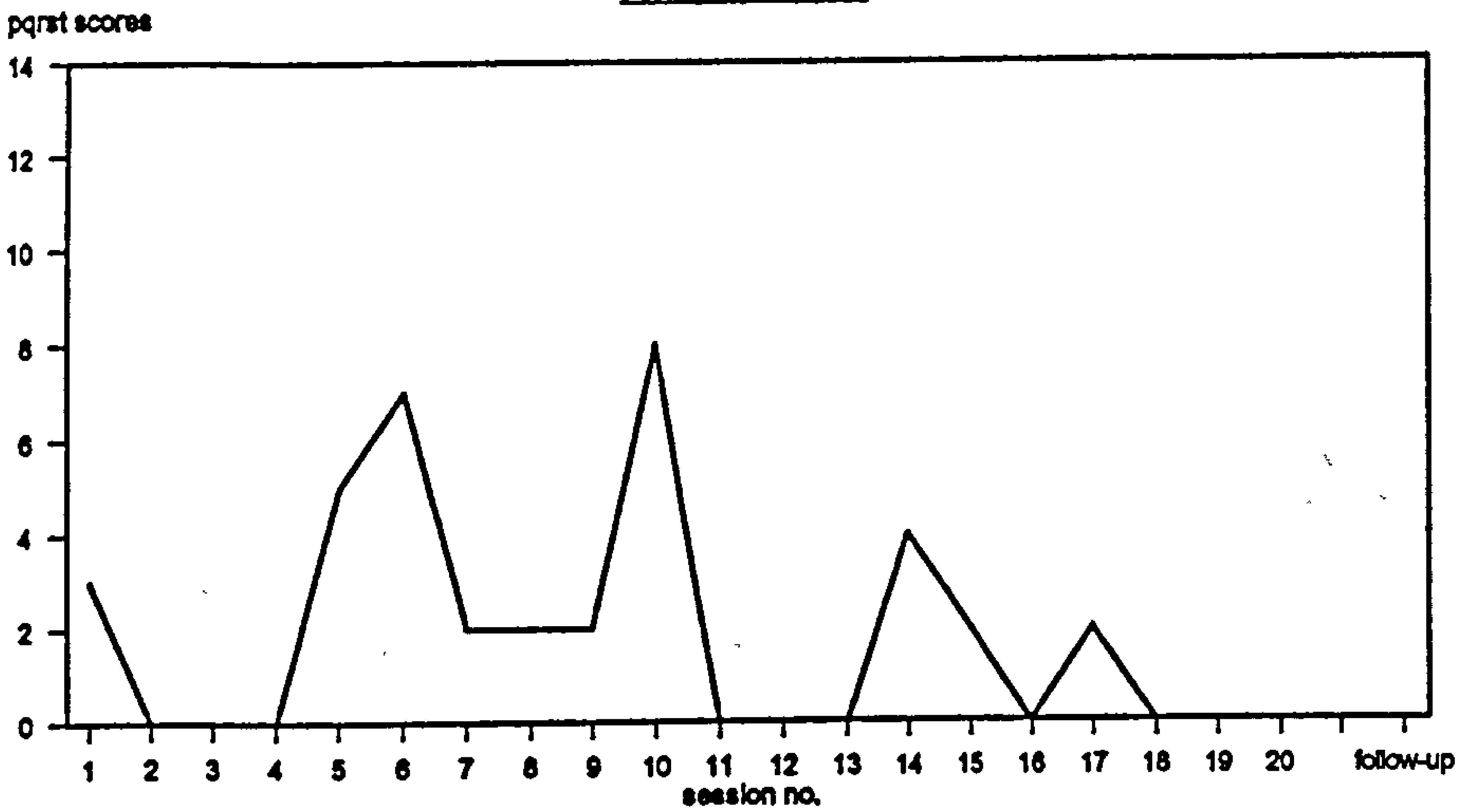


Depression

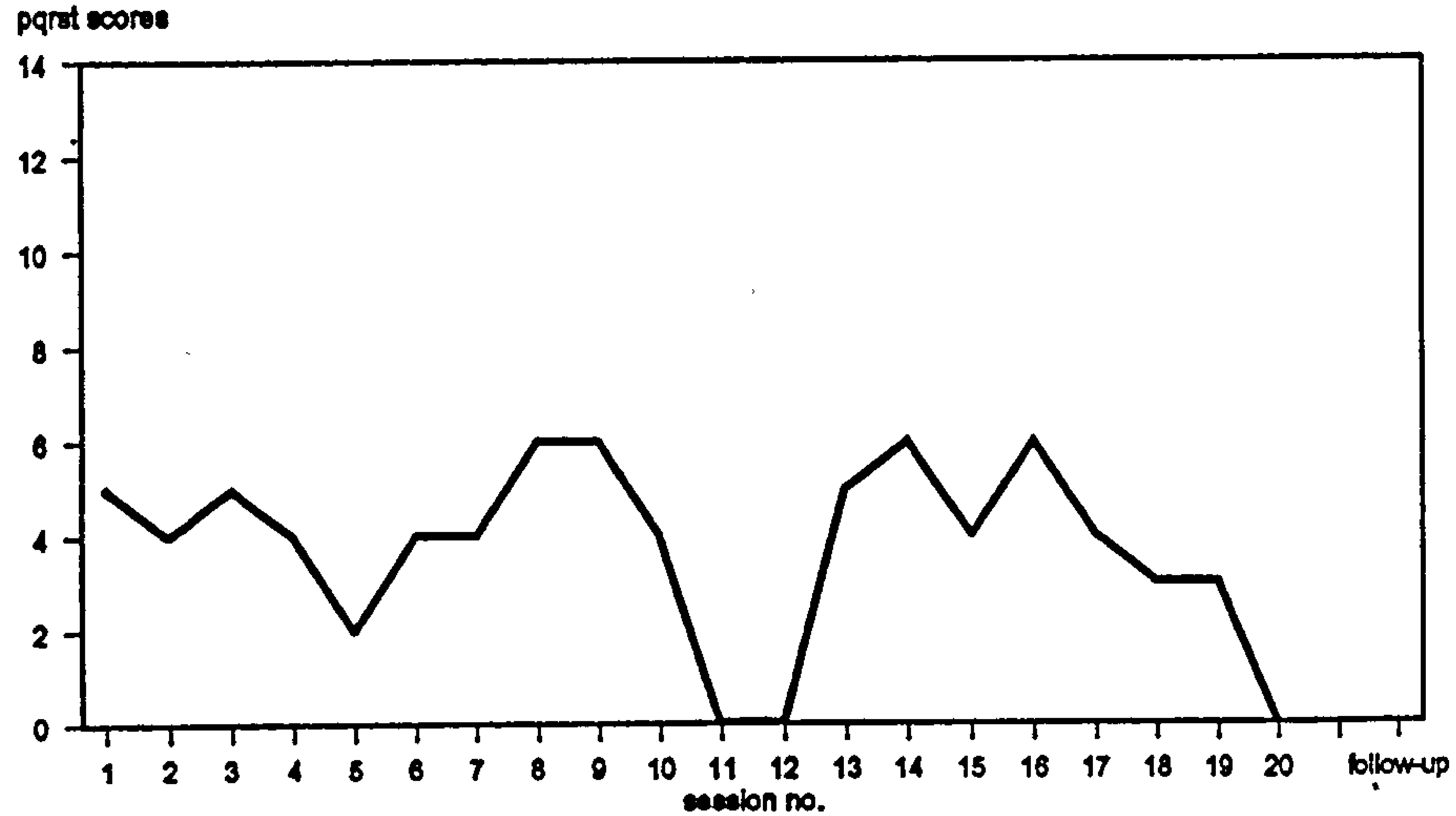


JH: PQRST graphs

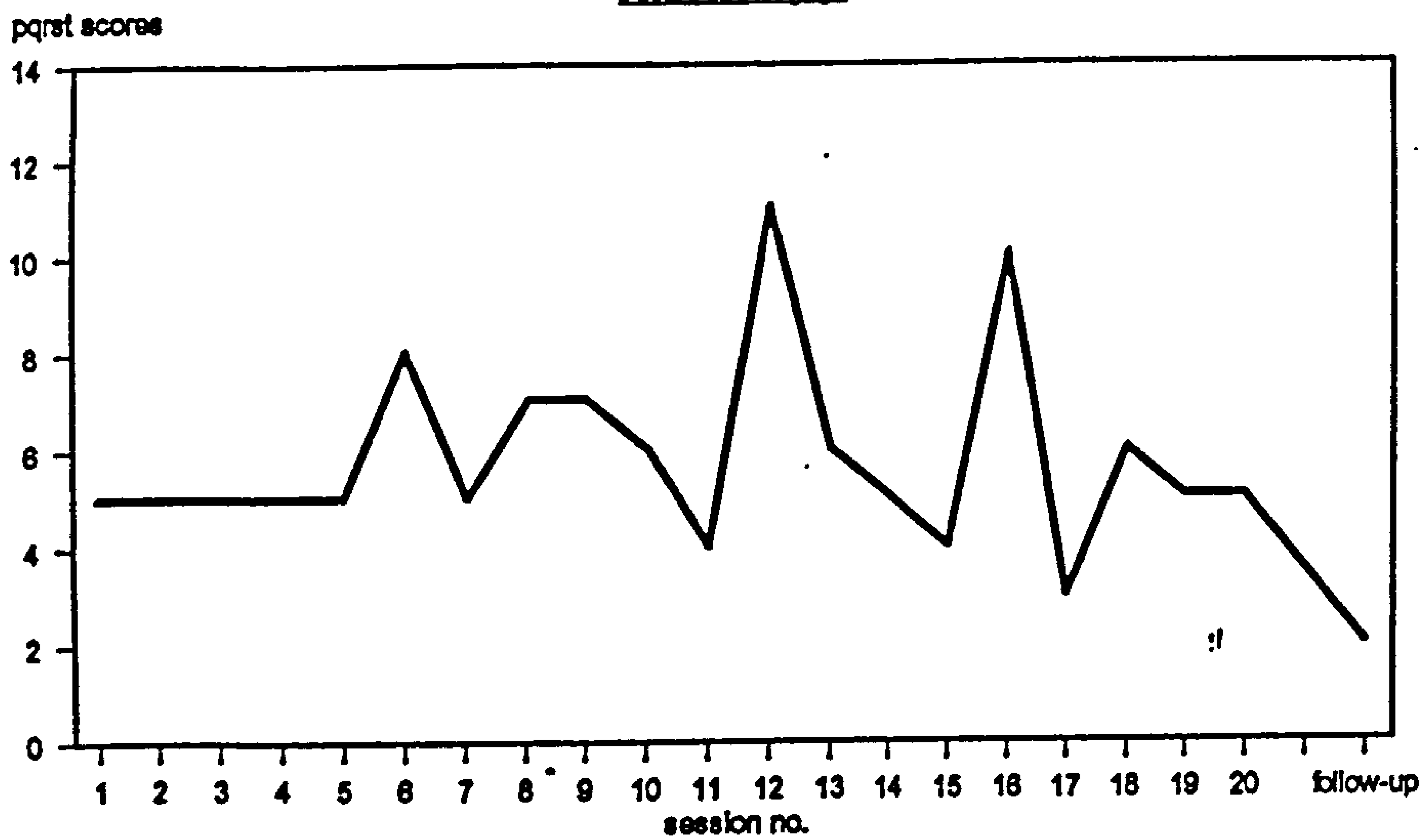
PQRST frequency graph



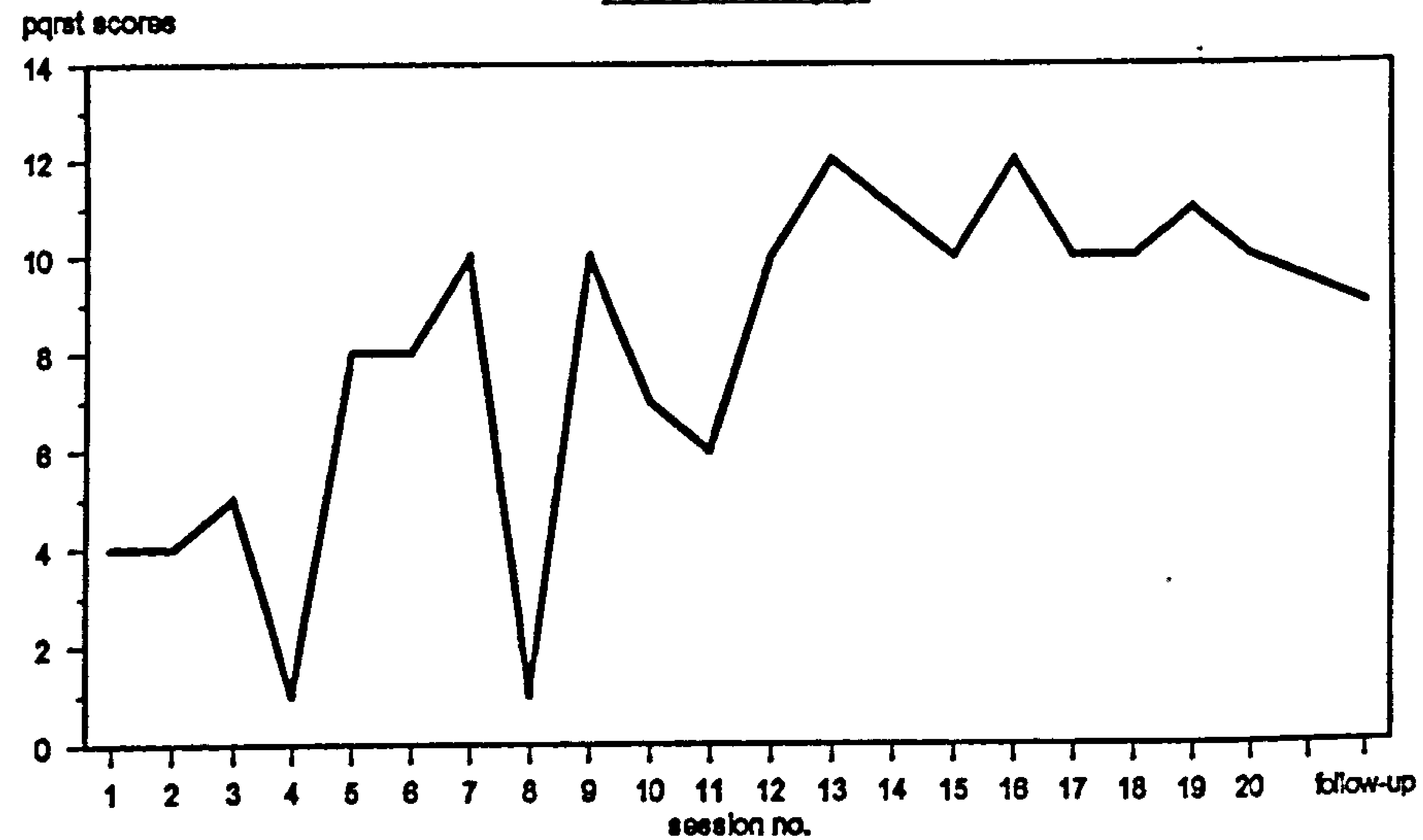
PQRST disruption to life graph



PQRST distress graph

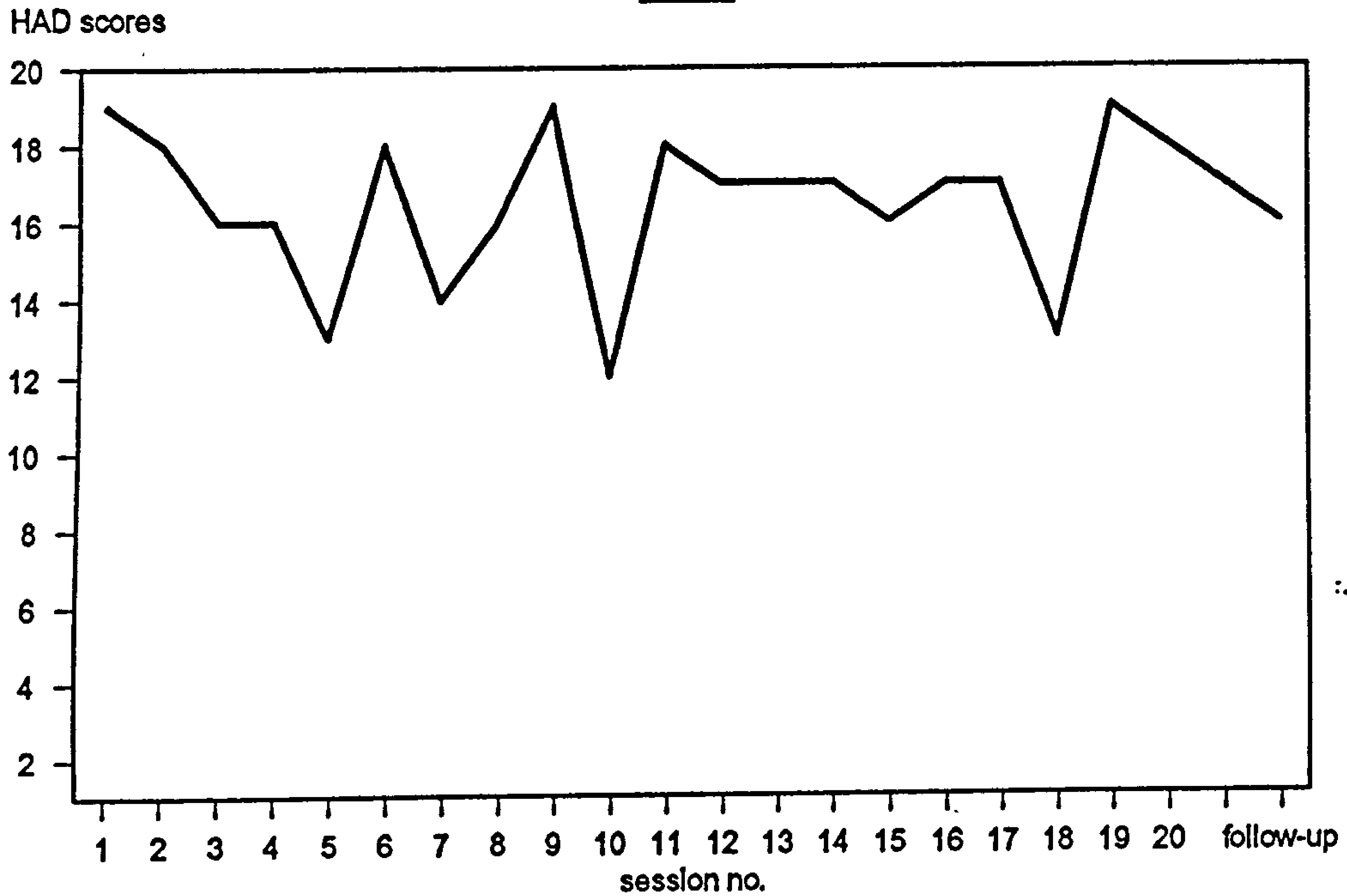


PQRST attributions graph

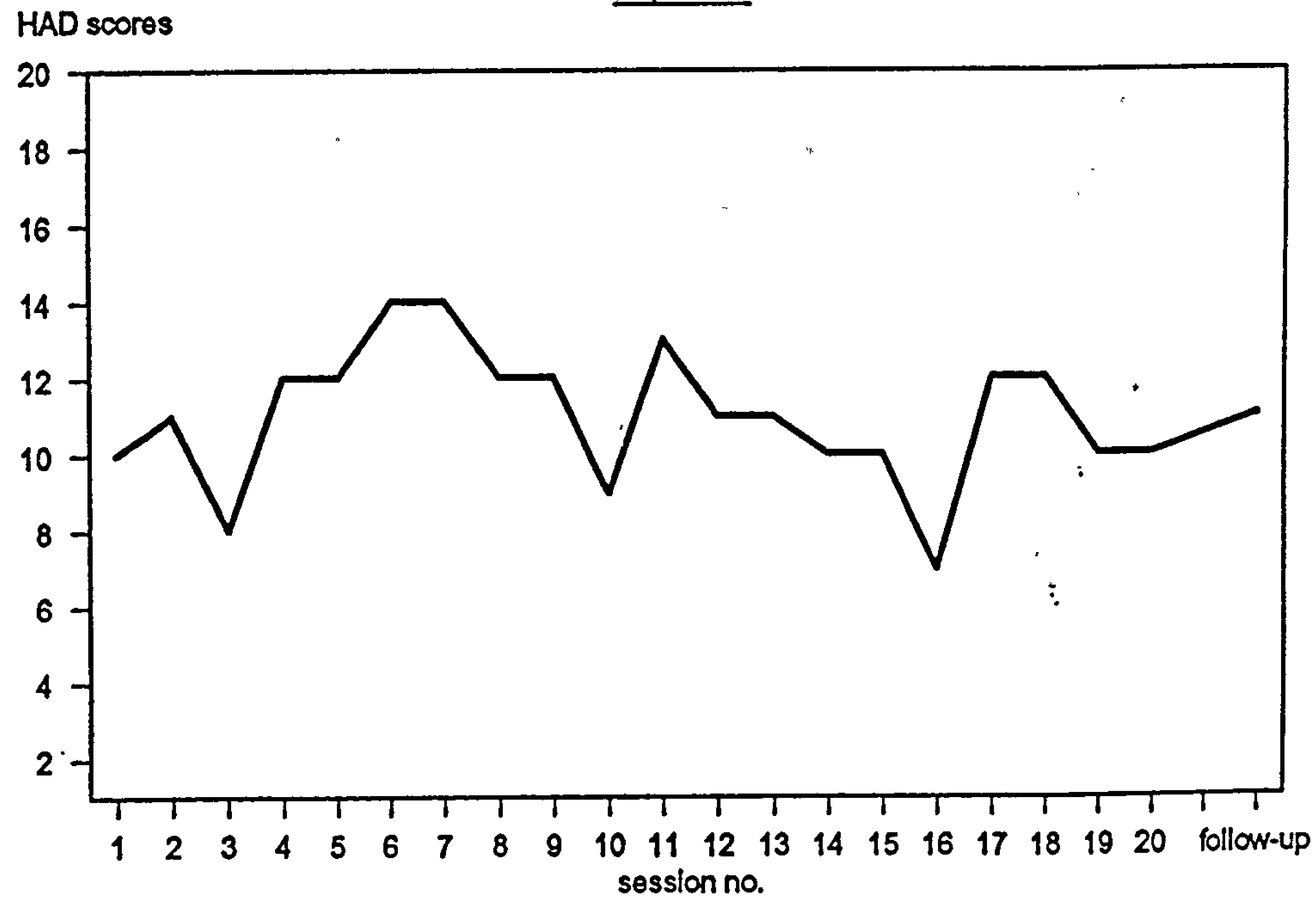


JH: Anxiety and depression graphs

Anxiety

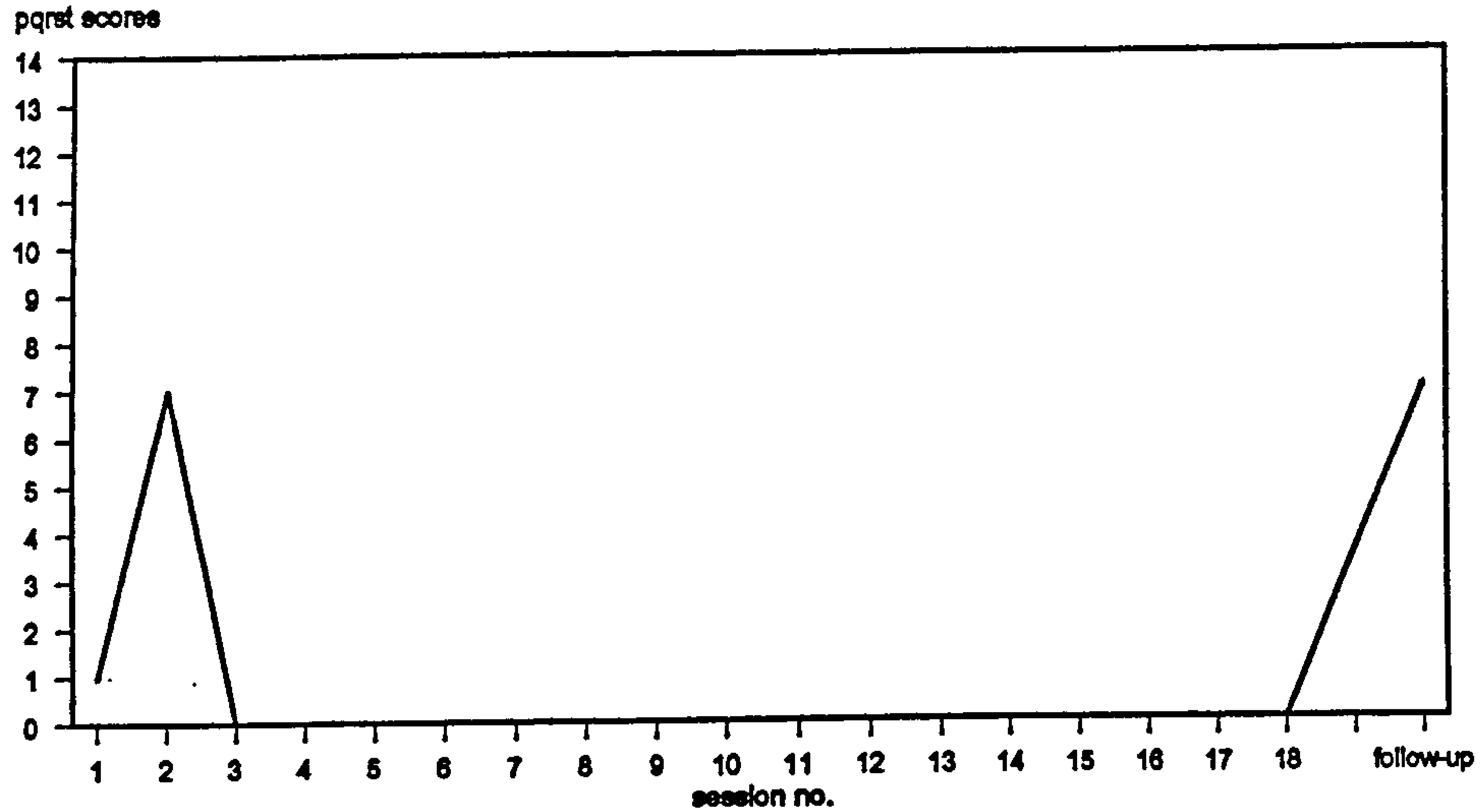


Depression

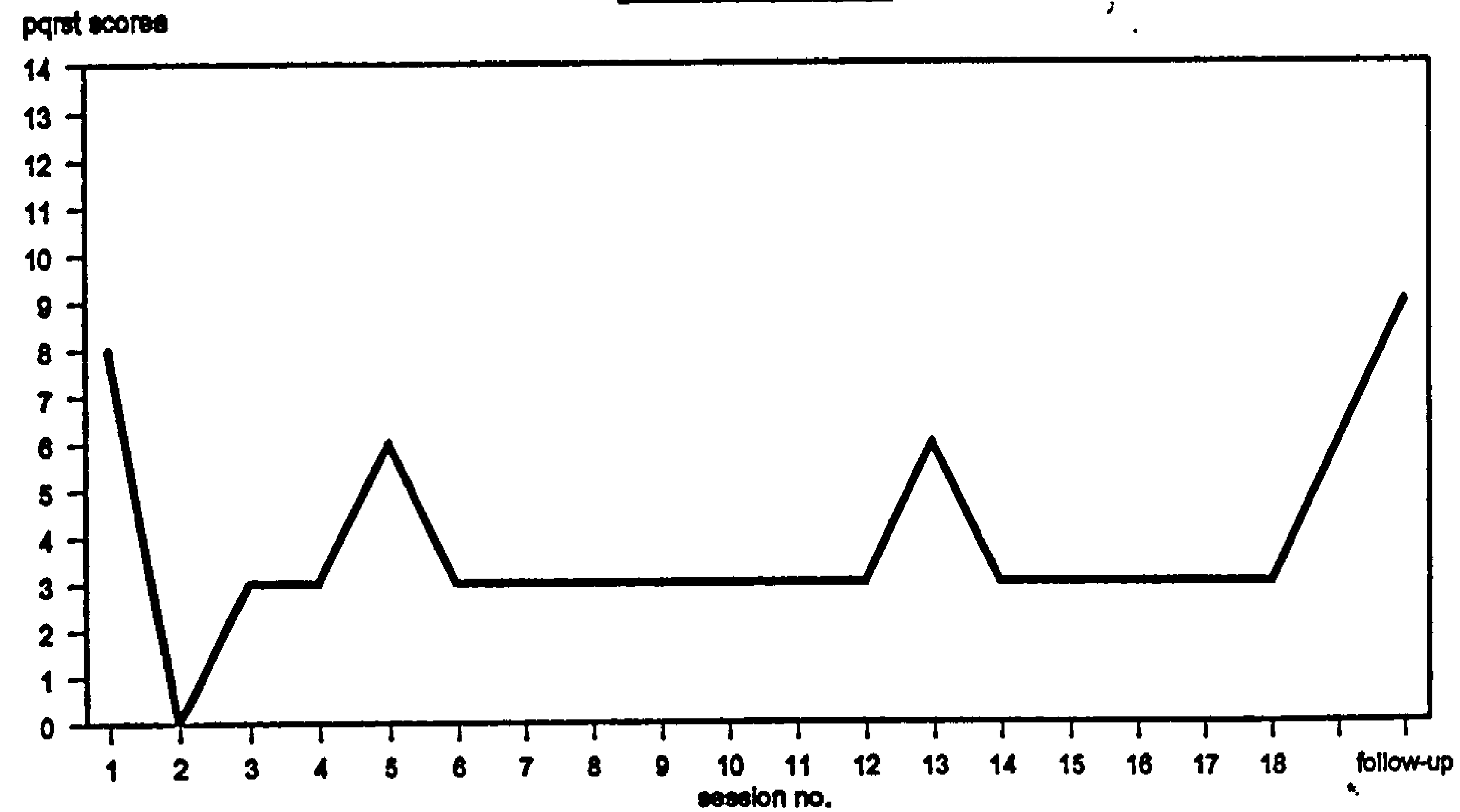


JM: PQRST graphs

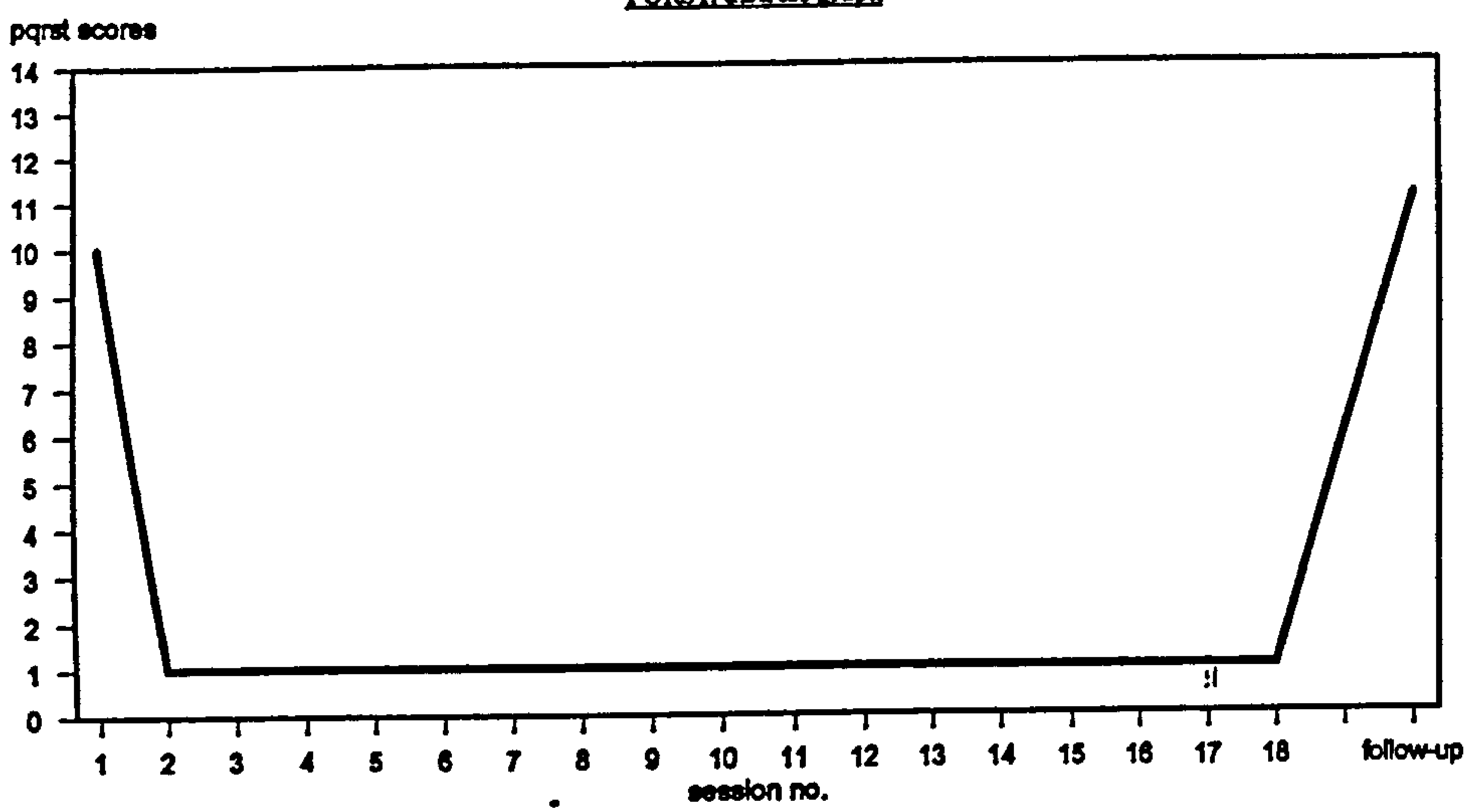
PQRST: frequency graph



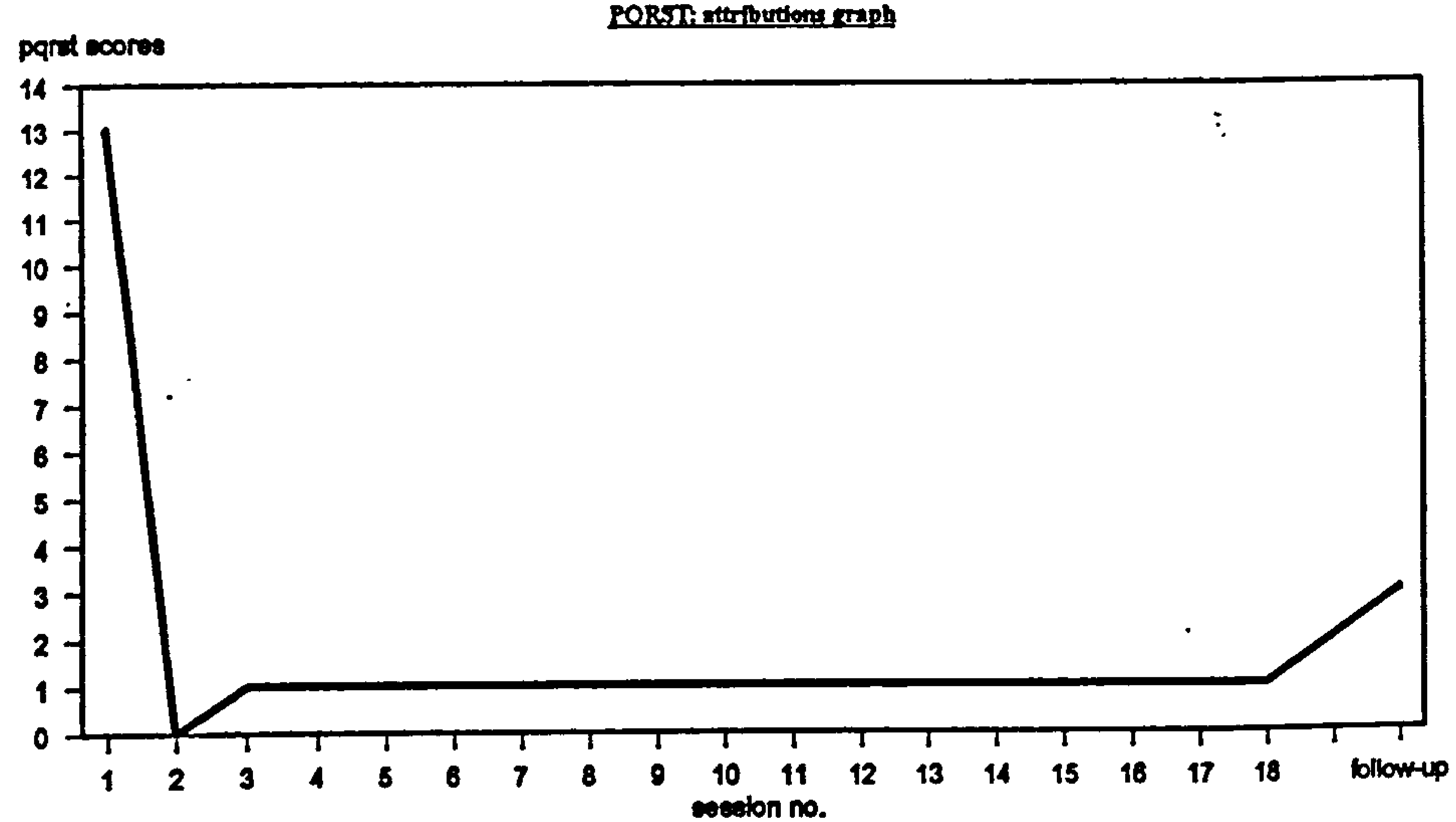
PQRST: disruption graph



PQRST: distress graph

