Cognitive-behavioral Treatment for Panic Disorder with Agoraphobia: An Evaluation of Cognitive and Exposure Components of Treatment

by

Vivienne C. Rowan

A thesis
presented to the University of Manitoba
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
in
Psychology

Winnipeg, Manitoba, 1989
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COGNITIVE-BEHAVIORAL TREATMENT FOR PANIC DISORDER WITH AGORAPHOBIA: AN EVALUATION OF COGNITIVE AND EXPOSURE COMPONENTS OF TREATMENT

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VIVIENNE C. ROWAN

A thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

DOCTOR OF PHILOSOPHY
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ACKNOWLEDGEMENTS

My sincere appreciation to the many people who contributed to the successful completion of this research and to my PhD. degree. My academic and clinical advisors and friends, Drs. Robert W. Tait and John R. Walker, devoted many hours of their time to planning the research project and to "mothering" it (and sometimes me) through to completion. Their assistance and support were invaluable.

I thank the other members of my examining committee: Drs. Joseph Pear and David Martin, and my external examiner, Dr. David Barlow, for their scholarly assistance and advice. I am also grateful to the staff of St. Boniface General Hospital, Department of Psychiatry, for providing financial assistance and office space. Many thanks to Renee Frenett, Andrea Hazen and Patricia Furer, and to Susan Peggy for donating their valuable time for secretarial services, interviews with subjects, and procedural reliability assessments, respectively.

I am very grateful to two special people, Bill TenHave and to my close friend Gloria Eldridge whose timely contributions and support brought this research to a successful conclusion. Thank you for always being there for me when I needed you the most.

Finally, my eternal gratitude to my husband Terry, and to our children Christopher, Stace, Robert, Sean, and
Shannon and our daughter-in-law Lori, for offering continual support and encouragement, and for tolerating my frequent mental and physical absences from your lives during my academic career. My deepest love and appreciation to you, my family. I dedicate my work to you.
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ABSTRACT

The effects of cognitive and exposure components of cognitive-behavioral treatment were examined in 10 subjects with Panic Disorder with Agoraphobia. Subjects were randomly assigned to one of two treatment series--series one or series two. Treatment components were introduced sequentially in a single subject staggered baseline design. Series one treatments were: (1) cognitive therapy (i.e., education about panic attacks and cognitive restructuring), (2) cognitive therapy with brief exposure (i.e., a brief period of hyperventilation exposure to interoceptive cues) followed by cognitive therapy, and (3) multiple-session exposure (i.e., several brief trials of hyperventilation exposure to interoceptive cues).

Series two treatments were: (1) cognitive therapy, and (2) multiple-session exposure. Procedural reliability was high. Dependent variables were collected daily, weekly, and pre- and post-treatment phases. Dependent variables included measures of panic attacks, anxiety, avoidance, and associated psychiatric symptoms.

The results indicated that distress and avoidance were reduced in 6 of 10 subjects following cognitive therapy, 5 of 5 subjects after cognitive therapy with brief exposure, and 7 of 10 subjects following multiple-session exposure. The cognitive therapy with brief exposure component was
modestly more effective in series one than the multiple-session exposure component in series two. Subjects rated cognitive therapy as the most beneficial component of treatment. Subjects' evaluative ratings of satisfaction with treatment, needs met, and symptom reduction were high. Implications for cognitive-behavioral treatment approaches are discussed.
In the most recent edition of *The Diagnostic and Statistical Manual of Mental Disorders-Revised* (DSM-III-R: American Psychiatric Association, 1987), Panic Disorder with Agoraphobia is defined as an anxiety disorder that is characterized by recurrent panic attacks, and/or persistent fear of having another panic attack, and avoidance behavior. The first panic attack consists of an episode of intense apprehension, fear and discomfort of sudden onset, with no immediately determinable cause. After experiencing one or more panic attacks, individuals often develop varying degrees of avoidance behavior of situations in which help may not be immediately available from a trusted person, or the occurrence of an attack might result in public embarrassment (e.g., Thyer & Himle, 1985; Uhde, Roy-Byrne, Vittone, Boulenger, & Post, 1985).

Historically, the treatment of Panic Disorder with Agoraphobia emphasized whichever aspects of the syndrome clinicians chose to highlight. Guided by the empirical work of pharmacological and behavioral researchers, medically oriented clinicians assumed that medication was the treatment of choice for panic attacks; whereas, behavioral clinicians considered *in vivo* exposure strategies appropriate for avoidance behavior.

Pharmacological researchers viewed avoidance behavior as resulting from patients' fears about having
biologically-based "spontaneous" panic attacks (e.g., Klein, 1981). Their treatment strategies focused on alleviating panic symptoms with antidepressants (e.g., imipramine) and, more recently, with minor tranquilizers such as alprazolam (e.g., Ballenger et al. 1988; Garakani, Zitrin, & Klein, 1984; Sheehan, Ballenger, & Jacobson, 1980; Zitrin, Klein, & Woerner, 1980; Zitrin, Klein, Woerner, & Ross, 1983). Less emphasis was placed on phobic avoidance of environmental stimuli. The assumption was that once panic attacks were blocked with medication, avoidance behavior would decline accordingly. However, clinical improvement was variable and treatment gains were often maintained only for the length of time that the drug remained in the patient's body. Relapses were common within three months of discontinuance of antidepressant medication (Sheehan, 1982). Furthermore, dropout rates from drug trials averaged between 35 and 40% (Mavissakalian & Barlow, 1981).

In contrast, behavioral researchers (e.g., Emmelkamp, 1982; Emmelkamp & Kuipers, 1979; Marks, 1978a; Mathews, Gelder, & Johnston, 1981) tended to target phobic avoidance of environmental stimuli (e.g., public situations) for treatment. Behavior therapy strategies emphasized in vivo exposure techniques to decrease avoidance behavior; little emphasis was placed on treating panic attacks directly (Barlow, 1986a; Barlow & Beck, 1984). The assumption was
that as patients confronted their fears of external events, panic attacks would decline. Although behavioral therapies were proven effective in diminishing agoraphobic avoidance and panic symptoms, investigators found that phobic avoidance often returned with the recurrence of panic attacks (e.g., Barlow, 1988; Chambless & Goldstein, 1981; Rapee & Barlow, in press).

More recently, several researchers have developed psychological treatment packages consisting of cognitive and exposure techniques (to be described fully later) which focus directly on eliminating panic attacks (e.g., Barlow & Cerny, 1988; Barlow, Craske, Cerny, & Klosko, 1989; Craske & Barlow, 1987; Clark, Salkovskis, & Chalkley, 1985; Gitlin et al., 1985; Klosko, Barlow, Tassinari, & Cerny, 1987). Although the psychological therapies for panic attacks are very new, the results are encouraging. Over 80% of patients with limited phobic avoidance report being panic free up to 24 months post-treatment.

The present study investigated the effects of cognitive and exposure treatments for Panic Disorder with Agoraphobia. The introduction will consider in turn: (a) the phenomenology of panic and avoidance, (b) the psychological models of panic attacks, (c) the cognitive-behavioral treatment approaches to panic attacks, and (d) a rationale for examining cognitive and exposure factors in the treatment of Panic Disorder with Agoraphobia. Unless
otherwise stated, DSM-III-R (1987) terminology (i.e., Panic Disorder with Agoraphobia) will be adapted throughout when describing studies which used DSM-III (1980; American Psychiatric Association) terminology (i.e., Panic Disorder or Agoraphobia with Panic Attacks).

The Phenomenology of Panic and Avoidance

Panic attacks are characterized by the sudden onset of intense anxiety. Panic symptoms include both heightened autonomic nervous system activity, such as heart palpitations, dizziness, and trembling; and such cognitive activity as thoughts of dying, going crazy, or doing something uncontrolled (DSM-III-R, 1987). With the passage of time, individuals usually develop intense fears of having another panic attack, and often display avoidance behavior of public situations (either widespread or of specific situations) such as shopping malls, restaurants, and line-ups. However, several investigators have argued that the phobic avoidance is more consistent with a fear of the panic symptoms and one's own reactions to those intense internal stimuli in particular situations, rather than with a fear of environmental stimuli per se (e.g., Barlow, 1988; Barlow & Beck, 1984; Clark, 1986; Craske, Sanderson, & Barlow, 1987; Goldstein & Chambless, 1978).

Anticipatory anxiety (i.e., fear of having another attack) is a common feature of the syndrome (e.g., Barlow et al., 1985; Craske et al., 1987; Rapee, 1987; Street,
Cognitive and Exposure Treatments

Craske, & Barlow, 1989), and continues to dominate the clinical picture in 93% of cases following onset of the first panic attack (e.g., Brier, Charney, & Heninger, 1986). Avoidance of specific situations in which the initial panic attack(s) occurred often lessens the chances for recurrence of a panic attack (e.g., Barlow & Beck 1984; Craske et al., 1987; Thyer & Himle, 1985). For example, to avoid experiencing panic symptoms, panic-prone individuals often establish familiar routes to work, shop in the same stores, and participate in only those social activities in which they are comfortable. Thus, depending on the extent of the avoidance behavior, the frequency and intensity of panic attacks may fluctuate considerably over the course of the disorder.

Common precipitants of initial panic attacks are stressful life events such as interpersonal conflicts, serious illness or death of a significant other, and drug reactions (e.g., Chambless & Goldstein, 1981; Doctor, 1980; Finlay-Jones & Brown, 1981; Kleiner & Marshall, 1987; Last, Barlow, O'Brien, 1984). Whatever the initial precipitant, however, anxiety reactions may subsequently be elicited by factors quite unlike the original stimulus conditions (e.g., Barlow, 1988; Foa, Steketee, & Young, 1984; Wolpe & Rowan, 1988). That is, panic attacks appear to take on a "life of their own" in that they come to be elicited by other external and internal events.
Alterations in internal stimuli are frequently the antecedent conditions which "cue" panic attacks. Individuals may be either unaware of the precipitants or may misinterpret innocuous physical sensations as signs of an impending panic attack (e.g., Barlow & Cerny, 1988; Barlow, 1985; Chambless & Goldstein, 1981; Clark, 1986). For example, anxiety-like bodily sensations associated with mild exercise, sexual activity, fluctuations in temperature (Barlow, 1985), or, flu symptoms (Chambless 1982) have also been found to cue panic attacks. Other investigators have noted that a hypersensitivity to pain (Roberts, 1984), intense fears of taking medications (Telch, Agras, Taylor, Roth, & Gallen, 1985), and high anxiety in response to drugs (Rapee, Ancis, & Barlow, 1988) accompany the disorder. Latimer (1983) and Marks (1983) commented that because the effects of some medications (especially tricyclic antidepressants) mimic anxiety symptoms, a large number of patients with panic attacks have difficulty tolerating the drugs' side effects.

The failure of patients to recognize internal stimuli as the antecedents of panic attacks and to attribute their cause to external stimuli support Orwin's (1973) early observations that:

These patients had become aware that speed [increased physical exertion] might precipitate sensations which they had come to regard as
components of the feared panic response, e.g., palpitations. They could not see the relationship of internal sensations to the state of physical activity, but assumed that the external environment, the known and expected provoker of anxiety, was causal (p. 175). That is, these patients became aware that slight physical exertion (e.g., walking quickly while leaving a supermarket) increased heart rate, which they recognized as a component of their panic symptomatology. However, they failed to view increased heart rate caused by physical exertion as a normal bodily reaction. Rather, they attributed their racing heart beat to the external environmental situation (e.g., the supermarket) since panic attacks had occurred previously in similar environmental contexts.

Further support for Orwin's conclusions comes from another early study in which stimuli that actually triggered anxiety reactions in patients were analyzed (Beck, Laude, & Bohert, 1974). The published descriptions suggest that the panic symptoms of many patients were elicited by physical sensations (e.g., physical exertion, back pain, gastrointestinal upset).

The preliminary claims that panic-prone patients display a heightened awareness of alterations in internal stimuli has been substantiated by more recent studies. For
example, King, Margraf, Ehlers, and Maddock (1986) concluded that, compared to healthy controls, patients with Panic Disorder with Agoraphobia showed a higher awareness of cardiovascular and gastrointestinal changes as indexed by self-report measures. Similarly, patients who were exposed to false feedback of sudden accelerated heart rate had higher anxiety ratings and displayed more physiological arousal compared to controls (e.g., Ehlers, Margraf, Roth, Taylor, & Birbaumer, 1988; Margraf, Ehlers, & Roth, 1987). Other studies have found that following a brief period of voluntary hyperventilation, patients with panic attacks rate their fear of anxiety symptoms higher than those with other anxiety disorders or controls (Holloway & McNally, 1987; Reiss, Peterson, Gursky, & McNally, 1986; Thyer, Papsdorf, & Wright, 1984). Thus, it appears that individuals who suffer from panic attacks are so apprehensive about experiencing panic symptoms that many different types of stimuli can produce aversive bodily sensations and anxiety related cognitive activity.

To account for why altered physiological arousal may cue panic attacks, early theorists speculated that the effect was established through interoceptive conditioning (Ackerman & Sachar, 1974; Breggin, 1964; Evans, 1972). Interoceptive conditioning involves the pairing of physiological arousal and cognitive activity with aversive events which subsequently results in excessive apprehension
of emotional responses (e.g., Barlow, 1986a). For example, Goldstein (1982) postulated that:

Panic attacks seem to occur as an unconditional emotional response to prolonged stress and conflict. Since they occur unpredictably, the most consistent, contiguous stimuli are introspective [sic] ones, such as one's heartbeat and blood flow. Thus anxiety is conditioned to these internal cues. In addition, second-order conditioning follows with the development of avoidance to places where panics have previously occurred and then generalizes to situations that have a similar characteristic--.... (p. 187).

Goldstein appears to be proposing a stimulus-stimulus conditioning account of Panic Disorder with Agoraphobia which he hypothesizes result from the following set of circumstances. Long-term stress and conflict are the unconditioned stimulus (UCS) conditions which produce the unconditioned response (UCR) in the form of the first panic attack (i.e., fear or anxiety as indexed by physiological arousal such as increased heart rate and changes in blood pressure). The first panic attack appears to have stimulus properties that act as conditioned stimuli (CSs) for subsequent panic attacks. That is, the feedback to the central nervous system that indexes changes in physiological activity in response to stress become the CSs
for further panic attacks (CRs).

Goldstein’s notion of second-order conditioning being involved in the development of avoidance behavior seems to suggest that internal stimuli (CSs) or the panic symptoms are coincidentally paired with external CSs such as public situations leading to avoidance of such environmental stimuli. However, he fails to specify the conditions that support or reinforce the avoidance behavior which is often maintained for prolonged periods despite the absence of stress and conflict. Furthermore, animal studies of escape and avoidance learning have found that second-order conditioning does not involve direct CS-UCS pairings, but rather the pairing of two or more distinctly different CS components, only one of which was previously paired with the UCS (e.g., Schwartz, 1978). Because Goldstein’s proposed mechanism has all CSs paired with the UCS, the mechanism cannot be one of second-order conditioning. Thus, Goldstein’s proposal has two major weaknesses: the mechanism of acquisition of the panic attack symptoms appears to be inaccurately labelled; and, no mechanism of reinforcement of the avoidance behavior is included.

Levis (1979) suggests a more parsimonious account of the development of panic attacks and avoidance behavior based on infrahuman research on symptom maintenance. Levis (1979) proposed a model based on conditioning principles to explain why human panic symptoms, especially avoidance
behavior, are so resistant to extinction in the absence of genuinely dangerous circumstances. The model has important implications for in vivo exposure treatment strategies, and may explain why such strategies have met with considerable success in the treatment of Panic Disorder with Agoraphobia.

Levis' Model of Avoidance Behavior. Levis (1982) argues that most individuals who develop psychopathological behavior have a history of events that have been associated with pain and punishment (unspecified UCSs). Emotional responses are classically conditioned to initially nonpunishing environmental stimuli by their pairing with punishing stimuli. Thereafter, when the organism comes into contact with these conditioned environmental stimuli, aversive emotional responses arise in the form of fear or anxiety. Escape or avoidance of the conditioned stimuli results in decrements in fear and instrumental conditioning of avoidance responses.

The strength of avoidance behavior does not depend on the intensity of the UCS, but rather on the complexity of the CS pattern (Levis, 1979). The stimulus pattern is comprised of a sequence of varied CSs (CS1, CS2, CS3 ... UCS) such as those found in our everyday environment. Contact with these punishing stimuli produces a wide variety of emotional (physiological arousal and cognitive activity) and behavioral responses (escape from or
avoidance of feared situations). In animal escape and avoidance conditioning, short latency responses to CS components (especially those ordered early in the chain) retard extinction of avoidance behavior because the remainder of the CS segments closest to the UCS are left unexposed. The same may be true of humans.

Each human has a unique conditioning history. Thus, the avoided stimulus patterns may differ for different individuals. Differences in avoided stimulus patterns may explain, in part, why in vivo exposure strategies that focused exclusively on environmental stimuli were successful for some patients, but not for others. Subjects who displayed residual symptoms following treatment may have been those whose avoided conditioned stimulus pattern were somewhat dissimilar to the subjects who demonstrated treatment success. Accordingly, superior clinical outcome should result after both careful assessment of the conditioned fear eliciting stimuli from internal and external sources, and adequate exposure to the total CS complex in the absence of the UCS during treatment. Exposure to the total CS complex may partially account for the superiority of the new therapeutic packages for the treatment of panic attacks. Subjects are usually exposed to an integrated treatment package which include a variety of components that elicit anxiety in many different ways (e.g., Barlow et al., 1989; Clark et al., 1985; Gitlin et
Thus, patients receive a more broad-based exposure treatment program than was offered with the conventional in vivo exposure to environmental stimuli strategy (e.g., Mathews et al., 1981).

Barlow (1986a; 1986b) has suggested that fear of physiological sensations is a critical feature of Panic Disorder with Agoraphobia. Following this line of reasoning, the central argument of this thesis is that Panic Disorder with Agoraphobia represents intense fear of autonomic arousal or bodily sensations which resemble those aversive bodily sensations experienced during the first few panic attacks. Accordingly, phobic avoidance is not restricted to external stimuli (i.e., places and events), but rather includes fear and avoidance of any stimuli, internal (e.g., accelerated heart rate associated with physical exercise) or external (e.g., public situations), which might alter physiological responding and trigger internal responses. Conceptually, what is being avoided is the occurrence of any bodily sensations resembling previously felt panic symptoms, the associated catastrophic thoughts (e.g., "I’m going to go crazy or do something uncontrolled"), and perhaps any situations where these reactions might have been experienced in the past. However, the predominant initial controlling stimuli are likely interoceptive cues or bodily sensations which may elicit further conditioned anxiety and ultimately,
additional full-blown panic attacks.

The hypothesis suggests that the most effective treatment strategies for eliminating panic attacks, fear of panic symptoms, and avoidance behavior are likely those which expose patients to the anxiety-like bodily sensations and associated cognitive activity. Exposure to feared sensations of autonomic arousal would enable patients to learn that these sensations are unlikely to produce a panic attack and most certainly will not result in death, loss of sanity, or loss of control. To this end, several applied studies have recently focused on the outcomes of various therapeutic packages which have included exposure to physiological sensations (e.g., Barlow et al. 1989; Clark et al., 1985; Gitlin et al., 1985). However, the theoretical mechanisms which might account for successful treatment effects are not well understood (Rapee & Barlow, in press).

**Psychological Models of Panic Attacks**

In the past few years, four psychological models of Panic Disorder with Agoraphobia have evolved from assessment and treatment outcome studies. Although these models tend to focus more on panic attacks than on agoraphobic avoidance (Levis, 1979; 1982), they share many features. For example, there is general consensus that panic attacks are initiated by stressful life events. Further, theorists agree that the physiological disturbance
involved in the first few panic attacks is usually followed by a negative psychological interpretation of the attacks. Moreover, both physiological and cognitive components are assumed to maintain panic attacks. However, theorists place different emphasis on which of the two components is most crucial in maintenance of the panic syndrome. Ley (1988) argues that chronic hyperventilation maintains panic symptomatology, while Beck (1985) contends that cognitive sets which process danger related events are the critical factors in the maintenance of panic anxiety. Other theorists (e.g., Barlow, 1988; Clark, 1986) have proposed more comprehensive models in which physiological and cognitive factors are viewed as interacting with environmental stimuli to produce increased anxiety which, sometimes, lead to full-blown panic attacks. A brief review of the four models and the studies from which these models have evolved follows.

Ley's Hyperventilation Model. Ley (1985a; 1987; 1988) hypothesizes that early symptoms of anxiety are reflected in mild chronic hyperventilation initiated by stressful life events. Hyperventilation results in increased expiration of carbon dioxide producing mild symptoms (e.g., a slight rise in heart rate and shortness of breath) which usually go unnoticed and can be tolerated for a relatively long period of time. Panic attacks (comprised of somatic and cognitive events) occur when chronic hyperventilation
rises abruptly beyond one’s tolerance level, perhaps in response to an additional stressor. The range and intensity of symptoms can vary considerably across and within individuals. Nevertheless, following the onset of the physical symptoms, cognitive fear develops because the individual views the aversive physical sensations as signalling a catastrophic event such as having a heart attack or going insane. Thus, for Ley, chronic hyperventilation is a crucial element in both the onset and the maintenance of panic attacks.

Ley’s model is supported by both unobtrusive observations of the breathing pattern of agoraphobics during individual interviews, and retrospective reports of bodily sensations and cognitive fear experienced during initial panic attacks (Ley, 1985b). Observations of breathing behavior indicated that each of the subjects displayed ventilatory responses (ranging from 16 to 22 breaths/min) above the normal resting respiration rate (12 to 14 breaths/min), suggesting mild chronic hyperventilation. From the ten retrospective reports, eight subjects stated that hyperventilation symptoms such as dyspnea and palpitations occurred in advance of the full-blown panic attack with the associated cognitive fear component.

Ley’s findings were later extended by investigations that examined the order in which patients experienced
specific panic symptoms (i.e., physical sensations and fear-related thoughts) such as heart palpitations and thoughts of losing control. The retrospective reports suggested that fear related cognitions usually follow, rather than precede the onset of distressing bodily sensations during the first panic attack (Wolpe & Rowan, 1988) and often during subsequent attacks (e.g., Craske, Grenier, Klosko, & Barlow, 1986). Other investigators have concluded that there is a marked similarity between the bodily sensations produced by voluntary hyperventilation and the somatic events involved in panic attacks (Clark et al., 1985; Compornolle, Hoogduin, & Joele, 1979; Garssen, Van Veenedal, & Bloemink, 1983; Hibbert, 1984; Salkovskis, Jones, & Clark, 1986; Salkovskis, Warwick, Clark, & Wessels, 1986).

The above correlational studies have shown links between the anxiety-like bodily sensations produced by hyperventilation and symptoms of naturally occurring panic attacks. Ley (1985a, 1987; 1988) contends that chronic hyperventilation is always present and is more important than cognitive factors in the onset of panic attacks. A few studies, although retrospective, have concluded that cognitive fear usually follows the onset of distressing bodily sensations in subsequent panic attacks.

**Beck's Cognitive Model.** Beck and Emery (1985) argue that the major factor in panic reactions is catastrophic
thoughts of a heart attack and losing control. These investigators concluded that thoughts and images associated with physical, mental, and behavioral catastrophe (e.g., death, fainting, going crazy, or losing control) were the primary triggers of additional panic attacks.

Further support for Beck's model comes from another recently published report on the interview data from 44 patients with Panic Disorder with Agoraphobia (Kenardy, Oei, Ryan, & Evans, 1988). In this study, subjects completed a two-part questionnaire on the factors related to onset and offset of initial and subsequent panic attacks. Although most subjects could not specify the antecedents of their initial panic attacks, they attributed the onset of subsequent attacks to cognitive activity such as fear of panic or having a stroke.

Panic attack offset, however, was attributed to cognitive and physiological factors equally. Seventy-two percent of subjects reported that they used some form of cognitive strategy (e.g., talk myself out of it, distract myself with other thoughts) to control panic attacks. However, only 18.9% of subjects found that the cognitive techniques consistently controlled panic. Thus, these subjects were able to employ successfully some form of cognitive coping strategy to control panic attacks despite the fact that they received no treatment whatsoever.

Another interesting finding was that of the patients
cognitions about severe illness, death, insanity, and losing control of one’s emotions. The physiological disturbance involved in subsequent panic attacks is viewed as a consequence of hypervigilence and exaggeration of normal autonomic nervous system activity. Beck (1985) hypothesizes that "fear schemas", or cognitive sets process danger-related information which interacts with internal and external stimuli to produce frightening misperceptions of relatively innocuous situations. The level of anxiety is equal to the degree of threat produced by the thoughts (e.g., thoughts of dying are likely more frightening than thoughts of fainting). Thus, for Beck, the locus of anxiety is in the individual’s ever-present hypervigilent cognitive schemata.

Beck’s model is supported by retrospective reports of panic symptoms experienced during initial and subsequent attacks of 30 subjects with Panic Disorder with Agoraphobia (Ottaviani & Beck, 1987). Initial panic episodes were precipitated by psychosocial events (e.g., leaving college) or physical sensations (e.g., starting medication or recovery from surgery). Subsequent panic attacks were triggered by misinterpretation of unexpected physical sensations not only in the presence of a psychosocial stressor, but also in the absence of such stimuli. Moreover, even unusual bodily sensations experienced during excitement in reaction to a positive event triggered
who took medication for panic attacks (25%), all reported that the medication aborted their attacks. Nevertheless, most subjects indicated a preference for cognitive strategies to control panic attacks. This suggests that, given a choice, at least some patients may be more willing to accept cognitive treatment strategies over drugs for panic attacks, possibly due to the unpleasant side effects associated with medication (Latimer, 1983; Marks, 1983; Rapee et al., 1988).

Beck’s cognitive model places heavy emphasis on panic inducing cognitive sets in the maintenance of panic attacks. Thoughts and images of possible physical harm or public embarrassment appear to trigger panic onset. In addition, patients often use cognitive strategies, for example, thoughts which distract them from symptoms, to control their panic attacks. Furthermore, most patients seem to prefer cognitively-based techniques over medication.

Clark’s Cognitive Model. Clark (1986) developed a model which combines physiological and cognitive factors (with a strong emphasis on cognitive variables) in the production of subsequent panic attacks. The model proposes that commonly experienced anxiety responses such as heart palpitations and breathlessness are misinterpreted as catastrophic events (e.g., having a heart attack). After having one or more panic attacks, the individual begins to
focus on his/her bodily sensations. Changes in physiological activity from any number of sources (e.g., physical exercise, anger during an argument, excitement in a positive context, environmental stimuli) are misinterpreted as signalling an impending attack. As physiological arousal (e.g., heart palpitations) increases, so does cognitive activity, especially catastrophic thoughts such as "This feels like a heart attack", which generates additional physiological arousal. At some point, the physiological and cognitive factors culminate in a full-blown panic attack. Unlike Ley (1988), Clark (1986) maintains that hyperventilation is an important factor in the panic reactions of some patients, but not in others. The thrust of Clark's model is that hyperventilation leads to a full-blown panic attack only if the bodily sensations produced by hyperventilation are perceived as aversive and misinterpreted as catastrophic. (Ley would argue that chronic hyperventilation initiates panic attack onset in all cases). Thus for Clark, one of the crucial factors in treatment is the patient's cognitive awareness of the connection between hyperventilation (or other processes which produce changes in bodily sensations) and panic attacks.

In support of the model, Clark and colleagues published three reports in which subjects with panic attacks received an integrated treatment package. The
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package involved the following components: (1) a brief period of hyperventilation (to demonstrate to the patient that anxiety-like sensations could be reproduced and terminated), (2) education about the cognitive and physiological factors that produce panic attacks, and (3) breathing retraining involving instructions to diaphragmatically breathe at a slow and consistent pace (Clark et al., 1985; Salkovskis, Jones, & Clark, 1986; Salkovskis, Warwick, Clark, & Wessels, 1986).

All subjects in these studies (n = 28) showed substantial and rapid reductions in panic attacks within two to three weeks of implementing treatment. One week after the completion of the treatment phase (Clark et al., 1985), some subjects were instructed to engage in previously avoided activities, while others received unspecified cognitive-behavioral treatment for additional problems (not detailed). Thus, the long-term effectiveness of the treatment package itself could not be evaluated. Nonetheless, with the addition of in vivo exposure and cognitive-behavioral treatments, subjects showed further improvement at 3 and 24 months follow-up.