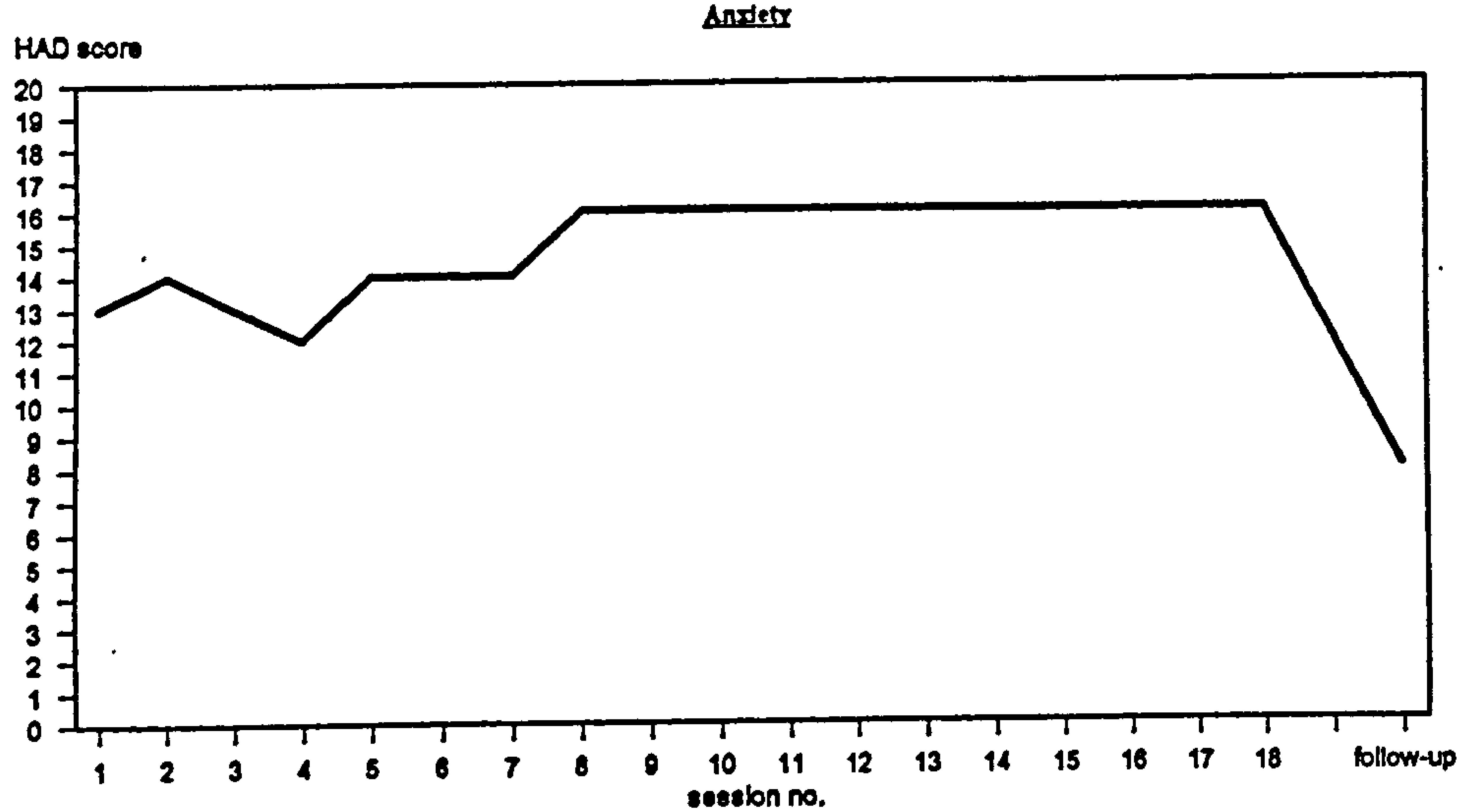


PQRST: attributions graph

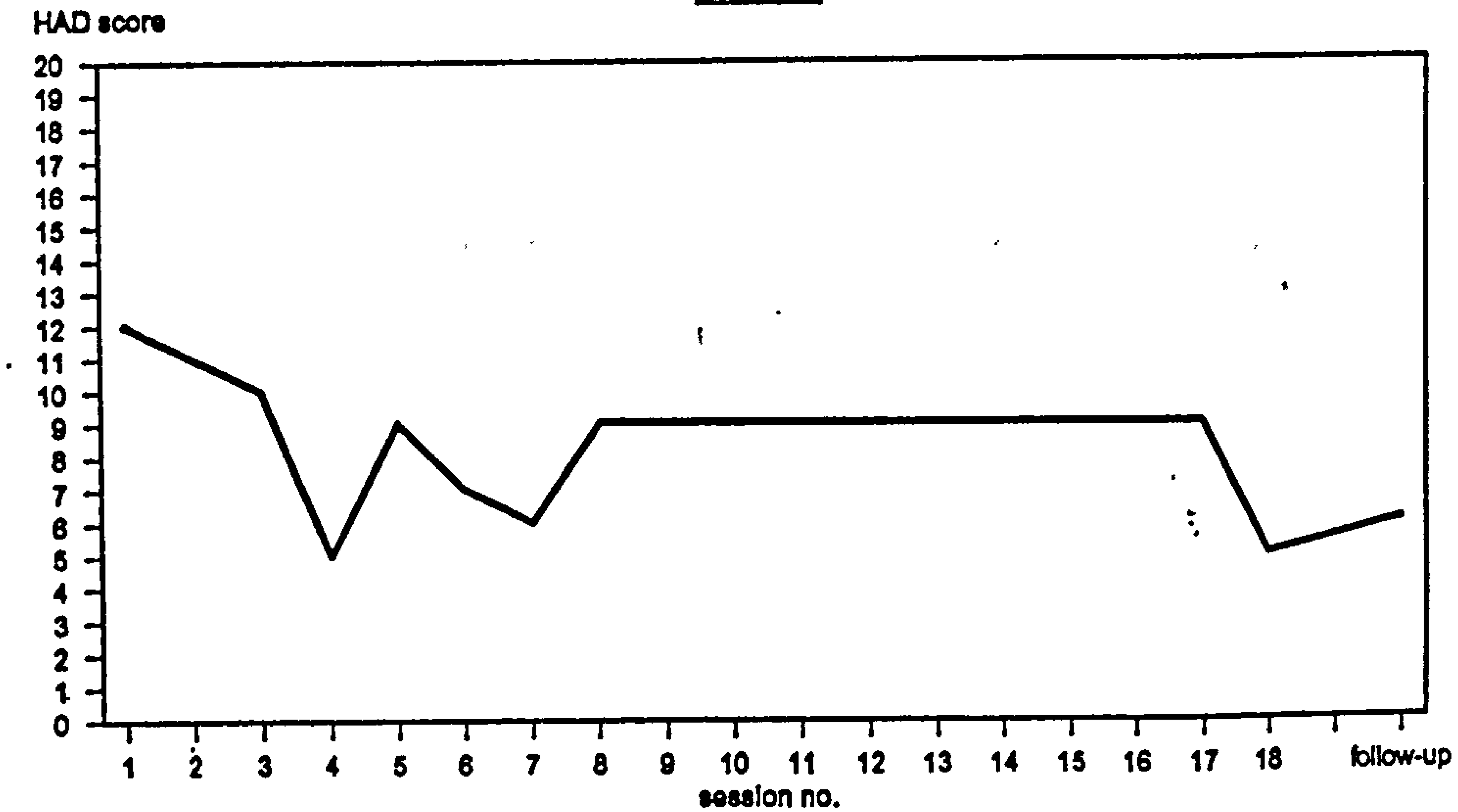


JM: Anxiety and depression graphs

Anxiety

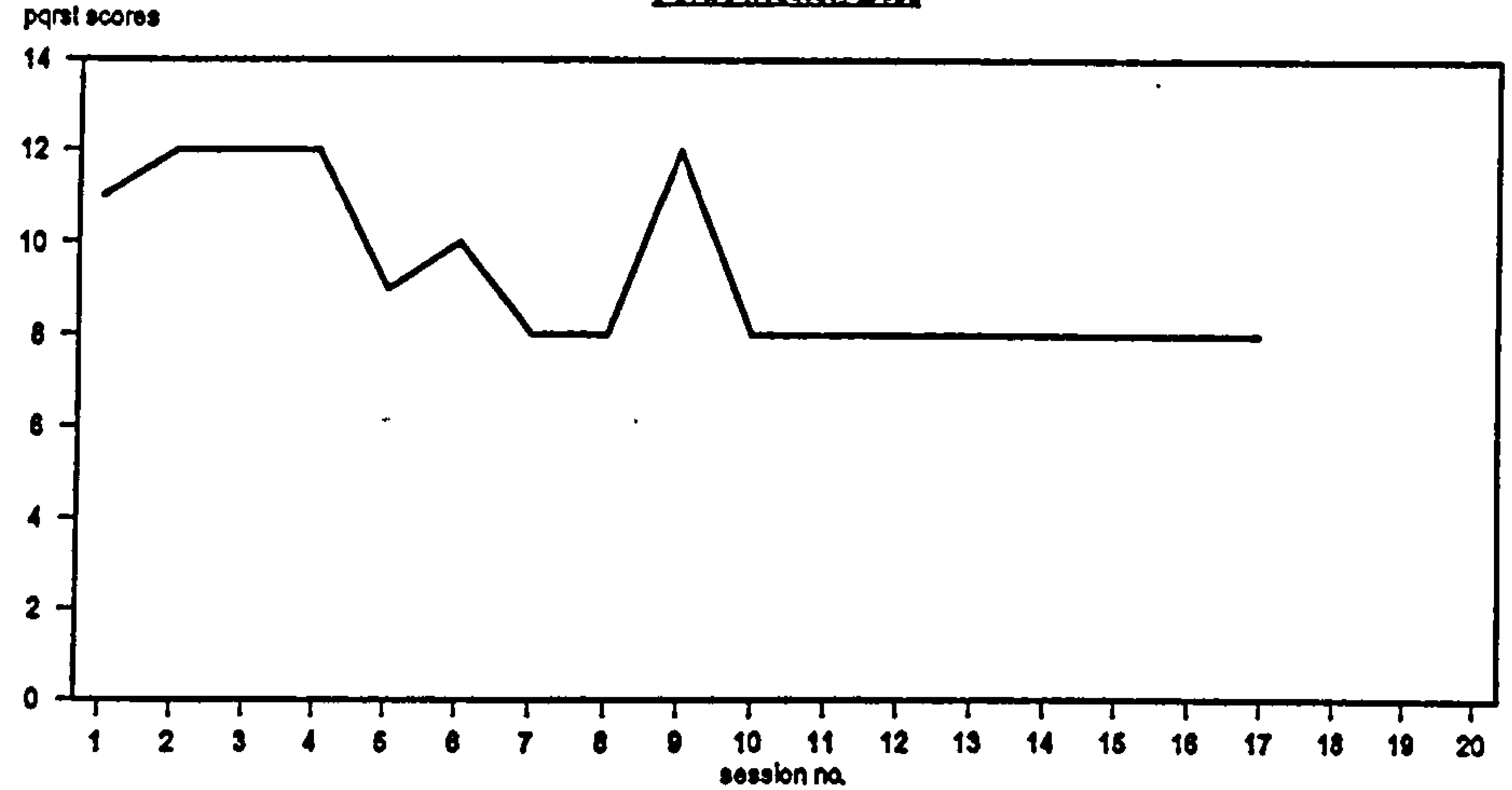


Depression

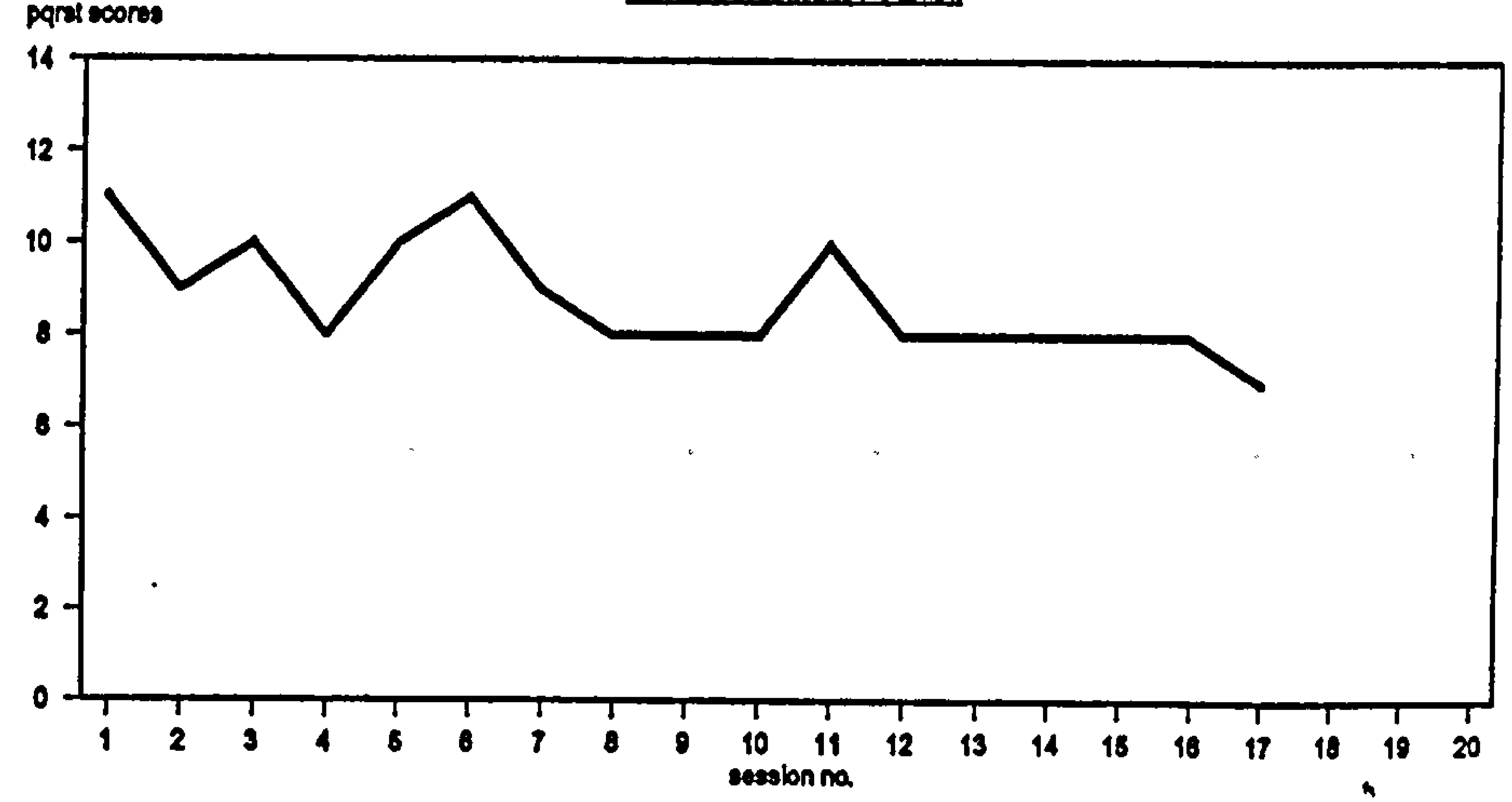


JT: PQRST graphs

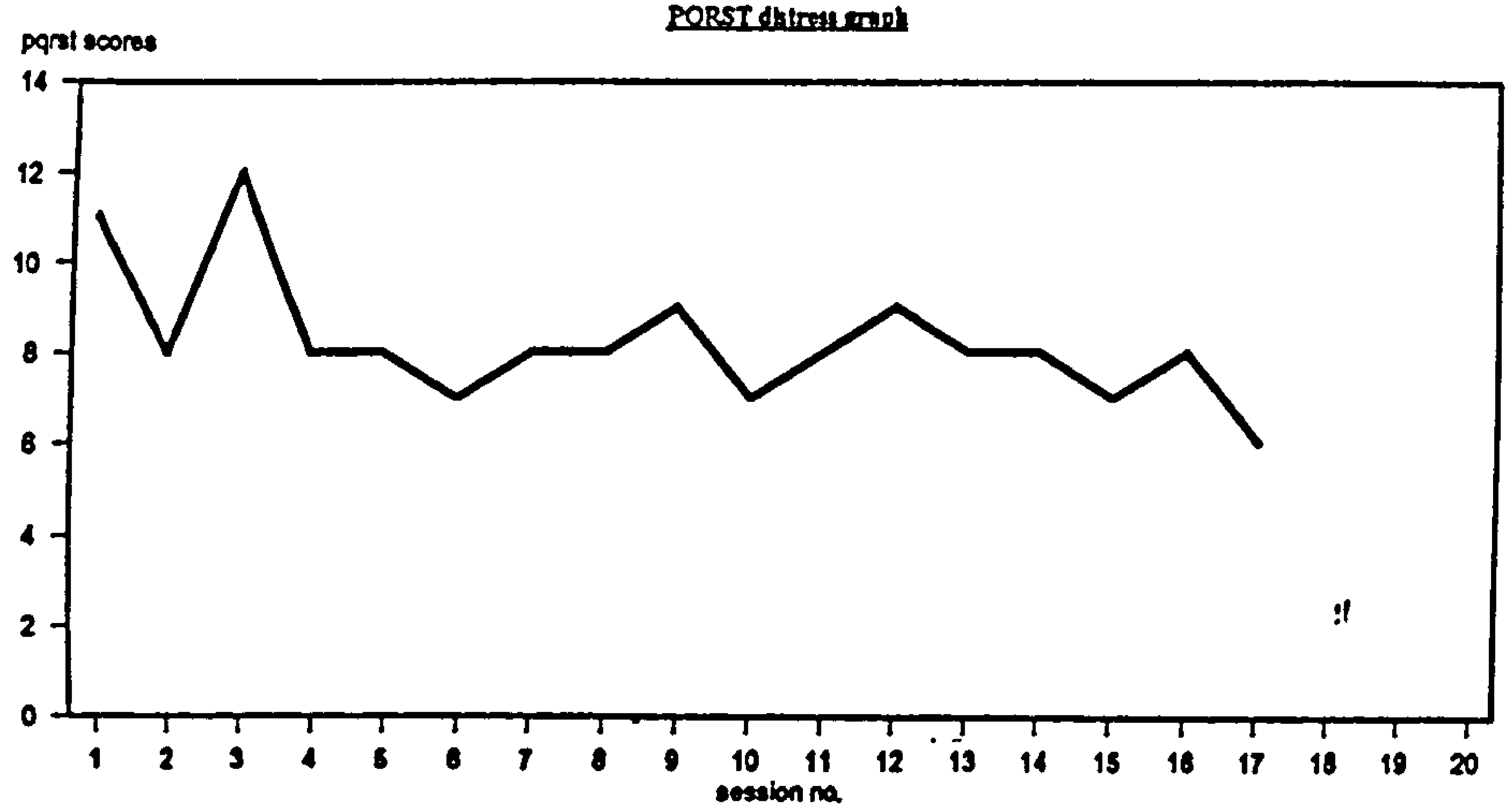
PQRST frequency graph



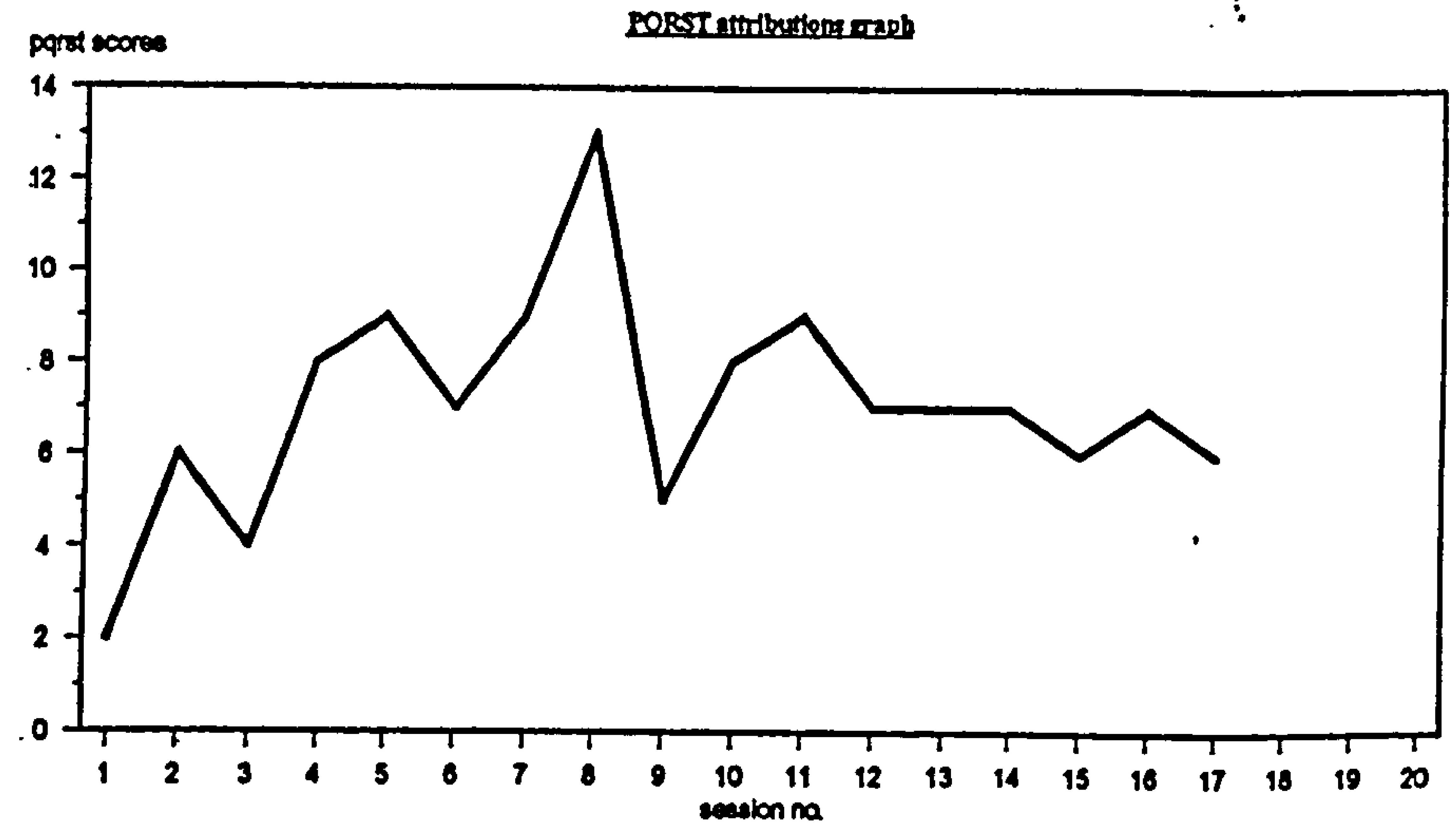
PQRST disruption to life graph



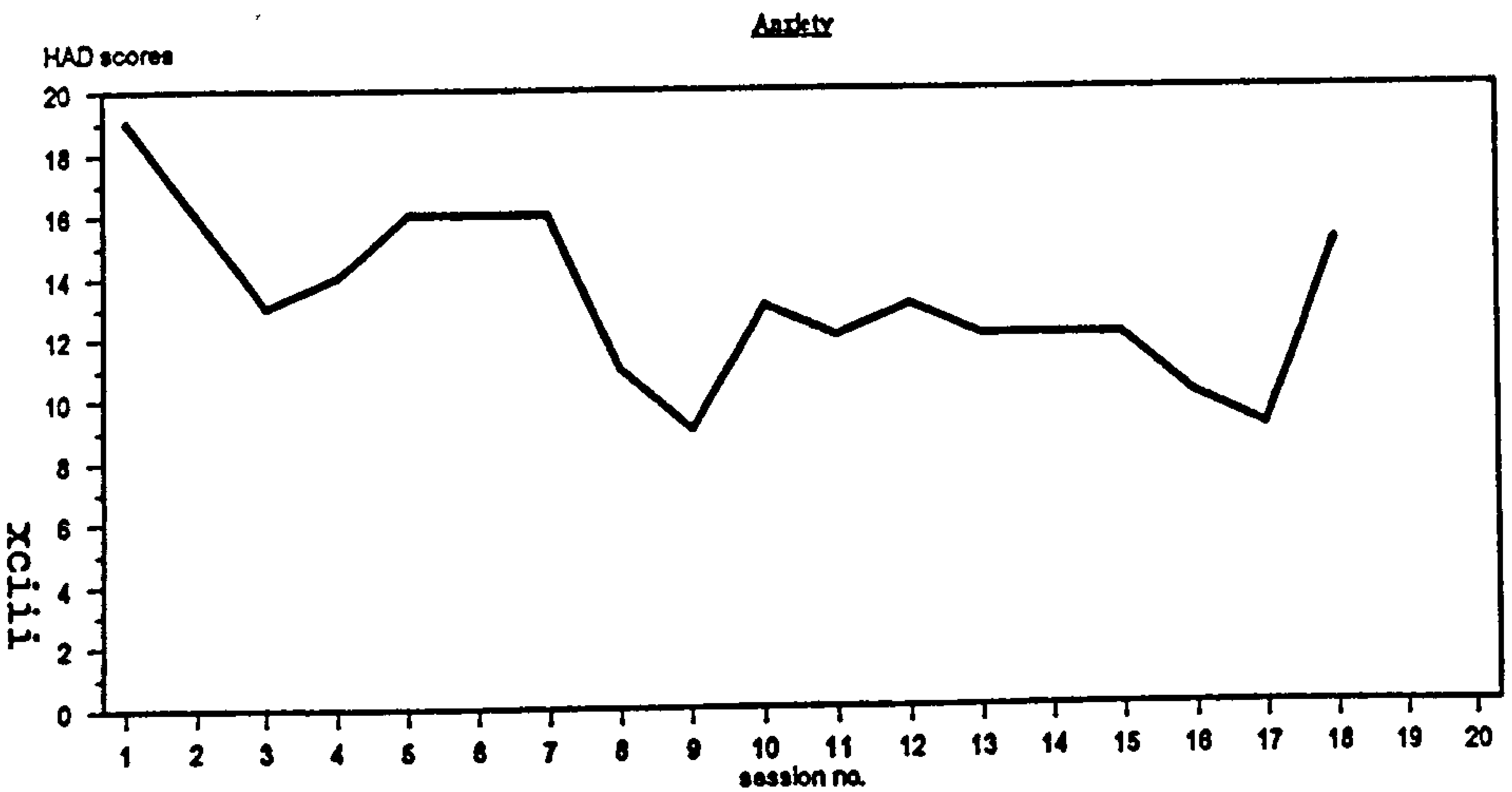
PQRST distress graph

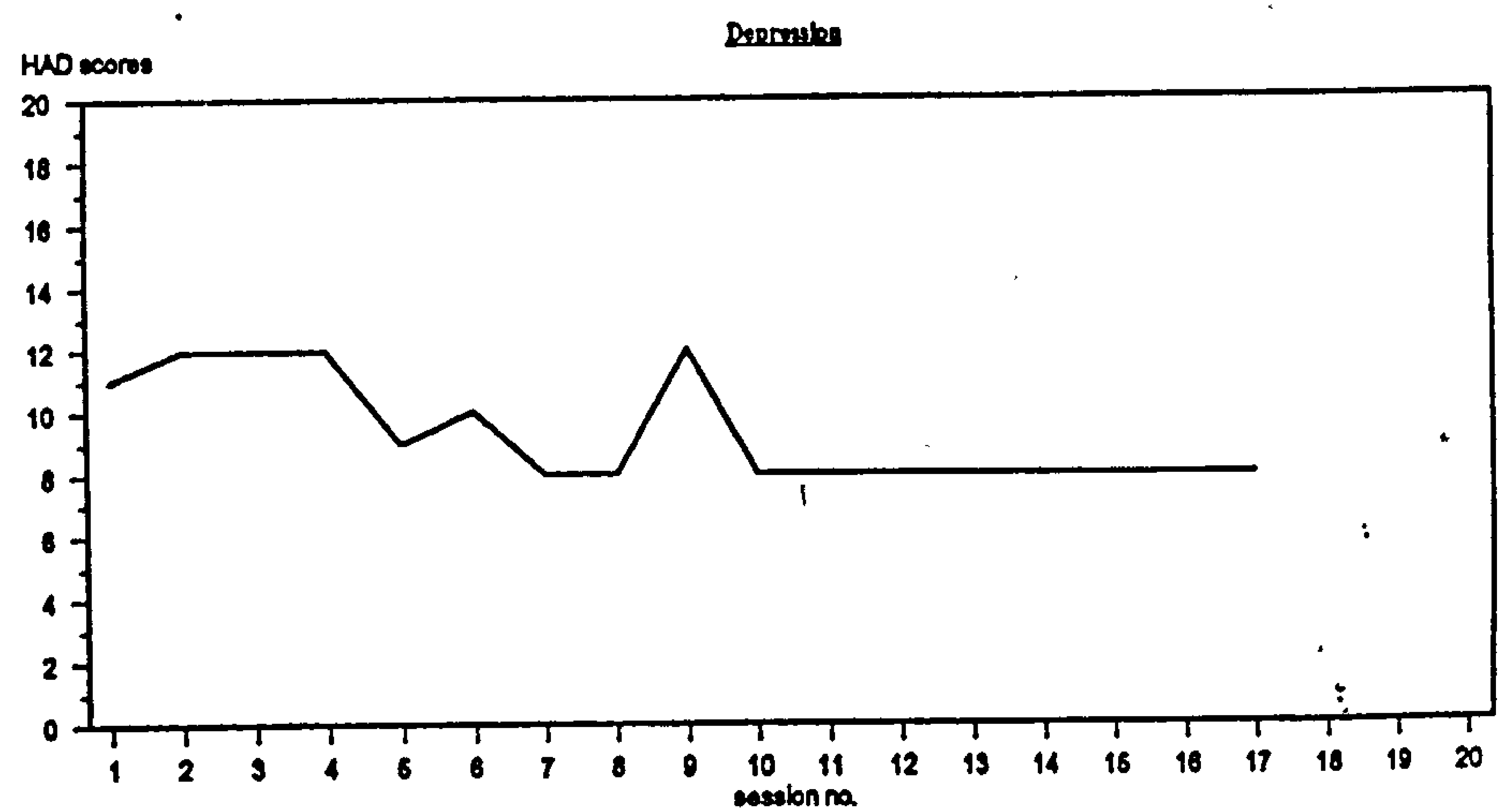


PQRST attributions graph



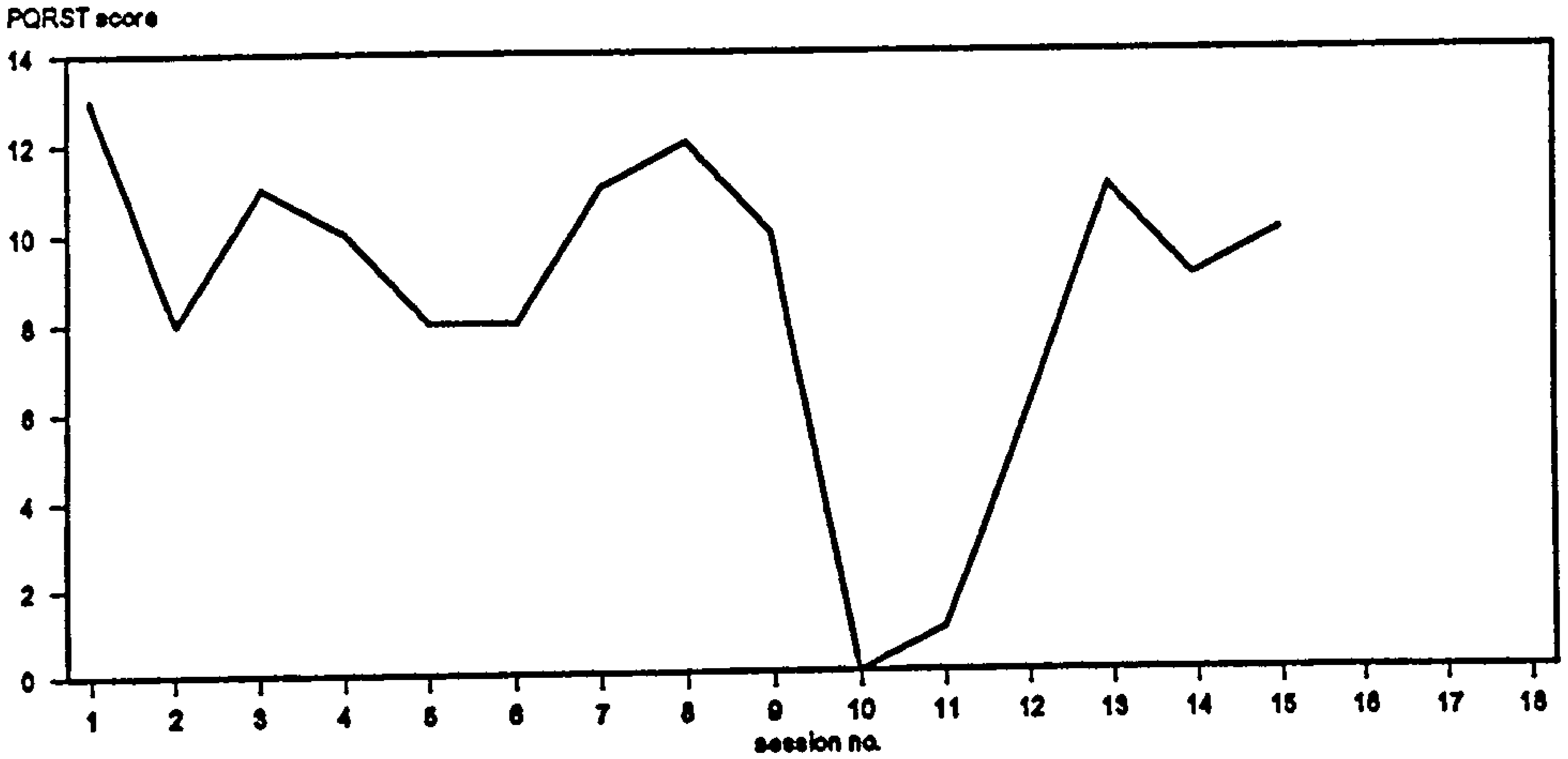
JT: Anxiety and depression graphs



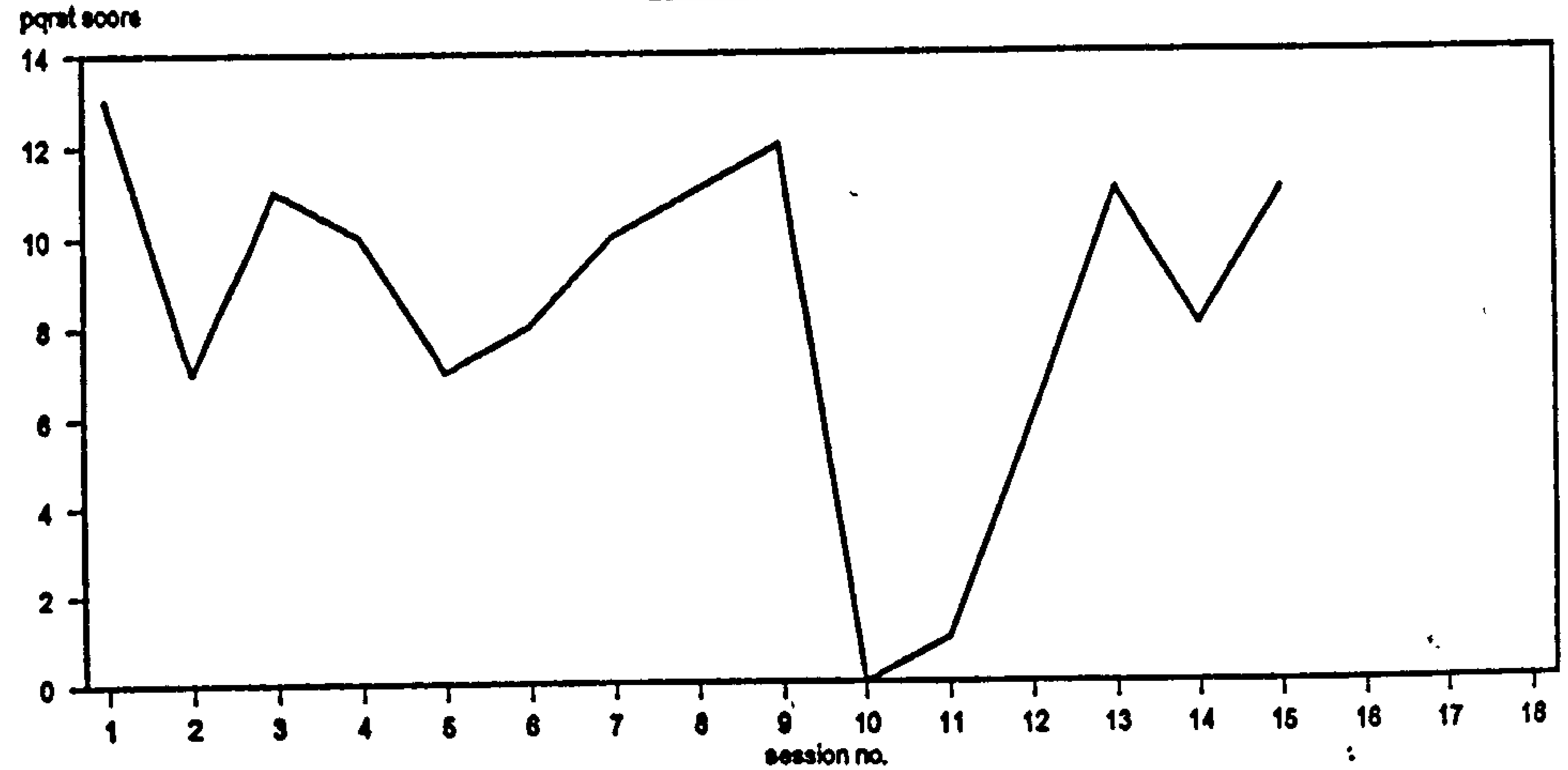


LP: PQRST graphs

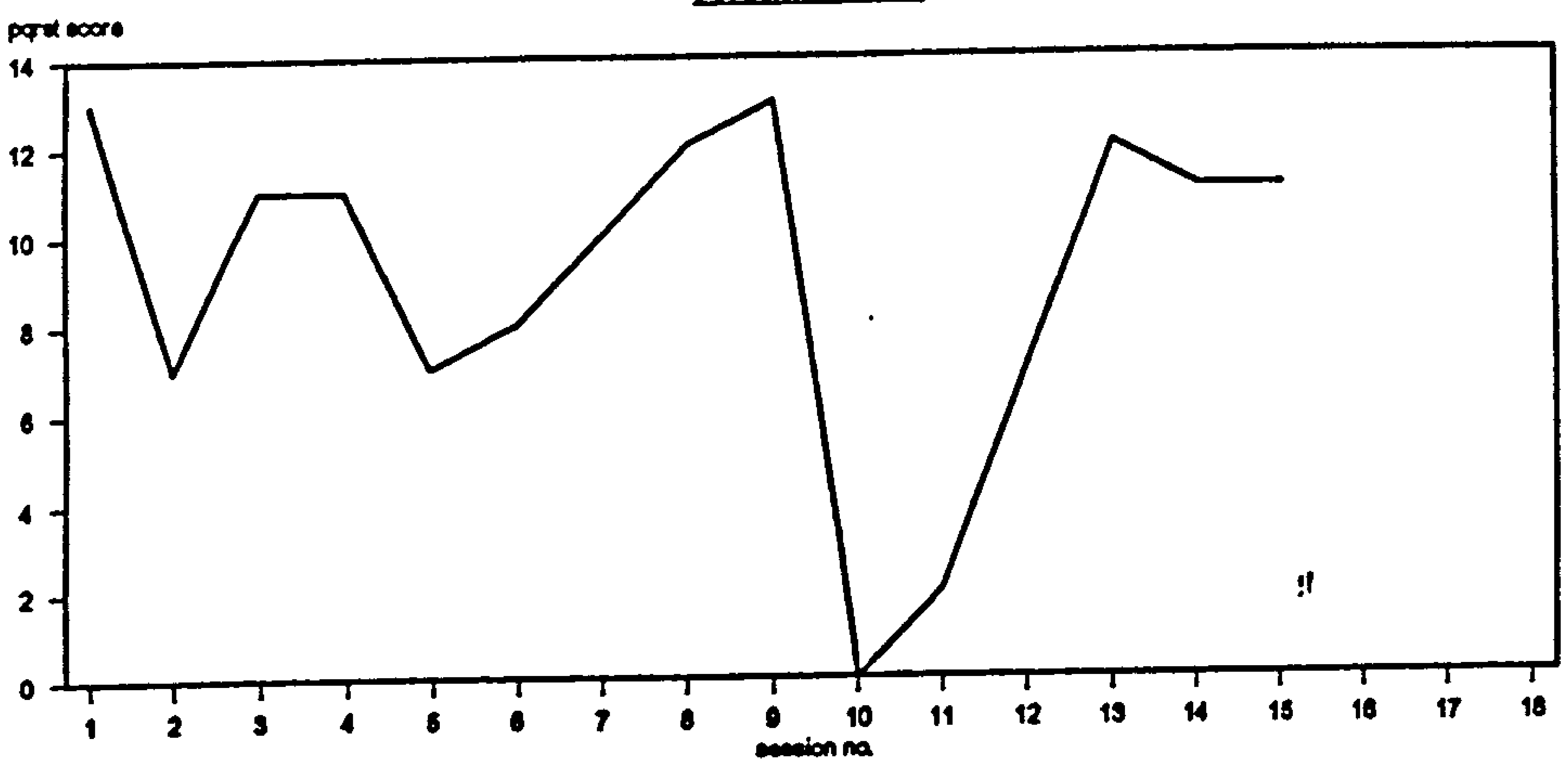