In summary, although Clark (1986) describes his model as "a cognitive approach to panic" (p. 463), the model has a much broader approach to panic attacks. All three components (i.e., cognitive, physiological, and environmental) are assumed to interact to culminate in a
panic attack. Furthermore, unlike Beck and Ley's model, Clark's model evolved from treatment studies in which subjects monitored their panic attacks daily while the factors hypothesized to produce panic attacks were manipulated.

**Barlow's Interactive Model.** Recently, Barlow (1988) outlined a comprehensive model of panic anxiety in which he characterizes the phenomenon of panic as an interactive cognitive-affective structure based on the association of "false alarms" (p.366) with interoceptive cues (somatic events). Alarms are defined as biologically adaptive fear responses which prepare an organism for flight or fight responses in the presence of a genuinely threatening stimulus. The threatening antecedent conditions which trigger these automatic responses can be specified and represent true alarms. False alarms or fear responses, however, are uncued anxiety reactions which occur in the absence of life-threatening circumstances. Although the antecedents which trigger false alarms are unclear, they are assumed to be produced by stressful life events, and are associated with the initial stage of Panic Disorder with or without Agoraphobia (e.g., Last et al., 1984).

According to Barlow, panic disorder begins with a biological vulnerability to overreact to stressful life event(s) due to sensitization of the alarm system to earlier stress. The stressful life event(s) triggers the
false alarm system or first panic attack. Because the false alarm is associated with interoceptive cues, the individual acquires learned alarm responses to these interoceptive cues. The process, in turn, creates a state of anxious apprehension about the possibility of more alarms. Anxious apprehension appears to be focused on the stressful life event previously experienced, but more so on the expectation of additional false alarms. This tendency to focus on somatic events may partially explain why individuals who suffer from panic attacks develop an acute sensitivity to alterations in internal stimuli from other sources such as mild exercise, flu symptoms, and medication (e.g., Barlow, 1985; Chambless, 1982; Last et al., 1984; Marks, 1983). In any case, anxious apprehension is hypothesized to fuel the learning of additional somatic and cognitive anxiety symptoms and, depending on other social and cultural factors, may lead to agoraphobic avoidance.

As with most models in psychology and psychiatry, Barlow's model evolved from initial investigations (Barlow, Hayes, & Nelson, 1984) which produced successful cognitive-behavioral strategies for alleviating panic attacks (e.g., Barlow et al., 1984; Craske & Barlow, 1987; Klosko et al., 1987; Waddell, Barlow, & O'Brien, 1984). Since Barlow's interactive model is very new, there are no published reports of studies designed to test aspects of the model. Future investigations may answer questions pertaining to
the role of anxious apprehension in exacerbating panic attacks and the nature of the social and cultural influences that produce agoraphobia in some patients, but not in others.

In summary, the four psychological models described above acknowledge that cognitive and physiological factors maintain panic attacks, but differ as to which of the two factors is the most crucial in contributing to the ongoing panic syndrome. Ley (1988) contends that the physiological component reflected in chronic hyperventilation initiates subsequent panic attacks, while Beck (1985) argues that the cognitive component represented in thoughts and images of physical, mental, and behavioral catastrophes produce additional panic attacks. Clark (1986) emphasizes the importance of cognitive factors, but extends his model to include physiological and environmental stimuli, all or any one of which can trigger later panic attacks. Similarly, Barlow's (1988) interactive model incorporates cognitive, physiological, and environmental factors in accounting for the maintenance of the panic syndrome, but places far more emphasis on exposure to internal stimuli in treatment than does Clark (Barlow, 1986a). In contrast to Beck and Ley, Clark and Barlow's models are supported by several treatment studies which manipulated cognitive and physiological factors while subjects provided concurrent records of panic symptomatology. Studies which have
developed successful cognitive-behavioral approaches for the treatment of panic attacks are reviewed in the next section.

**Cognitive-Behavioral Treatment Approaches to Panic Attacks**

While exposure *in vivo* has been widely accepted as the necessary component for successful treatment of avoidance behavior (e.g., Barlow & Waddell, 1985; Emmelkamp & Kuipers, 1979; Janson & Ost, 1982; Marks, 1981; Mathews et al., 1981), evidence for using psychological techniques (including exposure to interoceptive cues) for the treatment of panic attacks has only recently emerged (Clark, 1986; Craske, in press; Rapee, 1987; Rapee & Barlow, in press). Typically, psychological treatment for panic attacks involves the application of a comprehensive cognitive-behavioral treatment package consisting of multiple treatment components. The number of components employed in these treatment packages varies across studies. Some treatment packages (e.g., Bonn, Readhead, & Timmons, 1984, Clark et al., 1985; Rapee, 1985; Salkovskis, Jones, & Clark, 1986; Salkovskis, Warwick, Clark, & Wessels, 1986) consist of education about the mechanism involved in panic attacks (including a hyperventilation exercise to demonstrate provocation and control of panic symptoms) and breathing retraining. Reduction in panic frequency is attributed more to the patient’s ability to control panic symptoms through the paced breathing exercises than to the
effects of the cognitive component.

Other studies (e.g., Craske & Barlow, 1987; Gitlin et al., 1985; Klosko et al., 1987) include additional components such as relaxation training, and exposure to environmental stimuli and interoceptive cues in their treatment packages (see Barlow & Cerny, 1988 for a description of their treatment protocol). Since investigations of the effects of individual components have yet to be conducted, treatment success is attributed to the total package. Most of the studies described below did not include a no-treatment comparison (control) group with the exception of the those conducted by Barlow and colleagues.

In one of the earliest studies to employ a cognitive-behavioral treatment for Panic Disorder with Agoraphobia, Bonn et al. (1984) examined the contribution of a therapeutic package consisting of education combined with a hyperventilation provocation test and breathing retraining to in vivo exposure treatment. One group (n = 7) received the cognitive-behavioral package in two sessions followed by 7 weekly sessions of in vivo exposure to feared situations. The other group (n = 5) received 9 weekly sessions of in vivo exposure treatment only. Visual inspection of the published data suggests that large treatment effects occurred within 4 weeks. The results at post-treatment and at 1 month follow-up indicate that both groups showed similar decrements in panic attack frequency,
phobic avoidance, and somatic symptoms. However, when reassessed again at 6 months follow-up, there was a significant difference between the two groups. Subjects who received the cognitive-behavioral package including the in vivo exposure treatment continued to show improvement; whereas, those who received only in vivo exposure began to relapse.

Rapee (1985), in a single-case report, concluded that the provision of education about panic anxiety combined with a brief period of voluntary hyperventilation and breathing retraining produced marked reductions in panic frequency and intensity within three sessions. While Rapee attributed the success of treatment to breathing retraining, the education (cognitive) factor combined with the hyperventilation trial (providing exposure to feared interoceptive stimuli) may have been the active components in treatment. Other investigators (e.g., Clark et al., 1985) have suggested that the element of exposure induced through hyperventilation could be an important factor in treatment success. Since Clark’s research and cognitive model were the basis for the present study, this investigation will be examined in more detail.

In a larger uncontrolled trial, Clark et al. (1985) successfully treated 18 patients with panic attacks with unspecified avoidance behavior in two treatment sessions using a demonstration of the effects of hyperventilation,
education, cognitive restructuring, and breathing retraining. Panic attacks were viewed as a consequence of unpleasant bodily sensations and cognitive misinterpretation of those sensations.

The subject selection procedure involved having patients undergo a brief period of hyperventilation presented as a "diagnostic test". Subjects were then told to focus on their bodily sensations, which typically were similar to those experienced during a panic attack, and which produced similar cognitive responses. Any discrepancies between the effects of hyperventilation and naturally occurring panic attacks were clarified using an educational component which explained the physiological effects of hyperventilation. Only patients who rated the hyperventilation induced panic symptoms as similar to their naturally occurring panic attacks were selected for participation in the study.

The education or cognitive restructuring component consisted of an explanation of the way in which individuals with panic attacks misinterpret normal bodily sensations, including sensations related to apprehension and hyperventilation, as signals of the onset of a panic attack. Although subjects were explicitly instructed not to increase exposure to feared situations during the treatment phase, they were encouraged to "hypothesis test" their erroneous beliefs by conducting "mini experiments"
between sessions (e.g., exposing themselves to some of the bodily sensations related to panic attacks by activities such as inflating an air mattress by mouth). Finally, patients were instructed in controlled breathing. While the investigators attributed the effectiveness of the treatment to breathing retraining and changing catastrophic thoughts about panic attacks, they acknowledge that an alternative explanation is possible. Exposure to feared interoceptive stimuli (i.e., the diagnostic test and "hypothesis testing" homework assignments) may have been a major factor in the effectiveness of the treatment.

In another clinical trial, Gitlin et al. (1985) treated 11 patients with a package that emphasized education about the physiological aspects of panic, breathing retraining, relaxation, and exposure in vivo to environmental stimuli. The results at post-treatment, and at an average of 5 months follow-up, indicated that 10 of 11 patients no longer suffered from panic attacks.

An interesting, but seldom cited feature of this study was an evaluation of the patients' perspective of treatment outcome. When asked about the most beneficial components of the package at post-treatment, most patients agreed that the reassurance they received from education about the nature of panic changed their catastrophic misattributions of symptoms. Breathing retraining was reported to the next most helpful and component. The benefits of the remaining
components were not specified.

Barlow and colleagues have conducted a series of controlled studies to evaluate the efficacy of cognitive-behavior therapy for panic attacks. The first study, (Barlow, et al., 1984) involved 11 patients with Panic Disorder with Agoraphobia and 9 patients with Generalized Anxiety Disorder. Subjects received an integrated treatment package consisting of two components: progressive relaxation training (Bernstein & Borkovec, 1973) and EMG biofeedback, and cognitive-behavior therapy. The cognitive-behavior component involved education about anxiety and specific strategies for coping with anxiety and panic (i.e., self-statements and restructuring anxiety inducing thoughts). In addition, subjects were instructed to practice relaxation and panic coping strategies between treatment sessions. Unlike later studies by Barlow and colleagues, subjects in this study did not receive instructions to do specific exposure exercises to interoceptive or somatic cues (e.g., increase physical activity). However, based on an earlier study in which they demonstrated that relaxation exercises produce panic attack symptoms in some patients (Waddell et al., 1984), the authors acknowledged that relaxation and EMG biofeedback may be considered somatically oriented treatments.

An important aspect of this study was the inclusion of
the assessment of treatment integrity (e.g., Barlow, Hayes, & Nelson, 1984; Kazdin, 1982). That is, treatment sessions were monitored unobtrusively to ensure that the therapists administered the treatments appropriately. There were no deviations from the treatment protocol, thus ensuring that valid inferences could be drawn from their results.

At post-treatment, the treated groups showed substantial therapeutic gains compared to the wait-list control group on clinical ratings, psychophysiological measures, and on daily measures of panic and episodes of anxiety. Interestingly, there were no differences noted between the treated groups despite the fact that on pretreatment measures, Panic Disorder subjects displayed a higher somatic component to their panic anxiety relative to Generalized Anxiety Disorder subjects. One of the explanations offered by the investigators was that different subjects may have responded to different aspects of the treatment package. That is, subjects with Panic Disorder with Agoraphobia may have responded to relaxation and EMG biofeedback; whereas, Generalized Anxiety Disorder subjects may have been more responsive to the cognitively based component. In Levis' (1979; 1982) terms, although both groups suffer from anxiety, perhaps the avoided conditioned stimulus pattern of the two forms of anxiety differs to some unknown degree. Adding exposure for feared internal stimuli that trigger panic attacks may add to the
total CS complex to enhance treatment outcome.

More recently, Barlow and colleagues have developed treatment programs which emphasize exposure to interoceptive cues to a greater degree (e.g., Barlow & Cerny, 1988; Rapee & Barlow, in press). The exposure strategies are designed to generate the interoceptive cues which are most distressing to the individual patient (Barlow, 1986a; Zarate, Rapee, Craske, & Barlow, 1988). For example, patients whose primary symptoms are heart palpitations are instructed to engage in hyperventilation exercises (45 breaths over 90 seconds) or to do step-ups (48 steps for 2 min). Patients whose primary symptoms are dizziness and feelings of disorientation are instructed to spin in a swivel chair at a rate of 30 turns in 90 seconds. The rationale for this form of treatment is consistent with the empirical work on in vivo exposure for avoidance to feared external stimuli. However, the focus of interoceptive exposure is the feared and avoided internal bodily sensations and catastrophic thoughts about the possibility of, for example, fainting or having a heart attack rather than on external stimuli such as public places.

Craske & Barlow (1987) reported on a subsample of 45 patients with Panic Disorder with Agoraphobia from a larger controlled study in which progressive relaxation, cognitive restructuring and interoceptive exposure, and a combination
of both treatments were compared. Progressive relaxation consisted of patients applying techniques similar to those used by Bernstein and Borkovec (1973) in anxiety evoking situations. The cognitive restructuring and interoceptive exposure component involved teaching patients cognitive restructuring skills for coping with panic similar to those advocated by Beck and Emery (1985). Then, patients were instructed to conduct mini experiments in the therapist's office (e.g., hyperventilating for a brief period and focusing on their bodily sensations) to test their beliefs about unpleasant interoceptive stimuli. Finally, patients conducted exposure exercises in situations in which panic symptoms usually occurred. The combined treatment integrated relaxation with cognitive restructuring and interoceptive exposure.

The preliminary report suggested that there were few differences among the conditions following treatment. However, the combined results from the three treatment conditions indicated that 83% of patients in the treatment group were panic free compared to only 36% of the wait-list control group.

Finally, Klosko et al. (1987), using the same combined treatment as described above, concluded that 87% of Panic Disorder patients with limited phobic avoidance were panic free at the end of 15 weeks of cognitive-behavioral treatment. However, although many subjects in this study
evidenced high end-state functioning at post-treatment, the authors comment that "residual anxiety, particularly over the possibility of future panic attacks remained" (p. 18). Thus, it appears that this form of cognitive-behavior therapy did not eliminate subjects' anticipatory anxiety about having additional panic attacks. Perhaps increasing the duration of exposure to internal stimuli (e.g., several successive trials of voluntary hyperventilation to increase heart rate for prolonged periods) would be more effective in producing decrements in anticipatory anxiety.

In summary, evidence now exists for the efficacy of cognitive-behavioral treatments for the alleviation of panic attacks. Moreover, the techniques are producing treatment gains which are equivalent in magnitude to the gains resulting from in vivo exposure procedures for agoraphobic avoidance. However, little is known about which treatment components are essential for reducing panic attacks, agoraphobic avoidance, and anticipatory anxiety. Researchers should now begin to analyze the individual components of cognitive-behavioral packages to consider their contribution to treatment outcome.

A Rationale for Examining Cognitive and Exposure Components

In accordance with the increased emphasis on the importance of panic attacks in the development and maintenance of phobic avoidance (and other maladaptive behaviors related to excessive anxiety), behavioral
investigators are broadening their treatment focus to include exposure to interoceptive cues. Evidence for the therapeutic effectiveness of cognitive-behavioral techniques for the treatment of panic attacks is accumulating. However, because most of the treatments involve multiple components, it is difficult to determine the active ingredients in treatment (e.g., breathing retraining, education and cognitive restructuring, or exposure to internal and external stimuli). Perhaps some of the components are essential while others are unnecessary, or add only a modest amount to the overall effect of the treatment. Because the psychological treatments are very new, the mechanisms of action of treatment are not yet well understood.

Cognitive theorists (e.g., Beck, 1985) argue that panic anxiety is maintained by fear schemas or distorted cognitive sets. They contend that these cognitive aspects should be the main focus of change. An alternative explanation to the "cognitive" perspective is that the crucial element in treatment is "exposure" to the feared situation including exposure to interoceptive cues (Barlow, 1988; Barlow & Cerny, 1988; Rapee, 1987). Thus, physiological arousal is the primary target for change. There is also the important consideration of how much exposure to interoceptive stimuli may be necessary to obtain optimal treatment effects. Investigations of in
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*in vivo* exposure with animals (Baum, 1973; Oler & Baum, 1968), and with humans (e.g., Marks, 1975; Stern & Marks, 1973) found that massing trials with short intertrial intervals (prolonged exposure) to external stimuli was more effective than brief exposure with longer intertrial intervals in diminishing agoraphobic avoidance and compulsive rituals (Rabavilas, Bouloughouris, & Stefanis, 1976). To date, there are no published reports comparing prolonged with brief exposure to interoceptive stimuli.

Comparisons of *in vivo* exposure and cognitive restructuring treatments focusing on agoraphobic avoidance suggest that exposure produces superior overall treatment gains (e.g., Emmelkamp, Kuipers, & Eggeraat, 1978). Adding a cognitive restructuring component to treatments which emphasize *in vivo* exposure does not seem to produce clinically significant decrements in anxiety and agoraphobic avoidance beyond the effects of *in vivo* exposure (Emmelkamp & Mersch, 1982).

It may be, however, that cognitive changes occur very rapidly in response to the rationale for treatment which is usually provided to patients at the beginning of exposure-based treatments (e.g. Mathews et al., 1981). The education about panic disorder and the treatment rationale provided to patients is clearly a cognitive intervention which may produce immediate changes. For example, in a laboratory study, subjects with Panic Disorder with
Agoraphobia who were given an explanation of the physical sensations of panic attacks prior to inhalation of a carbon dioxide and oxygen mixture reported fewer catastrophic cognitions, panic symptoms, and less similarity to natural panic attacks than the group who received no explanation (Rapee, Mattick, & Murrell, 1986). Furthermore, previous research suggests that patients rate cognitive aspects of treatment as the most helpful (e.g., Gitlin et al., 1985) and the most preferred techniques for controlling panic attacks (e.g., Kenardy et al., 1988). Thus, education about panic disorder should reduce fear of associated symptoms fairly rapidly. However, the possible clinically significant effects of the cognitive aspects of treatment are unknown because they are never examined apart from the effects of exposure.

For example, most exposure based treatments include a cognitive component to initiate and maintain subject compliance and to promote maximal treatment gains (Rapee, 1987). Cognitive components are also found in the rationale given for treatment and in the instructions subjects receive at different points during the therapeutic process. Unfortunately, the cognitive components are hopelessly entangled with in vivo exposure techniques which makes it difficult to determine effective treatment components (Latimer & Sweet, 1984).

One of the most effective means of identifying
important components in a treatment package is through individual-subject research designs. Hawkins (1989) points out four primary advantages of conducting individual-subject design research. First, because the data from individual subjects are plotted separately and frequently, the direction of the effect on each subject is obvious. Second, the data are plotted in short intervals (e.g., usually in days or weeks) making it immediately clear when and how rapidly the behavior changed with each intervention. Third, the clinical significance of the behavior change can be evaluated by comparing the level of the final effect with that observed during pretreatment and during other interventions that may have been implemented at different times during the study. Finally, because the data are plotted continuously, the pattern of the treatment effect on each individual (e.g., which subjects show variability, and to which interventions) is readily apparent. For these reasons, Hawkins advocates the use of single-subject design methodology. However, there are several complex issues confronting clinical researchers who investigate treatment packages using single-case design.

Barrios (1984) recommends the following strategy in the conduct of a complete analysis of a two-component treatment package (B and C). Ideally, the clinical researcher would want to determine the effects of B alone, C alone, B and C together, B and C together vs. B alone and
C alone, and B and C together vs. the sum of the effects of B and C introduced separately. The order of the components should be counterbalanced to determine the possibility of sequence effects. (Sequence effects are the continuation of behavioral changes following an intervention such that they combine with the effects of subsequent interventions which make it difficult to isolate the effects of the subsequent interventions. This is a practical issue in clinical research because behavior change is not usually reversible [Barlow, Hayes, & Nelson, 1984]). It would also be necessary to ascertain the effects of B and C together compared to a no-treatment condition. Finally, in order to completely fulfill the requirements of individual-subject design, the above analysis would require several clinical cases. While individual-subject designs provide an excellent strategy for dismantling cognitive-behavior treatment packages, it is not possible to answer all of the questions about the effects of the various treatment components in a single study. Thus, the present study represented the early stage of inquiry into the possible active ingredients in cognitive-behavioral treatment.

Many investigators employ cognitive variables and some form of exposure to interoceptive cues (e.g., Barlow & Cerny, 1988; Clark et al., 1985; Gitlin et al., 1985), yet, no studies have been published in which the cognitive component (i.e., education/cognitive restructuring) has
been examined apart from exposure to interoceptive cues. There are several practical reasons that might explain why researchers have not evaluated the effects of cognitive components of exposure treatments.

Attempting to implement a treatment strategy without giving patients an adequate rationale (i.e., a cognitive component) for what they are doing may create an artificial and uncomfortable therapeutic environment in which progress is impeded in several ways. First, patients may be less likely to follow the therapist's instructions to engage in exposure-based aspects of treatment without an adequate rationale. Second, education and cognitive restructuring techniques are less anxiety evoking because patients are not required to engage in specific exposure exercises that increase their anxiety. Therefore, patients are more likely to comply with all of the treatment contingencies if given cognitive therapy component prior to exposure treatment. Finally, cognitive strategies are familiar to most therapists from a variety of different backgrounds and are less time consuming than in vivo exposure treatments (e.g., Emmelkamp, 1982; Marks, 1978b). Consequently, cognitively-based procedures are the most likely techniques to be adopted and used by clinicians and patients. For these reasons, the present study implemented cognitive therapy prior to introducing the other components of treatment.
The present study investigated the effects of cognitive and exposure treatment components on subjects with Panic Disorder and Agoraphobia. As will be described fully in the method section, subjects received one of two series of treatment components. Subjects in series one received: (1) a cognitive therapy component consisting of education and cognitive restructuring, (2) a cognitive therapy with brief exposure component consisting of a small element of exposure involving a brief period of hyperventilation (to illustrate the points made in the education and cognitive restructuring phase), followed by cognitive therapy, and (3) a multiple-session exposure component consisting of several brief trials of hyperventilation to facilitate exposure to feared interoceptive cues.

Subjects in series two received: (1) the cognitive therapy component, and (2) the multiple-session exposure component. This series was included to evaluate the impact of multiple exposure to feared bodily sensations without an emphasis on the cognitive aspects of exposure.

The cognitive therapy component emphasized education and changing catastrophic cognitions about panic attacks; whereas, the cognitive therapy with brief exposure component emphasized a vivid demonstration of the somatic and cognitive processes described in the cognitive model. The brief period of hyperventilation provided an analogue
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for some of the commonly reported somatic events that occur in panic attacks such as shortness of breath, heart palpitations, and dizziness (e.g., Clark & Hemsley, 1982; Clark et al., 1985; Thyer et al., 1984). The analogue was the basis for illustrating the cognitive model (Clark, 1986) which focuses on the way in which individuals who experience panic attacks misinterpret somatic events as a sign of impending death, craziness, or loss of control. The multiple-session exposure component emphasized repeated exposure to feared interoceptive cues. The sequence of treatments was chosen to evaluate the short-term effects of the cognitive therapy component alone without the other exposure related components, and then to evaluate the additive effects of brief exposure combined with cognitive therapy, and finally, to examine the effects of multiple exposure exercises to interoceptive cues.

Many investigators have found that large and rapid reductions in panic symptoms occur within two to three weeks of implementing cognitive-behavioral treatment (e.g., Clark, et al. 1985; Rapee, 1985; Salkovskis, Jones, & Clark, 1986; Salkovskis, Warwick, Clark, & Wessels, 1986). Thus, it seemed reasonable to expect substantial improvement in panic frequency and agoraphobic avoidance within a brief period of time following introduction of each treatment component. Based on previous research (e.g., Klosko et al., 1987), it was expected that if anticipatory
anxiety did decline, it might do so at a slower rate than panic attacks or avoidance behavior. Thus, a no-treatment phase was interpolated between each treatment component to examine the possibility of carry-over effects from the previous treatment component.
Method

Subjects

Eleven subjects were selected from the pool of referrals that family physicians made to the Anxiety Disorders Outpatient Clinic in the Department of Psychiatry at St. Boniface General Hospital. Subjects selected for participation in the study were required to meet the inclusion criteria that were based on the DSM-III-R description of Panic Disorder with Agoraphobia, and to pass exclusion criteria that were based on their medical and psychiatric history.

Inclusion Criteria. The inclusion criteria were based on subjects' responses to four diagnostic instruments. (See Appendix A for the reliability and validity scores and copies of the instruments used for subject selection.) The instruments were the following: the Anxiety Disorders Interview Schedule-Revised (DiNardo & Barlow, 1988), the Structured Clinical Interview Diagnosis for Panic Disorder (Spitzer, Williams, & Gibbon, 1987), the Fear Questionnaire (Marks & Mathews, 1979), and the Global Assessment of Severity Scale (Mavissakalian, Michelson, & Dealy, 1983).

Initially, the investigator interviewed prospective subjects by telephone to determine their suitability for inclusion into the study. The format of the interview was a modified version of the Anxiety Disorders Interview Schedule-Revised. The instrument provides a differential
diagnosis among the anxiety disorder categories in the DSM-III-R. Only subjects who reported experiencing panic attacks with symptoms similar to those produced by episodes of hyperventilation were selected as potential subjects for the study. Panic symptoms that can be produced by hyperventilation are: accelerated heart rate, shortness of breath, chest pain, dizziness, feelings of unreality, and increased apprehension and anxiousness (Clark & Hemsley, 1982; Clark et al., 1985; Compernolle et al., 1979; Hibbert, 1984; Thyer et al., 1984).

Following the telephone interview, prospective subjects were referred randomly to one of two clinical psychology graduate students for a second 90-min interview. These interviewers, who had been trained in assessing anxiety disorders, were used to minimize the contact between subject and investigator to reduce reactivity during the pretreatment phase. The subjects were interviewed individually, and a diagnosis of Panic Disorder with Agoraphobia was determined using the Structured Clinical Interview Diagnosis for Panic Disorder. The instrument is based on the DSM-III-R criteria and assesses two major features of panic disorder. The first feature is the characteristics of panic attacks (i.e., one or more unexpected panic attacks with four of thirteen symptoms in the past 4 weeks, or one or more attacks followed by a month or more of fear of having another attack). The
second feature is the presence of avoidance behavior in various situations (e.g., shopping malls). Only subjects who reported experiencing (within the previous month) either panic attacks or persistent fear of having another panic attack with a moderate degree of avoidance behavior were included in the study.

The Fear Questionnaire was used to assess the subject’s level of persistent distress and amount of phobic avoidance related to his/her main target phobia. Distress and avoidance were each rated on a 9-point scales (0 = not at all distressing to 8 = extremely distressing, and 0 = never avoid it to 8 = always avoid it). A self-rating of 4 or higher which indicated at least a moderate degree of distress and avoidance behavior was required for inclusion in the study.

Immediately after the 90-min interview, the investigator and interviewer independently assessed the degree to which the subject’s symptoms interfered with daily life activities. The 5-point Global Assessment of Severity Scale was used to rate symptom interference. A score of 1 indicated that the subject had no complaints and normal activity; whereas, a score of 5 indicated that either normal work or social activities were radically changed or prevented. A rating of 3 or higher, which indicated at least a moderate degree of interference in work and social functioning, was required for the inclusion
of the subject in the study. In the case of disagreement between the investigator and interviewer concerning the value of the rating, the lower score was assigned.

**Exclusion Criteria.** Prospective subjects were excluded from participation in the study if they reported either major organic disorders which might produce symptoms similar to panic disorder (e.g., seizure disorder) or other major psychiatric disorders. The exclusion criteria for organic disorders were any of the following problems: a history of cardiac disease, respiratory problems, low blood pressure, abnormal electrocardiogram, or thyroid dysfunction.

The major psychiatric disorders which resulted in exclusion from the study were features indicative of schizophrenia, obsessive-compulsive disorder, major affective disorder, or other serious psychiatric disorders (e.g., post-traumatic stress disorder). In addition, individuals were excluded if they scored 24 or higher (in the severe range) on the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The only exception to this criterion was one subject whose depressive symptoms were related to an increased frequency in panic episodes experienced 2 weeks prior to the interview. Since this subject’s depressive symptoms were secondary to her panic attacks, she was included in the study. However, her depression was monitored weekly with
the Beck Depression Inventory throughout the course of the study to examine the relationship between her panic attacks and depressive episodes.

Finally, subjects taking antidepressant medication were not included in the study. Minor tranquilizers such as diazepam, lorazepam, or alprazolam were allowed only if: subjects were taking these medications at least three months prior to the study, and the dosage did not exceed the equivalent of 10-mg of diazepam per day.