PQRST frequency graph



PQRST disruption to life graph



PQRST distress graph



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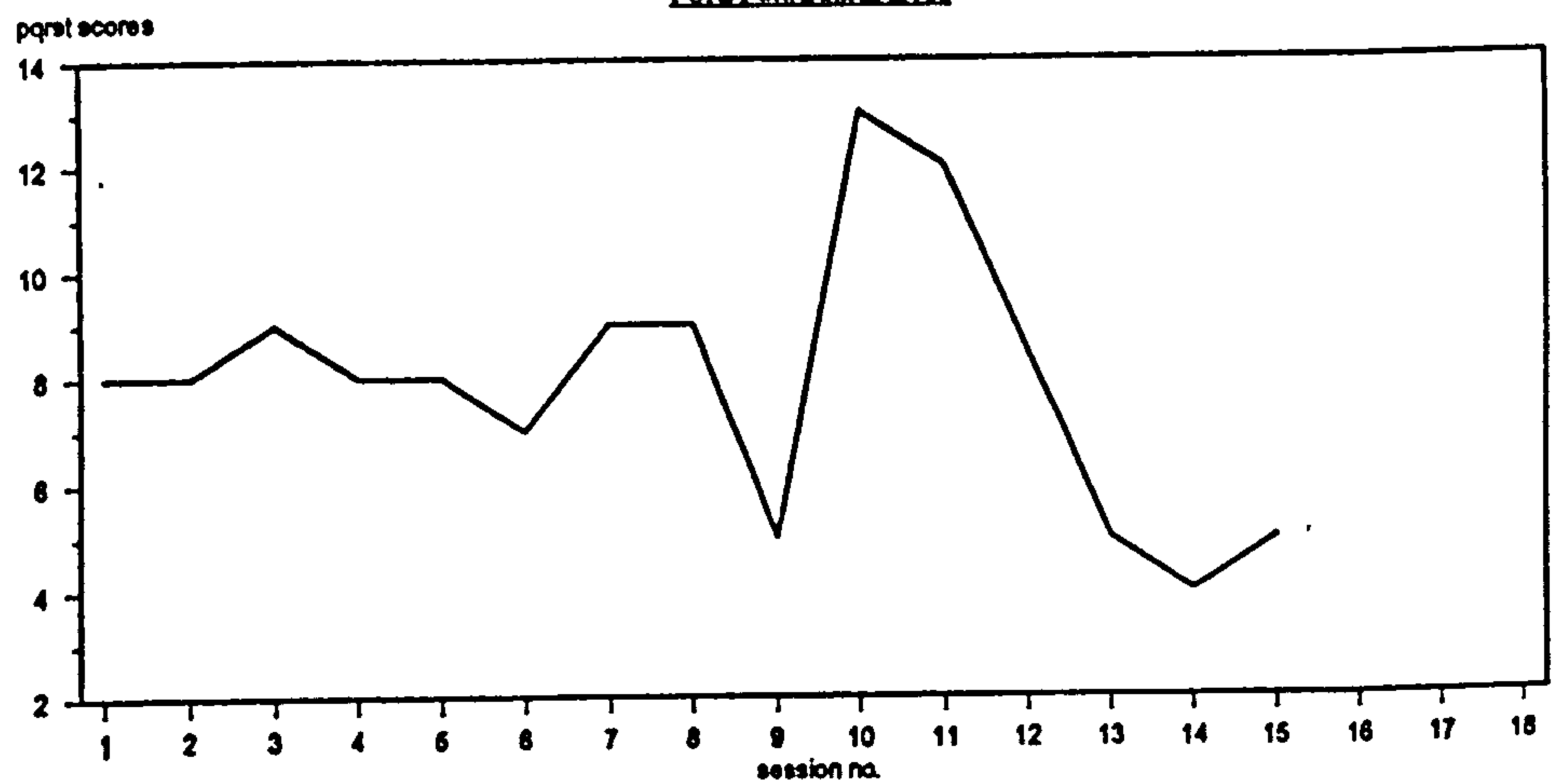
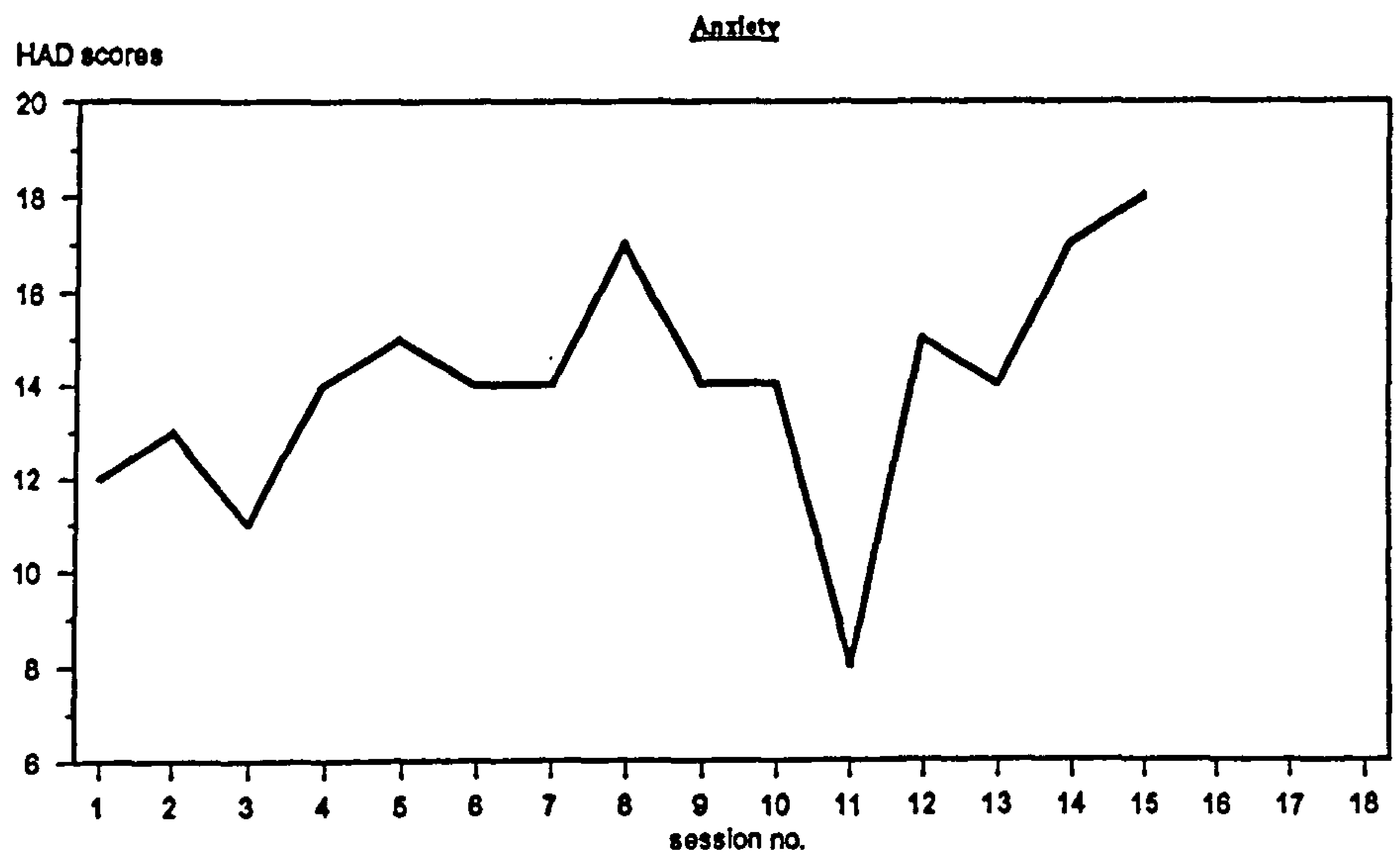
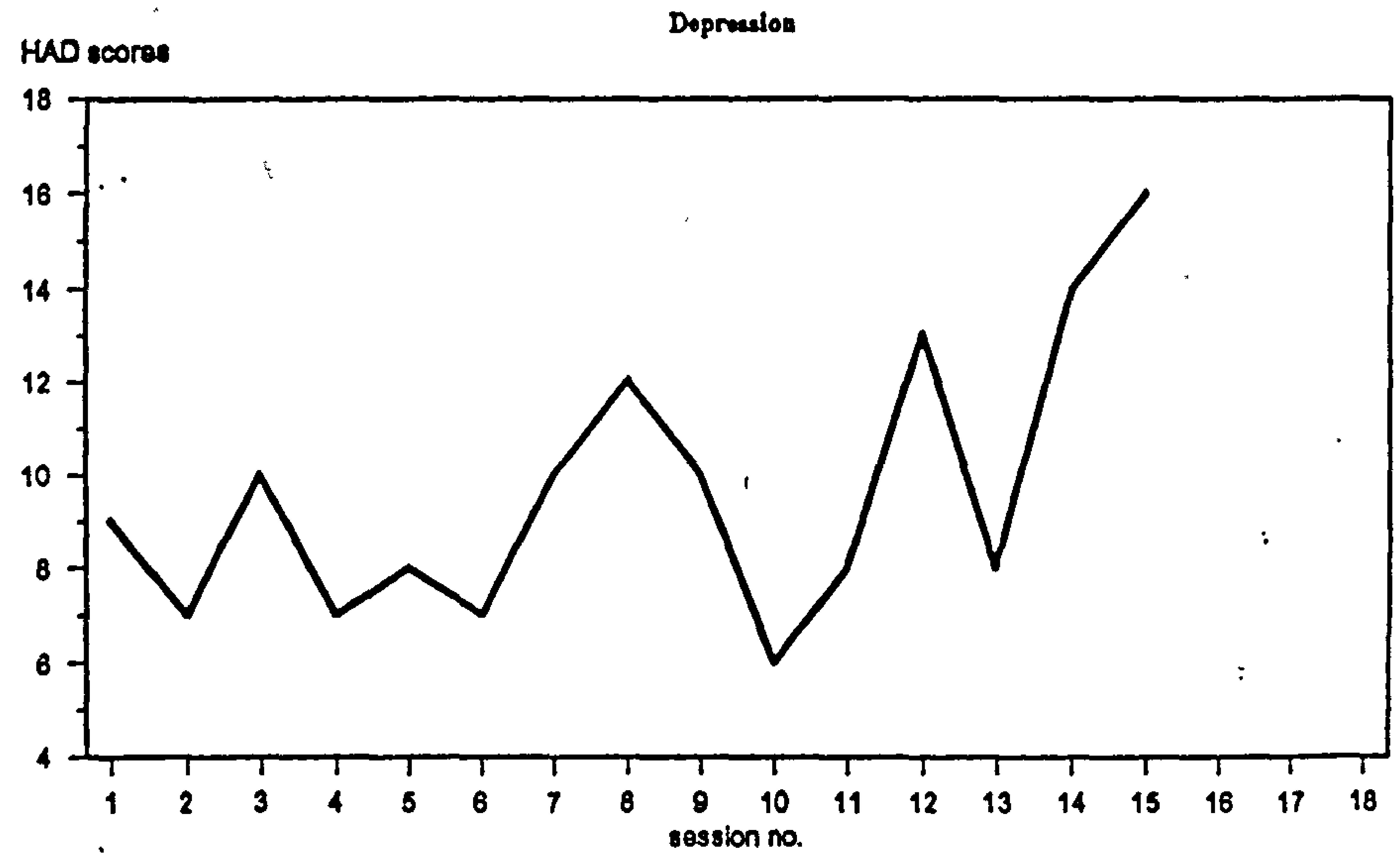


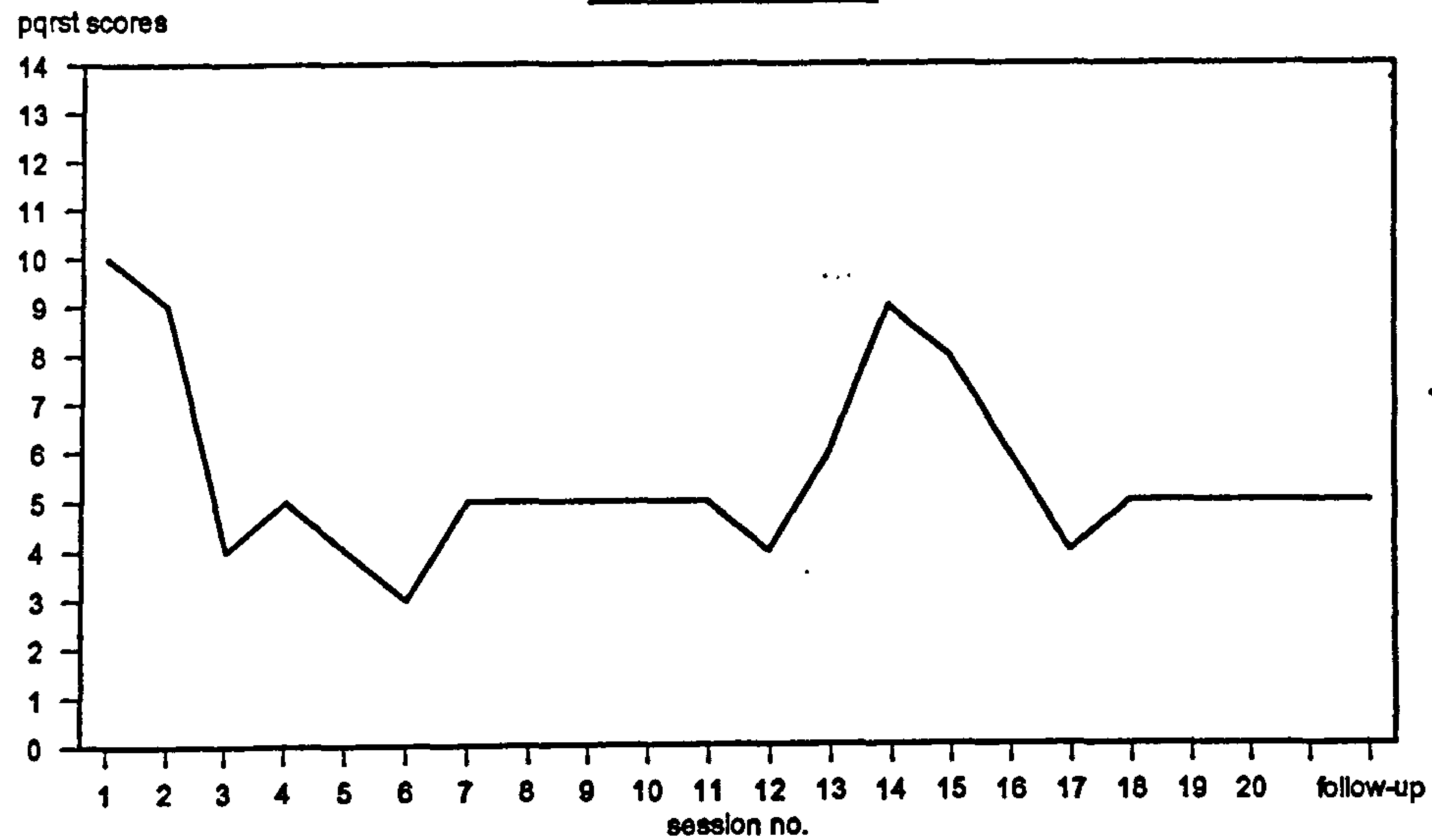
LP: Anxiety and depression graphs



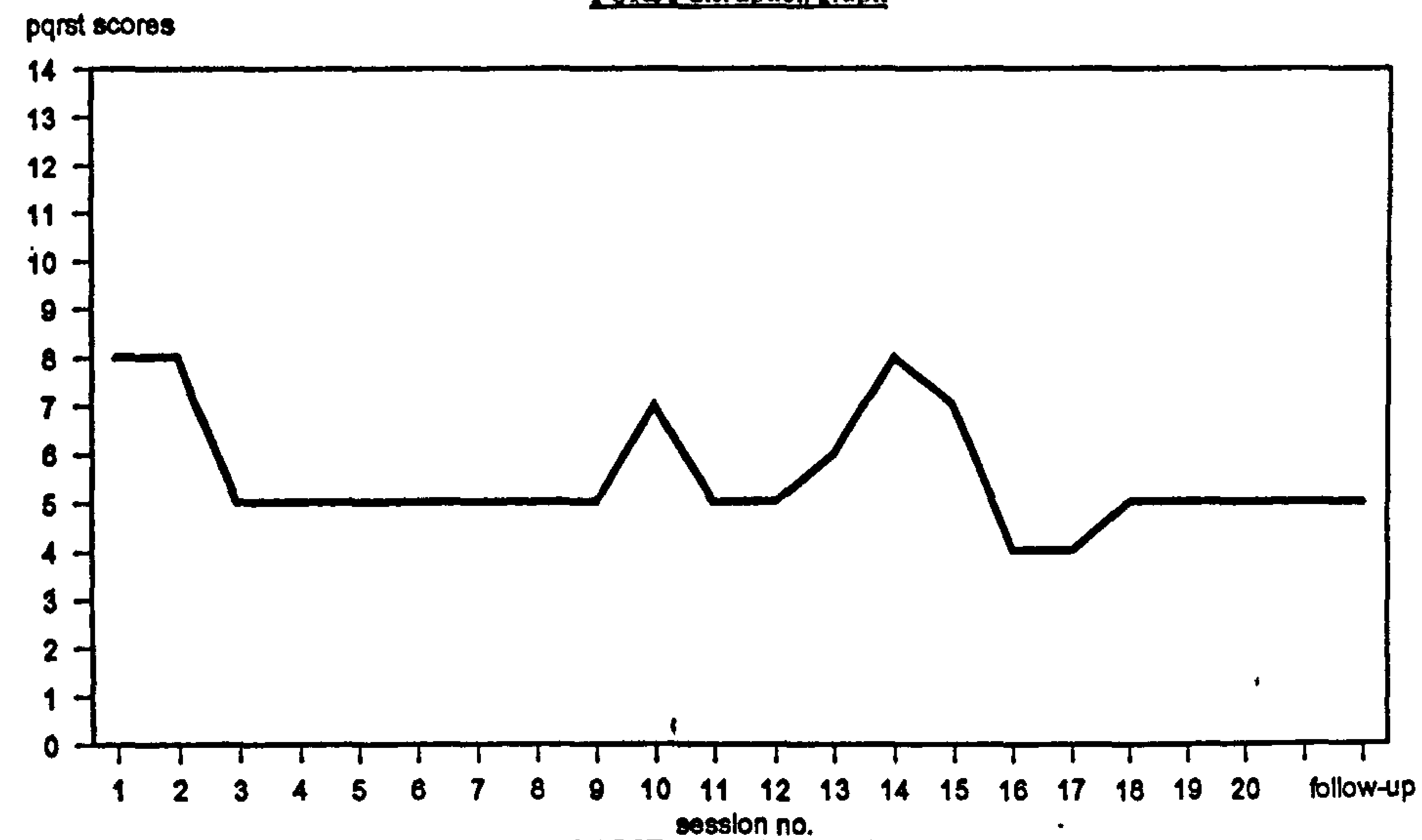


PG: PQRST graphs

PQRST frequency graph



PQRST disruption graph



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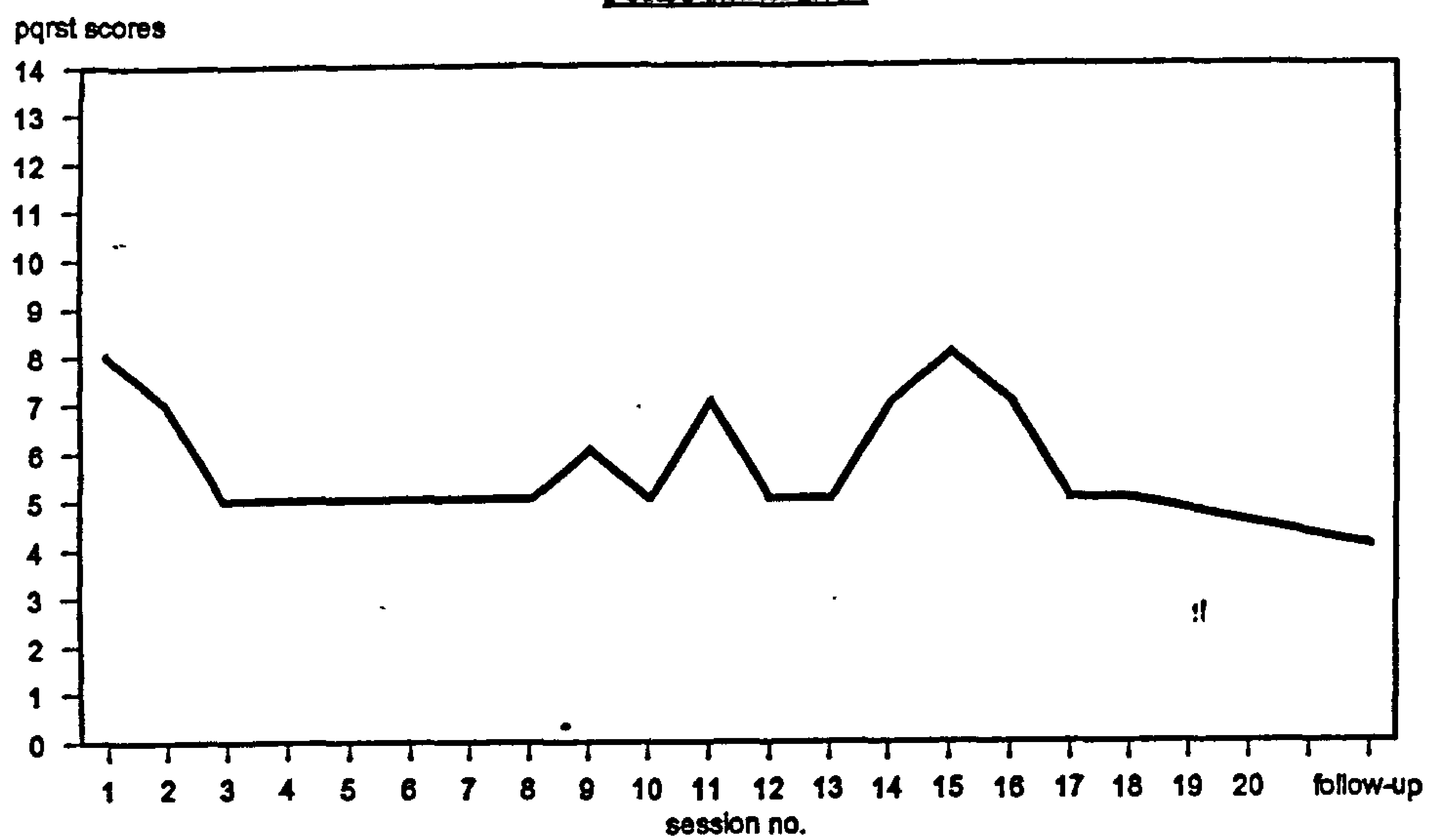

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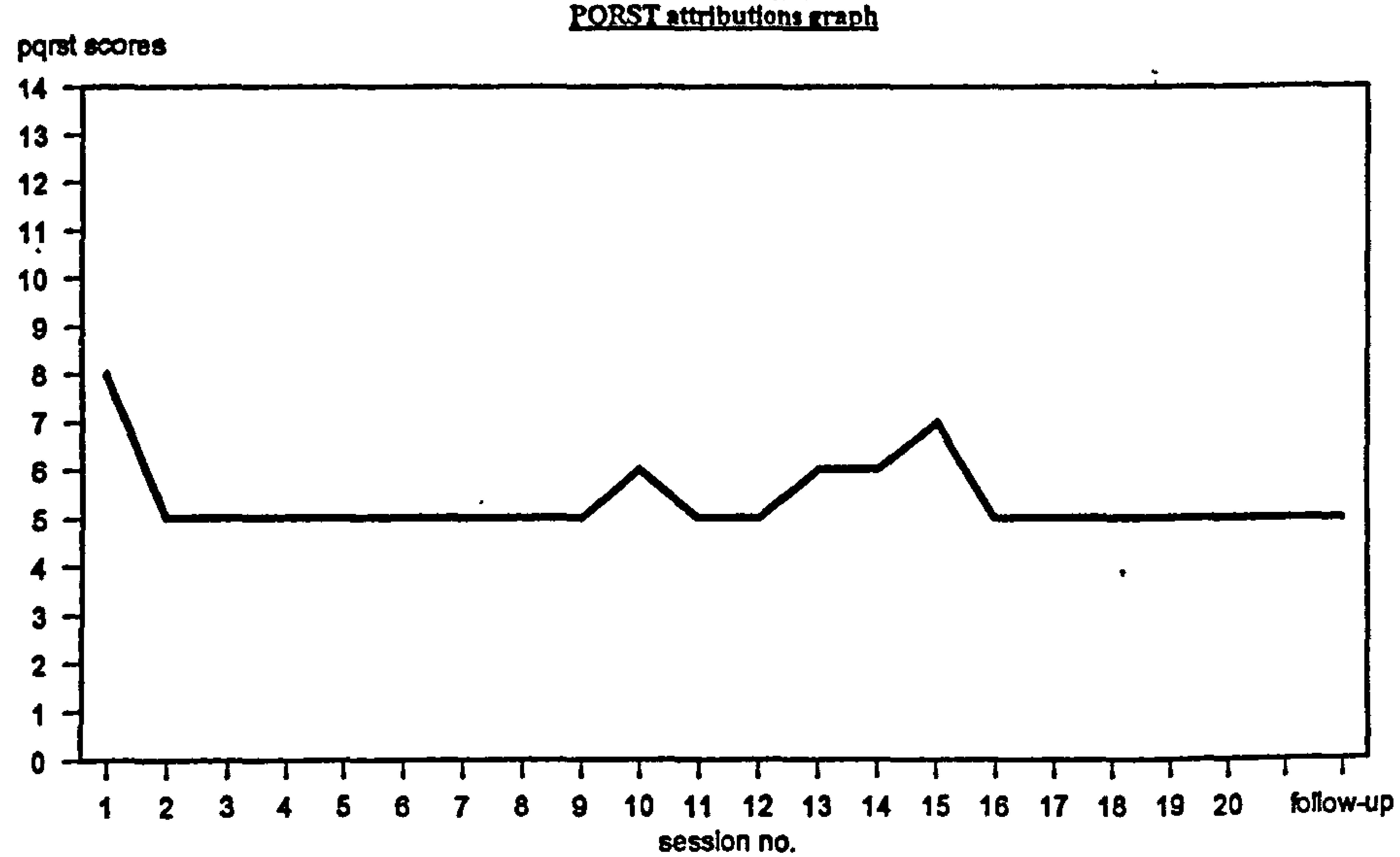
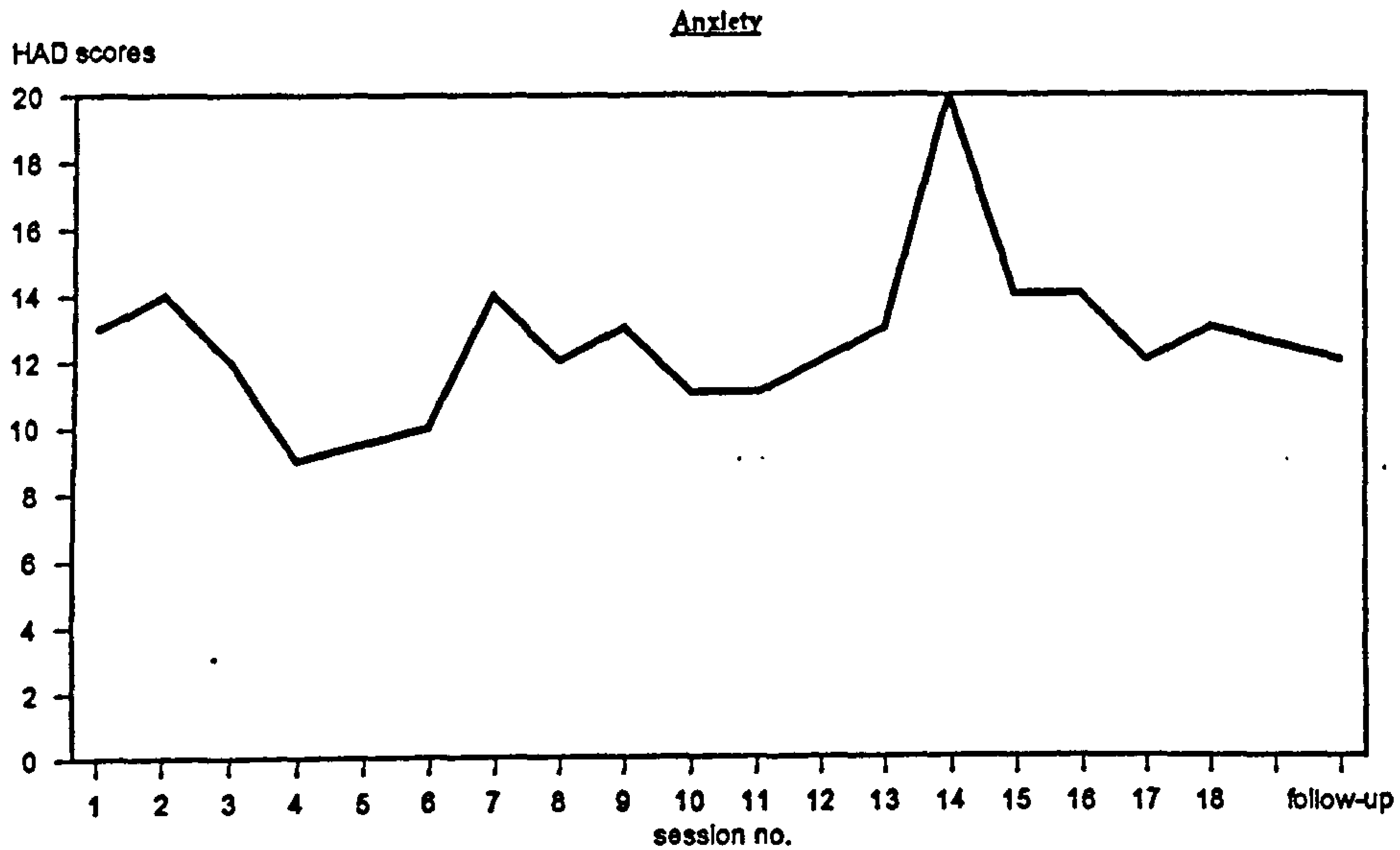
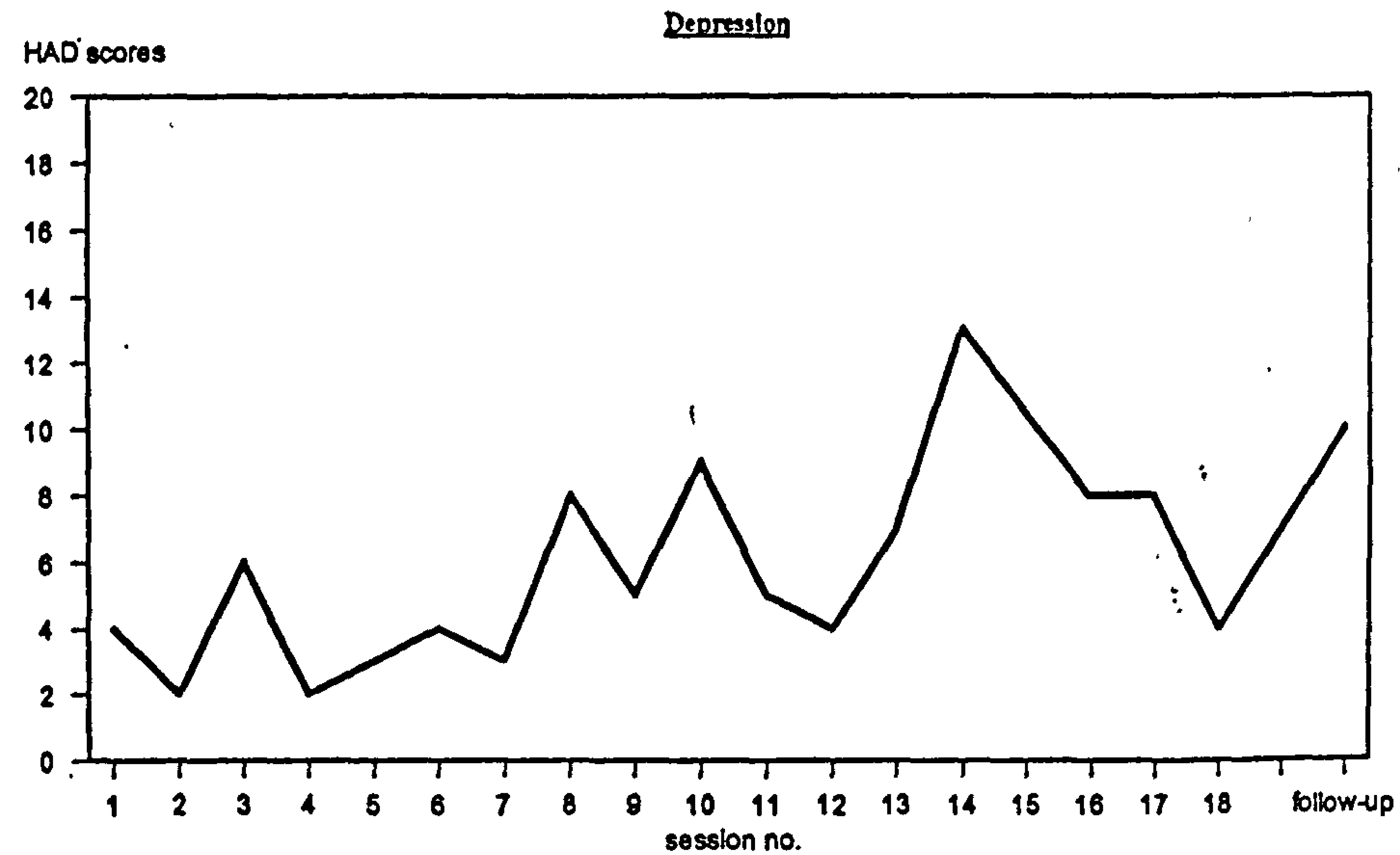