In summary, to be included in the study, subjects met the following criteria: (1) a diagnosis of Panic Disorder with Agoraphobia, (2) panic symptoms that were similar to bodily sensations experienced during or after hyperventilation (3 of the 20 subjects interviewed for participation in the study were excluded because their somatic symptomatology did not match hyperventilation symptoms), (3) a moderate degree of persistent distress and phobic avoidance related to an individualized main target phobia, and (4) a moderate degree of symptom interference with daily life activities. Patients were excluded from the study if they reported any of the following: (1) major organic disorders, (2) major psychiatric disorders, (3) co-existent severe depression, (4) the use of antidepressant medication, and (5) the use of minor tranquilizers exceeding the equivalent of 10-mg of diazepam per day.
Setting

All sessions were conducted in the behavior therapy treatment room in the Department of Psychiatry at St. Boniface General Hospital. The treatment room has soft lighting, is carpeted, and is furnished with a desk, a small table, comfortable chairs, filing cabinets, and biofeedback equipment.

Procedure

Following the 90-min assessment interview, subjects who met the selection criteria were given a rationale for treatment and signed the consent form (see Appendix B for the treatment rationale statement and patient consent form). Immediately after signing the consent form, subjects were randomly assigned to one of two treatment series (to be described in the following section entitled Experimental Conditions), and began pretreatment baseline recording of the daily and weekly measures. In addition, subjects were given two packages to complete at home. One package contained the pre-phase evaluation and the pre-treatment global measures, and the other package contained the diary forms and weekly Fear Questionnaires (to be described later under Dependent Measures).

Pretreatment baseline phases were staggered so that the length of baseline increased with each succeeding subject. For example, following 3 weeks of pretreatment baseline, treatment was implemented for the first subject
in each series while remaining subjects continued on baseline. Each treatment phase was of 2 weeks duration. There were four treatment sessions in each treatment phase. Treatment sessions were conducted with subjects individually twice weekly with at least 2 days between sessions. A 3-week baseline phase of no-treatment was interposed between each treatment phase to examine possible delayed effects of each treatment intervention. (Interpolated no-treatment conditions were extended an additional week for three subjects due to an illness, a death in the family, and a honeymoon, respectively). Follow-up assessments were conducted 6 weeks after termination of the final treatment session.

Subjects mailed the pretreatment measures to the investigator within the first week of baseline. The diaries and the Fear Questionnaires were mailed to the investigator each Tuesday during the pretreatment phase, between treatment phases (i.e., 3 weeks of no-treatment), and during the follow-up period. The investigator reviewed the incoming data regularly and telephoned subjects only if there were problems with the recording procedure (e.g., missing data). During the treatment phases, subjects brought their completed diaries and weekly Fear Questionnaires to the first session of each treatment week.

Additional self-report ratings and questionnaires measuring indices of change in anxiety, fears, avoidance,
depression, and general psychiatric complaints were completed at different intervals during the course of the study. These ratings and questionnaires were the within session measures which were completed during treatment sessions, and the pre- and post-phase evaluation, and post-treatment global measures. Subjects completed the pre- and post-phase evaluation measure in the behavior therapy treatment room at the beginning of the first session of each treatment phase, and at the end of the 6 week follow-up period. The post-treatment global package was completed in the behavior therapy treatment room at 6 weeks follow-up. The self-report ratings and questionnaires are described under Dependent Measures. The different points at which these measures were taken is described in the following section under Experimental Conditions.

**Experimental Conditions**

Subjects were randomly assigned to one of two experimental conditions--series one or series two. Accordingly, five subjects were placed in series one and six subjects in series two. Subjects in series one received three treatment components; whereas, those in series two received only two treatment components. Treatment components were introduced sequentially. The treatment components implemented for subjects in series one were the following: (1) cognitive therapy, (2) cognitive therapy with brief exposure, and (3) multiple-session
exposure. Whereas, subjects in series two received only: (1) cognitive therapy and (2) multiple-session exposure.

The experimental conditions introduced to subjects in each series are described below.

**Cognitive Therapy.** At the beginning of the cognitive therapy sessions, the investigator reviewed the completed diaries and selected the panic attack diary that the subject reported was most distressing. In cases where no panic attacks had occurred during the previous baseline phase or treatment week, the investigator used the most recently recorded panic diary or episode of intense anxiety described on the Daily Diary.

During the first session of the cognitive therapy phase, each subject provided details of the worst scenario that could possibly occur during a panic attack (e.g., "...and I will lose control and start screaming and I won’t be able to stop."). (The investigator recorded the subject’s responses to standardize the description for presentation during the final treatment session in the study.) The subject then rated, on a 9-point scale (0 = none to 8 = fully believe), how much s/he believed that the consequences s/he feared (losing control or going crazy etc.) would actually occur at the time of a panic attack in the natural environment. The subject was then given a written rationale for cognitive therapy and a diagram of the model explaining the cognitive approach to panic. (See
Appendix C for the written rationale and a diagram of the model "A Cognitive Approach to Panic" Clark (1986) provided to subjects). The investigator paraphrased the rationale and then answered any questions that the subject had about the treatment procedure.

The model describes panic attacks as being provoked, primarily, by misinterpretation of an internal stimulus (bodily sensation, thought, or image) which the person perceives as a threat of an impending catastrophe. The four steps in the model which are hypothesized to produce a panic attack are: (1) an internal or external triggering stimulus is perceived as threatening and, therefore, increases (2) apprehension causing the person to focus their attention on (3) bodily sensations which, in turn, are (4) interpreted as catastrophic. The feared catastrophes or consequences vary from person to person, but most often consist of intense fears about having a physical illness such as a heart attack or brain tumor, dying, or going crazy, or doing something uncontrolled.

After the investigator reviewed the model, the details of the subject's panic attack described on the Panic Attack Diary selected at the beginning of the session were incorporated into the model. The subject's understanding of the model in relation to his or her panic attacks or episodes of intense anxiety experienced in the previous weeks were reviewed during each of the three remaining
cognitive therapy treatment sessions.

**Cognitive Therapy with Brief Exposure.** The second treatment phase for subjects in series one consisted of a hyperventilation demonstration to illustrate the intense bodily sensations produced by overbreathing followed by cognitive therapy. After the investigator reviewed the subject’s completed diaries, the subject was instructed to hyperventilate as a "diagnostic test". The subject was not told what bodily sensations might be experienced, but rather was told that the exercise was a diagnostic assessment to help him/her learn more about anxiety.

During the diagnostic test, the subject was instructed to breathe quickly (approximately 30 breaths per min) and deeply through the mouth and nose for two min or until the exercise became too difficult. The investigator modelled the rate and depth of breathing for the first 10 breaths, timed the subject’s rate of breathing, and recorded the results. Immediately after the hyperventilation exercise, the subject was instructed to sit quietly and to observe any bodily sensations experienced. Once the subject’s sensations had diminished sufficiently (usually about 1 min 30s after the exercise), s/he completed the within session measures (i.e., the Similarities Questionnaire and the Fear of Bodily Sensations Scale described under Dependent Measures). The investigator reviewed these measures and then discussed the hyperventilation experience with the
subject. Finally, the subject was given a written rationale explaining the physiological effects of hyperventilation (see Appendix D for the written rationale provided to subjects). The investigator paraphrased the rationale and any questions the subject had about the treatment procedure were answered.

During the last three sessions of this phase, the subject's recordings of panic attacks and episodes of intense anxiety were incorporated into the model "A Cognitive Approach to Panic". In addition, subjects were given a copy of the model to take home and encouraged to determine the triggering stimuli, closely observe their bodily sensations, and specify their associated catastrophic thoughts whenever they became anxious. Subjects were also encouraged to confront difficult situations to generate the bodily sensations associated with anxiety. However, the therapist provided no specific instructions for entering these situations.

Multiple-session Exposure. The third phase for subjects in series one (and the second phase for subjects in series two) was the multiple-session exposure phase. After reviewing the completed diaries, the subject was told that panic attacks could be treated directly by graduated exposure to the uncomfortable bodily sensations or interoceptive cues that occur during panic attacks. Subjects were given a written rationale for graduated
exposure to interoceptive cues which the investigator paraphrased followed by answering any questions about the treatment procedure (see Appendix E for the written rationale provided to subjects). The subject then participated in a series of four hyperventilation exercises per session which were conducted in the following manner.

During the first session, the first exercise (trial) was conducted in the same manner as the diagnostic test described in the cognitive therapy with brief exposure phase received by subjects in series one. Once the subject’s sensations had diminished sufficiently, s/he completed the Similarities Questionnaire and the Fear of Bodily Sensations Scale. Finally, the investigator provided the subject with a written rationale explaining the physiological effects of hyperventilation (see Appendix F for the written rationale provided to subjects) and answered any questions about the treatment procedure. Immediately after completing the within session measures and receiving the rationale, the subject underwent three additional two-min hyperventilation trials conducted consecutively in the same manner as the first exercise. The time between each of these three trials was approximately two min. Immediately after each trial, the subject completed the Fear of Bodily Sensations Scale only.

During the remaining three treatment sessions of the multiple-session exposure phase, the subject underwent four
hyperventilation trials in succession conducted as described above. After each trial, the subject completed the Fear of Bodily Sensations Scale with exception of the last trial in the final session during which s/he also completed the Similarities Questionnaire. In addition, each subject was encouraged to conduct "mini-experiments" focusing on interoceptive exposure (i.e., hyperventilation practice at home, away from the safety cues of the investigator and the clinic).

At the end of the final multiple-exposure session, each subject again rated the scenario obtained at the beginning of the cognitive therapy phase. The subject rated how much s/he believed that the feared consequences such as losing control would actually occur at the time of a panic attack in their natural environment.

After the last session of multiple exposure, the subject entered the follow-up phase. Diary recording and completion of weekly Fear Questionnaires were terminated at the follow-up appointment which was scheduled 6 weeks after the last treatment session.

**Dependent Measures**

Five different classes of dependent variables were used during the study: daily, weekly, within-session, pre- and post-phase evaluation, and pre- and post-treatment global measures. Each day, subjects completed diaries describing details of their panic attacks, and self-ratings
of anticipatory anxiety (i.e., fear of having a panic attack), generalized anxiety, and phobic avoidance. The weekly measure was the Fear Questionnaire on which subjects rated their levels of anxiety/depression, distress and avoidance to an individualized main target phobia and two additional phobic situations. The within-session measures were self-ratings of pre- and post-session anxiety, fears of panic attack symptoms, and the similarity of hyperventilation induced symptoms to naturally occurring panic attacks. On the pre- and post-phase evaluation measure, subjects rated their levels of anxiety, somatization, and phobic anxiety. Finally, the pre- and post-treatment global measures assessed changes in anxiety, belief in fears, depression, and symptom interference with daily life activities. (See Appendix G for the reliability and validity scores and copies of the dependent measures.)

A description of each dependent measure follows.

**Daily Measures.** Each day, subjects completed two diary forms: the Daily Diary, and the Panic Attack Diary (only if a panic attack occurred). These diary measures were developed for use with patients being treated in The Anxiety Disorders Clinic at St. Boniface General Hospital (Walker, Rowan, & Eldridge, 1985).

On the Daily Diary, subjects rated three variables on a 9-point scale. The three variables rated upon rising and again at 6 pm were: anticipatory anxiety or worry about
having a panic attack (0 = not at all worried to 8 = extremely worried); degree of generalized anxiety (0 = not at all anxious to 8 = extremely anxious); and amount of generalized avoidance behavior (0 = none to 8 = extreme amount). Before bedtime, subjects rated their episodes of near panic attacks or intense anxiety for that day (0 = none to 8 = extreme amount). In addition, they recorded details of both their strategies for controlling or stopping feelings of near panic attack and the effectiveness of the strategies. Subjects also provided descriptions of their major worries for the day and recorded the amount and the time of medication and alcohol consumption.

Subjects completed the Panic Attack Diary immediately following the occurrence of a panic attack. They checked: the type of panic symptoms experienced from a list of 16 symptoms (13 symptoms were taken from DSM-III-R, 1987); the order of the first three symptoms experienced; and whether or not they expected to have a panic attack in that situation. In addition, subjects recorded a description of both the attack and the consequences of the attack. To describe the attack, they recorded: the duration of the panic attack; the situation in which the attack occurred; who was present when the attack occurred; the activity performed before and after the attack; and the thoughts that preceded and followed the attack. To describe the
consequences of the panic attack, subjects noted: how it changed their plans; how it affected other people with whom they were in contact at the time of the panic attack; how frightening or distressing the symptoms were on a 9-point scale (0 = not at all to 8 = extremely); what they did to attempt to control or stop the panic attack; and, how effective the strategy was in decreasing their symptoms.

Weekly Measures. Subjects completed a modified version of the Fear Questionnaire (Marks & Mathews, 1979) on Monday of each week during the study. On the Fear Questionnaire, patients used a 9-point scale to rate their levels of: persistent distress due to anxiety, phobic avoidance in three situations that the patient had identified, and anxiety/depression. The endpoints for the distress and avoidance scales were: 0 = not at all distressing to 8 = extremely distressing, and 0 = never avoid it to 8 = always avoid it. The anxiety/depression scale is comprised of 5 items each rated on a 9-point scale (0 = never to 8 = most of the time). Thus, the maximum obtainable score for anxiety/depression is 40 points.

Within Session Measures. Before and after each treatment session, subjects rated their general level of anxiety on a 9-point scale (0 = not at all anxious to 8 = extremely anxious). The rationale for pre- and post-session anxiety ratings was to index the amount of change in anxiety within and between treatment sessions.
Following the single hyperventilation trial during the cognitive therapy with brief exposure phase (i.e., series one) and after the first and last trial of the multiple-session exposure phase (i.e., series one and two), subjects completed the Similarities Questionnaire (developed by Clark et al., 1985). The instrument was selected to measure the effects of overbreathing and its relationship to naturally occurring panic attacks. On the Similarities Questionnaire, subjects rated the similarity of the effects of hyperventilation to their naturally occurring panic attack symptoms on a 9-point scale (0 = not at all similar to 8 = exactly the same as). The Fear of Bodily Sensations Scale was completed immediately following each hyperventilation trial. Subjects rated an increase in fear or distress produced by overbreathing on the 9-point Fear of Bodily Sensations Scale (0 = not at all to 8 = extremely).

Pre- and Post-Phase Evaluation Measure. Subjects completed the Symptom Checklist-90 (Derogatis, Lipman, & Covi, 1973) during the initial intake assessment, at the beginning of the first session of each treatment phase, and at the end of the 6 week follow-up period. The Symptom Checklist-90 is a 90-item self-report inventory of symptoms and problems commonly reported by psychiatric patients. Each item is rated on a 5-point scale (0 = not at all to 4 = extremely). The checklist provides nine scale scores
including: anxiety, somatization, phobic anxiety, obsessive-compulsive, interpersonal sensitivity, hostility, paranoid ideation, psychoticism, and depression. Of most interest in this research were indices of change in the anxiety, somatization, and phobic anxiety scale scores.