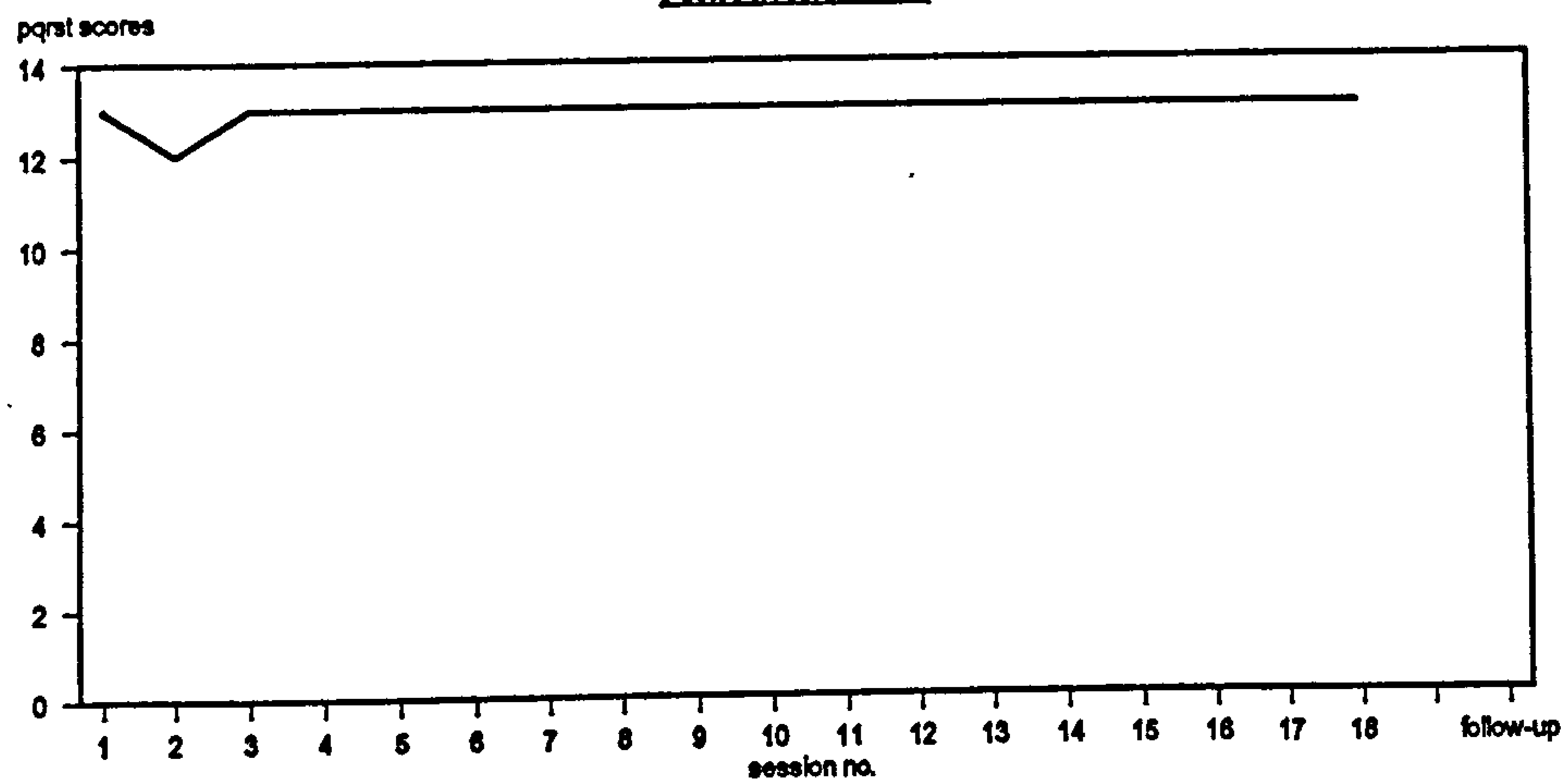
PG:Anxiety and depression graphs



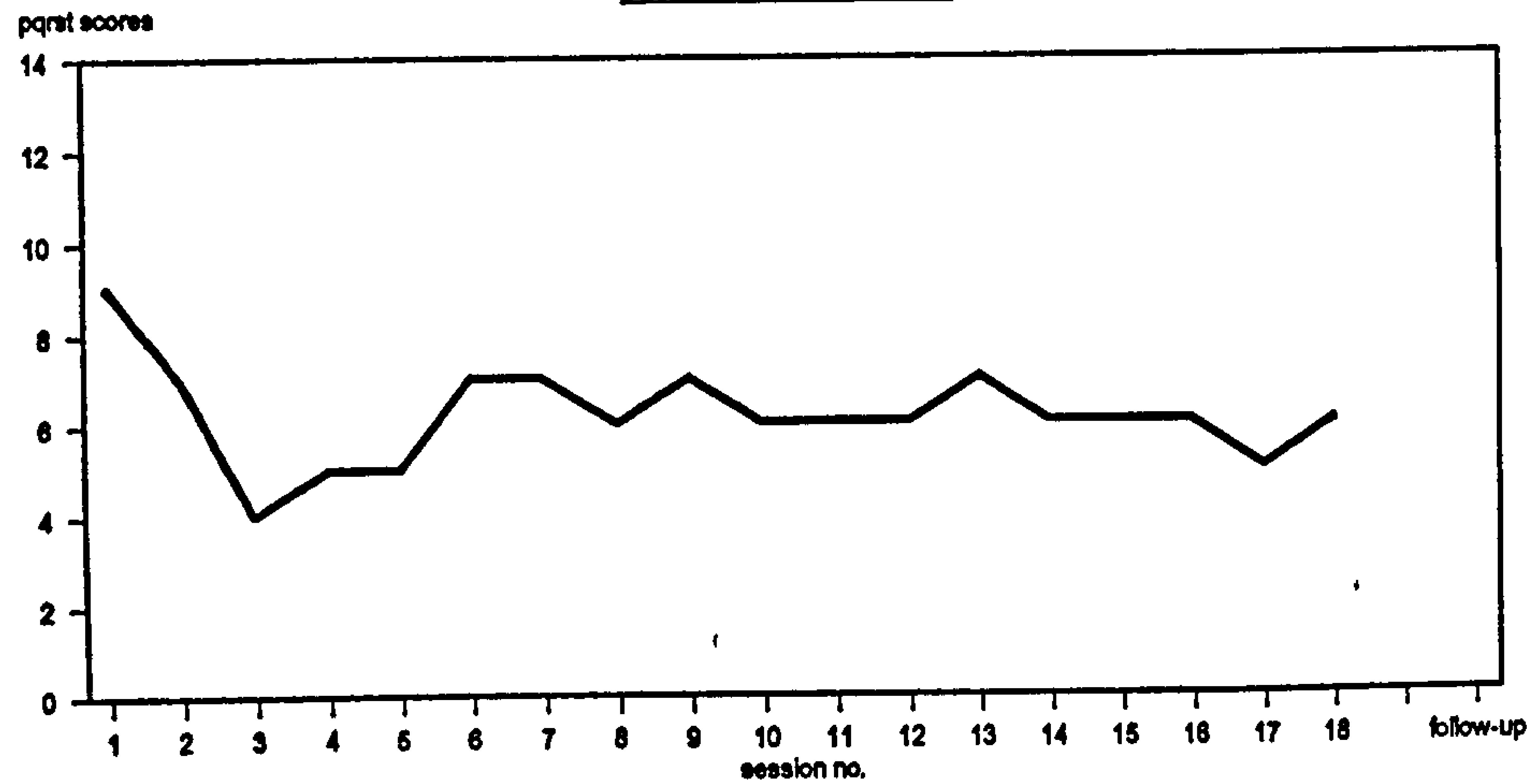


PS: PQRST graphs

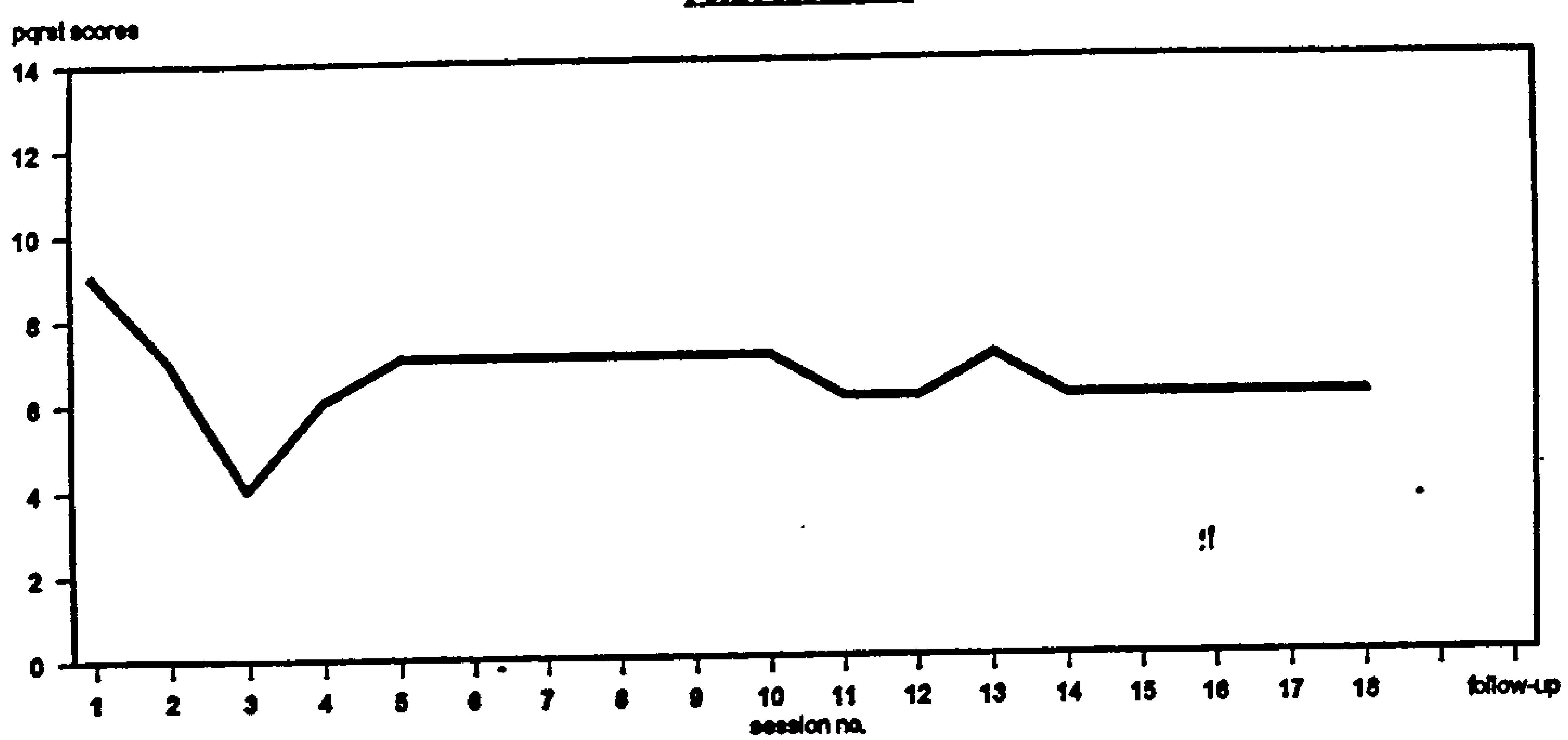
PQRST frequency graph



PQRST disruption to life graph



PQRST distress graph



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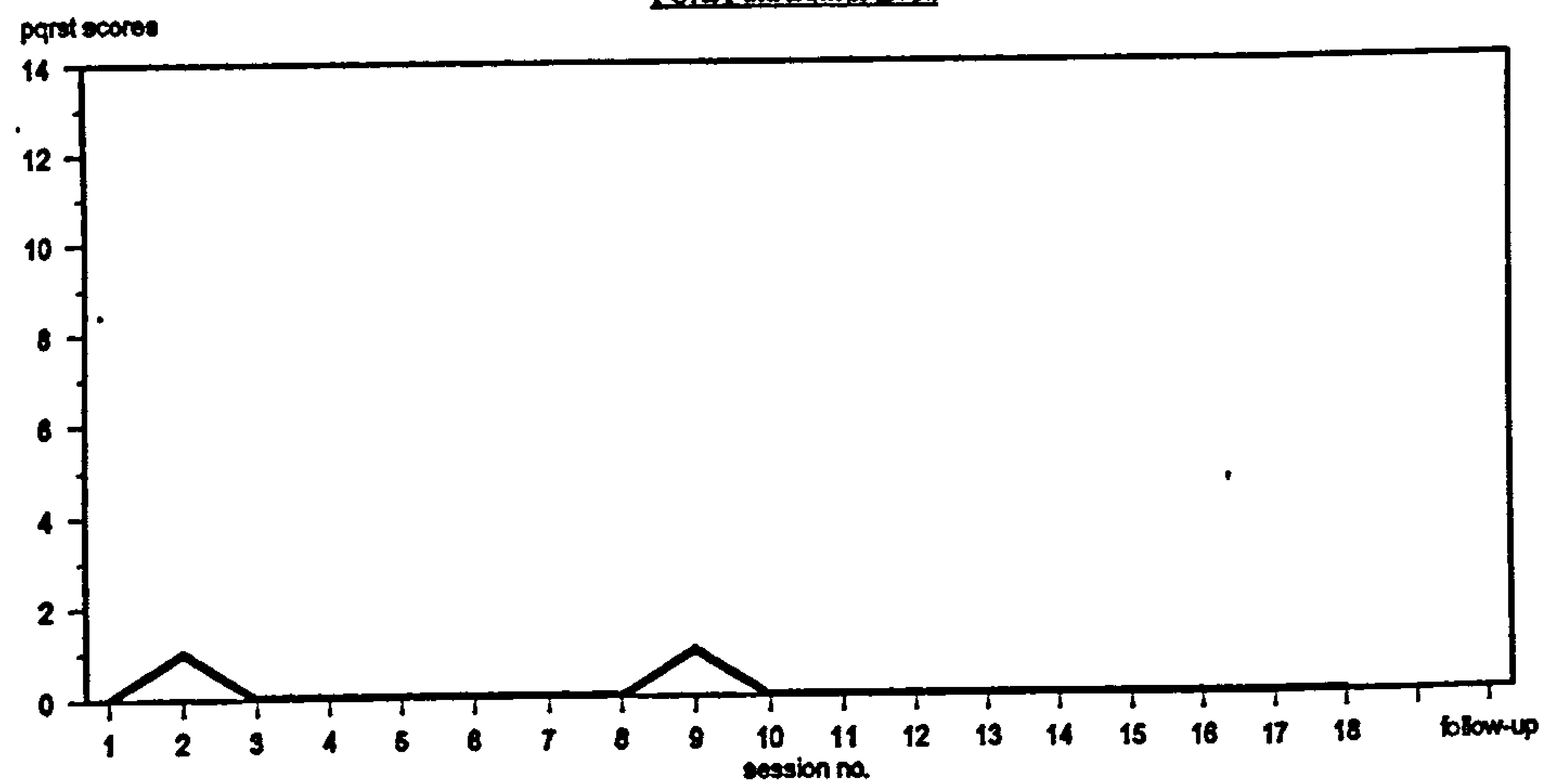
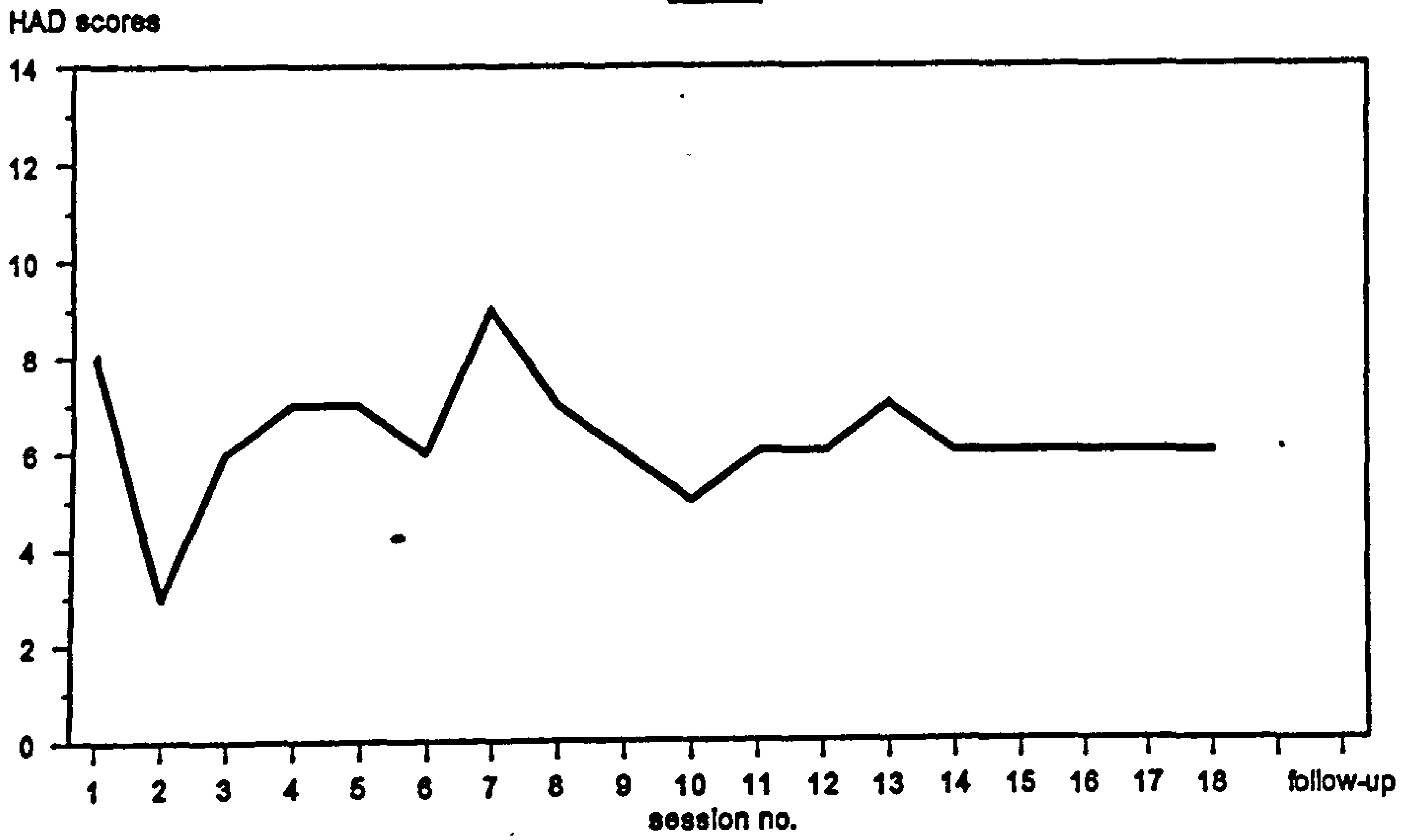
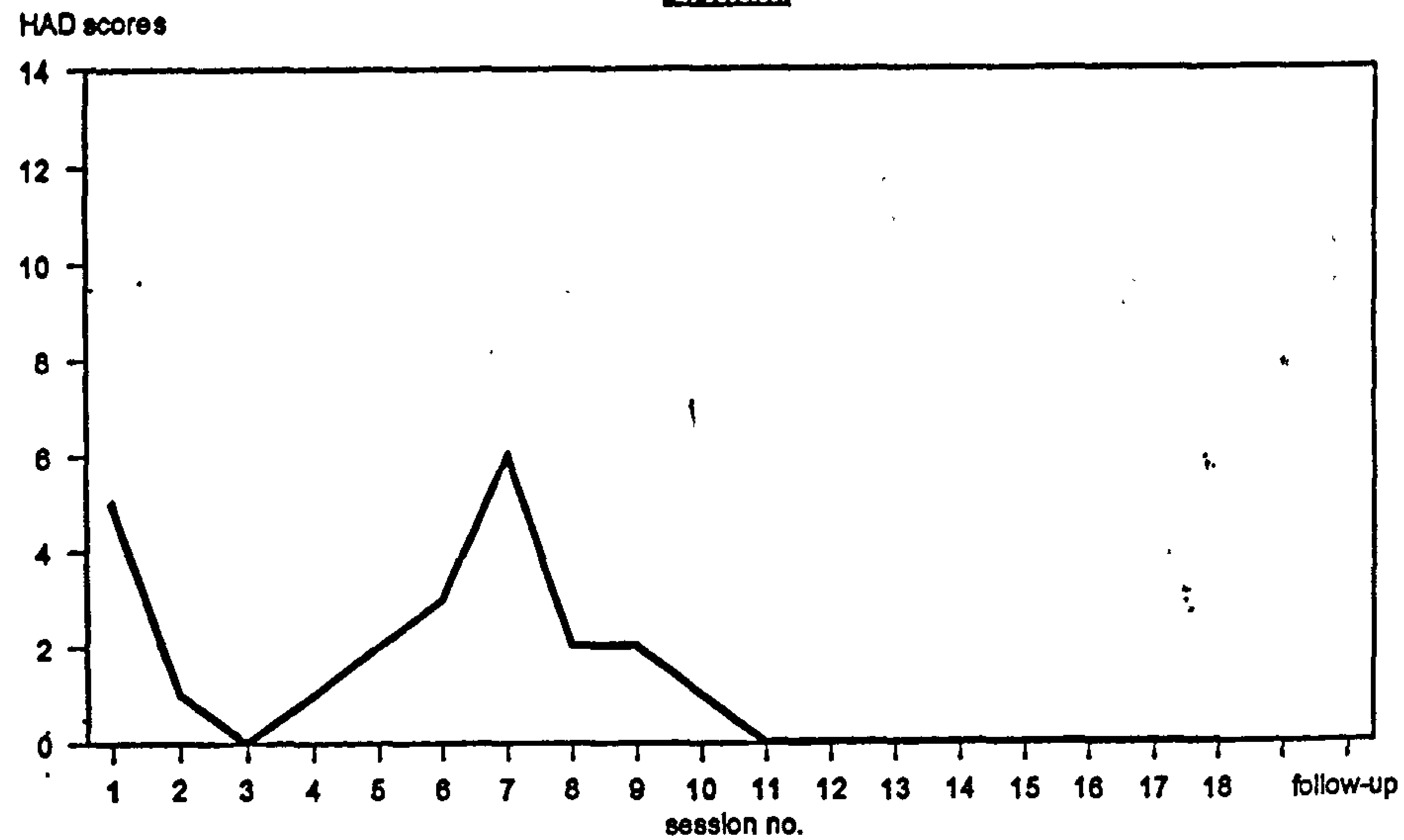


PS: Anxiety and depression graphs

Anxiety

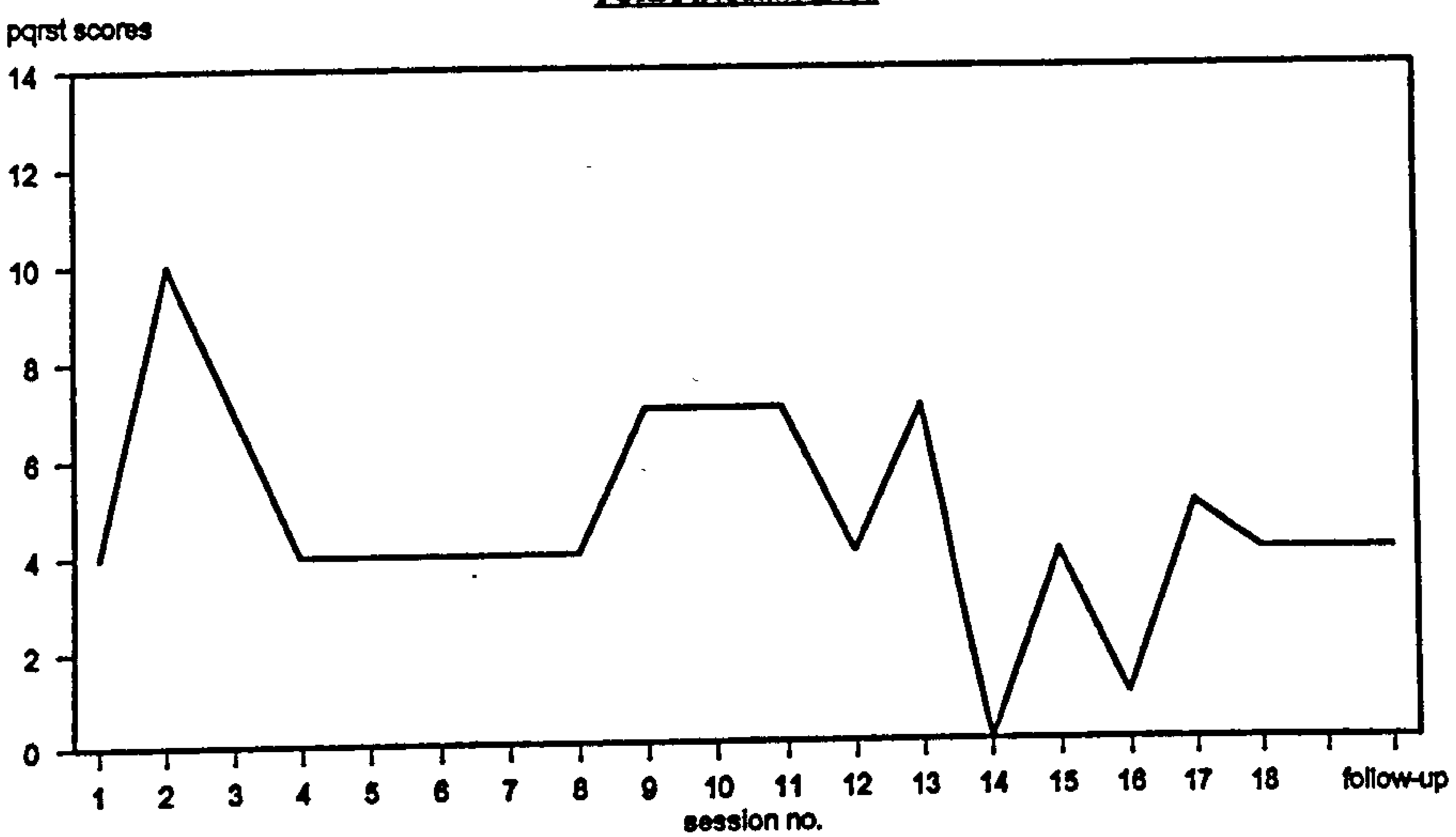


Depression

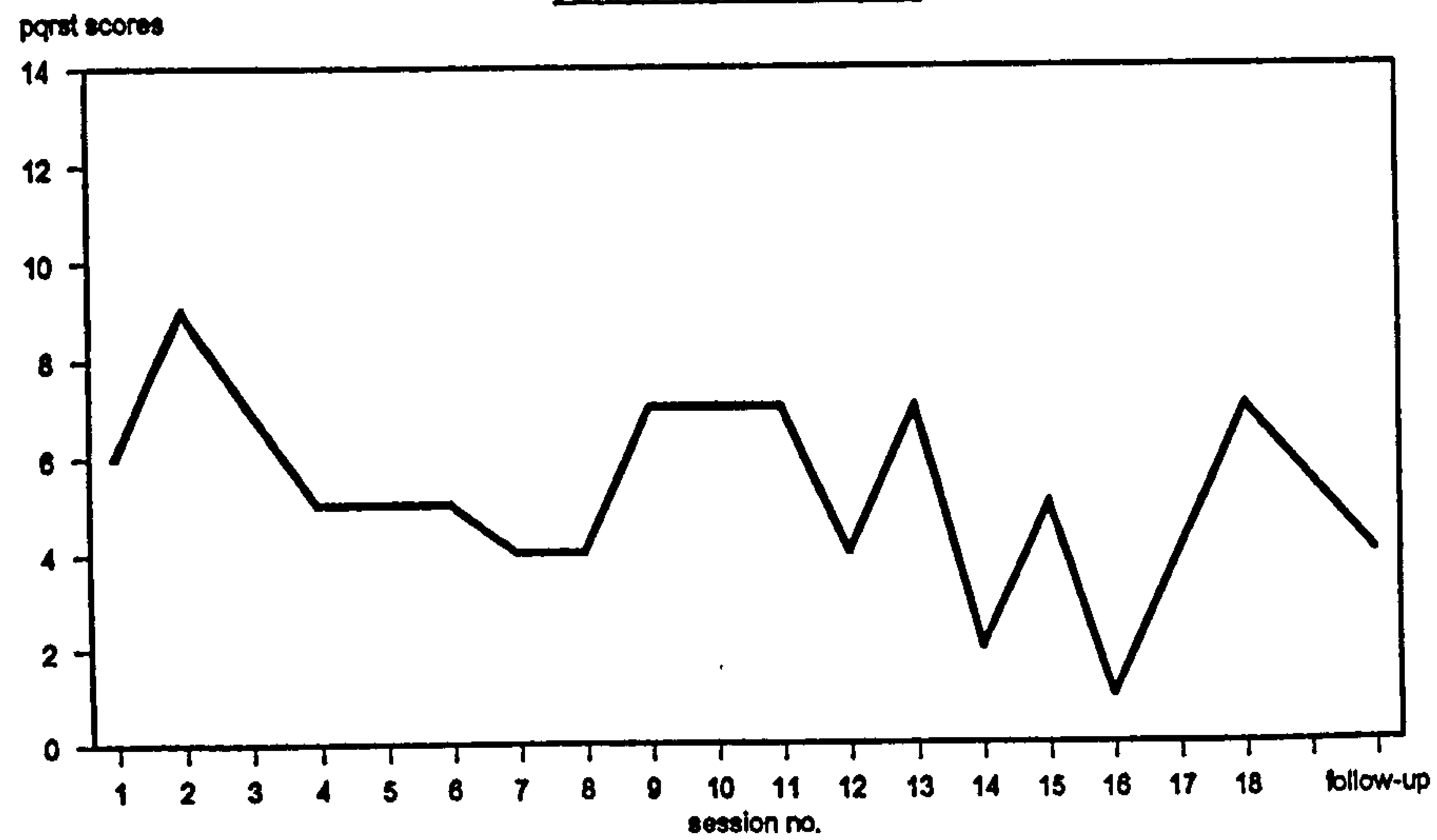


RH: PQRST graphs

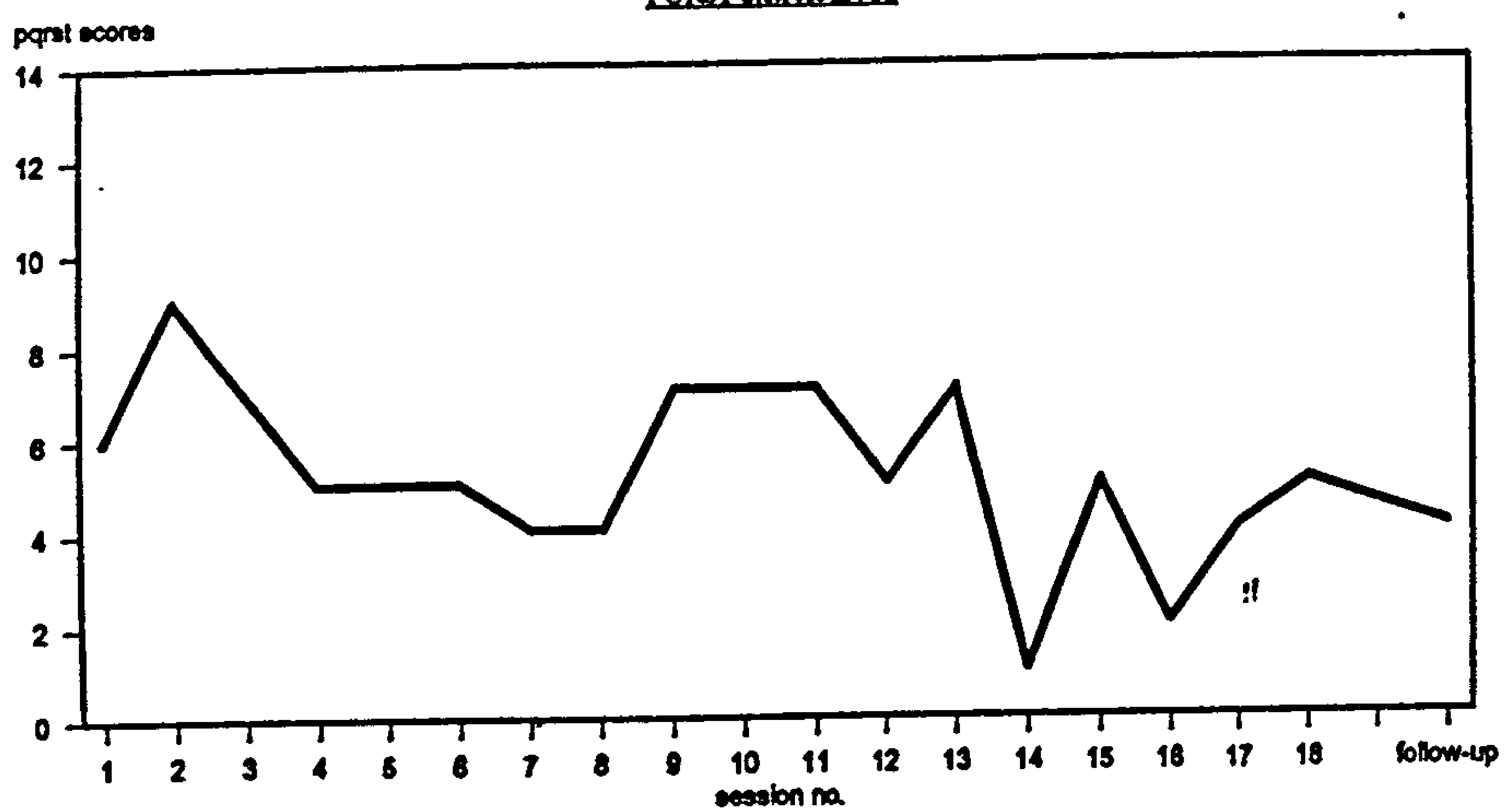
PQRST frequency graph



PQRST disruption to life graph



PQRST distress graph



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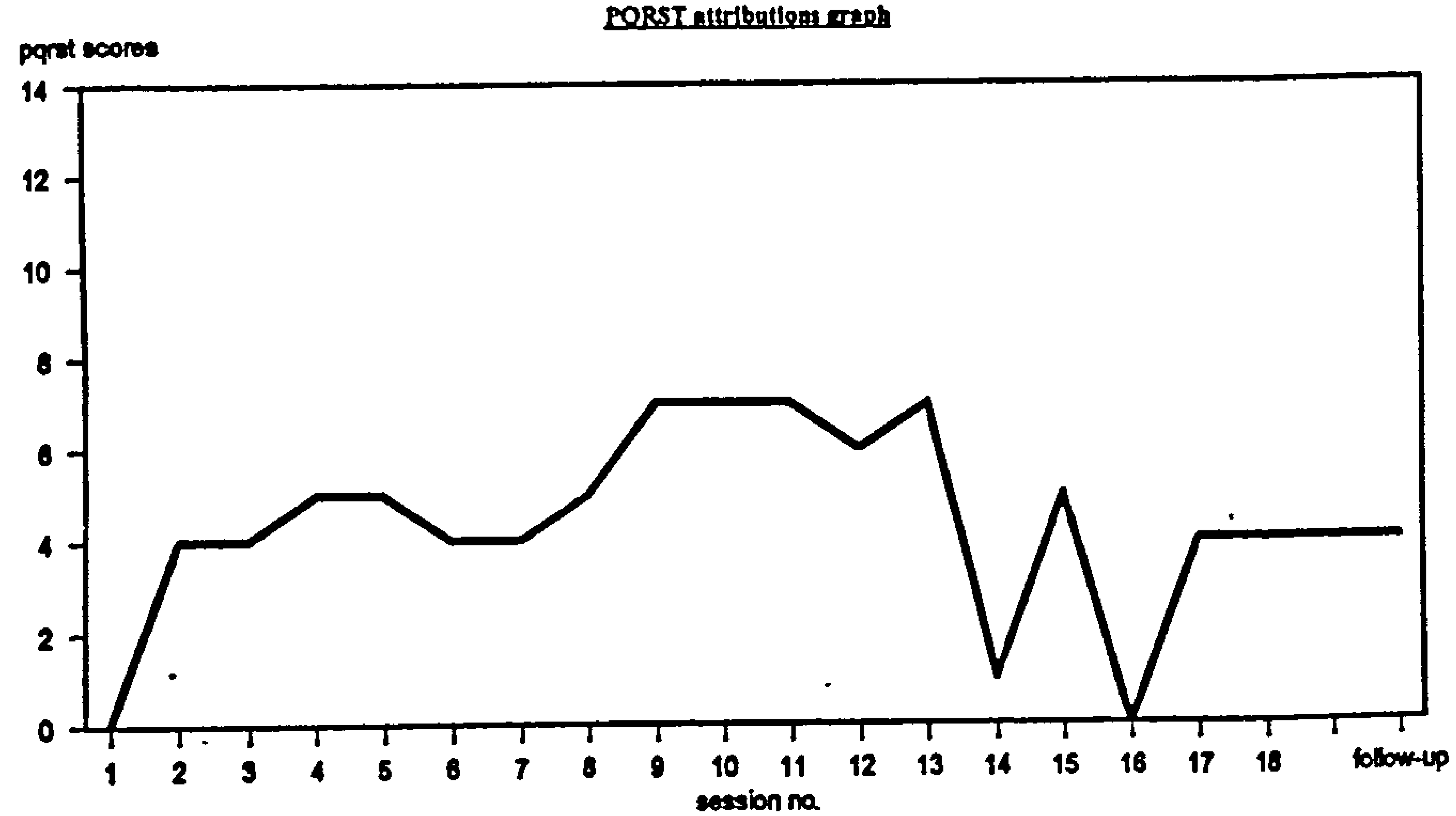
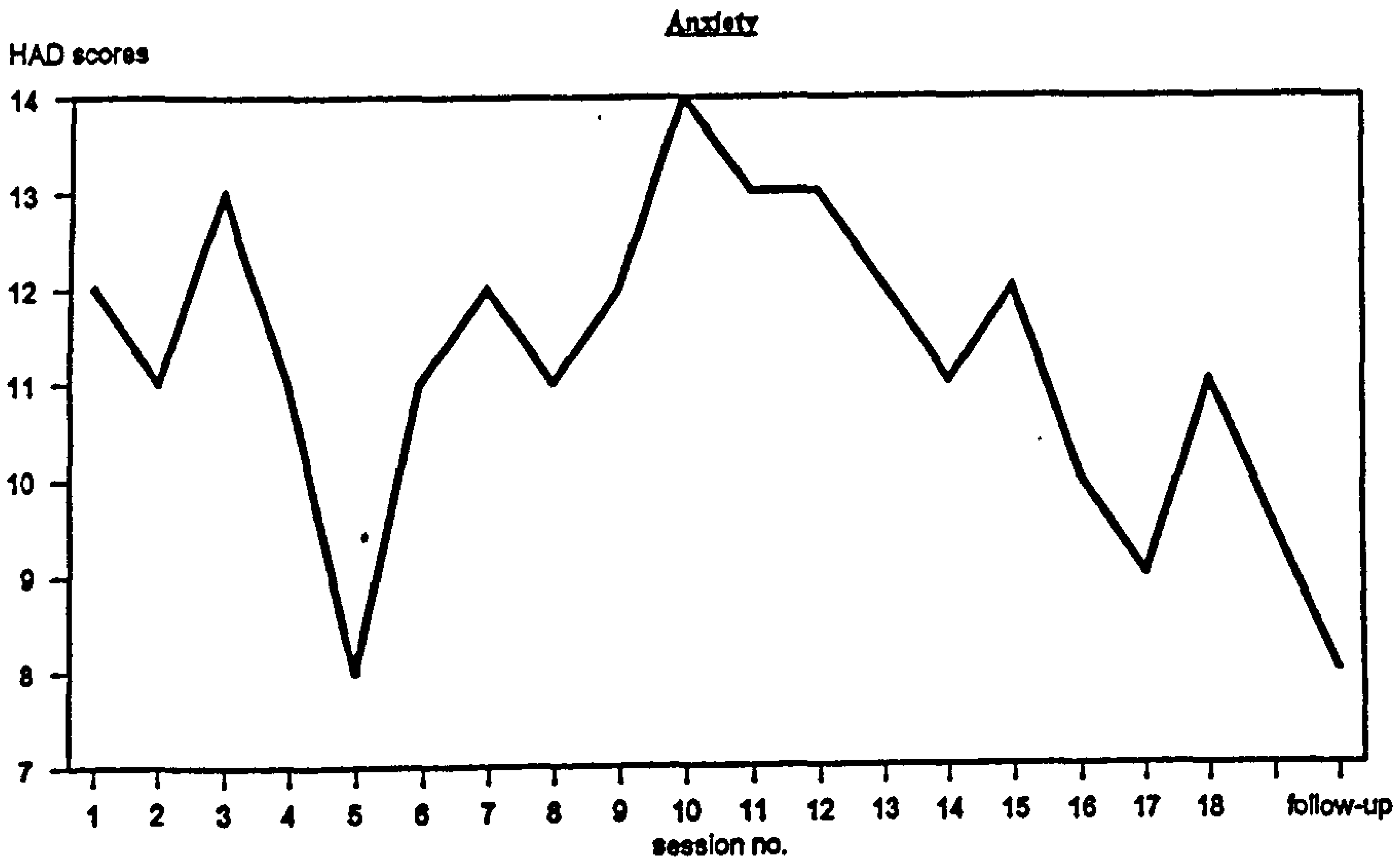
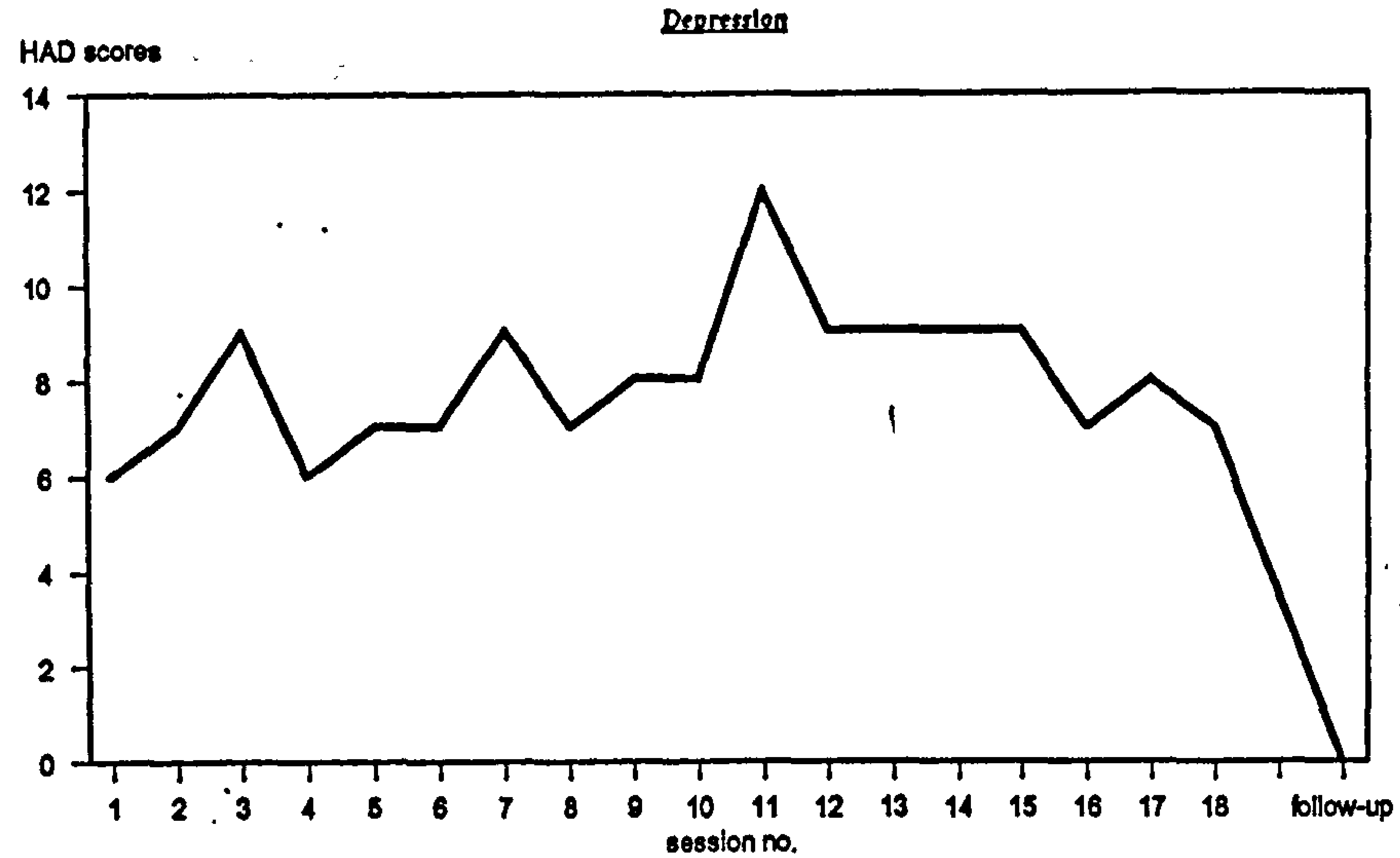


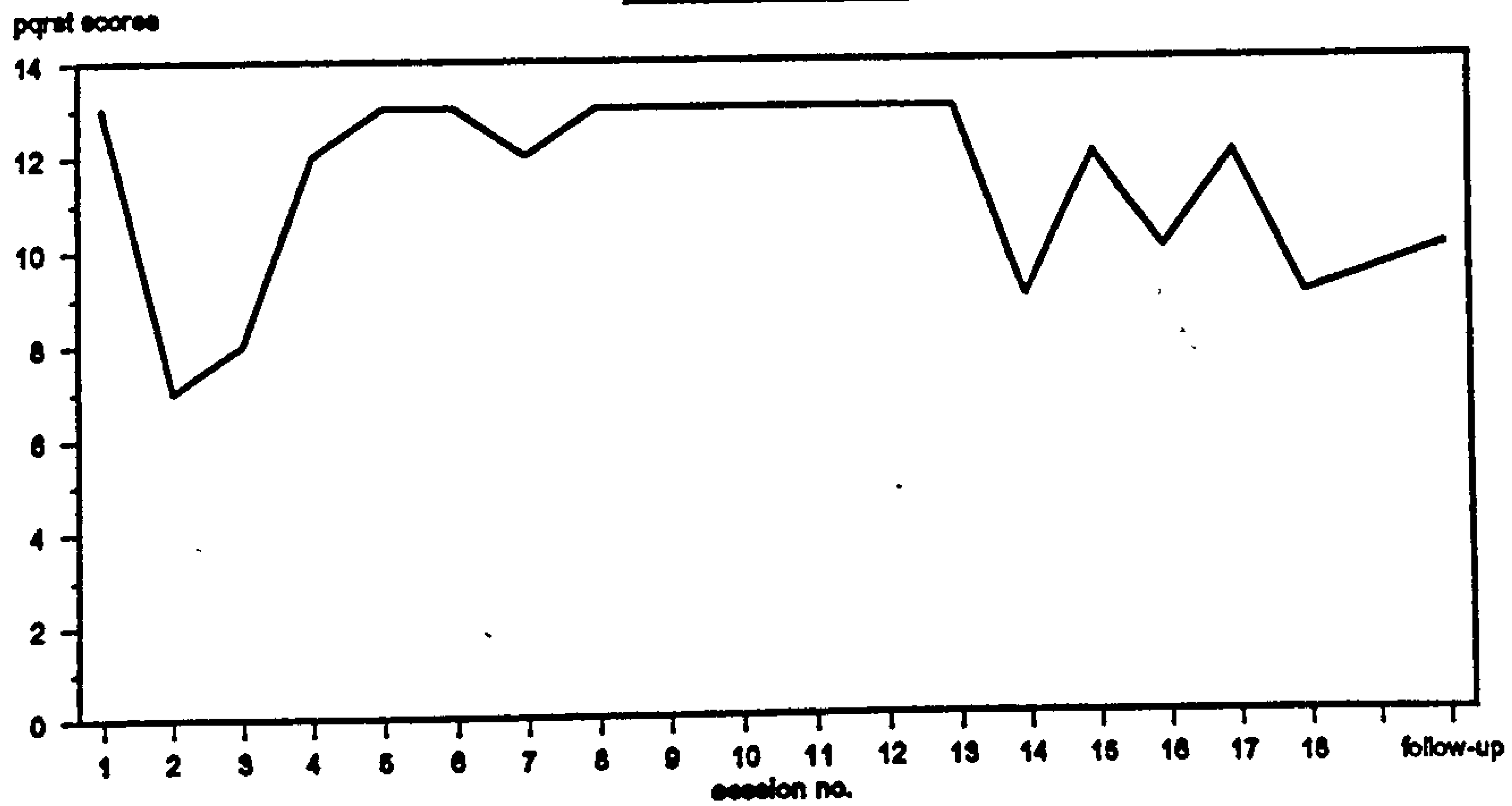
RH: Anxiety and depression graphs



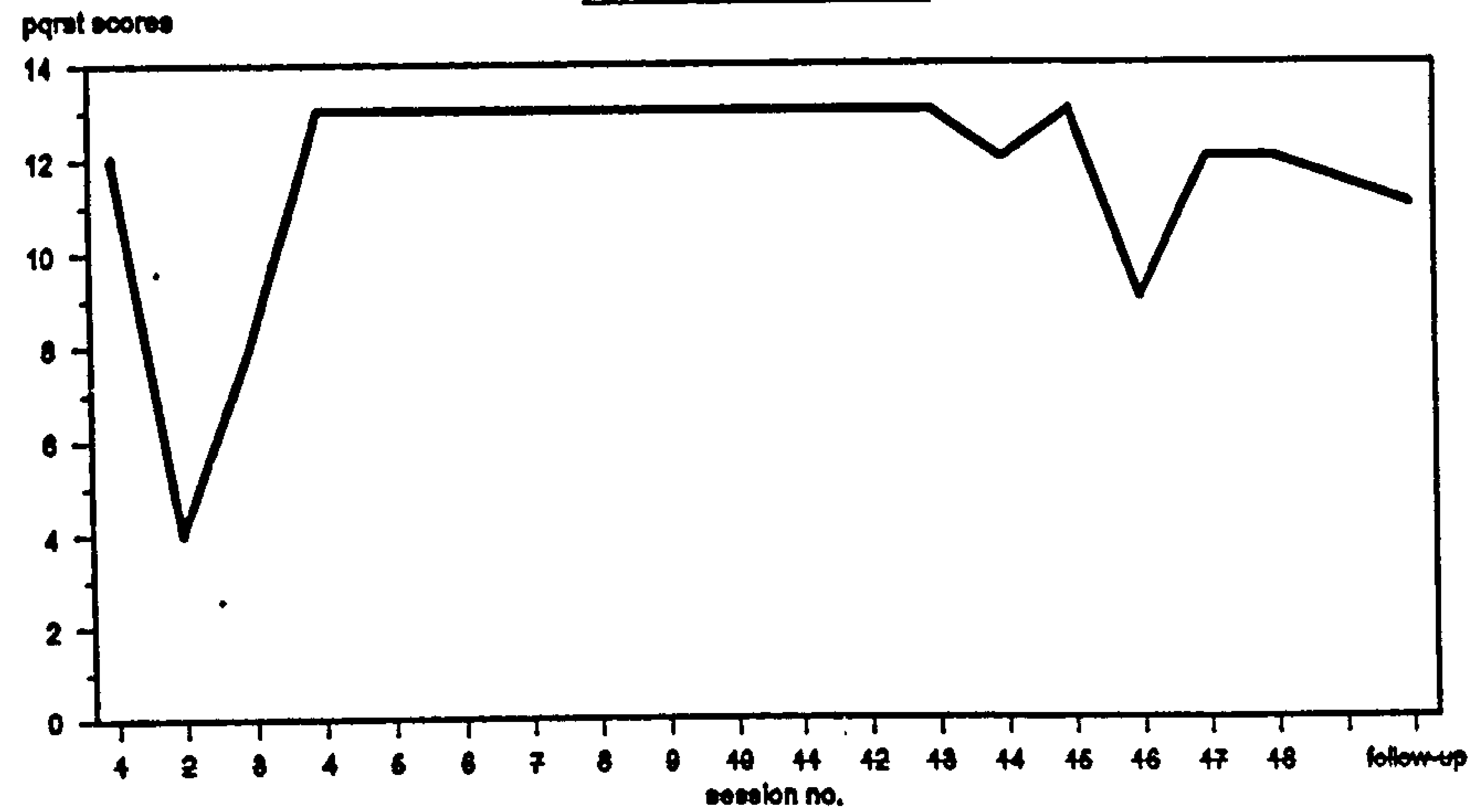


SB: PQRST graphs

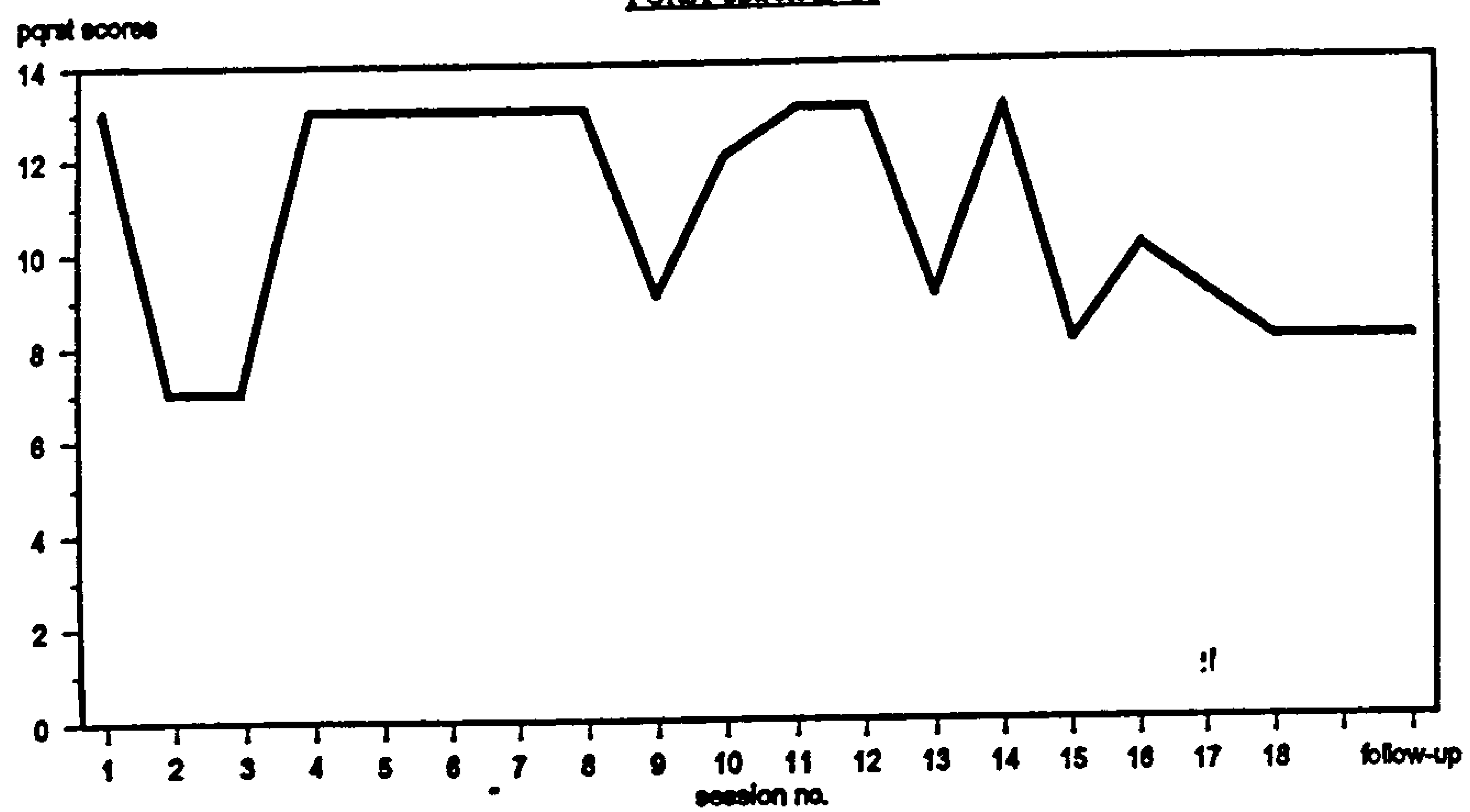
PQRST frequency graph



PQRST disruption to life graph



PQRST distress graph



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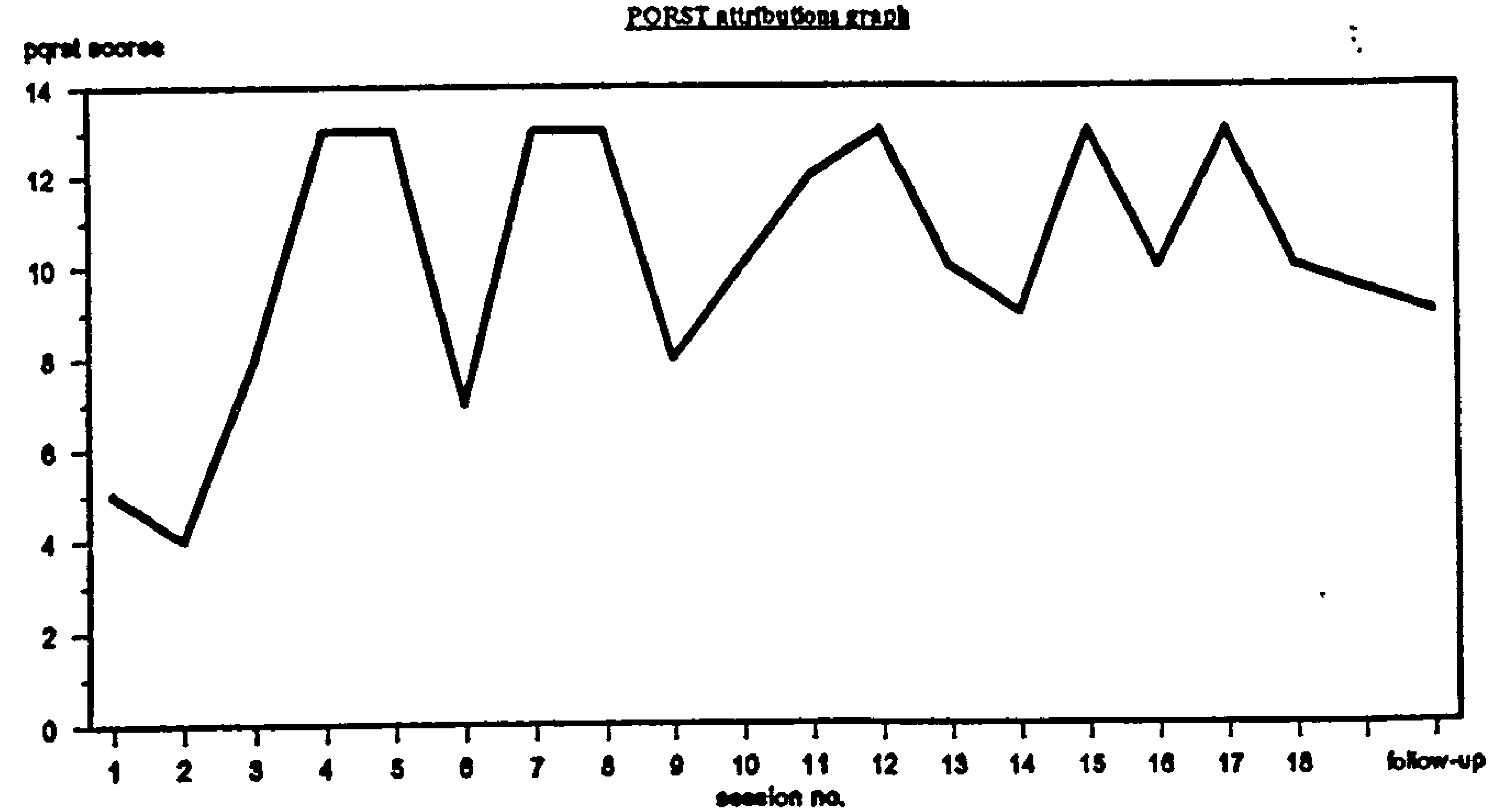

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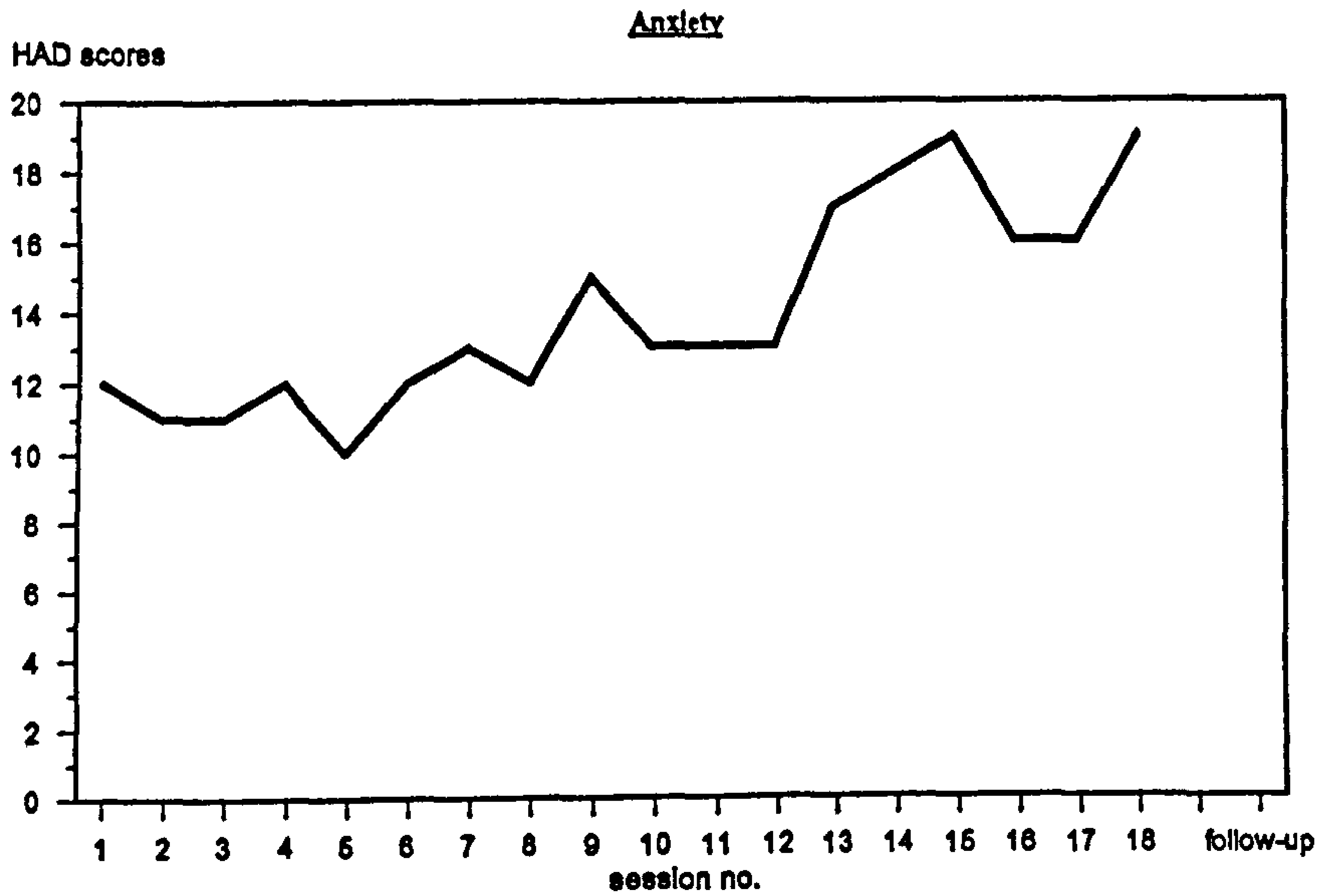
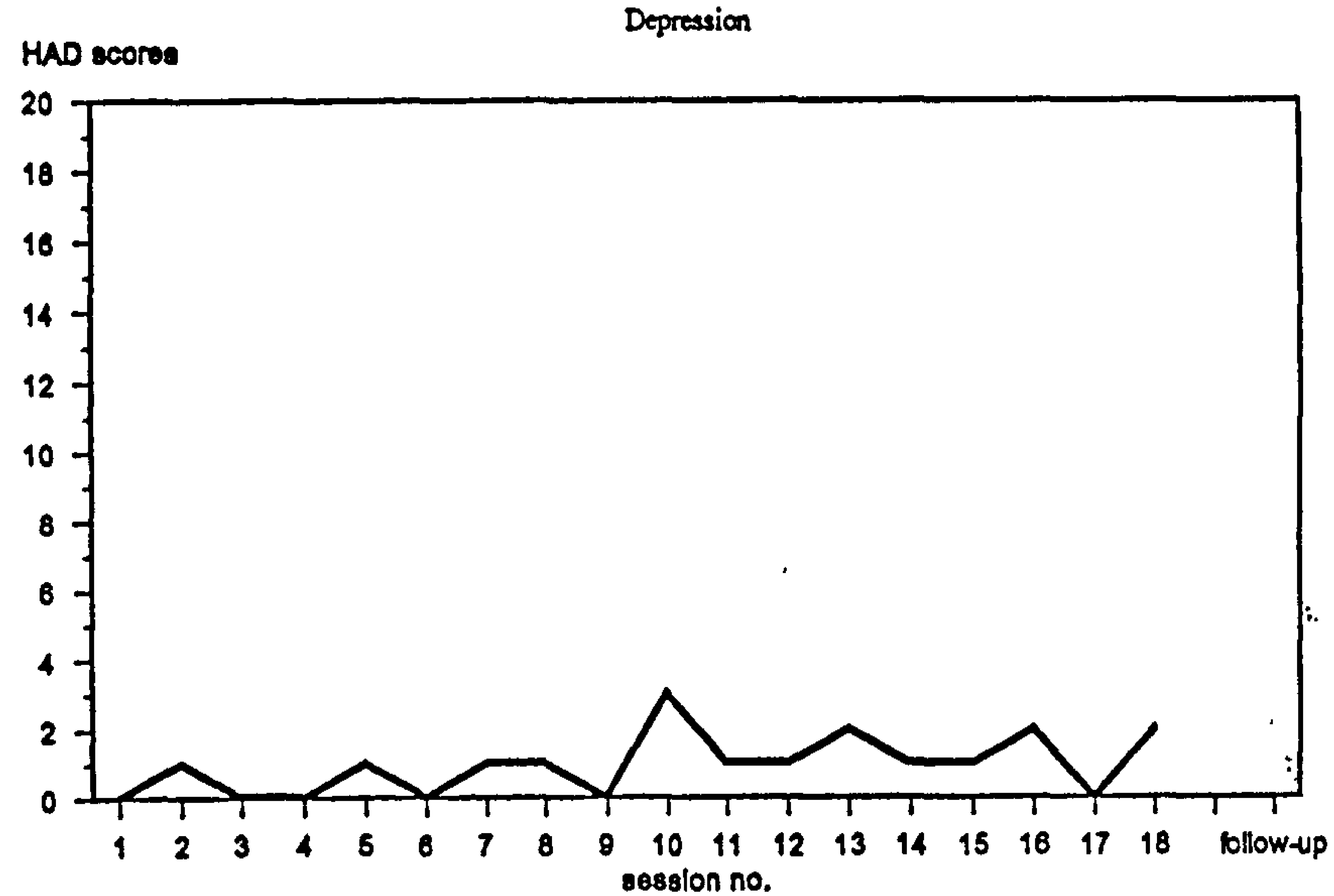
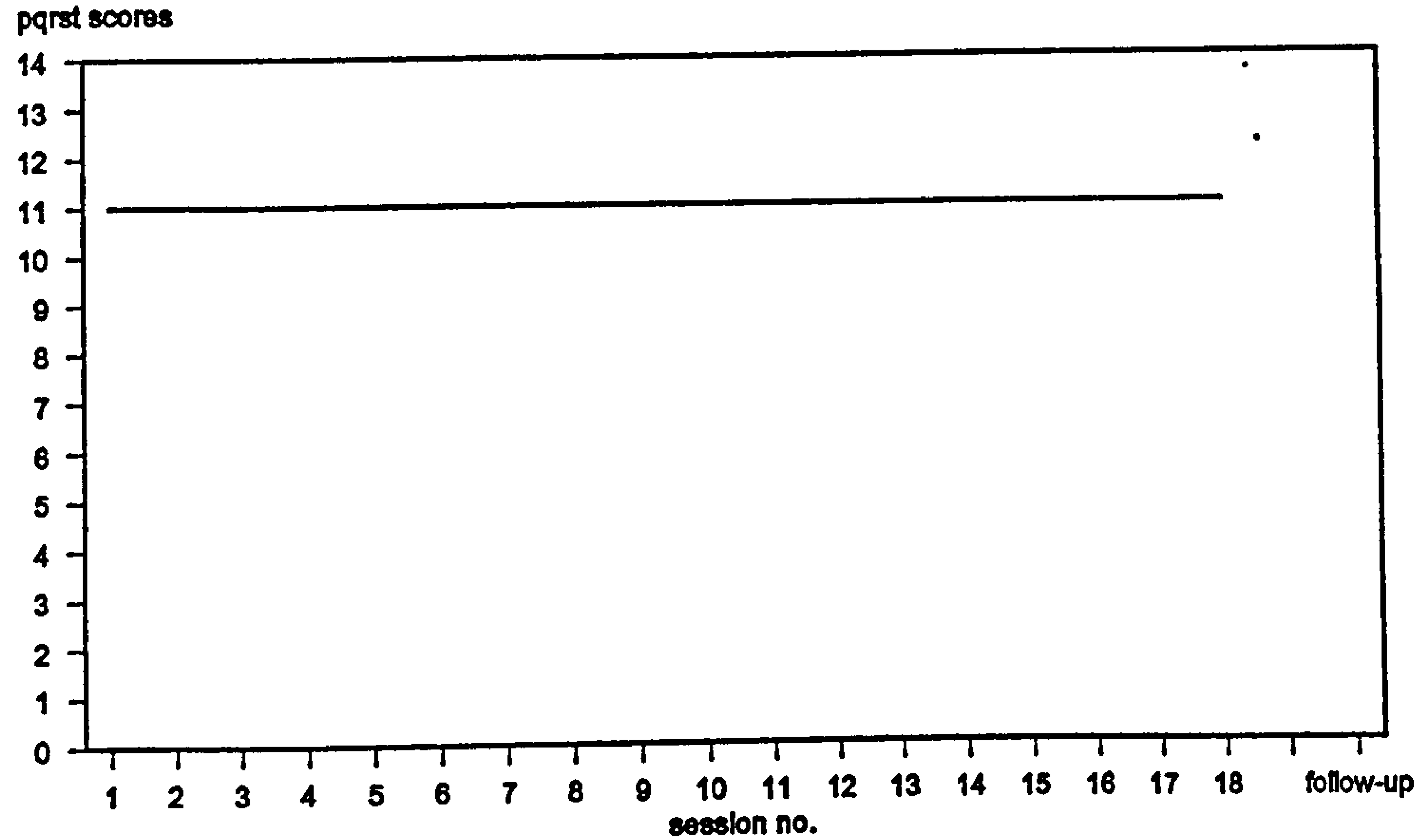




SS:PQRST graphs

PQRST frequency graph



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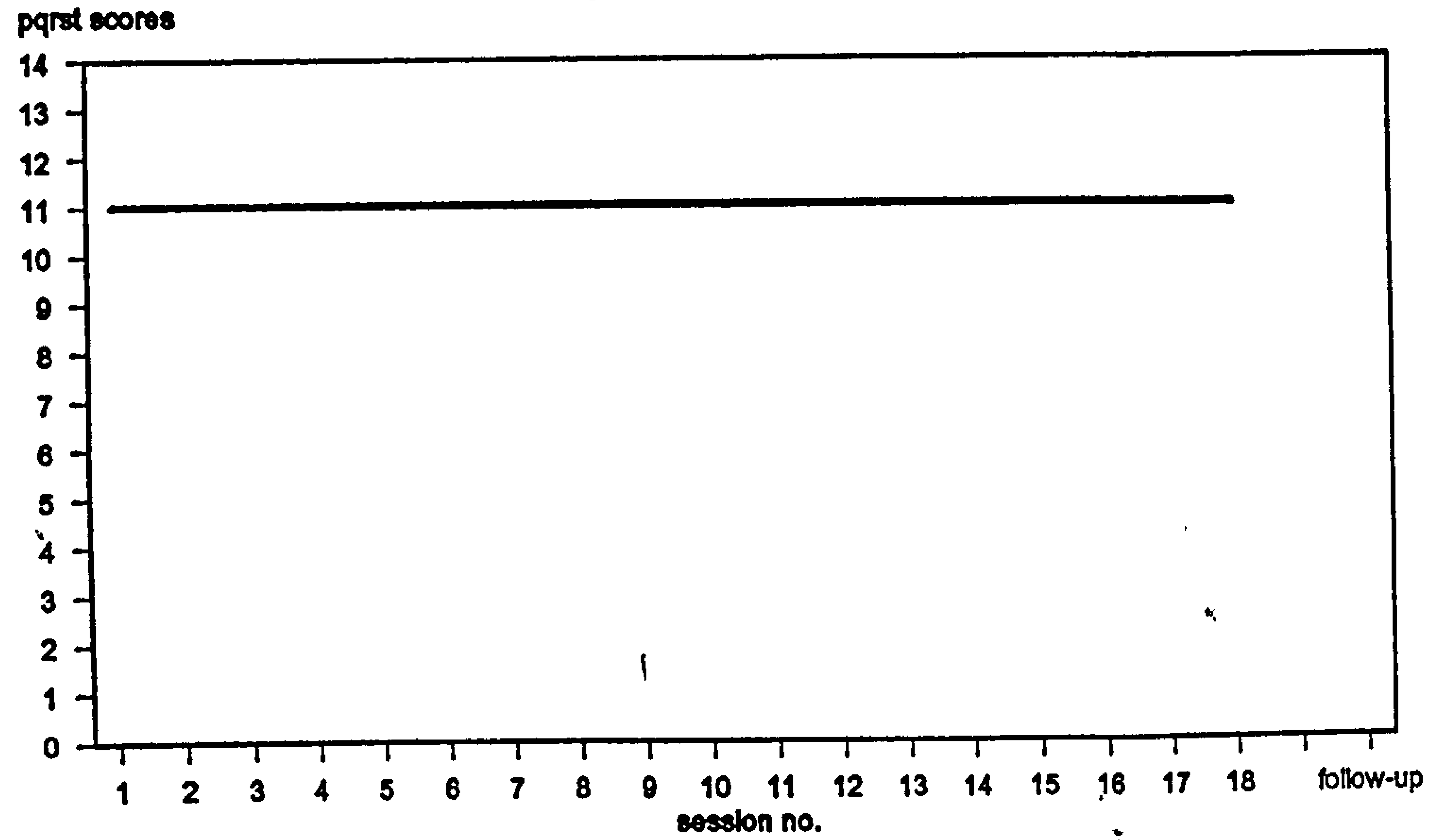

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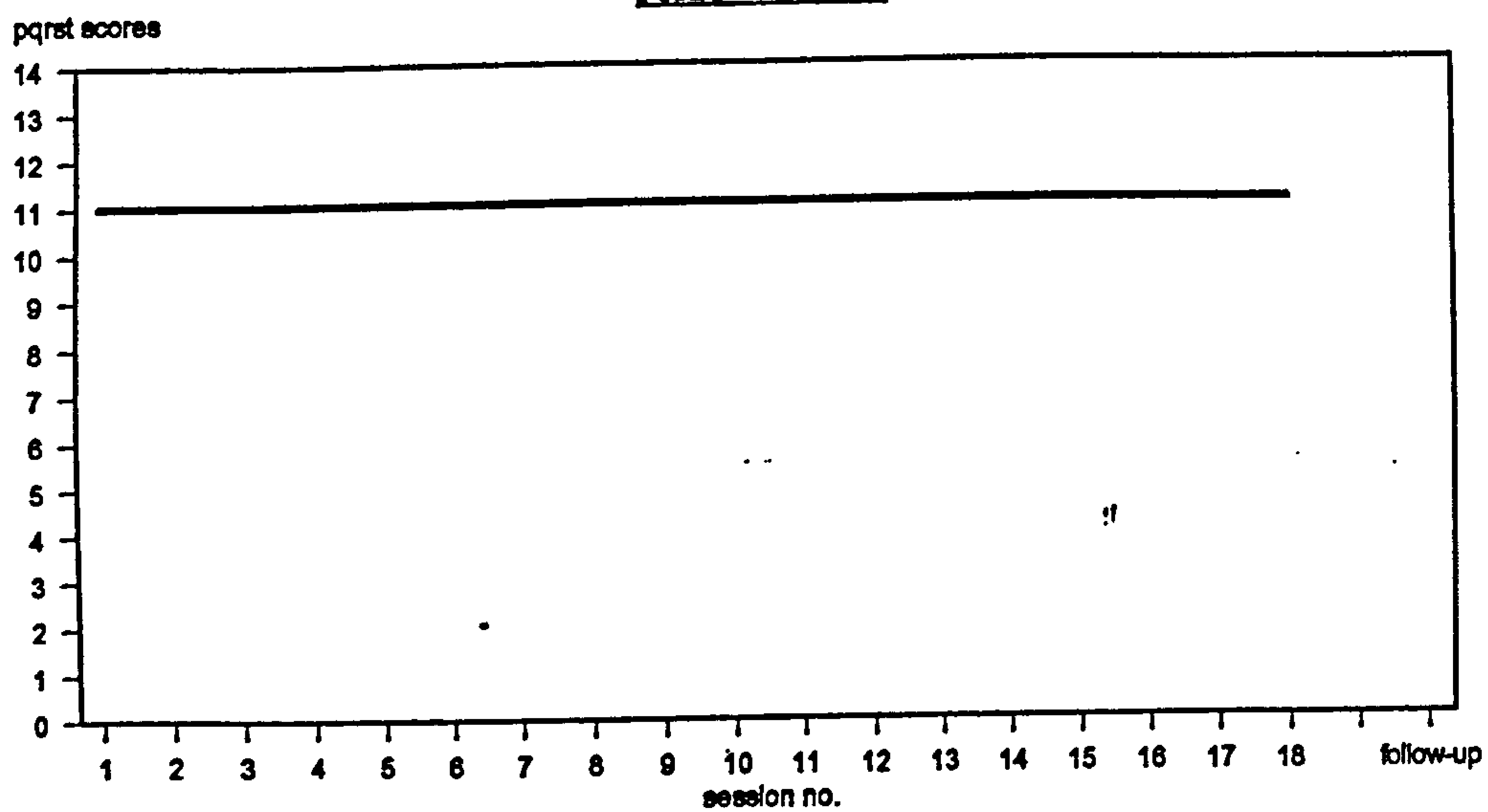

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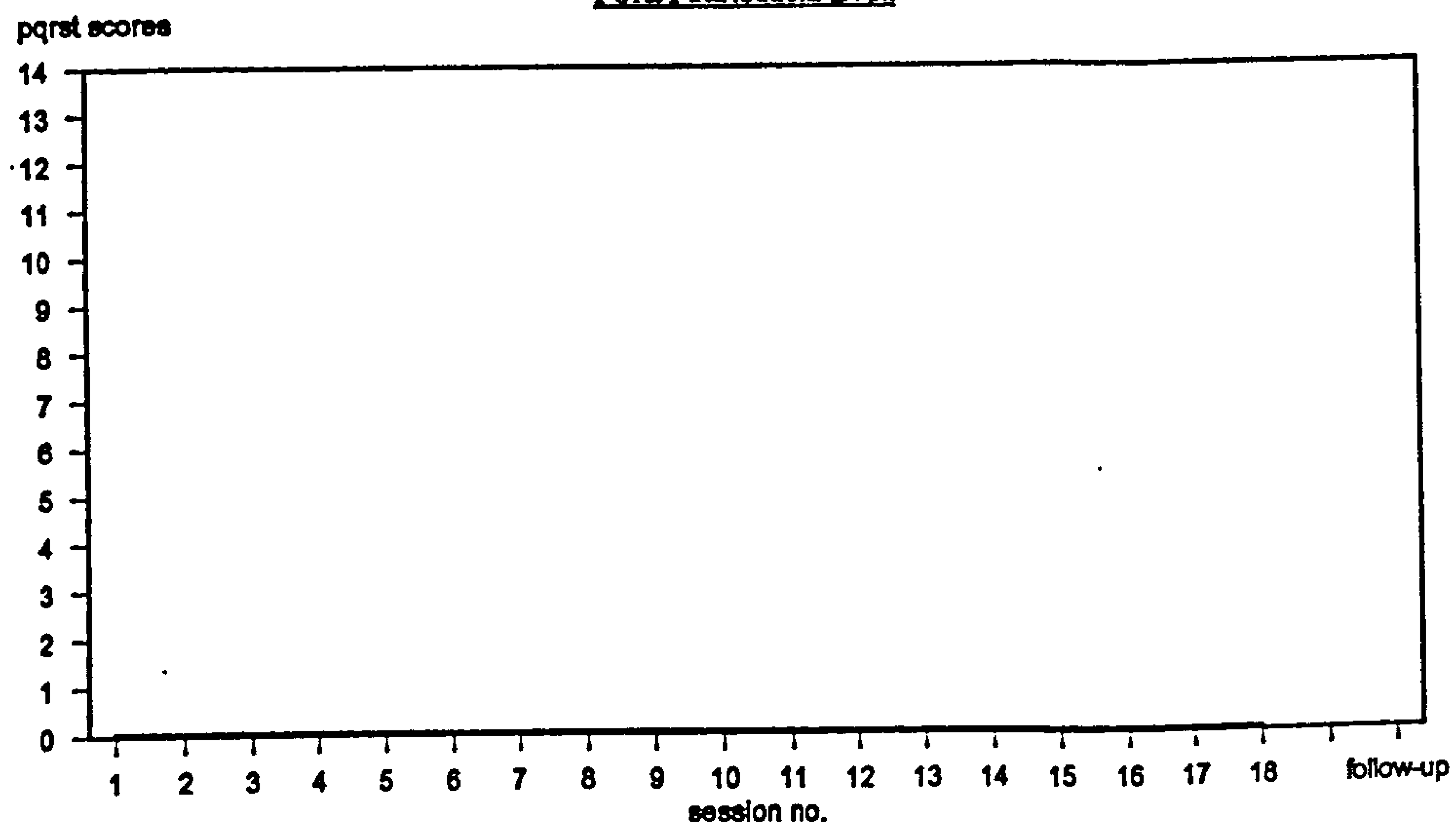
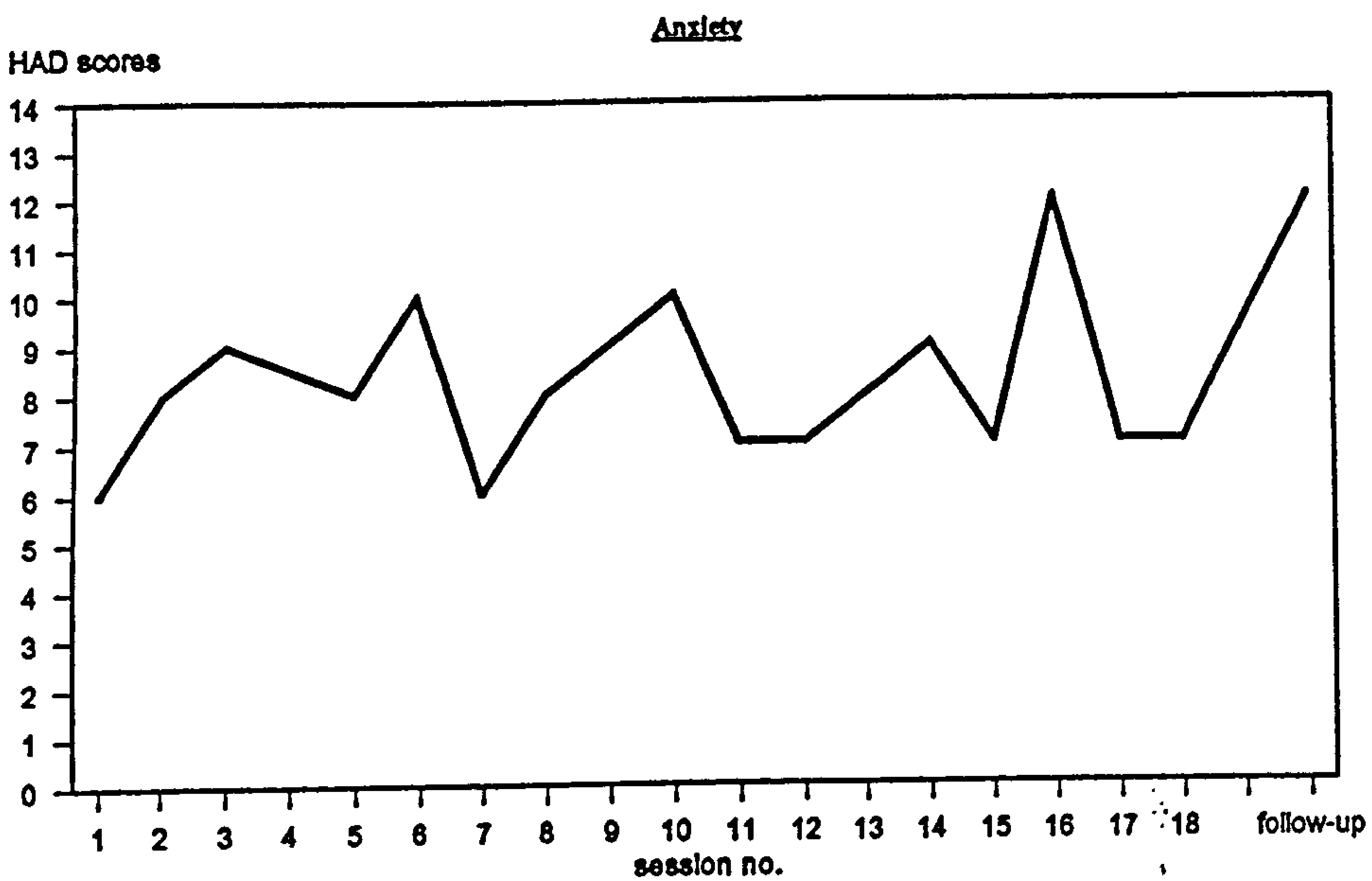
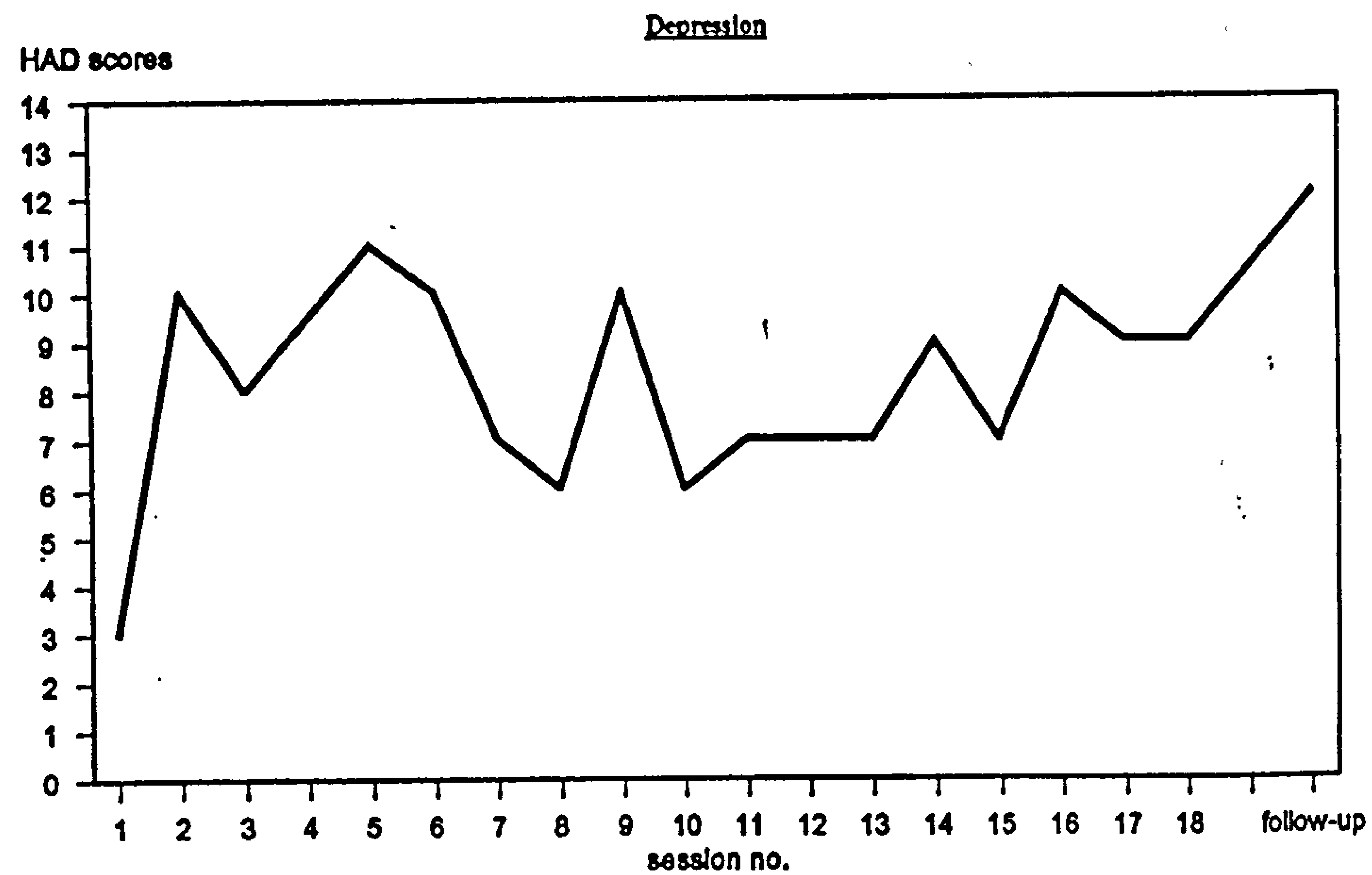