Pre- and Post-Treatment Global Measures. During the pretreatment assessment, subjects completed the Social Desirability Scale (Crowne & Marlowe, 1960). The scale is a 33-item true/false self-report questionnaire that evaluates the extent to which individuals tend to respond in a socially desirable manner. Additionally, four instruments were used pre- and post-treatment to measure changes in anxiety, fears, depression, and symptom interference with daily life activities. These four instruments were: the Anxiety Sensitivity Index (Reiss et al., 1986), the Spielberger State Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970), the Beck Depression Inventory (Beck et al., 1961), and the Global Assessment of Severity Scale (Mavissakalian et al., 1983).

The Anxiety Sensitivity Index is a 16-item self-report measure of the extent to which individuals believe anxiety/fear causes illness, embarrassment, or increased anxiety. Each item is rated on a 5-point scale (0 = very little to 4 = very much). The Spielberger State Anxiety Inventory is a 20-item self-report that measures how anxious the subject feels at the moment s/he completes the
scale: Items are rated on a 4-point scale (1 = not at all to 4 = very much so). The Beck Depression Inventory is a 21-item self-report inventory measuring severity of depression on a 4-point scale. Finally, the investigator and an interviewer independently reassessed the degree to which the subject’s residual symptoms interfered with social and work activities on the Global Assessment of Severity Scale (see Inclusion Criteria) at 6 weeks follow-up. In case of disagreement between the investigator and interviewer concerning the value of the rating, the highest score was assigned.

Experimental Design

Figure 1 displays, for the first two subjects in series one, an example of the single subject staggered baseline design employed in the study. As shown in Figure 1, pretreatment baselines were staggered in such a way that the length of baseline increased with the second subject (and each subsequent subject). Thus, the second subject served as a control for extraneous environmental variables which could coincide with the start of treatment for the first subject and show treatment effects where there are none. For example, following 3 weeks of pretreatment baseline, (1) the cognitive therapy phase (2) was implemented for the first subject while the second subject continued on baseline. After 2 weeks of cognitive therapy, these subjects then proceeded into the 3-week no-treatment
Figure 1.

An example of the single subject staggered baseline design employed in the study. Only the first two subjects in series one are depicted. The numbers 1 through 7 at the top of the figure represent the pretreatment baseline (1), treatment (2, 4, and 6), no-treatment baseline (3 and 5), and follow-up (7) phases. The dotted vertical lines on each frame separate the phases. The Y axis indicates the 9-point scale of one of the dependent measures (e.g., avoidance). The X axis indicates the week of the study that the measures were collected from the initiation of the study.
Cognitive and Exposure Treatments
baseline phase (3) and so on until all subjects received the seven phases. In accordance with the single subject staggered baseline design, treatment effects are demonstrated when the behavior changes only after the treatment variable has been introduced to the first subject while the pretreatment baseline(s) of the second (and subsequent) subject(s) remains unchanged.

The design evaluated the effects of the treatment components on the individual subjects. Subjects within the same series were compared to determine whether they showed similar patterns of behavioral change. Between series comparisons were also made to determine patterns of behavioral change.

**Procedural Reliability Assessments**

The intake interviews and treatment sessions were all audiotaped for reliability checks on the interviewer's and investigator's adherence to the protocols. All intake interviews and one quarter of sessions in each treatment phase were randomly selected and played to a trained independent assessor. The assessor listened to the tapes and scored each step of the intake interview and treatment session procedure on a blank protocol. The independent assessor's results were then compared to the protocols and the dependent measures that were completed at the time of the interviews and treatment sessions. Procedural reliability coefficients were calculated with the formula
agreements/agreements + disagreements x 100. Separate coefficients were calculated for interviews and treatment sessions.

The reliability coefficients for the intake interviews ranged from 88.8% to 100%. For the treatment sessions, the reliability coefficients were all 100%. The high procedural reliability coefficients were likely due to the highly structured nature of the interview and treatment protocols.
RESULTS

Patient Pretreatment Characteristics

All subjects met the DSM-III-R diagnosis of Panic Disorder with Agoraphobia of at least one year duration and onset prior to age 40 years. Subjects had a mean age of 35.6 years (range 24 - 53 yrs) and an average duration of the disorder of 11.7 years (range 1 - 29 yrs). Nine of the 11 subjects had received previous psychological and/or pharmacological treatment. Four subjects were receiving benzodiazepines within the acceptable range during the study. One subject terminated the use of antidepressant medication 4 weeks prior to beginning treatment. Nine subjects were female and two were male. One female subject in series two dropped out of the study following the first trial of the initial multiple exposure treatment session. She reported that she was unable to tolerate the effects of hyperventilation and declined further treatment. Thus, the data reported in the remainder of the results section are for 10 subjects--five in each series.

Subjects scored within the normal range on the Social Desirability Scale with the exception of one subject (CP) in series two. The Social Desirability Scale evaluates the extent to which individuals tend to respond in a socially desirable manner. CP's low score suggests that he had a tendency to respond to items on the scale in a manner indicating a strong need for assistance for his presenting
problems with anxiety (M. Kral, personal communication, June 30, 1989).

Table 1 shows what each subject feared would happen if he or she had a panic attack, and the descriptions of up to three situations that each subject avoided. Fears of losing control and going crazy were commonly reported. The avoided situations are typical of those described by patients who display agoraphobic behavior (DSM-III-R, 1987).

Figure 2 depicts the pretreatment mean scale scores of each subject on the Symptom Checklist-90 for series one (top frame) and for series two (bottom frame). The pretreatment mean scale scores of the normative sample are reported in Appendix G.

As shown in Figure 2, the scores of subjects in series one were less variable than those of subjects in series two on 8 of the 9 Symptom subscales. The variability (i.e., greater than one mean scale score) was most evident on the subscales measuring anxiety, phobic anxiety, hostility, and psychoticism. In addition, the figure suggests that subjects in series one displayed lower scores relative to subjects in series two. Subject two in each series (JD and DA) accounted for the highest scores on the majority of the scales. Of the nine subscales, JD in series one displayed the highest scores on seven; whereas, DA in series two showed the highest score on five. Thus, the scores on the
<table>
<thead>
<tr>
<th>Series</th>
<th>Number</th>
<th>Initials</th>
<th>Feared Consequences</th>
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<td>3</td>
<td>MB</td>
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<td>driving in unfamiliar areas</td>
</tr>
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<td>4</td>
<td>CF</td>
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<td>5</td>
<td>BC</td>
<td>going crazy</td>
<td>driving in the city</td>
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<td>CP</td>
<td>loosing control</td>
<td>driving children in unfamiliar areas</td>
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<td>visiting friends</td>
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<td>shopping malls</td>
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<td>4</td>
<td>AB</td>
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<td>eating in employee's cafeteria</td>
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<tr>
<td>2</td>
<td>5</td>
<td>AP</td>
<td>going crazy</td>
<td>shopping malls</td>
</tr>
</tbody>
</table>

Note. The dash indicates cases in which subjects were unable to identify a third avoided situation.
Figure 2.

The pretreatment mean scale scores on a 5-point scale (0 = not at all to 4 = extremely) on the Symptom Checklist-90 for each subject in series one (top frame) and series two (bottom frame). Subject numbers are defined in Table 1. The correspondence between subject number and each subject’s initials in series one were: $S_1$ (PD), $S_2$ (JD), $S_3$ (MB), $S_4$ (CF), and $S_5$ (BC); and in series two were: $S_1$ (CP), $S_2$ (DA), $S_3$ (SN), $S_4$ (AB), and $S_5$ (AP). The dark boxes indicate the norms for the Symptom Checklist-90. The X axis indicates the following Symptom Checklist-90 subscales and the corresponding abbreviations: ANX (anxiety), SOM (somatization), PHOB (phobic anxiety), OC (obsessive-compulsive), IS (interpersonal sensitivity), HOST (hostility), PI (paranoid ideation), PSY (psychoticism), and DEP (depression).
SERIES ONE

SERIES TWO

MEAN SCALE SCORES

ANX SOM PHOB OC IS HOST PI PSY DEP
Symptom Checklist-90 suggest that subjects displayed slightly different pretreatment characteristics.

**Daily Measures**

Each subject in series one completed Daily Diaries for an average of 126 days; those in series two recorded for an average of 116 days. Panic Attack Diaries were completed whenever subjects had an attack.

Table 2 shows subjects' retrospective reports of panic attack frequency during the first and second interview, and panic attack diary monitoring during pretreatment baseline, treatment and no-treatment phases, and during follow-up. Subjects' retrospective reports of panic attack frequency showed a substantial decline from the first to the second interview. At the second interview, one subject in each series (CF and SN) reported experiencing persistent fear of having another panic attack, although no full-blown panic attacks had occurred within the previous month. The weekly mean number of panic attacks per subject reported during the first and second interviews by the five subjects in series one were 3.2 and 1.6, and by the five subjects in series two were 4.0 and 2.2, respectively.

The number of panic attacks recorded on the panic attack diaries during the course of the study were considerably less than subjects' retrospective reports of panic attack frequency in the initial interviews. For diary recording during pretreatment, across treatment
### Table 2
Retrospective Report and Panic Attack Diary Monitoring

<table>
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<th>Subject</th>
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<th>initials</th>
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<td>Treatment Follow-up</td>
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| *Mean panic attacks per subject per week.
Cognitive and Exposure Treatments

phases and no-treatment phases, and during follow-up, the five subjects in series one reported a weekly mean of 0.02, 0.05, and 0.01 panic attacks per subject, respectively. Individual subjects in series one who reported that they had at least one panic attack during each of the phases were: JD and BC during pretreatment, PD, MB, and BC during treatment and no-treatment, and MB during follow-up.

Subjects in series two reported a weekly panic attack mean per subject of 0.12 during pretreatment, 0.10 across treatment phases and no-treatment phases, and 0.04 during follow-up. Individual subjects in series two who reported that they had at least one panic attack during each of the phases were: CP, DA, and AP during pretreatment, CP, DA, SN, and AP during treatment and no-treatment, and CP, DA, and AP during follow-up.

Although subjects in series one reported fewer panic attacks (n = 18) than subjects in series two (n = 52), the reported frequency was very low compared to retrospective reports across both series. Moreover, of the 52 panic attacks reported for series two, one subject (AP) accounted for 30 of the attacks. The low frequency of reported panic attacks during self-monitoring precluded an evaluation of the effects of the individual treatment components on the frequency of panic attacks. Despite the low frequency of panic attacks recorded during the study, however, the characteristics of the panic attacks were examined. These
data are reported in Appendix H.

The low frequency of panic attacks was paralleled by Daily Diary reports of low ratings of: anticipatory anxiety (i.e., fear of having a panic attack), generalized avoidance, and generalized anxiety. Figure 3 shows the mean scale scores on the Daily Diary for anticipatory anxiety, generalized avoidance, and generalized anxiety.

Generally, subjects in both series tended to rate anticipatory anxiety, generalized avoidance, and generalized anxiety on the lower end of the scale (i.e., 2.5 or less). Since subject’s scores in both series were low during the pretreatment phase, an examination of the effects of the individual treatment components was not possible. Thus, points of comparison to determine changes in scores were made between pretreatment and post multiple-session exposure (i.e., follow-up) phases only.

The mean pre- to post-treatment changes in scores for subjects in series one were: 1.3 to 0.1 for anticipatory anxiety, 2.4 to 0.0 for generalized avoidance, and 1.6 to 0.1 for generalized anxiety. For subjects in series two, the mean pre- to post-treatment changes in scores were: 1.9 to 1.4 for anticipatory anxiety, 1.0 to 0.8 for generalized avoidance, and 2.4 to 1.3 for generalized anxiety.

Visual inspection of individual subject data at 6 weeks follow-up; however, shows that anticipatory anxiety
Mean scale scores on a 9-point scale (0 = none to 8 = extremely) on the Daily Diary for anticipatory anxiety (i.e., fear of having a panic attack), generalized avoidance, and generalized anxiety. The X axis indicates the numerical representation of each baseline phase for which these data are reported. The baseline phases for subjects in series one were: (1) pretreatment, (2) post cognitive therapy, (3) post cognitive therapy with brief exposure, and (4) post multiple-session exposure. The baseline phases for subjects in series two were: (1) pretreatment, (2) post cognitive therapy, and (3) post multiple-session exposure. The scores of each subject in series one (PD, JD, MB, CF, and BC) are displayed on the left side of the figure. The scores of each subject in series two (CP, DA, SN, AB, and AP) are displayed on the right side of the figure.
Cognitive and Exposure Treatments

PHASES

SERIES ONE

SERIES TWO
and generalized avoidance scores either decreased to zero or were reduced to a minimal amount in 7 of 10 subjects. Anticipatory anxiety and generalized avoidance scores declined in all subjects in series one and in two subjects in series two (i.e., SN and AB).

In summary, subjects tended to use the lower end of the 9-point scales for anticipatory anxiety, generalized avoidance, and generalized anxiety. Despite these low scores, however, a comparison between pre- and post-treatment scores suggests that the anticipatory anxiety and generalized avoidance scores tended to decrease more than generalized anxiety scores, especially for subjects in series one.

**Weekly Measures**

Each week, subjects completed the Fear Questionnaire on which they rated on a 9-point scale their levels of the following: persistent distress due to anxiety, phobic avoidance in three situations (see Table 1 for descriptions of primary and subsidiary avoided situations), and anxiety/depression. Each subject in series one completed these measures for an average of 18 weeks; those in series two completed the measures for an average of 16.3 weeks.

Figure 4 shows subjects' self-ratings of persistent distress and avoidance in the primary avoided situations (Avoid 1) that were described in Table 1 (e.g., walking alone, eating in restaurants, going into shopping malls).
Scores measuring persistent distress and avoidance in primary situations (Avoid 1) described in Table 1 (e.g., walking alone). Distress and avoidance were rated weekly on 9-point scales (0 = not at all distressing to 8 = extremely distressing, and 0 = never avoid it to 8 = always avoid it) on the Fear Questionnaire. The X axis indicates the week of the study that the measures were collected. The scores of each subject in series one (PD, JD, MB, CF, and BC) are displayed on the left side of the figure. The scores of each subject in series two (CP, DA, SN, AB, and AP) are displayed on the right side of the figure. The scores of two subjects in series two (CP and AP) are missing for the first week of follow-up because the measures were not completed by the subjects.