SS: Anxiety and depression graphs

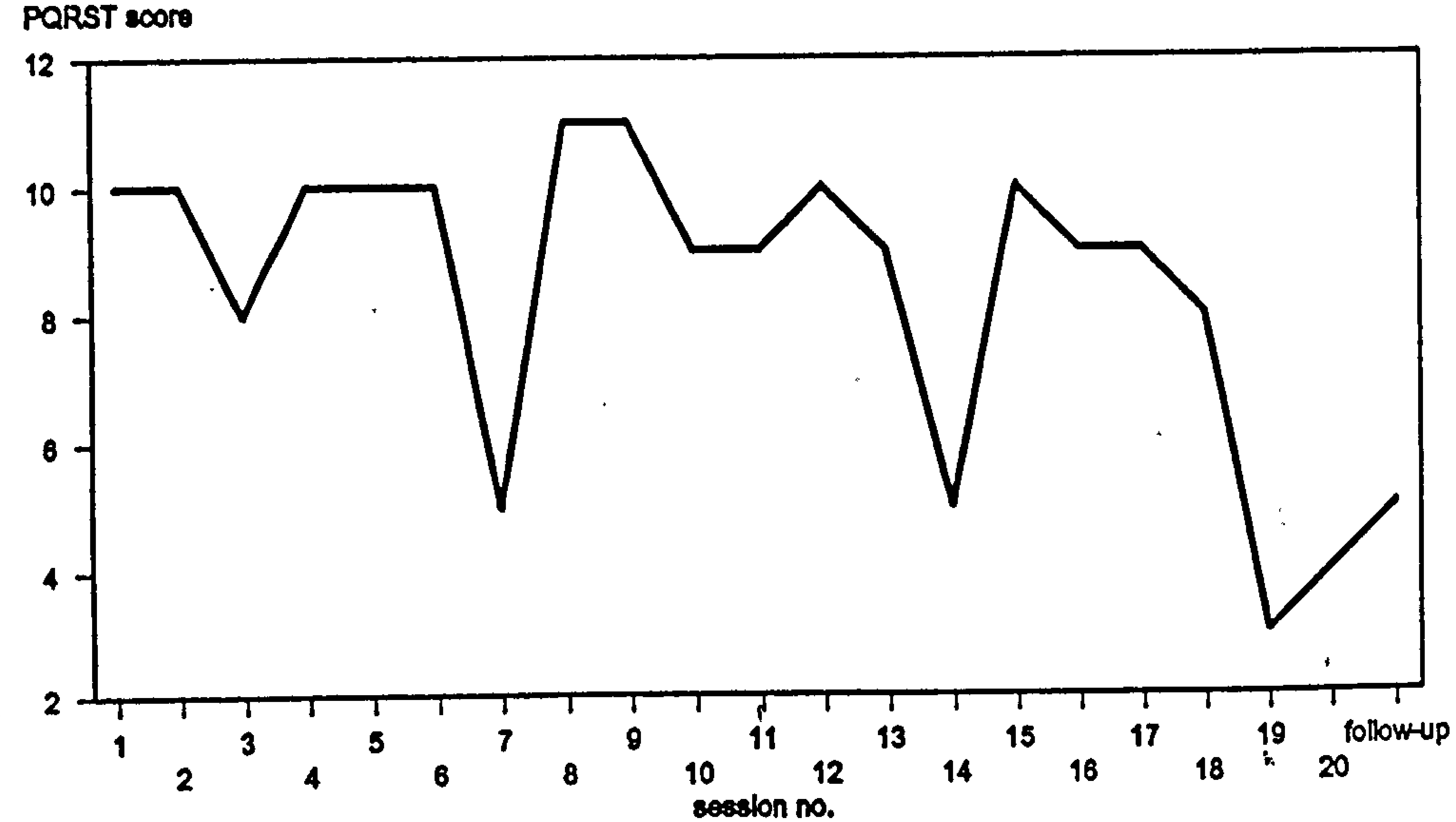




TM: PQRST graphs

PQRST frequency graph

PQRST disruption graph



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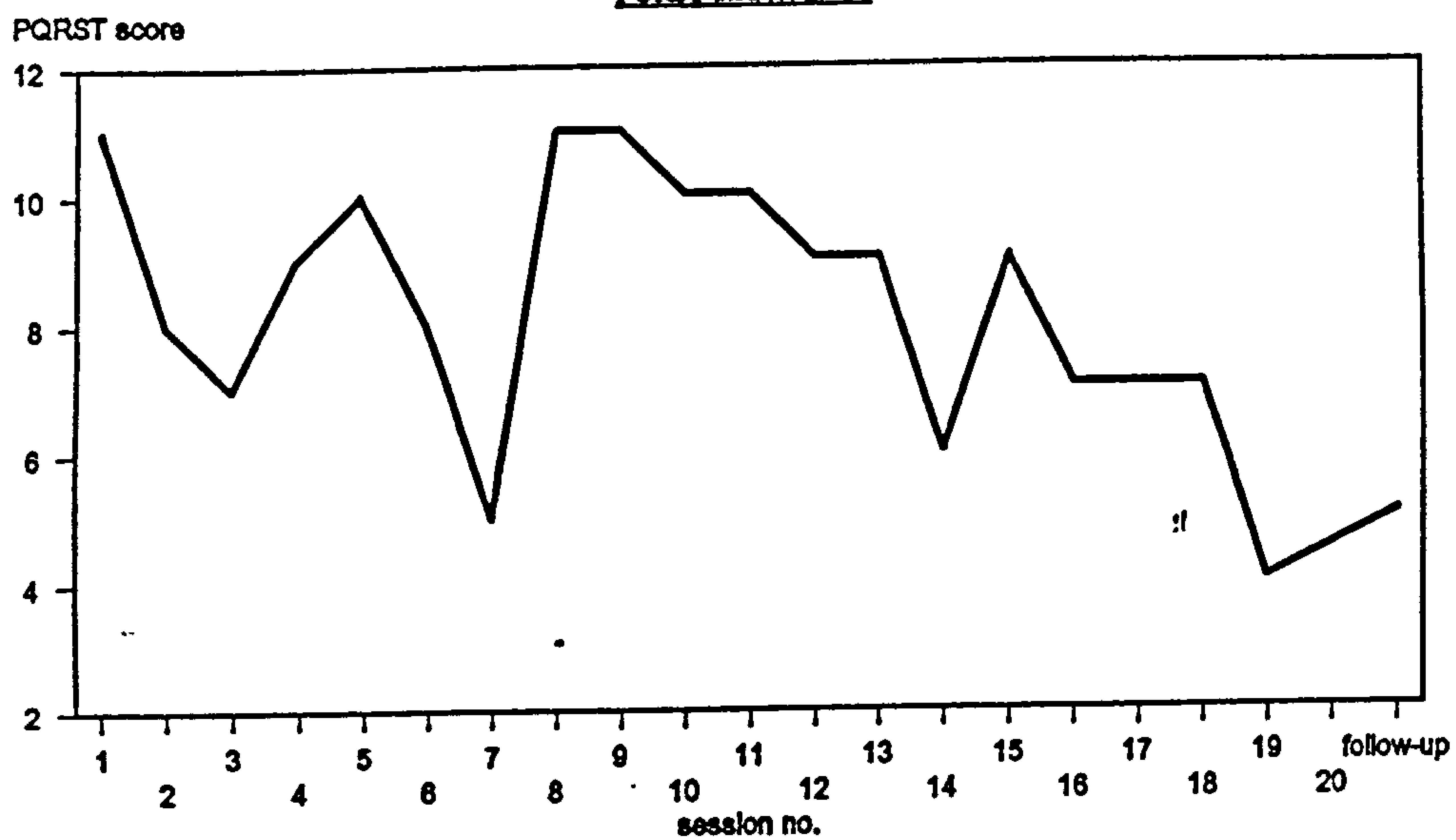
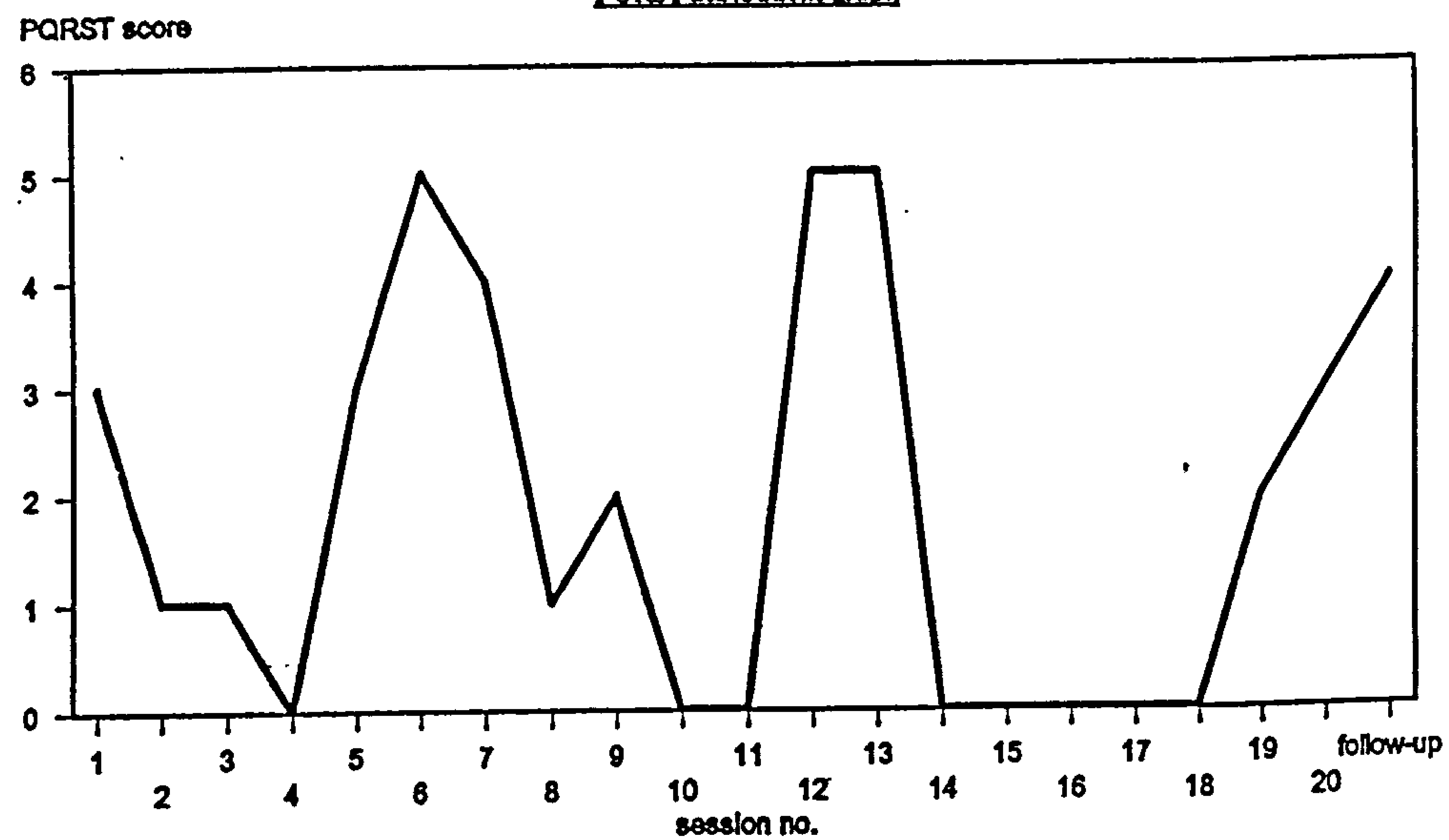
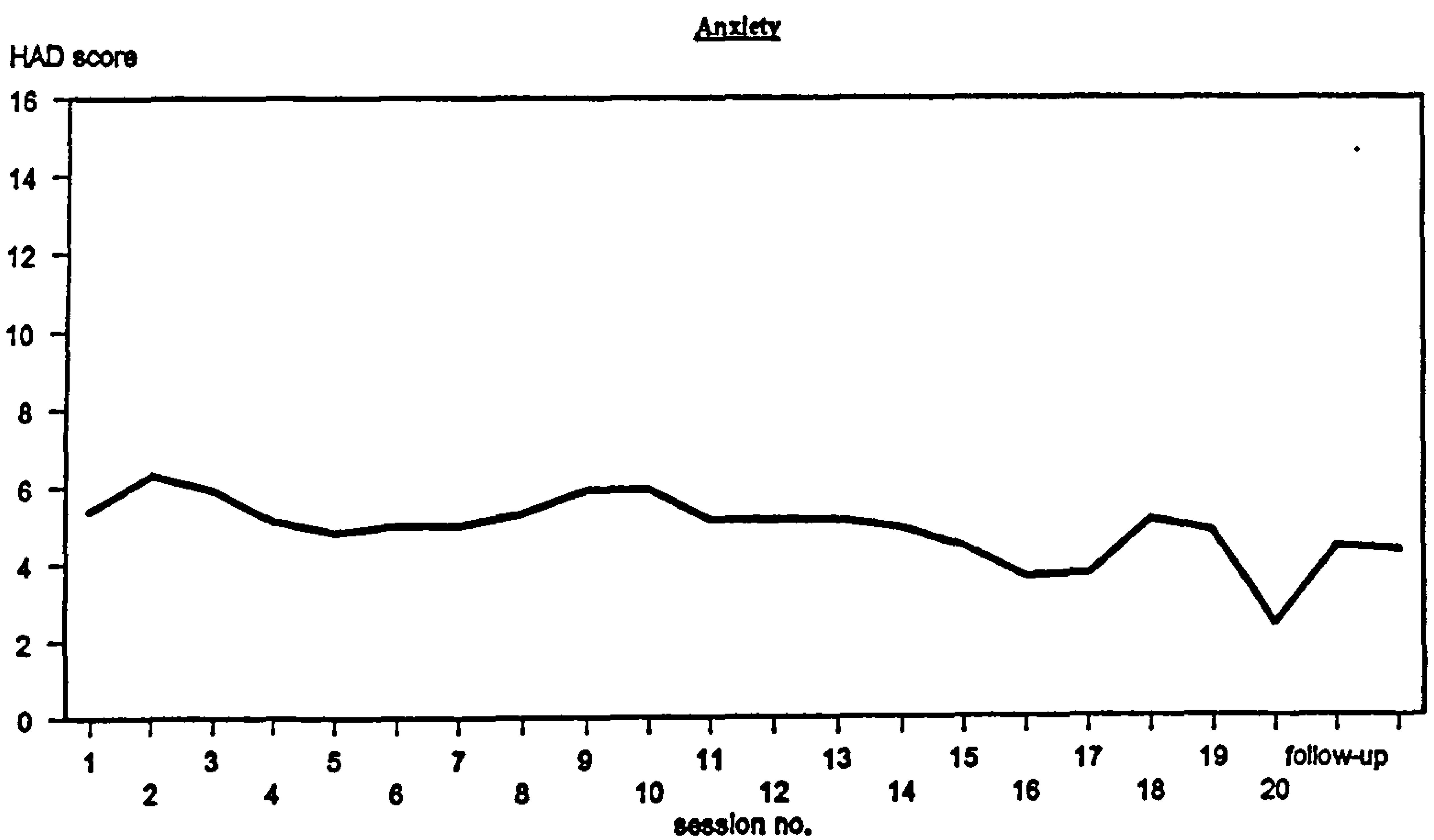
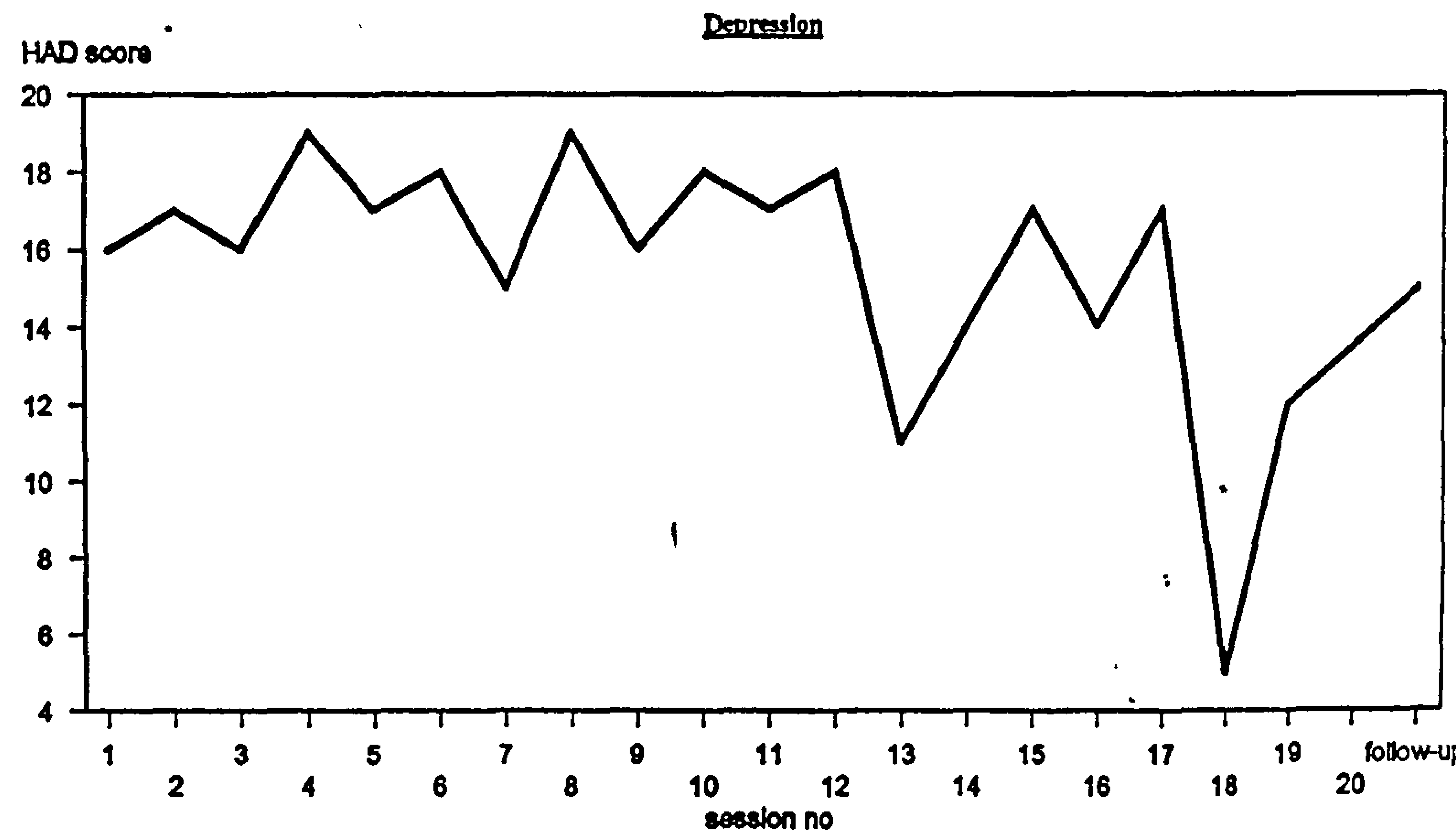


PQRST attributions graph



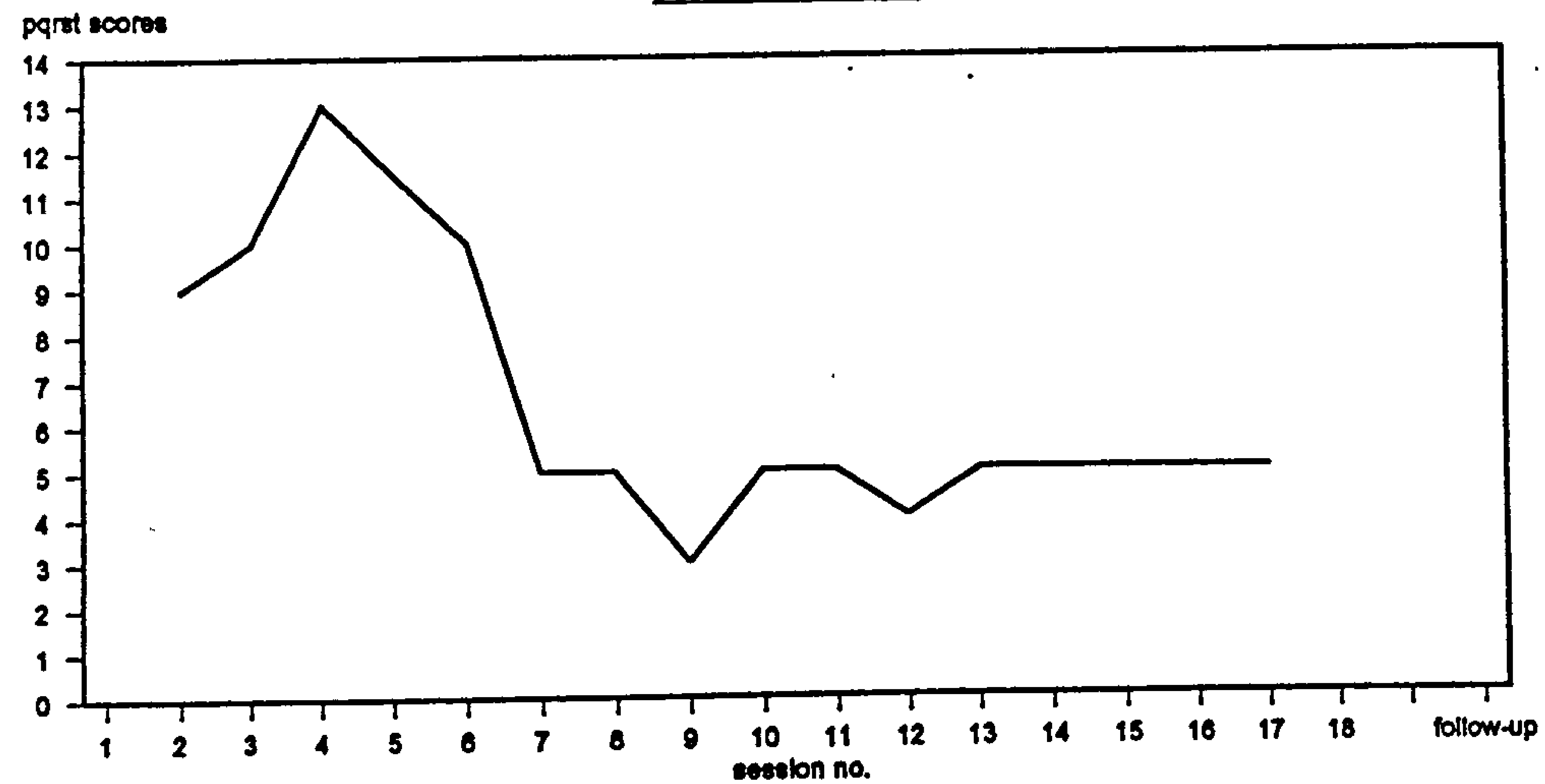
TM: Anxiety and depression graphs



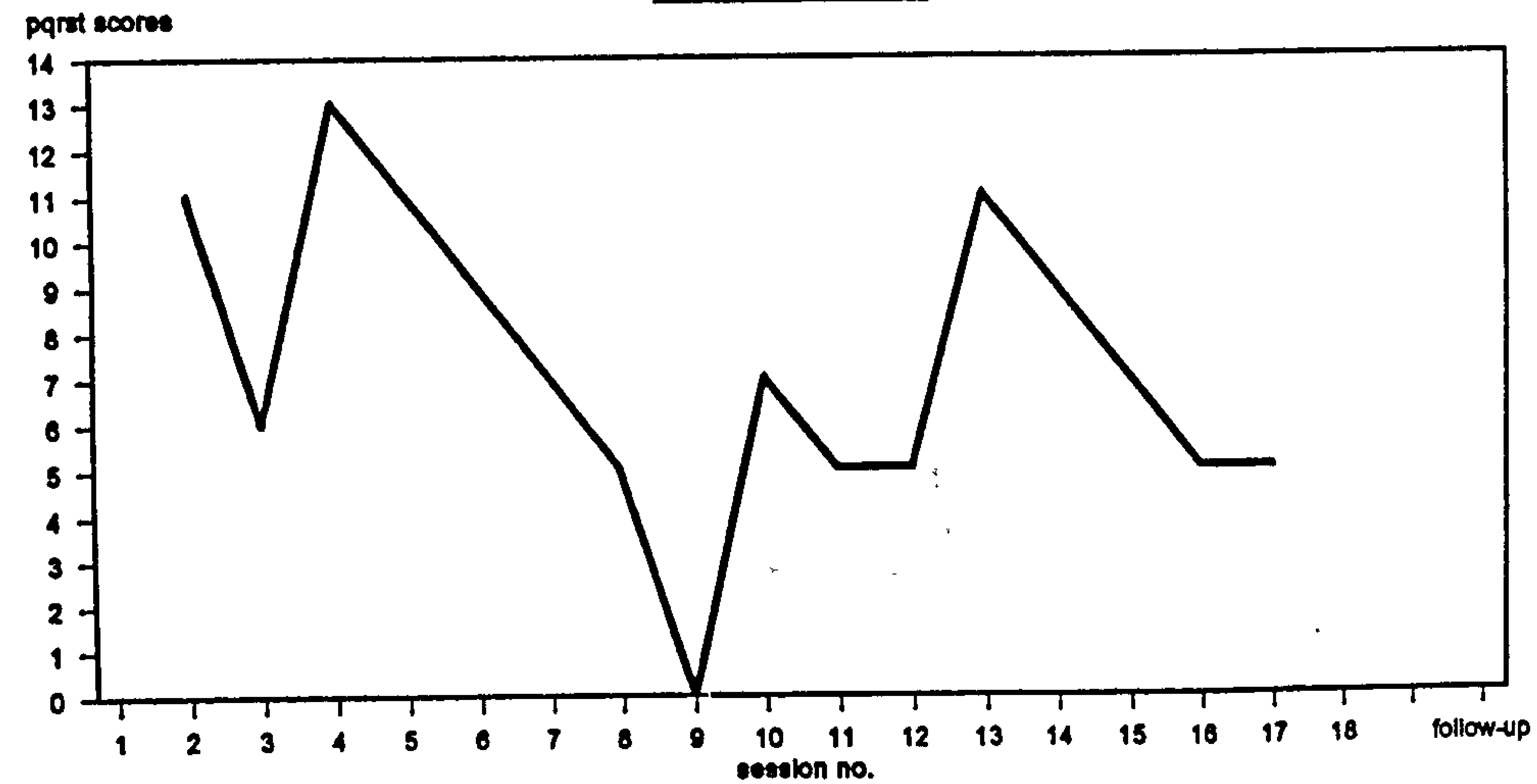


VR: PQRST graphs

PQRST frequency graph



PQRST disruption graph



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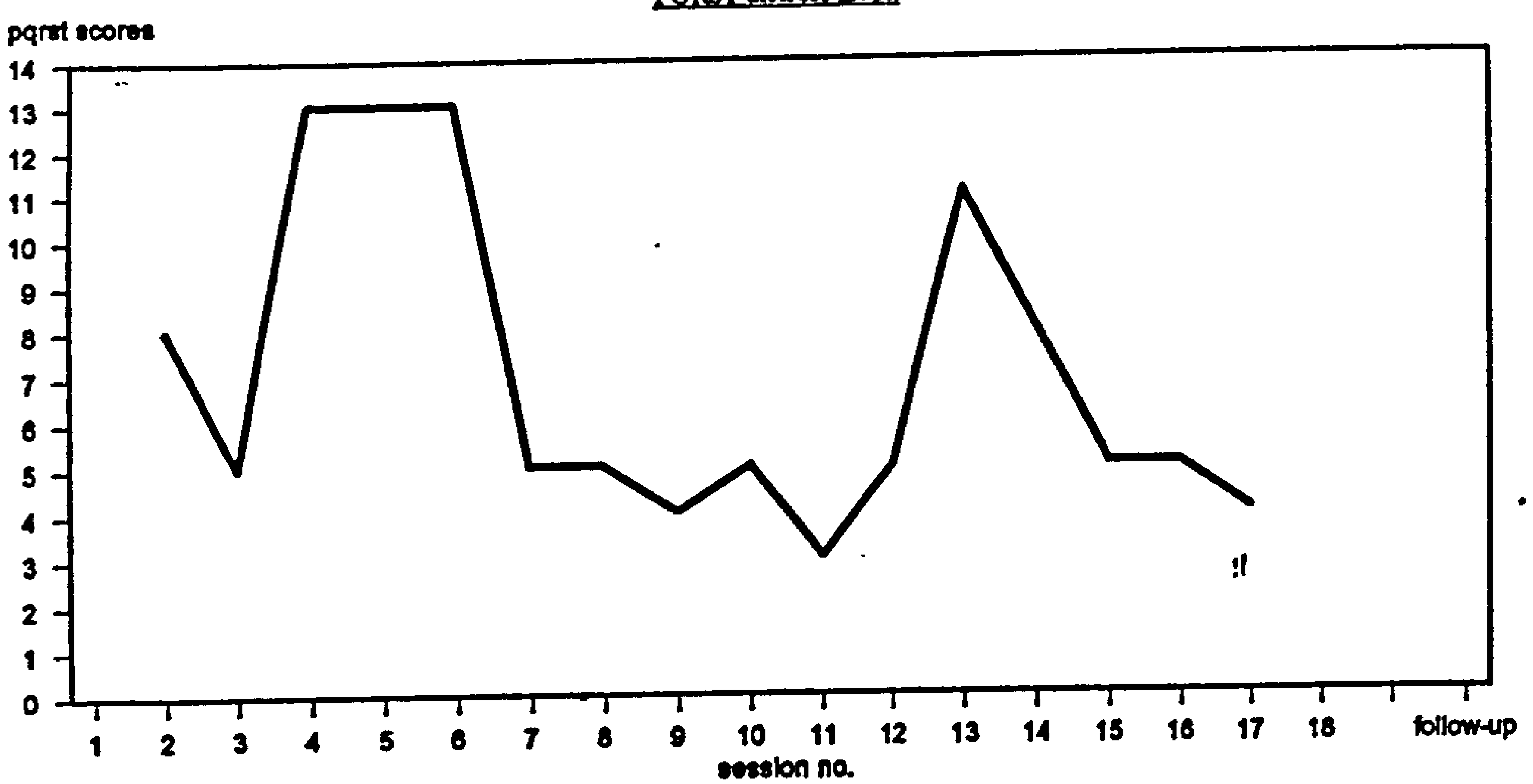
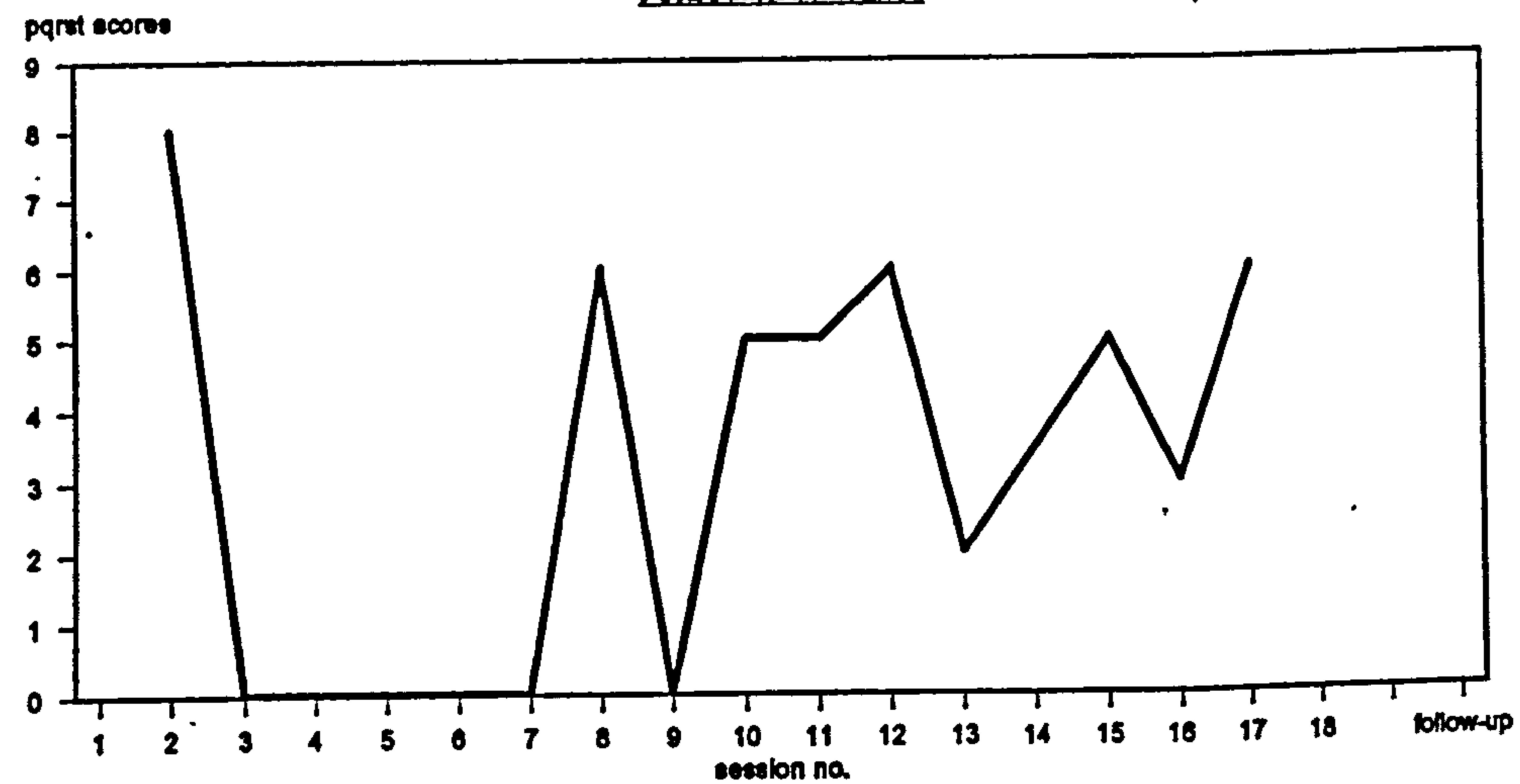
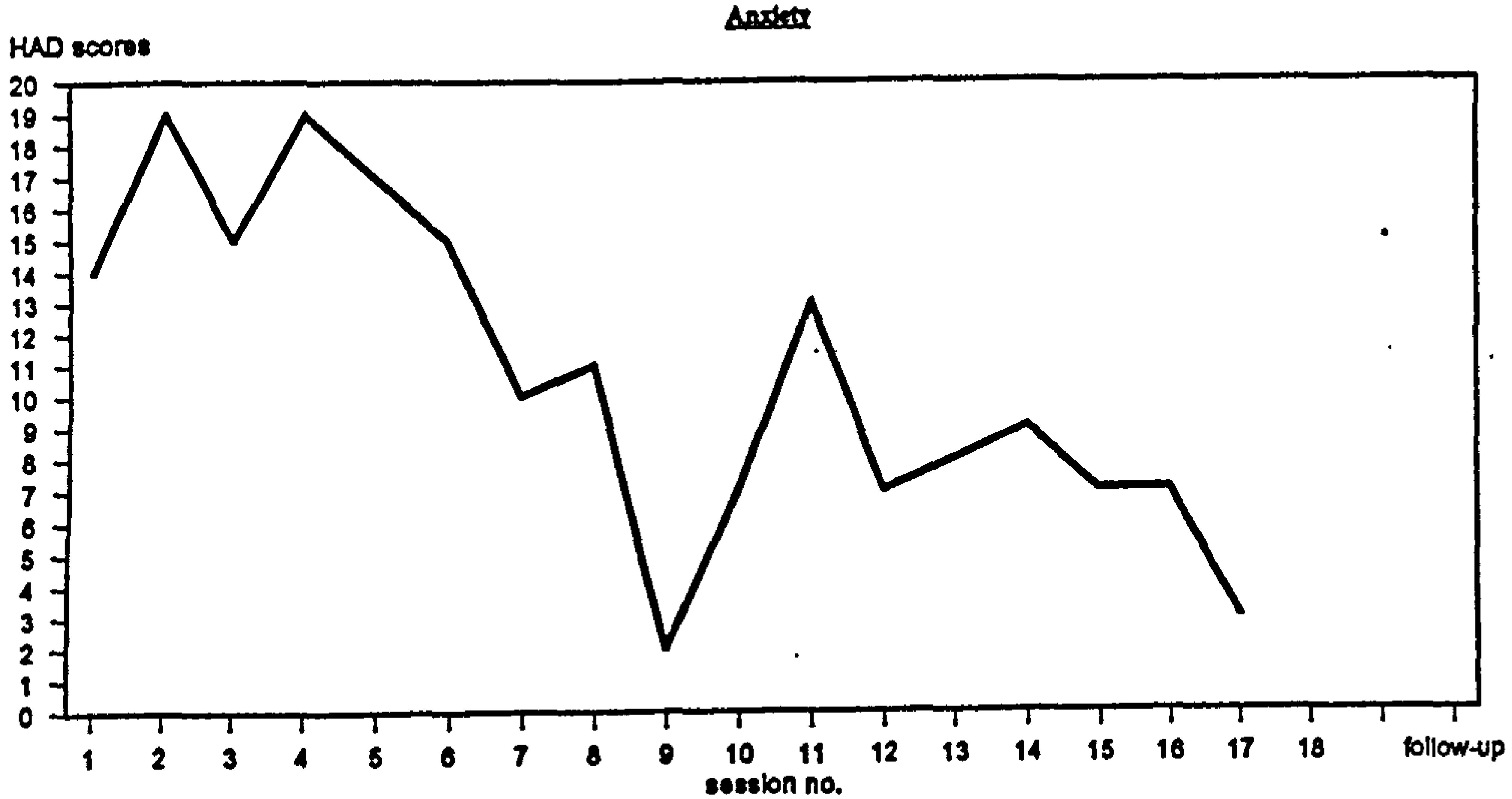