The dotted vertical lines on each graph separate the phases which are indicated by the numbers on the tops of PD’s and CP’s graphs. The phases for subjects in series one were: (1) pretreatment baseline, (2) cognitive therapy, (3) baseline, (4) cognitive therapy with brief exposure, (5) baseline, (6) multiple-session exposure, and (7) follow-up. For subjects in series two, the phases were: (1) pretreatment baseline, (2) cognitive therapy, (3) baseline, (4) multiple-session exposure, and (5) follow-up.
In accordance with the experimental design, the duration of the initial pretreatment baselines were staggered so that the duration of each successive subject's baseline was increased by 2 weeks over the duration of the baseline of the preceding subject. Thus, each subject served as a control for preceding subjects. There was one exception to the staggered pretreatment baseline. The first treatment (i.e., cognitive therapy) for one subject in series one (MB) was implemented after five rather than seven weeks of baseline because she was leaving the city unexpectedly.

In general, there was concordance between distress and avoidance scores related to the primary avoided situation. As shown in Figure 4, pretreatment baseline scores of distress and avoidance were stable across most subjects (slight variability was observed in the pretreatment scores of PD, DA, AP) prior to the introduction of cognitive therapy. When changes in scores did occur in treated subjects, they did so only after the treatment was applied to each individual while scores remained unchanged in untreated patients. Thus, the requirements of the experimental design were met; the observed changes can be attributed to the experimental treatments.

Clinically significant treatment effects were defined as a reduction of at least 2 points on the 9-point severity scale (Mavissakalian, 1986b). To determine the impact of each treatment component, comparisons were made at the
final point in each baseline phase (i.e., pretreatment, post cognitive treatment, post cognitive therapy with brief exposure, and post multiple-session exposure for subjects in series one; and pretreatment, post cognitive therapy, and post multiple-session exposure for subjects in series two). To determine the overall effects of the treatments implemented for subjects in each series, the last data point of the pretreatment baseline phase was compared to the data points at 3 and 6 weeks follow-up.

Discussion of changes in self-ratings of distress and avoidance behavior will focus first on the effects of each treatment component and then on the overall effects of the treatments on the subjects in each series. As noted in the method section, the design is intended to evaluate behavioral changes in individual subjects. Subjects within the same series are compared to determine whether they show similar patterns of change. Some general comments will also be made about the patterns of change between the two series; however, only tentative statements can be made about comparisons between the two series of subjects because subjects in series one, but not those in series two, received an additional treatment component (i.e., cognitive therapy with brief exposure) giving the former group four additional treatment sessions.

Figure 4 shows that after implementing the cognitive therapy component, 4 of 10 subjects met the criterion for
clinically significant change for distress and avoidance. The distress and avoidance scores of one subject in series one (JD) decreased by 2 points or 22%. The distress scores of three subjects in series two declined by at least 2 points (DA = 3, SN = 4, and AB = 4) an average of 3.7 points or 41%. The avoidance scores also met the 2-point criterion showing a decrease by (DA = 4, SN = 2, and AB = 4) an average of 3.3 points or 37% following cognitive treatment.

After subjects in series one received the cognitive therapy with brief exposure component, the criterion for clinically significant change was met by 4 of 5 subjects for distress and 3 of 5 subjects for avoidance. The distress scores declined (PD = 2, JD = 2, MB = 4, and CF = 5) an average of 3.3 points or 37%, and avoidance scores decreased (PD = 2, MB = 6, and CF = 6) an average of 4.7 points or 52%.

Following the multiple-session exposure component, 4 of 10 subjects met the criterion for clinically significant change for distress and/or avoidance. The distress scores of two subjects in series one (MB and BC) declined by 3 points, an average of 3 points or 33%. In addition, the avoidance scores of two subjects in series one decreased (JD = 2 and BC = 3) an average of 2.5 points or 28%. Only one subject in series two (CP) showed a decline in distress and avoidance scores. Each of CP’s scores decreased 4
points or 44% from initial post cognitive therapy values.

When pretreatment baseline scores were compared to scores at 3 weeks follow-up, all 10 subjects in the study met the criterion for clinically significant change. The distress scores of subjects in series one declined (PD = 2, JD = 5, MB = 7, CF = 6, and BC = 4) an average of 4.5 points or 53%. The distress scores of subjects in series two decreased (CP = 4, DA = 4, SN = 4, AB = 5, and AP = 2) an average of 3.8 points or 42%. The avoidance of primary situation scores decreased (PD = 2, JD = 5, MB = 6, CF = 6, and BC = 4) an average of 4.6 points or 51% for subjects in series one, and (CP = 4, DA = 4, SN = 2, AB = 5, and AP = 2) an average of 3.4 points or 38% for subjects in series two.

At 6 weeks follow-up, all patients maintained their treatment gains. Moreover, some subjects showed further improvement in avoidance of primary situations (PD and MB in series one), or in distress and avoidance (SN in series two). The distress and/or avoidance scores of two subjects from series one (JD and MB), and one subject from series two (AB) decreased below the 2-point criterion for clinically significant change following multiple-session exposure. This reduction precluded the evaluation of further improvement during the follow-up period.

In summary, the results of the distress and avoidance scales shown in Figure 4 lead to four major conclusions.
First, the cognitive therapy component alone produced a clinically significant change in 4 of 10 subjects—-one subject in series one and three subjects in series two. The greater impact of cognitive therapy on these four subjects may have been due to different subject characteristics. Second, the cognitive therapy with brief exposure component received by subjects in series one produced a clinically significant change in 4 of 5 subjects for distress and 3 of 5 subjects for avoidance. Third, multiple-session exposure produced additional treatment gains in 4 of 10 subjects—three subjects in series one and one subject in series two. Finally, at three weeks follow-up, subjects in series one and series two showed decrements of 53% and 42% in distress and 51% and 38% in avoidance, respectively. The effects of treatment on subjects in each series were maintained at 6 weeks follow-up.

Figure 5 shows the self-ratings of avoidance subjects displayed in the two additional feared situations (i.e., Avoid 2 and Avoid 3) described in Table 1 (e.g., jogging, being away from home, shopping malls). As shown in Figure 5, the requirements of the experimental design were met. Pretreatment baseline durations were increased with each succeeding subject (with the exception of MB). The baseline scores of subsidiary avoidances were relatively stable for all subjects prior to the introduction of the cognitive therapy component. Changes in subjects’ scores
Scores measuring degree of avoidance in subsidiary avoided situations (Avoid 2 and Avoid 3). Subsidiary avoided situations were rated weekly on a 9-point scale (0 = never avoid it to 8 = always avoid it) on the Fear Questionnaire. The X axis indicates the week of the study that the measures were collected. The scores of each subject in series one (PD, JD, MB, CF, and BC) are displayed on the left side of the figure. The scores of each subject in series two (CP, DA, SN, AB, and AP) are displayed on the right side of the figure. The scores of two subjects in series two (CP and AP) are missing for the first week of follow-up due to noncompliance. Avoid 3 scores are missing for JD and AP because they were unable to identify a third avoided situation.

The dotted vertical lines on each graph separate the phases which are indicated by the numbers on the tops of PD’s and CP’s graphs. The phases for subjects in series one were: (1) pretreatment baseline, (2) cognitive therapy, (3) baseline, (4) cognitive therapy with brief exposure, (5) baseline, (6) multiple-session exposure, and (7) follow-up. For subjects in series two, the phases were: (1) pretreatment baseline, (2) cognitive therapy, (3) baseline, (4) multiple-session exposure, and (5) follow-up.
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SERIES ONE

SERIES TWO
occurred only after the implementation of the treatment variable while scores remained unchanged in untreated subjects.

Again, clinically significant treatment effects were defined as a minimum of a 2-point reduction on the 9-point scale. To determine the impact of each treatment, comparisons were made at the final point in each baseline phase (i.e., pretreatment, post cognitive treatment, post cognitive therapy with brief exposure, and post multiple-session exposure for subjects in series one, and pretreatment, post cognitive therapy, and post multiple-session exposure for subjects in series two). To determine the overall effects of the treatments implemented for subjects in each series, the last data point of the pretreatment baseline phase was compared to the data points at 3 and 6 weeks follow-up. Discussion of changes in subsidiary avoidance behavior will focus first on the effects of each treatment component and then on the overall effects of treatment.

Figure 5 indicates that after implementation of the cognitive therapy component, 5 of 10 subjects met the criterion for clinically significant change for subsidiary avoidances. The Avoid 2 and Avoid 3 scores of one subject in series one (PD) decreased by 2 points or 22%. The Avoid 2 scores of four subjects in series two declined by at least 2 points (CP = 2, DA = 5, SN = 2, and AB = 3) an
average decrement of 3 points or 33%. Similar decrements were observed in the Avoid 3 scores of these four subjects (CP = 2, DA = 3, SN = 2, and AB = 5) an average of 3 points or 33%.

After the cognitive therapy with brief exposure component was implemented for subjects in series one, 3 of 5 subjects met the criterion for clinically significant change. The Avoid 2 score of JD declined by 2 points or 22% and the Avoid 3 scores decreased (MB = 8, and BC = 5) an average of 6.5 points or 72%.

Following the introduction of the multiple-session exposure component, 6 of 10 subjects met the criterion for clinically significant change. Three subjects in series one showed further decrements in their Avoid 2 scores (MB = 8, CF = 8, and BC = 4) an average of 6.7 points or 74%, and the Avoid 3 scores of two subjects declined (PD = 2 and CF = 3) an average of 2.5 points or 28%. Two subjects in series two evidenced a decrement in their subsidiary avoidance scores. The Avoid 2 and Avoid 3 scores of SN decreased by 4 points or 44% and the Avoid 3 score of CP declined by 2 points or 22%.

When pretreatment scores were compared to scores at 3 weeks follow-up, 9 of 10 subjects in the study met the criterion for clinically significant change. The Avoid 2 scores of five subjects in series one declined (PD = 2, JD = 4, MB = 8, CF = 8, and BC = 4) an average of 5.2 points
or 58%. The Avoid 3 scores of four subjects in series one (JD failed to identify a third avoided situation) decreased (PD = 4, MB = 8, CF = 3, BC = 6) an average of 5.3 points or 59%. For subjects in series two, the Avoid 2 scores of four subjects decreased (CP = 2, DA = 6, SN = 6, AB = 3) an average of 4.3 points or 48%; whereas, their Avoid 3 scores (AP failed to identify a third avoided situation) declined (CP = 4, DA = 4, SN = 6, and AB = 5) an average of 4.8 points or 53%.

At 6 weeks follow-up, the treatment gains were maintained in all but one subject from series one (CF’s Avoid 3 score increased 3 points). However, another subject in series one (PD) showed a further 2 point decrease in her Avoid 2 score. Furthermore, 5 of the 7 remaining subsidiary avoidance scores of four subjects in series one were so low at 3 weeks follow-up that given the 2-point criterion for change, further effects could not be measured at 6 weeks follow-up. For subjects in series two, the Avoid 2 scores of CP and AP decreased by 2 points; whereas, the Avoid 2 and Avoid 3 score of AB increased by 2 points between 3 and 6 weeks follow-up. At 3 weeks follow-up, 3 of the 7 remaining subsidiary avoidance scores of two subjects in series two had declined such that further change could not be measured at 6 weeks follow-up.

In summary, the changes in scores on the subsidiary avoidance scales (Figure 5) were similar to the changes in
scores on the distress and primary avoidance scales (Figure 4). The major conclusions are as follows. First, the cognitive therapy component alone produced a clinically significant change in 5 of 10 subjects—one subject in series one and four subjects in series two. Of the five subjects who responded to the cognitive therapy component on the subsidiary avoidance scale, three subjects in series two (DA, SN, and AB) also showed treatment gains on the distress and primary avoidance scales. Second, 3 of 5 subjects in series one showed clinically significant treatment gains following implementation of the cognitive therapy with brief exposure component. Of these three subjects, two subjects (JD and MB) also showed positive treatment gains on the distress (JD) and on the primary avoidance (MB) scales. Third, the multiple-session exposure component produced additional treatment gains in 6 of 10 subjects—four subjects in series one and two subjects in series two. Three of the subjects from series one also showed decrements on the distress (MB and CF) and on the primary avoidance (PD, MB, and CF) scales; whereas, one subject (CP) showed treatment gains on the distress and primary avoidance scales. Finally, at 3 weeks follow-up, subjects in series one and series two showed decrements of 58% and 48% in Avoid 2 scores and 59% and 53% in Avoid 3 scores, respectively. Both series showed similar scores at 6 weeks follow-up.
Figure 6 shows the total anxiety/depression scores on the Fear Questionnaire for subjects in series one and in series two. As shown in Figure 6, the requirements of the staggered baseline across subjects design were met. Pretreatment baseline durations were increased with each succeeding subject (with the exception of MB). The baselines scores of anxiety/depression were relatively stable for all subjects prior to the introduction of the cognitive therapy component. Changes in subjects’ scores occurred only after implementation of the treatment variable while scores remained unchanged in untreated subjects.

Clinically significant treatment effects were defined as a minimum reduction of 10 points on the 0 - 40 point severity scale. As with the distress, primary avoidance, and subsidiary avoidance scales, points of comparison to determine the impact of each treatment component on individual subjects were made at the last data point in each baseline phase. To determine overall treatment effects, the last data point of the pretreatment baseline phase was compared to the data points at 3 and 6 weeks follow-up.

Following implementation of the cognitive therapy component, 3 of 10 subjects met the criterion for clinically significant change for anxiety/depression. The scores of all subjects in series one failed to meet the
Scores measuring degree of anxiety/depression on the Fear Questionnaire for each subject in series one (PD, JD, MB, CF, and BC) displayed on the left side of the figure and in series two (CP, DA, SN, AB, and AP) displayed on the right side of the figure. The scores of two subjects in series two (CP and AP) are missing for the first week of follow-up due to noncompliance. Each of the five items comprising the anxiety/depression scale were rated weekly on a 9-point scale (0 = never to 8 = most of the time). Thus, the maximum obtainable score is 40 points. The X axis indicates the week of the study that the measures were collected.