PQRST attributions graph

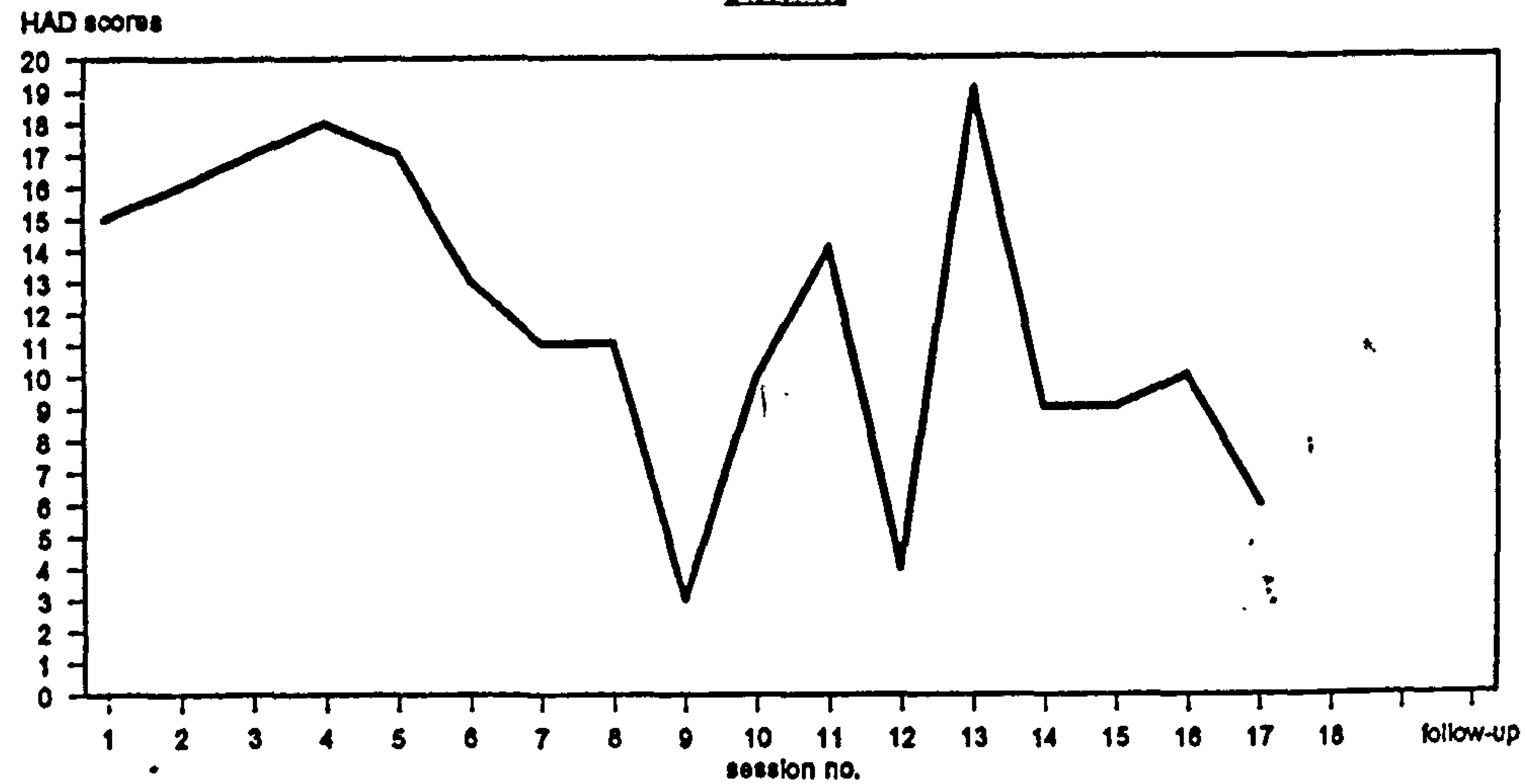


VR: Anxiety and depression graphs

Anxiety

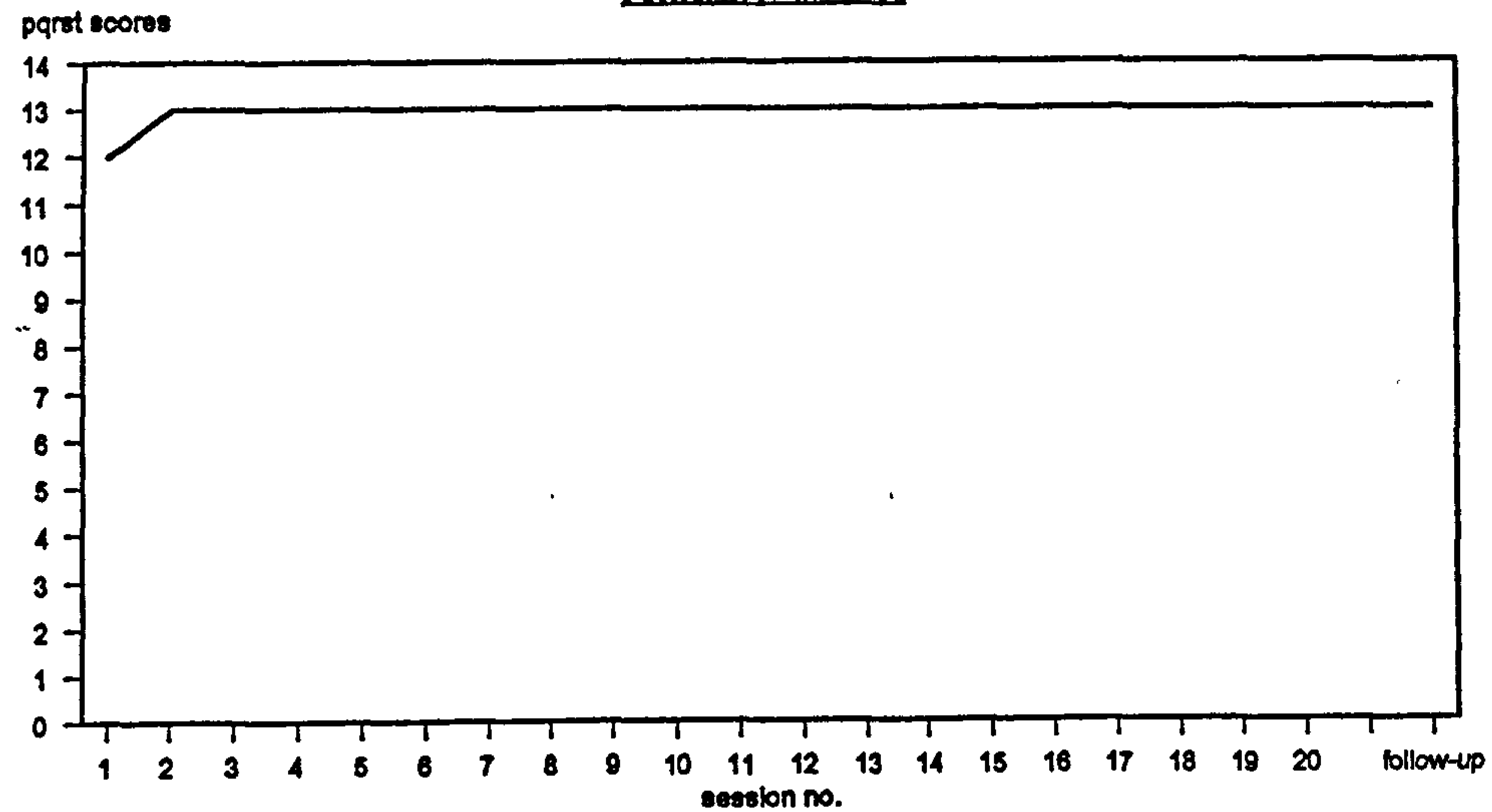


Depression

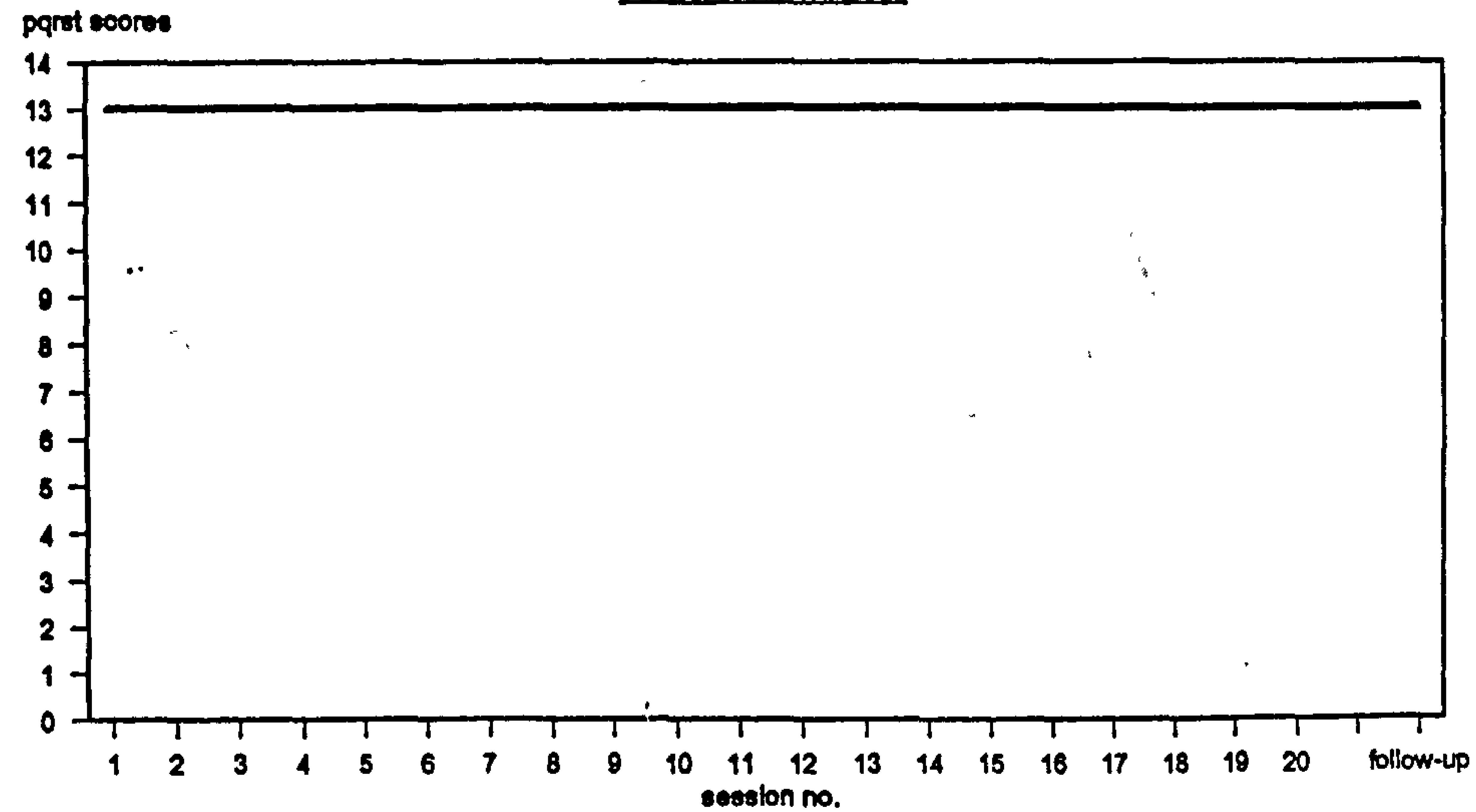


WR: PQRST graphs

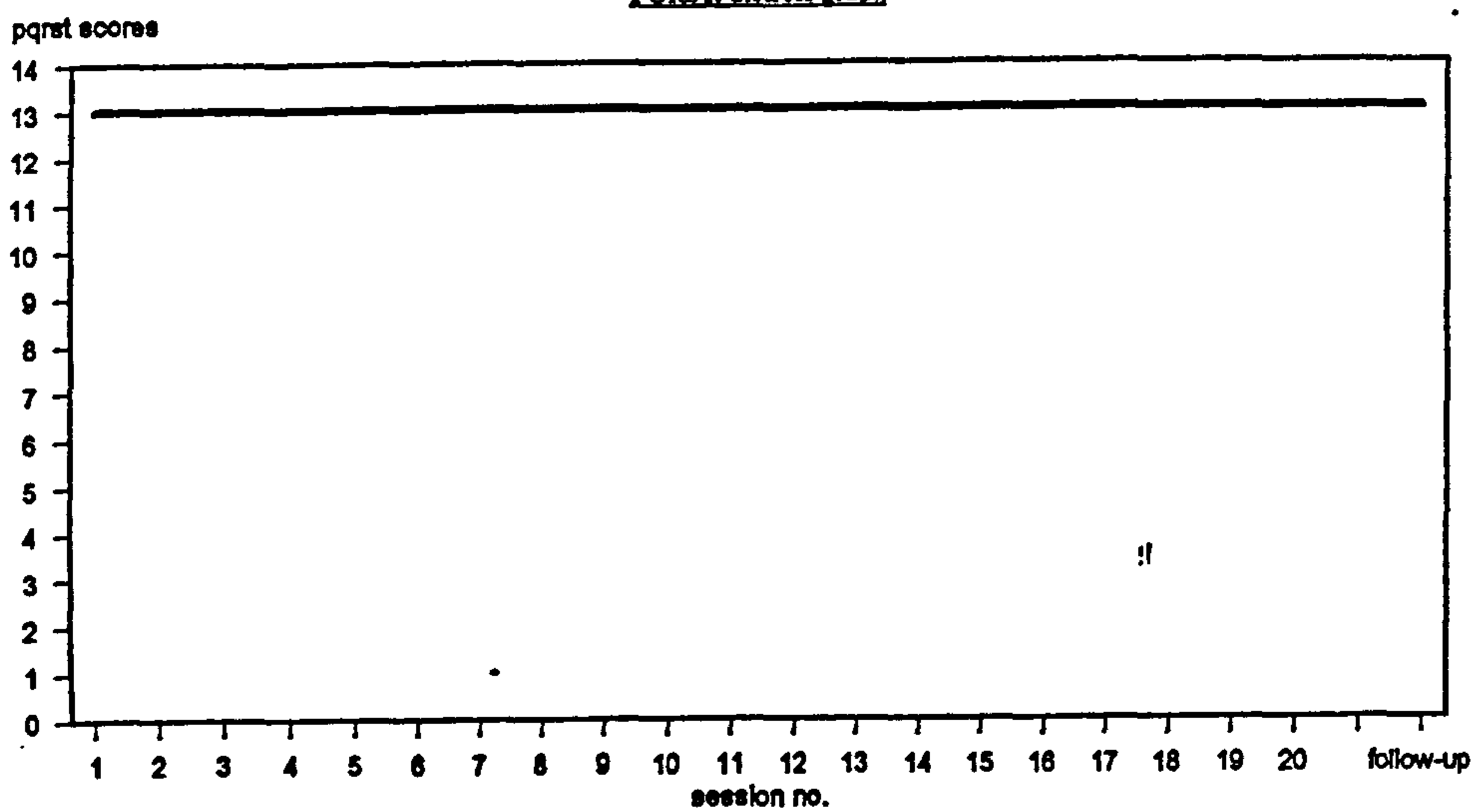
PQRST: frequency graph



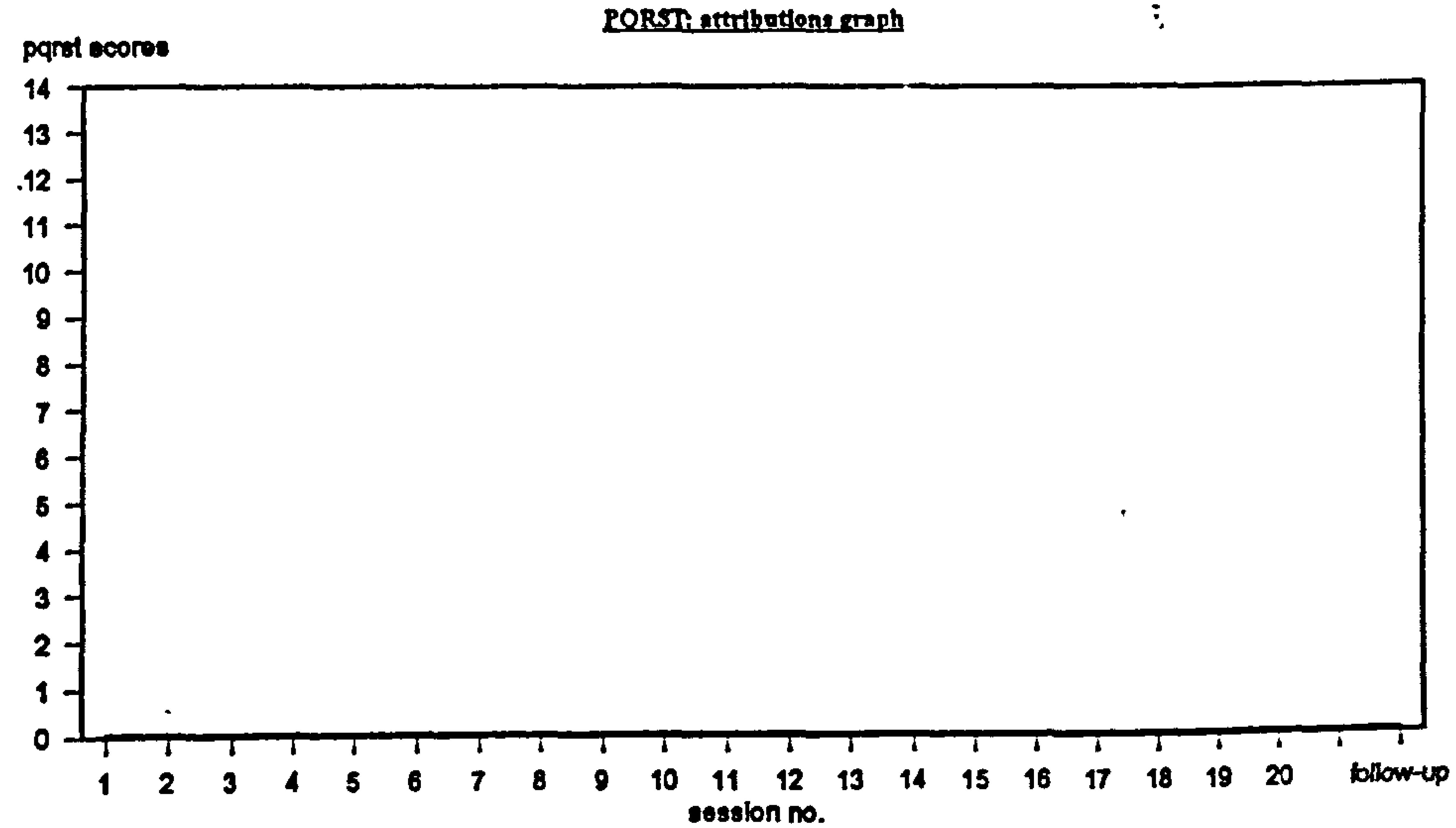
PQRST: disruption graph



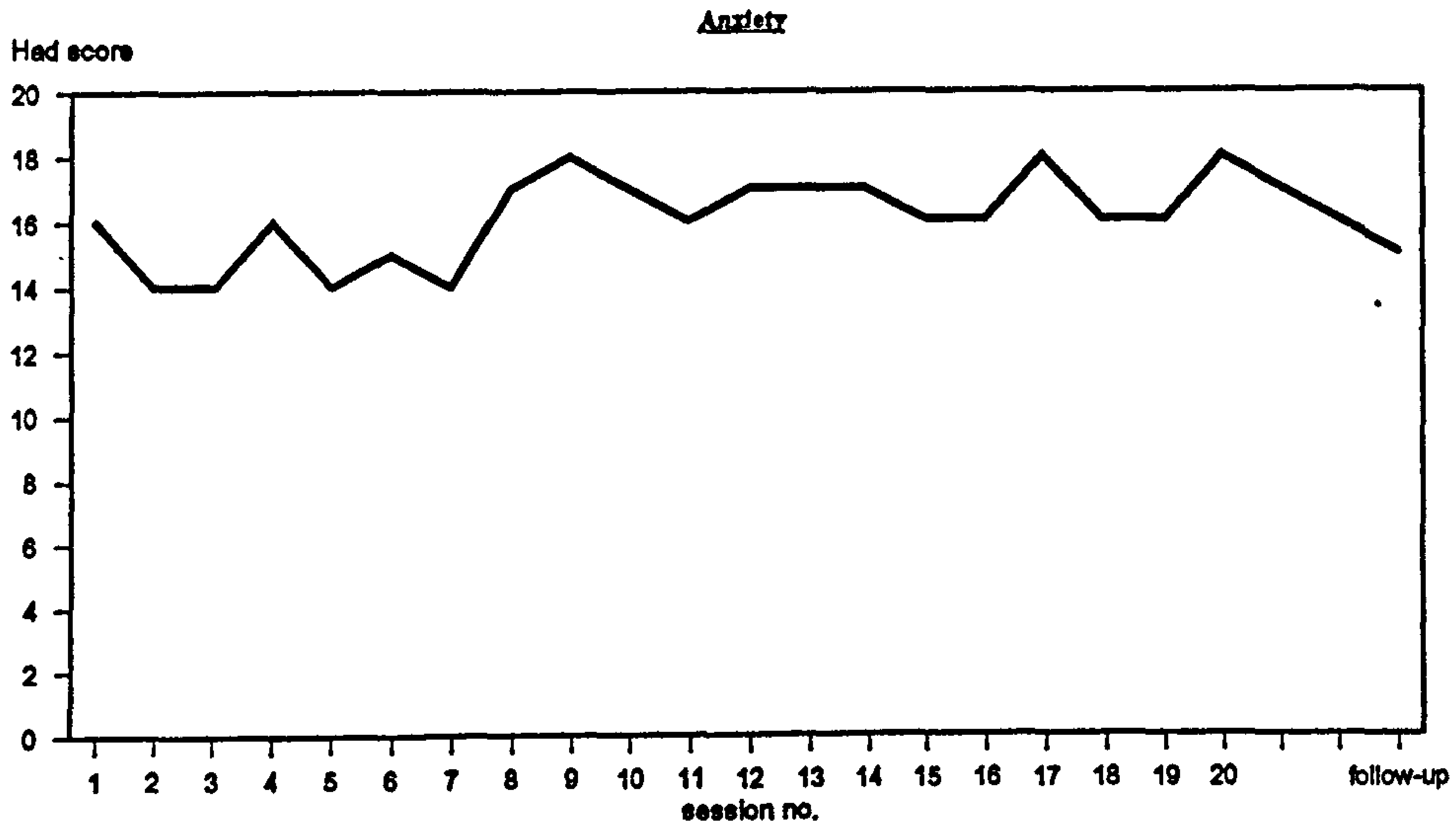
PQRST: distress graph

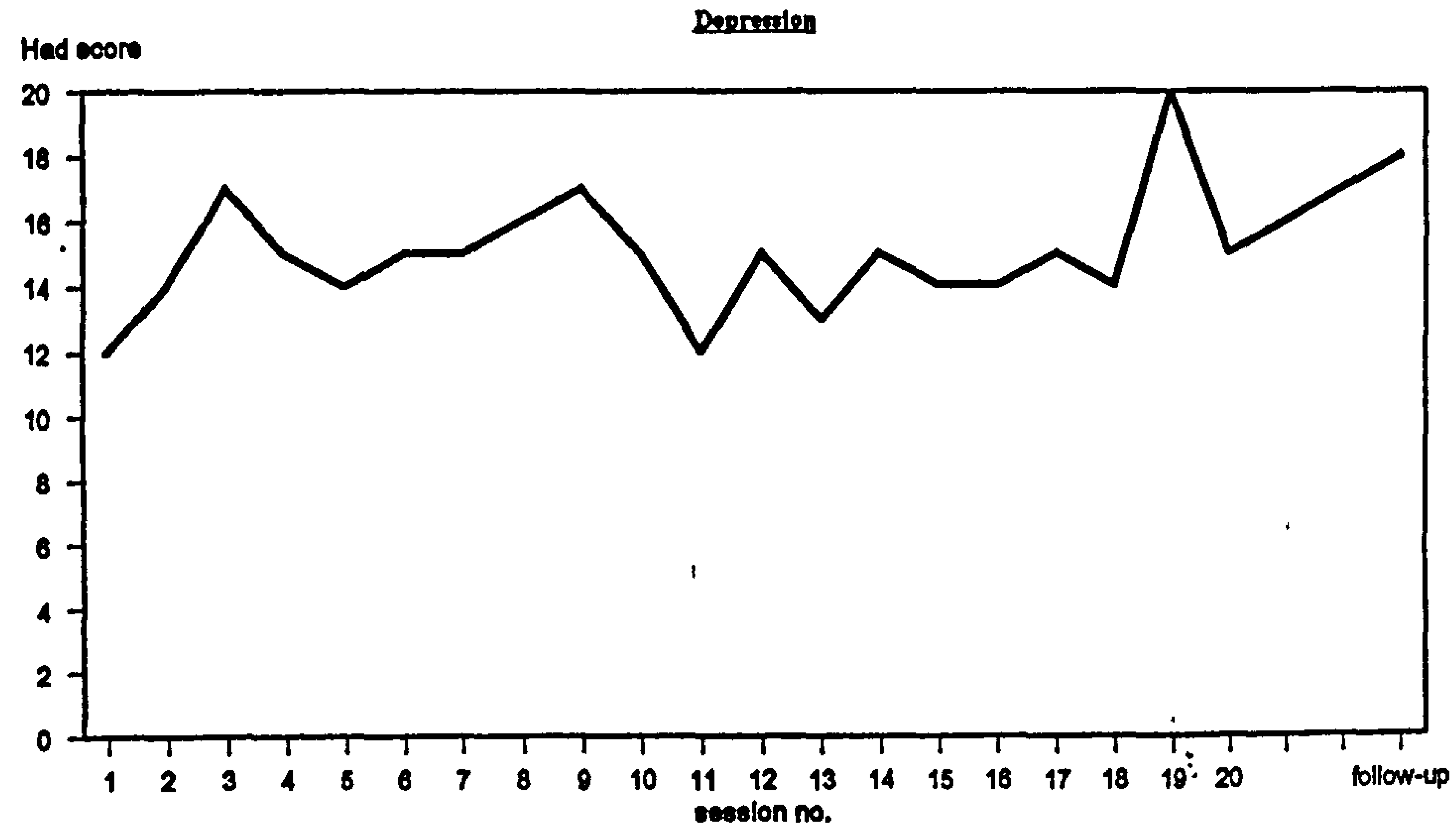


PQRST: attributions graph



WR: Anxiety and depression graphs





Appendix 5

Publications

Behavioural and Cognitive Psychotherapy, 1993, 21, 335–346

Clinical Section

Psychological Treatment of Chronic Auditory Hallucinations: Two Case Studies

Gillian Haddock, Richard P. Bentall and Peter D. Slade

University of Liverpool

Two cases involving the cognitive-behavioural treatment of hallucinations are described. In both cases, a focusing strategy was used with a view to enabling patients to reattribute the nature and meaning of their experiences. One patient showed a marked reduction in the frequency and content of his voices. The second patient showed little change. The implications of observations made during therapy for the future development of cognitive-behavioural strategies for use with psychotic patients are discussed.

Hallucinations, which are amongst the most disturbing and persistent of psychiatric symptoms, are usually regarded as evidence of schizophrenia (Sartorius, Shapiro and Jablensky, 1974) but are found in association with a wide range of medical and psychiatric diagnoses (Slade and Bentall, 1988). Evidence reviewed by Bentall (1990) suggests that hallucinatory experiences occur when private, internal, mental events are misattributed to a public source. For example, auditory hallucinations tend to be associated with subvocalization (e.g. Inouye and Shimizu, 1970; Green and Preston, 1981), a normal concomitant of verbal thought (McGuigan, 1978) and tend to be blocked by concurrent verbal tasks such as reading or speaking (e.g. James, 1983).

However, the precise mechanism responsible for the hallucinator's misattribution of internal events to an external source remains a matter of contention. Hoffman (1986) has argued that auditory hallucinations occur when the unintended verbal products of a discourse planning deficit are perceived as alien to the self; this theory carries the implication that hallucinations should be closely associated with thought disorder which does not seem to be the case (Slade and Bentall, 1988). Frith and Done (1987) have suggested that a deficit in an internal monitoring mechanism may be responsible for all the positive symptoms of schizophrenia including hallucinations. Bentall (1990), on the other hand, has argued that reality monitoring might be considered a metacognitive skill subject to both bottom-up and top-down influ-

Acknowledgement: The research described in this paper has been supported by a Medical Research Council grant to Dr Bentall and Professor Slade.

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ences. The suggestion that top-down processes (beliefs and expectations about what kinds of events are likely to be experienced) may be involved is consistent with evidence that cultural beliefs influence the experience of hallucinations (Bourguignon, 1970; Al-Issa, 1978) and with the psychoanalytic hypothesis that the psychotic patient's voices are cognitions that are unacceptable to self (Areiti, 1974).

Research has indicated that a wide range of psychological approaches may be helpful in the management of psychotic hallucinations. In a review of the relevant literature, Slade and Bentall (1988) found 40 published clinical reports, mostly single-case studies, in which psychological methods were employed. Methods included operant procedures (Nydegger, 1972); systematic desensitization (Slade, 1973); thought-stopping (Allen, Halperin and Friend, 1985); performance on concurrent verbal tasks such as naming objects (Erickson and Gustafson, 1968); self-monitoring (Glaister, 1985); aversion therapy (Weingaertner, 1971); wearing ear-plugs (Morley, 1987) and "first person singular therapy" in which patients are required to discuss their voices in the first person (Green, 1978). Noting that it was likely that these disparate methods acted through common mechanisms, Slade and Bentall proposed that three separate processes might be involved: (i) anxiety reduction; (ii) "focusing" in which the patient attends more to hallucinatory experiences and thus learns to reattribute them to an internal source; and (iii) distraction, in which the patient learns to ignore the hallucinatory experiences. Slade and Bentall further argued that focusing was most likely to produce a lasting change in a patient's hallucinatory experiences as the reattribution of the source of a hallucination from "externally generated" to "internally generated" was considered vital for therapeutic progress. On the same grounds, it was argued that distraction techniques would only produce a temporary reduction in hallucinations. Slade and Bentall (1988) made no predictions about the relative efficacy of anxiety reduction techniques, although these are undoubtedly likely to prove helpful when hallucinatory episodes are triggered by stressors.

In a recent study by Nelson, Thrasher and Barnes (1991), 20 long term hallucinators were treated using distraction techniques and, consistent with Slade and Bentall's predictions, the therapeutic benefits observed were largely temporary. Fowler and Morley (1989) reported a study of five patients who were treated using a method which emphasized focusing: the patients were encouraged to bring on and dismiss their hallucinations in the hope that this would lead them to reattribute their voices to themselves. However, a clinically significant reduction in hallucination frequency was reported for only one of the subjects. A therapeutic approach described by Tarrier, Harwood, Yusopoff, Beckett and Baker (1990), which also has some features that emphasize focusing, has been called "coping skills enhancement". The aim of this approach is to enhance coping skills already in the patient's repertoire. However, close attention is paid to particular psychotic experiences such as hallucinations, which are explicitly attributed to illness. Tarrier *et al.* reported two case studies in which considerable therapeutic improvements were achieved by this strategy.

In this paper we describe two case studies in which focusing techniques were employed, although the interventions used were somewhat different to those employed by Fowler and Morley (1989). Specifically, the patients involved were asked to attend to various aspects of their voices (loudness, tone, location, content) in graded steps designed to minimize any anxiety experienced. In one of these case studies, substantial therapeutic benefits were observed whereas, in the other, this was not the case.

Case study 1: BT

History

BT was a 45 year old man whose first psychiatric admission had been in 1972, when he had been diagnosed as schizophrenic. He had had ten admissions to psychiatric wards before being referred for treatment by his consultant psychiatrist. He had worked in a bakery and as a labourer but had been unemployed since the early 1970s. He lived alone but had some support from his family, who lived locally. BT was receiving neuroleptic medication which had not affected his voices; by arrangement with the consultant, this was mainatined at a stable level throughout treatment. Prior to the commencement of treatment, he was assessed using the Present State Examination (Wing, Cooper and Sartorious, 1974). He was also assessed using a structured hallucination interview devised by the present authors, full details of which will be reported in a later publication. This revealed that he was experiencing hallucinations only in the auditory modality. BT described both male and female second and third-person voices which occurred continuously and which appeared to emanate from various external sources including passers-by, television, radio, running water, cars and other machinery. The voices were worse when he was with other people, when it was noisy and when he was feeling depressed. The content of the voices was both positive (e.g. "You're okay, you'll be all right") and negative (e.g. "We want you dead"). BT was unsure about the cause of the voices. He sometimes believed that they were caused by other people who were conspiring against him, but at other times he felt they were the consequence of bad experiences he had had in the past. In this regard he was particularly concerned about an incident during early adulthood when he had sexual intercourse with a fourteen year old girl. BT felt extremely guilty about this incident and often believed that the voices were a punishment for it.

Treatment and outcome

BT was treated over 20 sessions using a focusing approach to the voices. In this approach, the patient is encouraged to explore the content and meaning of the voices within a therapeutic relationship. It was hoped that, by gradually exposing the patient to his voices, this would allow him to identify their true origin, and to resolve any psychological difficulties reflected in their content.

In order to minimize any anxiety associated with this process, focusing was achieved by means of a series of graded exercises. Early exercises involved the patient listening to and describing the physical characteristics of the voices, including their loudness, tone and gender. Later exercises involved talking about the content of the voices, their meaning and their relationship to ordinary thoughts and related beliefs. As part of this process BT was asked to keep a daily diary reporting on the frequency, loudness, friendliness/hostility and distress caused by the voices, as well as a report of the activities he had engaged in each day. In addition, at the beginning of each session, he was asked to complete a Personal Questionnaire Rapid Scaling Technique (PQRST) form (Mulhall, 1978) rating the frequency of the voices, the disruption they caused to his life, his distress consequent upon them, and the extent to which he believed the voices to be his own thoughts. A Hospital Anxiety and Depression scale (Zigmond and Snaith, 1983) was also completed at the beginning of each session. Twenty weekly sessions, of approximately one hour each, were conducted in total.

By recording the voices between sessions and focusing in great detail on the voices during sessions, the therapist was able to clarify BT's experiences. It became apparent that the voices varied and tended to divide into three distinct types: external voices that originated from nowhere, external/internal voices that originated from people and machinery, and finally, internal negative thoughts. Clarifying these distinctions allowed BT to record the frequency and distressfulness of each of these separately and allowed the therapist to explore their meaning and function. The exclusively external voices usually seemed to come from far away. As can be seen from Figure 1, the frequency of these voices as recorded in his diary decreased during treatment. In addition, the content of these voices was initially mostly hostile and this changed to only pleasant or neutral voices towards the end of treatment.

The second type of voices were those that originated from people, radio and television, and working machinery. When asked to focus on these experiences during sessions, it became clear the BT was actually hearing something real when these occurred. This could often be mumbled voices through walls or hums coming from machinery. BT was often unclear about the content of these experiences. For example, he would report that "I thought I heard them say f... off". It became apparent that most of his reportings of voices from other people or machinery were preceded by, "I think they said". It was hypothesized, therefore, that these phenomena reflected BT's misinterpretation of actual auditory events. In order to address this problem, BT was presented with the therapist's formulation and asked to record the content of these experiences while concurrently generating alternative explanations or interpretations. He was able to do this and found that it gave him some control over the voices, resulting in a gradual reduction but not total elimination of these experiences.

Lastly, focusing allowed BT to explore experiences that appeared to be intrusive sexual thoughts about religion. Being a very religious man, BT found these thoughts extremely distressing. He was unhappy about recording these as he felt ashamed of them, but he was able to discuss them and their relationship to his religious beliefs. He found that he was also able to use the techniques that he had attempted with the voices which appeared to originate from external stimuli.

In addition, some time was spent exploring the development of his voices and

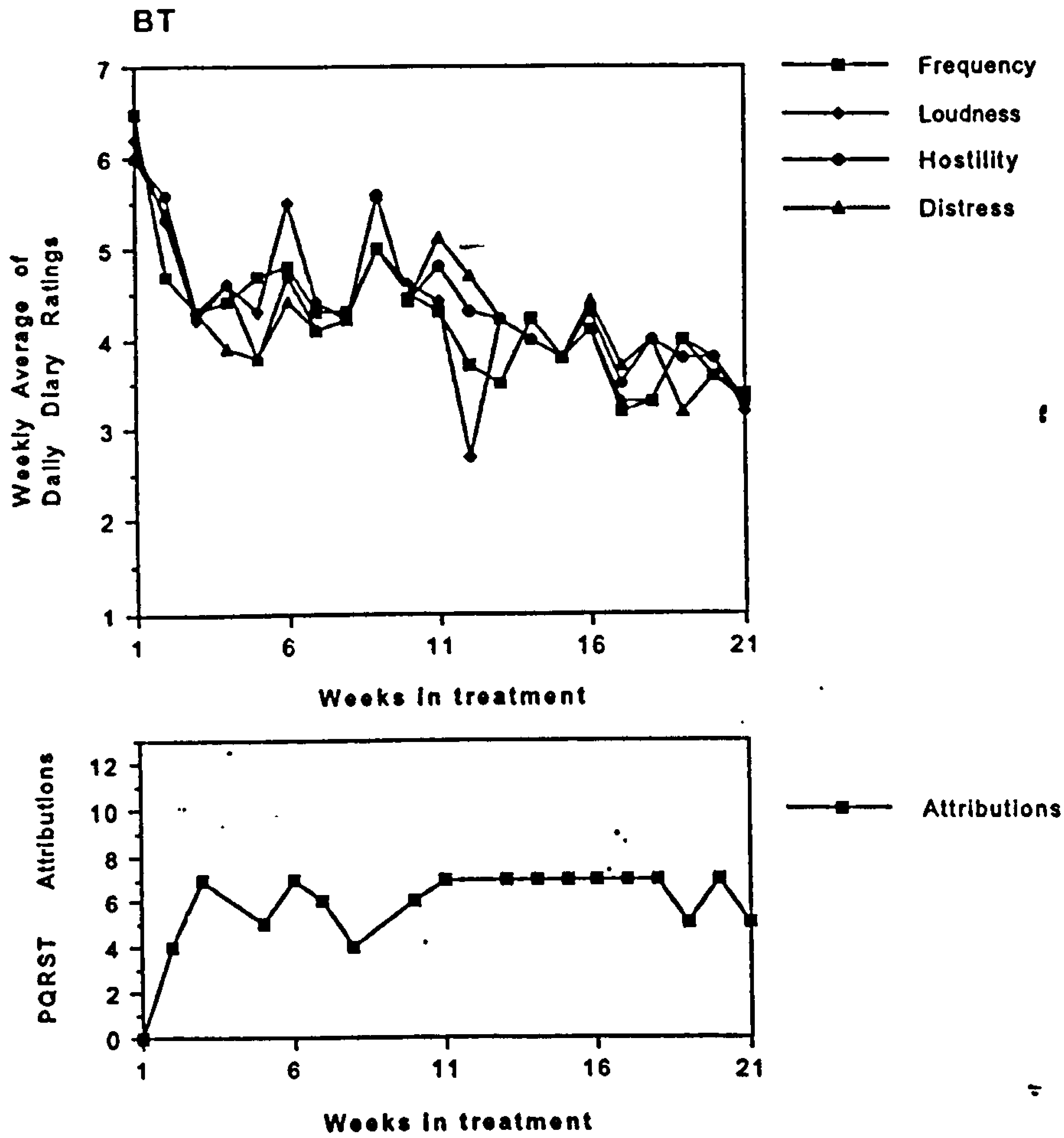

FIGURE 1. Average weekly daily diary scores for frequency, loudness, hostility and distress caused by BT's "external" voices (see text for definition) and weekly PQRST ratings of the amount to which he believed these voices to be his own thoughts. Anchor points for the frequency scale were "For a short time" (1)—"All day long" (9); for the loudness scale were "Mostly very faint" (1)—"Mostly very loud" (9); for the distress scale were "Mostly very pleasant" (1)—"Mostly very distressing" (9) and for the hostility scale were "Mostly friendly" (1)—"Mostly hostile" (9).

their relationship to his past experiences in order that he could discuss his guilt regarding the incident with the young girl.

As can be seen from Figure 1, in addition to the decrease in the frequency of his voices, BT also reported a change in their quality, so that they became quieter, mostly pleasant instead of mostly hostile and less distressing to him. Ratings from the PQRST, which are not given here, were less sensitive to changes in frequency, although they did show some frequency reduction. However, Figure 1 also shows the degree to which BT believed the voices to be his own thoughts as reflected in PQRST ratings. There was a gradual increase in BT's conviction in this proposition during sessions. This change was not complete as he still believed that some of his experiences were actual voices. This belief was very important to him as he felt that the pleasant voices were related to his religion and were meant to help and support him.

Case study 2: AA

History

AA was a single, 45 year old man unemployed and living in a Salvation Army hostel and was referred for treatment by the day centre which he attended. He had obtained "O" level equivalent qualifications at school and had worked as a painter and decorator until 1975, when he lost his job due to psychiatric ill health. He was first seen by a psychiatrist in 1969, when he received a diagnosis of schizophrenia. Since that time he had been admitted to hospital 20 times but had lived in the community, supported by the day care centre, for the three years immediately preceding treatment. This support was removed suddenly during treatment. He had no particular friends at the hostel and no family. His only support was a friend whom he visited every day.

AA was receiving neuroleptic medication which was maintained at a stable level by his psychiatrist for the duration of the treatment. Prior to the commencement of treatment, he was also assessed using the Present State Examination and the structured hallucination interview. This assessment revealed that, although he reported some unusual visual experiences in the past, AA was currently experiencing hallucinations only in the auditory modality. The hallucinations consisted of both male and female third-person voices perceived as being of external origin and were experienced almost continuously throughout the day and especially at night. They tended to be worse when he was alone, when it was quiet, and when he was bored, conditions which were most evident in his room in the hostel where he lived.

The voices were all hostile in content and AA believed two of them to belong to a close friend and an ex-girlfriend. These would make insulting comments about AA, who believed that he could hear them having sexual intercourse in the next room. Other voices which he heard were not of people he recognized. He was alaways upset by the voices and, although he was unclear about their cause, he thought it possible that they were a result of stressors which he had experienced in the past, for example the death of his parents. Despite this, he did not feel that the voices actually originated from his mind. Rather, he believed that his psychological problems were the cause of the voices being directed towards him.

Treatment and outcome

AA received 20 sessions of treatment of approximately one hour each, followed by six follow-up sessions. For the first six sessions he was treated using distraction techniques, including listening to a personal stereo, reading and performing mental puzzles. As part of this process, he was asked to keep a daily diary and, at the beginning of each session, to complete PQRST and HAD forms identical to those used by BT.

AA's diary and PQRST attribution scores throughout treatment are shown in Figure 2. It can be seen that there was a rapid increase in the frequency, loudness and hostility of his voices, and the distress he experienced because of them also increased following the introduction of the distraction techniques. AA stated that he found the walkman and the other techniques to be of some use for obscuring his voices. However, from his accounts during clinical sessions and from questionnaire reports it was apparent that this strategy was having a negative effect overall and was increasing his anxiety and depression. His distress was such that a new therapeutic strategy was thought appropriate, and it was decided to attempt a focusing approach as described in case study 1.

By recording and paying attention to the nature of AA's experiences, it was found that, although perceived as hostile and threatening, the actual auditory experience was not always intrinsically so. For example, muted voices and mumblings were often heard coming from the room adjacent to his at the hostel. The content of these experiences was unclear until AA himself placed his own interpretation on to these sounds as his friend and his ex-girlfriend saying bad things about him while engaged in sexual intercourse. In addition, AA would hear real voices saying things which he interpreted as being directed towards him. For example, he could often hear snatched conversations at night in his hostel. He would then select bits of these which he felt were applying to him and ascribe hostile interpretations to them.

In view of these observations, it was hypothesized that many of AA's experiences reflected distorted interpretations of actual auditory events. It was further hypothesized that the distraction techniques employed earlier had not been effective because they had not addressed AA's thought processes that were the basis of his "voices". In the sixth session, therefore, AA was presented with this formulation and was asked to record his voices as they happened, using automatic thought recording forms similar to those used in the cognitive therapy of depression (Williams, 1992). AA was also asked to generate alternative interpretations of his experiences. For example, AA was aware that the walls of the hostel were very thin and that there was a noisy, elderly resident in the room next door. AA was able to reattribute some of his experiences to the elderly man snoring and talking in his sleep. Attempts were made to address AA's feelings about his friend and his ex-girlfriend. Unfortunately, AA was rather defensive on these points and little progress was achieved.

AA's attributions about his experiences changed periodically over the next 23 sessions (see Figure 2) but the frequency of his voices continued to increase and then remained high. He was unable to consistently maintain the hypothesis that the voices were his misinterpretations of actual auditory experiences. He was also

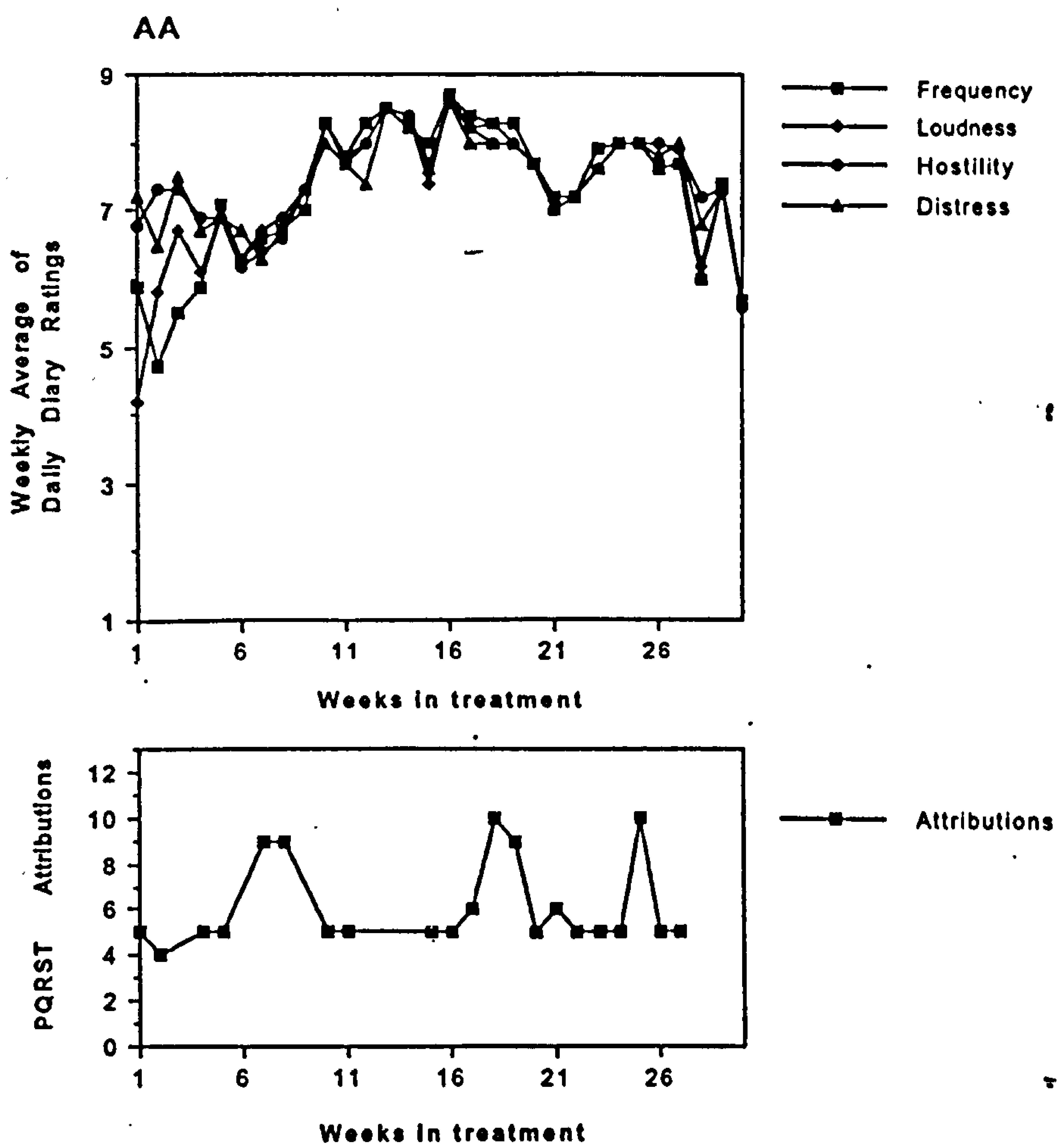

FIGURE 2. Average weekly daily diary scores for frequency, loudness, hostility and distress caused by AA's voices and weekly PQRST ratings of the amount to which he believed the voices to be his own thoughts. Anchor points for diary ratings were as in Figure 1.

extremely depressed at times and this contributed to his conviction that his original interpretations were accurate. In addition, his support from the day centre was withdrawn when it moved premises and because AA was thought by the centre staff to be coping extremely well. Unfortunately, this successful coping was partly due to the large amount of support he was receiving from the day centre and from his sessions with the therapist. The withdrawal of support led to an increase in AA's reports that the voices were real and not the product of his own thoughts.

Although treatment continued to encourage AA to focus on his experiences, which he became very competent at doing, he continued to express doubts regarding the formulation. As can be seen from Figure 2, AA alternated between believing quite strongly and believing only slightly that the voices were his own thoughts. His situation in the hostel contributed to these difficulties as it was extremely noisy, especially at night, and he felt that he had no friends there. His only friend, who had considerable psychiatric problems, proved to be more of a burden than a help and contributed to AA's continuing low self-esteem. Continuing follow-up sessions allowed these other important issues to be addressed and, as can be seen from Figure 2, a slight decrease in his symptoms to approximately their original level was shown.

Discussion

In this paper we have described two case studies in which patients with chronic auditory hallucinations were treated using a focusing strategy. One patient responded well to therapy, showing a reduction in the frequency with which he experienced hallucinations, together with a change in their emotional content so that they became more benign and much less distressing. The second patient responded less well, showing no substantial change in either the quality or frequency of hallucinations, despite some fluctuation in his attributions about them. These case studies illustrate a number of important points relevant to the psychological treatment and understanding of psychotic symptoms.

First, the data raise the question of to what extent reattribution of hallucinatory voices to self is necessary for therapeutic change. Certainly, BT's relatively good response to therapy in contrast to AA's relatively poor response seemed to reflect BT's relative willingness to believe that his voices were self-generated. Bentall (1990) has suggested that the tendency to mistake thoughts for voices may reflect both bottom-up processes (a general failure to discriminate between self-generated and external events) and top-down processes (abnormal beliefs or schemas which bias the hallucinator's classification of perceived events as self- or other-generated).

Psychotherapeutic strategies such as the approach reported here might be thought to influence top-down processes in particular. It is possible, therefore, that the success of any therapeutic intervention of this sort will depend on, on the one hand, the extent to which beliefs and expectations play a role in the patient's hallucinatory experiences and, on the other hand, the extent to which the therapist is able to challenge and modify these beliefs and expectations.

A second and related point concerns the phenomenology of patients' hallucinations. Careful attention to the experiences described by both patients revealed that their hallucinations were complex and varied. Thus, in the case of BT, three distinct types of experiences were recorded. The success of the therapy for BT seemed to some extent to depend upon the therapist's ability, by means of the focusing strategies, to facilitate the patient's recognition of these differences. Clearly, the variety of these experiences, and the fact that they changed over time, indicates that multiple cognitive processes may be involved and that a single causal mechanism for hallucinations may prove elusive. One possibility is that, even if most hallucinatory experiences do reflect a failure to discriminate between internal and external events (Bentall, 1990), patients may differ widely in the kinds of cognitive events misattributed to external sources.

In the case of both patients, some of the apparent hallucinatory experiences seemed to be based on the misinterpretation of actual auditory experiences. Mather (1974) has argued that other kinds of psychotic experiences, particularly delusions, may reflect patients' attempts to explain anomalous experiences. While it is doubtful whether this is a sufficient explanation of delusions (Kaney and Bentall, 1989; Bentall, Kaney and Dewey, 1991) the possibility that similar processes may be operating in some kinds of hallucinations must be acknowledged.

An important component of treatment seemed to be the implicit normalization of the patients' hallucinatory experiences, which was more readily accepted by BT than AA. Other authors have advocated the use of a normalizing strategy when using cognitive-behavioural interventions with psychotic symptoms (Kingdom and Turkington, 1991). The two case studies also illustrate the importance of attending to the apparent functions that voices have for patients. BT seemed to experience the voices as a punishment for unresolved guilt whereas, for AA, it might be argued, the voices seemed to serve the positive function of allowing access to psychiatric services. Of course, whether these apparent functions had an impact on therapeutic outcome must remain a matter of speculation. AA's inability to accept alternative interpretations of his voices might, in part, reflect his depressing social and material circumstances. This raises a further important issue which must be considered when carrying out psychotherapeutic work with psychotic patients. Such patients often live in inadequate conditions with little social support (Pilgrim, 1990) and, unless their material and social needs are addressed first, the success of psychological therapies is likely to be very limited.

Taken together, these observations raise the question of whether psychological interventions are more likely to be effective if implemented earlier in the psychiatric careers of patients. It is notable that both patients had been hallucinating for more than two decades at the time they were referred for treatment. Early intervention should be more effective if the functions and meanings of hallucinatory experiences are more accessible at this stage and if the intervention precedes the downward social drift associated with severe mental illness (Cochrane, 1983). One benefit of early intervention might be that it would prevent the formation of complex delusional elaborations which are resistant to change and which may help to maintain the hallucinatory experiences.

The preliminary evidence presented here suggests that focusing, together with a variety of other cognitive-behavioural strategies, may be of help to some patients suffering from psychotic hallucinations. However, the results also suggest that no more than cautious optimism about the usefulness of this approach is warranted at present. Indeed, this study has identified a number of important impediments to therapeutic change that may limit the efficacy of a range of psychotherapeutic procedures with psychotic patients. On a more positive note, it is unlikely that the range of possible therapeutic strategies, even strategies that emphasize focusing, has been exhausted. Until recently, comparatively little interest has been directed towards the cognitive-behavioural treatment of psychotic experiences (Slade, 1990) and this approach might rightly be regarded as in its infancy. Further refinements of existing approaches, the development of innovative strategies, carefully conducted single case-studies and controlled trials are required to identify precisely which therapeutic methods are most efficacious in which circumstances, and which patients are most likely to benefit.

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Cognitive Behavior Therapy for Persistent Auditory Hallucinations: From Theory to Therapy

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In this paper we briefly review psychological research into the causes and treatment of auditory hallucinations. A model of hallucinations is described in which it is hypothesized that hallucinatory experiences occur when there is a failure to attribute internal, mental events to the self. One implication of the model is that, by focusing on the characteristics and meaning of their hallucinations, hallucinating patients may learn to reattribute their voices to themselves. We present preliminary data from six chronically ill patients taking part in a trial of this kind of treatment. Three of the patients showed evidence of a decrease in the amount of time spent hearing voices, together with a reduction in the distress experienced as a consequence of the voices.

In recent years there has been growing interest in the possibility of developing cognitive-behavioral interventions for psychotic patients. Such therapies have been advocated as part of rehabilitation strategies designed to ameliorate the cognitive deficits presumed to underlie psychotic illness (Adams, Malatesta, Brantley, & Turkat, 1981; Bentall, Higson, & Lowe, 1987; Brenner, 1989; Meichenbaum & Cameron, 1973), as methods of enhancing coping skills (Tarrier, Harwood, Yusopoff, Beckett & Baker, 1990) or as part of a strategy designed to normalize psychotic experiences (Kingdon & Turkington, 1991). However, despite some promising reports (Slade, 1990), comparatively little attention has been directed towards the possibility of developing cognitive-behavioral

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interventions targeted at specific psychotic symptoms. Clearly, such interventions are most likely to be effective if based on a thorough understanding of the behavioral and cognitive processes implicated in the particular symptoms concerned.

In this article we describe an intervention specifically designed to ameliorate chronic auditory hallucinations. In the first part of the article we present a selective review of the clinical and experimental literature on hallucinations, together with the model of hallucinations that has informed the development of this intervention. This model proposes that hallucinatory experiences occur when an individual fails to attribute internal, mental events to the self and instead attributes these events to sources that are alien or external to the self. In the second part of the article, in which we describe the intervention in detail, we present initial data from six chronically ill patients taking part in a treatment trial.

Research into Auditory Hallucinations

An hallucination may be defined as a percept-like experience that occurs in the absence of an appropriate stimulus, that has the full force and impact of a corresponding ("real") perception, and that is not amenable to direct and voluntary control by the experiencer (Slade & Bentall, 1988). Although hallucinations, especially in the auditory modality, are usually regarded as first-rank symptoms of schizophrenia (Sartorius, Shapiro, & Jablensky, 1974), they are in fact associated with a wide range of pathologies (Asaad & Shapiro, 1986) and are sometimes reported by people who are otherwise normal and who do not regard themselves as psychiatrically ill (Romme & Escher, 1989; Slade & Bentall, 1988).

Considerable cultural differences exist in the experience of hallucinations, both in the extent to which they are reported by people who regard themselves as normal (Bourguignon, 1970), and in the modality of hallucinations reported to clinicians by patients in different parts of the world (Al-Issa, 1978; Sartorius et al., 1986). These cultural differences have important implications that will be discussed below. Any model of the psychological processes responsible for hallucinations must be informed by four further observations.

First, clinical studies indicate that hallucinations are most likely to occur during periods of anxiety or stress (e.g., Slade, 1972). Consistent with this, studies indicate that the onset of hallucinations is associated with fluctuations in psychophysical arousal (e.g., Cooklin, Sturgeon, & Leff, 1983). Second, research indicates that the experience of hallucinations can be influenced by environmental conditions such as sensory deprivation or exposure to white noise or other forms of unpatterned stimulation (Margo, Hemsley, & Slade, 1981). Third, some studies have indicated that auditory hallucinations tend to be associated with covert activity of the speech musculature or "subvocalization" (e.g., P. Green & Preston, 1981; Inouye & Shimizu, 1970), although the evidence for this tends to be equivocal (M. F. Green & Kinsbourne, 1990). Finally, there is evidence that auditory hallucinations tend to be blocked or inhibited by concurrent verbal tasks such as reading or speaking (e.g., James, 1983; Margo et al., 1981).

In the light of these observations, a consensus has begun to emerge about the nature of hallucinatory experiences (Bentall, 1990; Frith, 1992; Heilbrun, 1980; Hoffman, 1986). Central to this consensus account is the assumption that hallucinations occur when private or mental events are not attributed to the self. Ordinary individuals normally label a perceived event as "real" if it is believed to be externally generated and "imaginary" or "thought" if it is believed to be self-generated. Hallucinations occur when this process breaks down so that self-generated experiences are mislabeled as "real" or "alien." As several authors point out (Bentall, 1990; Hoffman, 1986), this model is consistent with philosophical accounts of first-person reports of mental processes. Skinner (1945) and the later Wittgenstein (1953) both argued that individuals cannot learn to describe internal stimuli directly in the way that names are learned for particular classes of public stimuli. Rather, the ability to make subjective descriptions of private experiences is limited, and such descriptions require inferences from publicly available information (Bloor, 1983). On this account, people infer whether a perceived event is self-generated or externally generated on the basis of a range of information, some of which may be contextual. Experimental evidence indicates that, in extreme circumstances, ordinary people make errors of judgment in this domain, either misclassifying actual stimuli as "imaginary" (Perky, 1910; Segal, 1970) or mistaking memories of thoughts for memories of "real" events (Johnson & Raye, 1981).

Despite this consensus about the nature of hallucinations, authors differ in their hypotheses about the exact cognitive abnormalities responsible for the hallucinator's failure to attribute self-generated mental events to the self. One theory, suggested by Hoffman (1986), proposed that patients suffering from auditory hallucinations have a discourse planning disorder with the consequence that they experience their subvocal speech as unintended. However, no consistent relationship has been observed between hallucinations and speech disorders, and the theory fails to account for hallucinations in nonauditory modalities (Slade & Bentall, 1988). Another theory has been suggested by Frith and Done (1987), who have argued that all positive symptoms reflect a deficit in a neuropsychological mechanism responsible for monitoring the source of perceived events. However, the neuroanatomical locus of this mechanism remains a matter of speculation, and direct tests of the theory have yet to be carried out (Frith, 1992).

A more detailed model, which is consistent with the philosophical literature already referred to and with much of the clinical and experimental data on hallucinations, has been developed by the present authors over a number of years (Bentall, 1990; Bentall & Slade, 1985; Slade, 1976; Slade & Bentall, 1988). According to this model, discriminating between self-generated events and external stimuli is considered to be a metacognitive skill and, like other forms of discrimination, is a function of specific characteristics of the events that are being discriminated and of the individual's beliefs and expectations ("top-down" processes in the language of cognitive psychology). These beliefs and expectations reflect the individual's knowledge about what kinds of events are likely to occur in the public and private domains and also reflect fundamental assumptions about the kinds of causal agencies that operate in the world (spirits, telepathy, etc., for example).

This model has the advantage of explaining the apparent association between hallucinations in the auditory modality and subvocalization. Evidence from normal subjects suggests that subvocal activity often accompanies ordinary verbal thought (McGuigan, 1978), which, according to the model, the hallucinator misattributes to an external source. This explains why verbal tasks tend to inhibit hallucinatory experiences, as such tasks can partly inhibit the ongoing stream of covert verbal activity (Baddeley, 1986; Sokolov, 1972).

Consistent with existing evidence (e.g., Margo et al., 1981), the model implies that distinguishing between internally generated and externally generated auditory sensations should be most difficult under conditions of unpatterned stimulation, when the signal-to-noise ratio is poor. The observed relationship between hallucinations and anxiety is also accounted for, as anxiety tends to be associated with deficits in information-processing efficiency (Eysenck, 1992), which might be expected to affect the ability to discriminate between self-generated and external events. The model also explains why cultural differences in the experience of hallucinations are observed, because it is assumed that expectations about what kind of events are likely to be "real" are encoded in cultural practices (people see ghosts because they believe in them). Finally, according to the model, reinforcement processes (particularly anxiety reduction) may facilitate the misclassification of certain kinds of internally generated events (for example, anxious worries, negative thoughts about the self, and feared intentions) as alien to the self. Once an unpleasant thought has been misclassified in this way, reinforcement will increase the likelihood that this will occur again.

A number of investigations have been carried out to test the model's central claim that hallucinations reflect an error of judgment. Bentall, Baker, and Havers (1991) studied the performance of hallucinating patients using a "reality monitoring" paradigm in which they were required to discriminate between words they had heard and words they had generated in response to experimenter-provided clues. Hallucinating patients were as accurate as deluded control patients but made more errors in which they misclassified words they had generated as words they had heard. However, these differences were generally quite small and were significant in only one of the two conditions employed. Clearer evidence of the hallucinator's tendency to misattribute internally generated events to external sources was obtained in an earlier study, using signal-detection methodology (Bentall & Slade, 1985) in which hallucinating patients, in comparison with nonhallucinating patients, were found to show an abnormal bias towards detecting speech in white noise. No differences were observed between hallucinators and nonhallucinators on the measure of perceptual sensitivity employed in this study.

The model's prediction that hallucinators' perceptual misattributions are partially driven by expectations was tested in a further study by Young, Bentall, Slade, and Dewey (1987) that was a replication, with some refinements, of a study originally undertaken by Mintz and Alpert (1972). In both studies it was found that hallucinating patients, in comparison with nonhallucinating patients, were more likely to report auditory and visual perceptions consistent with simple suggestions they had been given.

Taken together, these findings support both the hypothesis that hallucinators fail to accurately attribute self-generated mental events to the self and the further hypothesis that beliefs and expectations play a role in this process. One implication of this account is that methods might be developed to help patients gradually to reattribute those voices to themselves.

From Theory to Therapy

Psychological approaches that have been reported as treatments for hallucinations include operant procedures (e.g., Nydegger, 1972); systematic desensitization (e.g., Slade, 1973); thought-stopping (e.g., Allen, Halperin, & Friend, 1985); distraction and verbal suppression procedures such as listening to music or covert counting (e.g., Nelson, Thrasher, & Barnes, 1991); self-monitoring (e.g., Glaister, 1985); aversion therapy (e.g., Weingartner, 1971); wearing earplugs (e.g., Morley, 1987) and "first person singular therapy" (Greene, 1978) or similar techniques (Fowler & Morley, 1989) in which patients are explicitly encouraged to attribute their voices to themselves. In a review of this literature (Slade and Bentall, 1988), we have previously pointed out that the very diversity of these apparently successful techniques raises important questions about possible common modes of action. We tentatively suggested that the interventions fell into three main groups: (i) those techniques that emphasize distracting hallucinators from their voices; (ii) those techniques that encourage patients to focus on their voices; and (iii) techniques that involve some form of anxiety reduction.

We argued that distraction techniques (e.g., using a stereo Walkman or reading materials), although useful for some patients, would not produce lasting benefits because they would not address the fundamental cognitive disorder implicated in hallucinations (the misattribution of self-generated events to an external or alien source). Consistent with this prediction, Nelson et al. (1991), in a study with twenty chronically hallucinating patients, observed that the benefits of distraction techniques were generally short-lasting. We further predicted that focusing techniques, in which there is a strong requirement for hallucinators to identify their voices as relating to themselves, would be more likely to bring about long-lasting therapeutic changes, as this approach directly addresses the assumed cause of hallucinators' abnormal experiences.

To test the relative efficacy of distraction and focusing techniques, we have initiated a treatment trial in Liverpool in which these two approaches are being compared. In the remaining part of this article we present some preliminary results from a group of six subjects treated using focusing methods. In developing our focusing techniques we have attempted to expand and build upon existing successful approaches. However, in contrast to previous research, our intervention was based on the specific model of hallucinations that we have already described.

The aim of the focusing treatment was to reduce the frequency of voices and/or the distress associated with them by means of the gradual reattribution of the voices to the self. When this attribution was not possible because of patients' fixed beliefs (e.g., because the beliefs served a positive function), then attempts were made to achieve these goals by restructuring the thoughts and feelings that were consequent on the voices. The therapy involved a combination of self-monitoring, techniques that encouraged the patient to reattribute their voices to themselves, desensitization to the anxiety caused by the voices, and a number of other elements developed specifically for the study. These are outlined in more detail in the method section.

Method

Subjects

The subjects reported here were the first six to complete focusing therapy as part of our ongoing treatment trial. They were recruited through local psychiatric services and had a *DSM-III-R* (American Psychiatric Association [APA], 1987) diagnosis of schizophrenia. The diagnosis was made initially by the referring psychiatrists and in each case was confirmed by one of the authors using data collected during an initial assessment (see below). The subjects had persistent auditory hallucinations that had not responded significantly to neuroleptic medication and that were experienced at least three times a week. The subjects were 5 men and 1 woman, with an average age of 36.2 years (range = 22–46 years) and an average history of hearing voices of 14 years (range = 3–22 years). A detailed case study describing the treatment of one of these subjects (BT, the first to complete therapy) has been reported elsewhere (Haddock, Bentall, & Slade, 1993).

Procedure

Patients were interviewed and gave informed consent before they were recruited to the study. Consultant psychiatrists agreed to keep neuroleptic and other medications stable throughout the treatment and follow-up periods. As part of the initial assessment, the patients were administered the Present State Examination (Wing, Cooper, & Sartorius, 1974) and a structured interview designed to elicit information on the phenomenology and content of voices and hallucinations in other modalities. The interview also assessed patients' emotional reactions to their voices, their attributions about them, and their coping strategies. Between 18 and 20 sessions of approximately one hour each were offered to the patients.

Intervention

For monitoring purposes, at the beginning of each session subjects were asked to complete a Hospital Anxiety and Depression Scale (HAD; Zigmond & Snaith, 1993) and a modified version of the Personal Questionnaire Rapid Scaling Technique (PQRST; Mulhall, 1978), assessing frequency of voices over the past week, the distress caused by the voices, the disruption to their life caused by the voices and the extent to which the patients believed their voices to be their own thoughts (patients' attributions). In addition, patients completed a daily hallucination diary before going to bed each night. If they had heard voices during the day, the patients were required to rate the duration (with anchor points "for a short time" and "all day long"), loudness ("mostly very faint" to "mostly very loud"), distress ("mostly very pleasant" to "mostly very distressing") and hostility ("mostly friendly" to "mostly hostile") of the voices on 9-point scales. Patients were also asked to write a brief account of their daily activities. The diary was examined by the therapist (GH for all of the patients reported here with the exception of patient TM, who was treated by RPB) while subjects were completing the HAD and the PQRST.

In session 1, patients were familiarized with the assessment measures and were given a description of the focusing approach and its rationale. In subsequent sessions, although some time was spent discussing the monitoring measures and homework, for most of the time the patients were required to focus on their voices by paying more attention to them while reporting on their characteristics and content, together with related thoughts and feelings, as outlined below. The methods used to achieve this included some techniques already reported in the literature (e.g., concurrent self-monitoring; Reybee & Kinch, 1973) and other methods newly developed for study (described below). We employed a desensitization approach to focusing on the voices so that any anxiety associated with them would be confronted gradually.

Phenomenological data obtained during the monitoring exercises were used in later sessions to create a formulation agreed between the therapist and the patient. Patients were encouraged to examine similarities and differences between voices and self-generated thoughts or worries, the relationship between the voices and anxiety or stressful events, evidence which they had used to determine whether the voices were self-generated, and their beliefs and expectations in relation to the voices.

The stages outlined below were followed with all patients. Although introduced in the order described, at times jumps were made from one stage to another and back again depending on the needs of individual patients.

Physical characteristics of the voices. This involved patients focusing on and discussing the form and physical characteristics of their voices, including their number, their loudness, their tone, their accent, their apparent gender and their location in space. Several short focusing exercises (a few minutes each) were carried out within each session, allowing the patient and the therapist to discuss the nature of the patient's experiences. If the patient had more than one voice he or she was generally asked to focus on one at a time. Patients were also asked to identify a time at home when they could conduct a focusing exercise, recording their experiences on paper. These exercises were reviewed and discussed at the beginning of the next session. This first stage of focusing therapy was important because it allowed patients to become comfortable with the focusing procedure and to accept the principle of discussing the characteristics of their voices in the nonthreatening atmosphere provided by the therapist.

Content of the voices. When the patients had become comfortable with focusing on the physical characteristics of the voices, they were asked to focus on their content. This often involved directly shadowing the voices. Some patients experienced difficulty when attempting this verbally, in which case they were asked to write down what the voices said. Some part of each session was then spent discussing the content and relating it specifically to associated thoughts and feelings. It was often apparent that the content of the voices reflected patients' worries and anxieties. As in (i), patients were asked to focus on and record their voices between sessions as homework.

Related thoughts and assumptions about voices. Finally, attention was paid to patients' beliefs and thoughts about the voices. Patients were encouraged to record events antecedent to the voices, the voices themselves, and the thoughts and feelings that were consequent upon them, both during sessions and as homework. This usually led to a formulation of the meaning and function of the voices that was shared between the therapist and the patient and was used as a basis for further intervention during later sessions. This formulation often involved the patients' accepting the voices as self-generated within the context of viewing themselves as suffering from a mental illness.

It was clear that a formulation requiring reattribution of voices to the self would not be acceptable to some patients. In these cases the therapist acknowledged that the patient's beliefs about the origins of the voices should be respected but held that the thoughts and feelings that arose as a consequence of the voices were attributable to the patient and therefore worthy of attention.

For some patients the actual process of reaching a formulation appeared to be therapeutic in itself, whereas for others, it allowed the identification of areas where changes could be made. Some patients became aware that the voices themselves were not intrinsically distressing, but that their thoughts about the voices were the cause of considerable discomfort. Some patients identified circumstances that contributed to the distress caused by the voices (e.g., when the content of the voices reflected general life worries). In such cases, patients were encouraged to use the content of the voices to help them to recognize specific problem areas. For example, one patient (HB, see below) recognized that her voices tended to become worse following family arguments. She became aware that the content of her voices reflected the things that she was feeling and thinking about her family but that she was unable to express. Specific targets and goals were then set to allow her to address these difficulties with her family, and techniques such as rehearsal, problem solving, and cognitive restructuring were employed to help her work towards these goals.

The final sessions of therapy were used to review any progress achieved and to plan for the future. Patients were encouraged to take away records of the work that they had completed in therapy and to continue to focus on their voices and associated thoughts.

Preliminary Results

The data presented here are from the first six patients to receive focusing therapy as part of an as yet incomplete treatment trial. For this reason, no data from a control intervention is available. Furthermore, as no stable baseline data were available, the findings reported here must be treated with caution. The upper panels of Figure 1 show average weekly diary scores for the duration of voices and distress experienced for the six patients who have completed therapy. Loudness and hostility scores are not given in this figure for reasons of clarity. Also for brevity, PQRST ratings of voice characteristics are not reported, although these were largely consistent with diary ratings.

As shown in Table 1, all diary ratings were highly correlated with each other (p at least < 0.01), with the exception of the loudness ratings of DL, which were not strongly correlated with his duration, distress, or hostility measures. In contrast with the other patients, DL's loudness ratings were generally low and, along with his other ratings, did not vary much from week to week. The observed lack of correlation between loudness and other ratings for this patient may therefore reflect the overall lack of variance in his data.

As can be seen from Figure 1, changes were apparent on many of the measures throughout treatment for some but not all of the patients. A clear reduction in the duration of the voices, and a reduction in the distress associated with them, can be seen in the cases of three of the subjects (RH, TM, and BT).

None of the patients experienced a worsening of symptoms as a result of focusing, although we have previously reported a patient whose symptoms worsened following distraction therapy and who subsequently did not improve with focusing therapy (Haddock et al., 1993).

Measures of the patients' beliefs that the voices were their own thoughts (their attributions) are shown in the lower panels of Figure 1. (Session numbers do not necessarily coincide with the weeks shown in the diary ratings, as occasionally there was more than one week between sessions; for example, if the therapist was on vacation.) High scores indicate that subjects attributed their

TABLE 1
SPEARMAN CORRELATION COEFFICIENTS SHOWING RELATIONSHIPS BETWEEN WEEKLY AVERAGES OF PATIENT'S DAILY RATINGS OF DURATION, DISTRESS, LOUDNESS AND HOSTILITY OF VOICES

Subject		Duration	Loudness	Hostility
HB	Loudness	0.929		
	Hostility	0.973	0.945	
	Distress	0.964	0.903	0.961
SB	Loudness	0.816		
	Hostility	0.844	0.912	
	Distress	0.854	0.912	0.927
RH	Loudness	0.939		
	Hostility	0.876	0.916	
	Distress	0.924	0.916	0.972
DL	Loudness	−0.253		
	Hostility	0.959	−0.125	
	Distress	1.000	−0.253	0.959
TM	Loudness	0.865		
	Hostility	0.858	0.815	
	Distress	0.795	0.774	0.953
BT	Loudness	0.911		
	Hostility	0.747	0.777	
	Distress	0.619	0.611	0.914

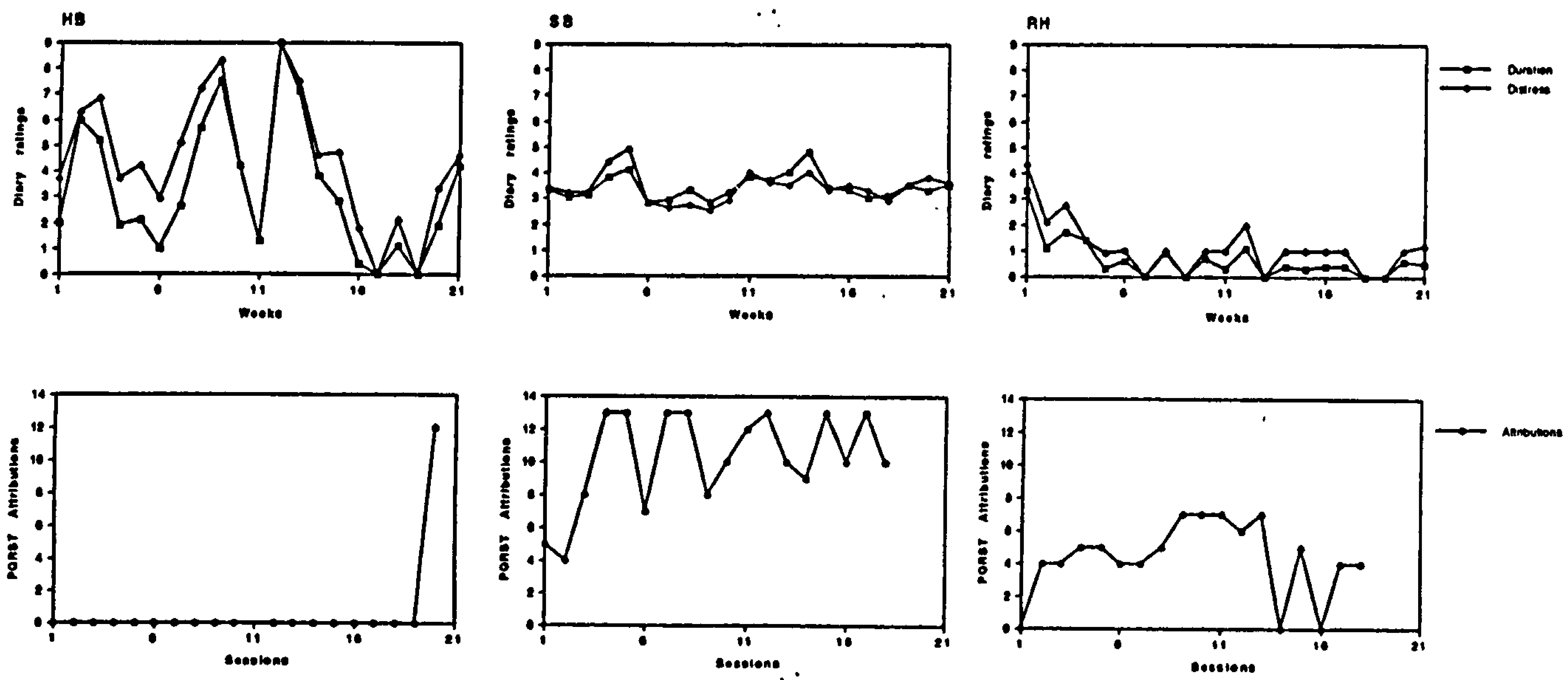
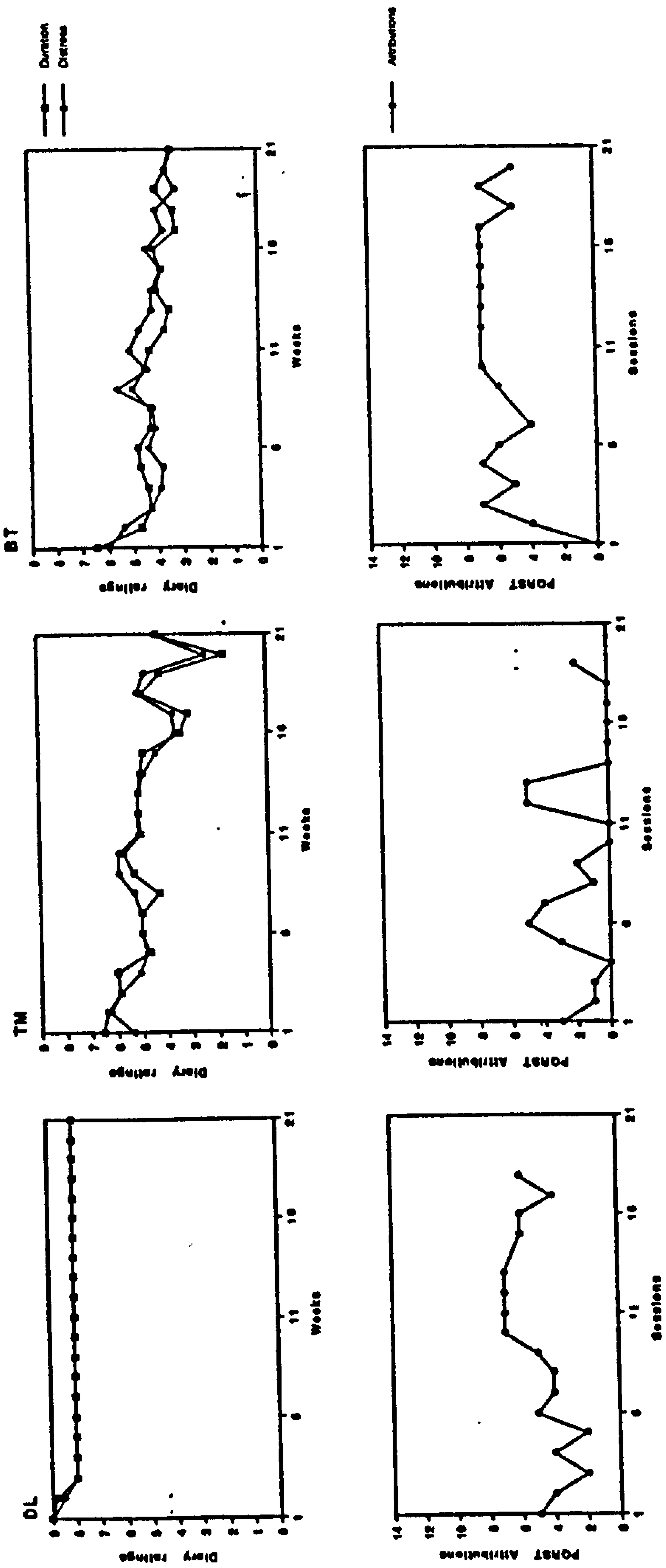


FIG. 1. Daily diary ratings (average over weeks) of the duration and distress caused by voices for six patients undergoing focusing therapy (top panels; see text for details of anchor points). Also shown are patients' attributions (belief that voices are thoughts) as measured by the Personal Questionnaire Rapid Scaling Technique (Mulhall, 1978) at the beginning of each session. High scores in upper panels indicate higher levels of distress or longer duration. High scores in lower panels indicate that patients attributed voices more to self. Note that, because of occasional breaks between sessions, session numbers only approximately equal week numbers.


BT
TM
DL
Duration
Distress
Attributions
Diary ratings
PORST Attributions
Weeks
Sessions

voices to themselves, whereas low scores indicate that they attributed the voices to alien or external causes. Changes in these attributions can be seen in all of the patients. In three cases (SB, DL, and BT) the scores indicate a willingness to attribute their voices to themselves that increases as therapy progresses. Less consistent shifts in attributions can be seen in two subjects (RH and TM), and one subject showed a shift only at the beginning of the very last therapeutic session (HB). It is interesting to note that in the case of one of the patients who showed inconsistent attribution shifts (RH), a considerable increase in his attribution of voices to self was observed during the early weeks of therapy, corresponding to a decrease in duration of voices. At a later stage in therapy his attribution of his voices to himself decreased, despite a continual improvement in the other measures. The second patient who showed inconsistent attributions (TM) had committed a violent offense instigated by his voices; in his case the attribution of voices to self was embraced for a few sessions until this caused him considerable anxiety about his personal responsibility for the crime he had committed. TM subsequently gave very low ratings on the PQRST attribution items (implying external attributions about the voices) but, during discussion with his therapist, clearly attributed both his voices and his crime to an illness for which he felt no responsibility.

Discussion

In this article we have described a theoretical model of hallucinatory experiences and a therapeutic procedure based on this approach. It should be emphasized that the data reported are not single case design data, as no stable baseline measures were taken. The present findings therefore cannot empirically establish the value of our approach. Nonetheless, the preliminary results we have presented indicate that the focusing techniques that we have developed from our model may be useful in reducing the frequency of persistent auditory hallucinations, together with the distress associated with these experiences, in some patients. With one exception, there was covariation between patients' ratings of the distress caused by the voices and ratings of their duration, loudness, and hostility. In this study it is unclear whether a reduction in one of these aspects produced a reduction in the others or whether our intervention had a simultaneous effect on all four areas.

The relationship between changes in patients' attributions about their voices and reductions in frequency and distress was clearly complex. Only one patient showed a change in duration and distress that appeared to be clearly associated with a change in attributions. Two patients showed a reduction in duration and distress without a consistent change in their attributions. However, clinical data indicated that, for these patients, there were motivational factors that could account for this apparent discrepancy between voice characteristics and attributions. These observations suggest that it may be premature either to accept or reject the hypothesis that therapeutic change requires modification of patients' beliefs about their voices. Further research is clearly required to address this question.

A distinction that may prove to be important in this regard is that between implicit and explicit judgments (e.g., Reber, 1989); cognitive research indicates that, in ordinary people, explicit and verbalizable judgments are not always concordant with judgments that are made implicitly and without thinking. The therapeutic intervention we have described was clearly targeted at changing patients' explicit judgments about the sources of their experiences. Although we have emphasized the role of beliefs and expectations in reality judgments, it is possible that discriminating between self-generated and external events is, in part, an implicit skill that relies on tacit knowledge (Bentall, 1990).

It should be noted that the patients described here can in many ways be regarded as "worst bet" candidates for therapy, as they had been experiencing hallucinations for many years and had not responded to traditional methods of treatment. Whether the changes experienced by the more successful patients will prove to be long-lasting and whether, as we hypothesize, focusing will prove to be more efficacious than distraction approaches remains to be established following the collection of further data. It is also important to note that three of the six patients reported here did not show consistent benefits as the result of focusing therapy. These therapy failures may be the result of a number of factors that may be more or less intrinsic to our therapeutic technique.

First, a maximum of twenty sessions of treatment were offered to patients, which is about the same amount of time that might be required for the cognitive-behavioral treatment of moderate depression (Williams, 1991). It is possible that further sessions would have produced improvements in those who did not respond. Further studies should investigate whether therapeutic outcome is proportional to the number of sessions provided. Second, encouraging patients to reattribute their hallucinatory experiences to themselves was very anxiety-provoking for some, especially in the early stages. Sometimes this approach was actively resisted, despite our attempt to introduce it gradually over a number of sessions. This seemed to be because patients found the attribution of negative or hostile content to the self to be quite threatening. In this context it is interesting to note that a common objection made to the use of psychodynamic therapies with psychotic patients is that these therapies raise anxiety-provoking issues with which patients are unable to cope (Mueser & Berenbaum, 1990). Third, as we have noted in a previous report (Haddock et al., 1993), environmental stressors associated with persistent psychotic disorders (for example, poverty and poor housing) may impair the ability of some subjects to benefit from therapy. Fourth, it might be argued that patients who were less chronically ill would have been more able to benefit from focusing therapy, as the beliefs and expectations sustaining the hallucinations of such patients might have been less rigidly held. Finally, of course, it is possible that focusing therapy is completely inappropriate for some patients because it fails to address cognitive biases and deficits that are not adequately described by our theoretical model. In particular, it is possible that attentional or other global cognitive processing deficits, which have frequently been observed in experimental studies of psychotic patients (M. F. Green, 1992), might impair the ability of patients to engage in the therapeutic process. This hypothesis, if supported by further research, would suggest that cognitive-behavioral interventions of the sort described in this article might best be employed in combination with cognitive-rehabilitation techniques such as those described by Brenner (1989). Indeed, it seems plausible that psychological interventions that address both cognitive deficits (as in cognitive rehabilitation) and cognitive biases (as in focusing therapy) will be most likely to produce lasting benefits for severely ill patients.

Taken together, the arguments and findings given in this article suggest that cautious optimism about the value of cognitive-behavioral interventions for hallucinating patients may be warranted. It is unlikely that the range of possible therapeutic strategies, even strategies that emphasize focusing, have been exhausted as yet. Given that the cognitive-behavioral treatment of psychotic experiences might rightly be regarded as being in its infancy (Slade, 1990), further refinements of existing approaches, the development of innovative strategies, carefully conducted single case-studies, and controlled trials are required to identify precisely which therapeutic methods are most efficacious in which circumstances, and which patients are most likely to benefit.

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