The dotted vertical lines on each graph separate the phases which are indicated by the numbers on the tops of PD’s and CP’s graphs. The phases for subjects in series one were: (1) pretreatment baseline, (2) cognitive therapy, (3) baseline, (4) cognitive therapy with brief exposure, (5) baseline, (6) multiple-session exposure, and (7) follow-up. For subjects in series two, the phases were: (1) pretreatment baseline, (2) cognitive therapy, (3) baseline, (4) multiple-session exposure, and (5) follow-up.
criterion for change. However, the three subjects in series two (DA, SN, and AB) whose scores showed a decline in distress, primary avoidance, and subsidiary avoidance also showed a decrease in anxiety/depression scores following cognitive therapy. Their anxiety/depression scores declined (DA = 19, SN = 16, and AB = 18) an average of 17.7 points or 43%.

After receiving the cognitive therapy with brief exposure component, 2 of 5 subjects in series one met the criterion for clinically significant change. The scores of these two subjects decreased (PD = 10 and MB = 12) an average of 11 points or 27%. Similar decrements were observed in the scores of two additional subjects from series one (JD = 12 and BC = 10) or 27% after receiving the multiple-session exposure component. Only one subject in series two (AP) showed a decline in this measure following multiple-session exposure. Her anxiety/depression score declined 13 points or 32% from the initial post cognitive therapy value.

At 3 weeks follow-up, one subject from series one (CF) and two subjects from series two (CP and DA) failed to meet the criterion for clinically significant change on the anxiety/depression scale. Excluding these three subjects, 7 of 10 subjects met the criterion for clinically significant change at 3 weeks follow-up. The scores of the remaining four subjects in series one declined (PD = 23, JD
= 12, MB = 12, and BC = 16) an average of 15.8 points or 39%. For the three remaining subjects in series two, their anxiety/depression scores decreased (SN = 16, AB = 20, and AP = 12) an average of 16.0 points or 39%.

At 6 weeks follow-up, subjects in both series continued to maintain their treatment gains, while one subject in series two (SN) showed further improvement (a 12 point or 30% decrease) in anxiety/depression. The scores of four subjects in series one (PD, JD, MB, and BC) were sufficiently low after either cognitive therapy with brief exposure or multiple-session exposure that given the 10-point criterion for clinically significant change, there was no room for further change between 3 and 6 weeks follow-up. This was also observed for one subject in series two (AB) after cognitive therapy.

Of the three subjects who failed to meet the criterion for clinically significant change at 3 weeks follow-up, one subject in series two (DA) showed a dramatic change (a 25 point or 61% decrease) in anxiety/depression at 6 weeks follow-up. The high variability in her scores during follow-up appeared to be related to sudden recurrence of panic attacks associated with the onset of acute family problems. The other two subjects who did not meet the 10-point criterion for change, one in each series (CF and CP), failed to show improvement on this measure at either 3 or 6 weeks follow-up.
In summary, the cognitive therapy component alone produced a clinically significant change in 3 of 10 subjects on the anxiety/depression scale. These three subjects also evidenced clinical change on the distress, primary, and subsidiary avoidance scales. Following implementation of the cognitive therapy with brief exposure component for series one, 2 of 5 subjects showed a clinically significant change. Finally, 3 of 10 subjects demonstrated further improvement after multiple-session exposure on the anxiety/depression scale.

Six major conclusions can be drawn from the observed reduction in scores on the distress, primary avoidance, subsidiary avoidances, and anxiety/depression scales on the Fear Questionnaire. First, the cognitive therapy component produced clinically significant changes in 4 of 10 subjects on the distress and primary avoidance scales, 5 of 10 subjects on the subsidiary avoidance scales, and 3 of 10 subjects on the anxiety/depression scale. Of these ten subjects, the same three subjects from series two consistently showed a positive response to the cognitive therapy component on all of the weekly measures. Second, the cognitive therapy with brief exposure component produced clinically significant treatment effects in 4 of 5 subjects on the distress scale, 3 of 5 subjects on the primary avoidance scale, 3 of 5 subjects on the subsidiary avoidance scales, and 2 of 5 subjects on the
Third, multiple-session exposure produced additional significant treatment gains in 4 of 10 subjects on the distress or primary avoidance scales, 6 of 10 subjects on the subsidiary avoidance scales, and 3 of 10 subjects on the anxiety/depression scale. Fourth, the number of subjects in series one who showed clinically significant change on the weekly measures following the cognitive therapy with brief exposure component vs. the multiple-session exposure component were equivalent with exception of the distress scores. On the distress scale, treatment effects were observed in 4 of 5 subjects after cognitive therapy with brief exposure and 2 of 5 subjects after multiple-session exposure. Fifth, at 3 weeks follow-up, subjects in series one showed slightly more treatment gains than subjects in series two on 4 of 5 of the weekly measures. The percentage change from pretreatment baseline compared to 3 weeks follow-up for subjects in series one and subjects in series two were as follows: 53% vs. 42% for distress, 51% vs. 38% for primary avoidance, 58% vs. 48% for Avoid 2, 59% vs. 53% for Avoid 3, and 39% vs. 39% for anxiety/depression. Finally, at 6 weeks follow-up, subjects who showed clinically significant change on the weekly measures maintained their low scores or showed further improvement.

**Pre- and Post-Phase Evaluation Measure**

Subjects completed the Symptom Checklist-90 during the
initial intake assessment, at the beginning of the first session of each treatment phase, and at 6 weeks follow-up. Figure 7 shows the mean scale anxiety, somatization, and phobic anxiety scores on the Symptom Checklist-90. The results indicate that on average, subjects responses on the anxiety, somatization, and phobic anxiety scales were similar to those reported on the Daily Diary scales. That is, subjects in both series tended to use the lower end of the scale (i.e., 2.0 or less). During the pretreatment phase, scores were in the slight to moderate range which precluded an examination of the effects of the individual treatment components. Thus, comparisons to determine changes in scores were made at pretreatment and at 6 weeks follow-up only.

Figure 7 indicates that the average scale values for both series were similar at pretreatment and tended to decline to similar values at 6 weeks follow-up. The mean changes in scores from pre- to post-treatment for subjects in series one were: 1.76 to 0.36 for anxiety, 1.16 to 0.50 for somatization, and 1.12 to 0.26 for phobic anxiety. For subjects in series two, the mean changes in scores from pre- to post-treatment were: 1.84 to 0.82 for anxiety, 0.92 to 0.82 for somatization, and 1.96 to 0.54 for phobic anxiety. The scores of the normative sample on the Symptom Checklist-90 were: anxiety 0.7, somatization 0.6, and phobic anxiety 0.6.
The mean scale anxiety, somatization, and phobic anxiety scores on a 5-point scale (0 = not at all to 4 = extremely) on the Symptom Checklist-90. The scores of each subject in series one (PD, JD, MB, CF, and BC) are displayed on the left side of the figure. The scores of each subject in series two (CP, DA, SN, AB, and AP) are displayed on the right side of the figure.

The X axis indicates the numerical representation of each point that these measures were obtained. For series one, subjects were assessed at the following points: (1) initial intake, (2) post cognitive therapy, (3) post cognitive therapy with brief exposure, (4) post multiple-session exposure, and (5) six weeks follow-up. For series two, subjects were assessed at: (1) initial intake, (2) post cognitive therapy, (3) post multiple-session exposure, and (4) 6 weeks follow-up.
Visual inspection of individual subject data suggests that one subject in each series (CF and CP) showed little or no change on the scales at 6 weeks follow-up. However, several scores of subjects in series one were reduced to zero; anxiety for three subjects (PD, MB, and BC), somatization for two subjects (MB and BC), and phobic anxiety for three subjects (JD, MB, and BC). The treatment received by subjects in series two reduced only one score (phobic anxiety) for one subject (AP) to zero. Similar results were shown on the Daily Diary (see Figure 3).

In summary, subjects tended to use the lower end of the 5-point scale which placed their scores in the slight to moderate range at pretreatment. The average scale scores of both series tended to be similar at pretreatment and decreased to similar values (within the zero to slight range) at 6 weeks follow-up. Visual inspection of individual subject data suggests that more anxiety relevant scores were reduced for subjects in series one than for those in series two.

Figure 8 displays the pre- and post-treatment mean scale scores of each subject on the Symptom Checklist-90 for series one and series two. The figure shows that the scores of subjects in series one were less variable and less extreme relative to the scores of subjects in series two at pretreatment. However, the scores of subjects in both series approached the normative sample at
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SERIES ONE

SERIES TWO

SERIES ONE

SERIES TWO

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Figure 8.

The pre- and post-treatment mean scale scores of each subject on the Symptom Checklist-90 for series one (top frames) and series two (bottom frames). Each subject’s number is defined in Table 1. The correspondence between subject number and each subject’s initials in series one were: S₁ (PD), S₂ (JD), S₃ (MB), S₄ (CF), and S₅ (BC); and in series two were: S₁ (CP), S₂ (DA), S₃ (SN), S₄ (AB), and S₅ (AP). The dark boxes indicate the norms for the Symptom Checklist-90. The Y axis indicates the 5-point scale (0 = not at all to 4 = extremely) on which the items comprising each subscale were scored. The X axis indicates the Symptom subscales. The subscales and the abbreviations indicated in the figure are as follows: ANX (anxiety), SOM (somatization), PHOB (phobic anxiety), OC (obsessive-compulsive), IS (interpersonal sensitivity), HOST (hostility), PI (paranoid ideation), PSY (psychoticism), and DEP (depression).
post-treatment. There was one exception to this observation. As indicated by CP’s ($S_1$) extreme scores, there were no apparent changes in his scores from pre- and post-treatment with the exception of his score on the hostility subscale. Of the other two subjects ($S_2$/JD in series one and $S_2$/DA in series two) who displayed the extreme scores on the majority of the scales at pretreatment, only JD continued to evidence a score considerably higher than the norm on one subscale (somatization).

Pre- and Post-Treatment Global Measures

Table 3 shows the results of the pre- and post-treatment global measures: the Global Assessment of Severity Scale, the Anxiety Sensitivity Index, the Spielberger State Anxiety Inventory, and the Beck Depression Inventory. Assessments were taken during the intake interview and at 6 weeks follow-up.

The Global Assessment of Severity Scale measures panic symptom interference in daily life activities on a 5-point scale ($1 = $no complaints and normal activity to $5 = $normal work or social activity radically changed or prevented). All subjects’ scores decreased by 1 to 3 points. Nine subjects reported that they continued to experience minor symptoms, but the symptoms no longer interfered with daily life activities. However, one subject from series two (CP) continued to experience symptoms which produced marked
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Table 3
Pre- and Post-Treatment Global Measures

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<td>Subject</td>
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<td>Global Assessment of Severity Scale&lt;sup&gt;a&lt;/sup&gt; (1-5)&lt;sup&gt;c&lt;/sup&gt;</td>
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</tr>
<tr>
<td></td>
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<td>2</td>
<td>AB</td>
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<tr>
<td></td>
<td>BC</td>
<td>4</td>
<td>1</td>
<td>AP</td>
</tr>
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<td>Anxiety Sensitivity Index&lt;sup&gt;b&lt;/sup&gt; (0-64)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>PD</td>
<td>51</td>
<td>18</td>
<td>CP</td>
</tr>
<tr>
<td></td>
<td>JD</td>
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<td>CF</td>
<td>39</td>
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<td>BC</td>
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<td>AP</td>
</tr>
<tr>
<td>Speilberger State Anxiety Inventory&lt;sup&gt;b&lt;/sup&gt; (20-80)&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>DA</td>
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<td></td>
<td>CF</td>
<td>38</td>
<td>37</td>
<td>AB</td>
</tr>
<tr>
<td></td>
<td>BC</td>
<td>39</td>
<td>20</td>
<td>AP</td>
</tr>
<tr>
<td>Beck Depression Inventory&lt;sup&gt;b&lt;/sup&gt; (0-63)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>PD</td>
<td>21</td>
<td>7</td>
<td>CP</td>
</tr>
<tr>
<td></td>
<td>JD</td>
<td>15</td>
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</tr>
<tr>
<td></td>
<td>MB</td>
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<td></td>
<td>BC</td>
<td>3</td>
<td>0</td>
<td>AP</td>
</tr>
</tbody>
</table>

Note:  
<sup>a</sup>Independent assessor rating.  
<sup>b</sup>Self-report ratings.  
<sup>c</sup>Range of possible scores.
interference with normal work or social activities. The average percentage score change from pre- to post-treatment was 62% for subjects in series one and 49% for those in series two.

The Anxiety Sensitivity Index is a 16-item questionnaire that uses a 5-point scale (0 = very little to 4 = very much) to measure the extent to which individuals believe anxiety/fear causes illness, embarrassment, or increased anxiety. The scores of nine subjects declined by 7 to 58 points. One subject's (CP) score was higher at post-treatment than at pre-treatment indicating that his belief in the negative effects of anxiety increased over the course of the study. The average percentage score change from pre- to post-treatment was 54% for subjects in series one and 61% for those in series two.

The Spielberger State Anxiety Inventory is a 20-item questionnaire that uses a 4-point scale (1 = not at all to 4 = very much so) to obtain a measure of how anxious the subject feels at the moment s/he completes the inventory. The scores of all subjects declined 1 to 39 points at post-treatment. The scores of nine subjects ranged from "no anxiety" to the bottom of the moderately anxious range; whereas, the post-treatment score of one subject (CP) continued to remain in the highly anxious range. The average percentage change in the scores from pre-to post-treatment was 28% for subjects in series one and 34%
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for subjects in series two.

The Beck Depression Inventory is a 21-item inventory that measures severity of depression on a 4-point scale. The scores of nine subjects were within the normal range (0 to 9; Beck et al., 1961) at post-treatment. One subject’s (CP) score continued to remain in the moderately depressed range. The average percentage score change from pre- to post-treatment was 60% for subjects in series one and 68% for subjects in series two.

The subject (DA) who was allowed to enter the study despite her high depression score (see Subject Selection Procedure), showed concordance between scores on the weekly Beck Depression Inventory, the anxiety/depression scale (Figure 6), the subsidiary avoidance scales (Figure 5), and panic attack frequency (Table 2). Her Beck Depression scores decreased to the normal range following the introduction of cognitive therapy. However, her scores on the Beck Depression Inventory, and the anxiety/depression and subsidiary avoidance scales increased sharply at 2 and 3 weeks post multiple-session exposure. During this period, she recorded four panic attacks and commented on the Panic Attack Diaries that she was having acute family problems to which she attributed her panic attacks. This observation was not surprising since previous research with animals (Mineka, 1985) and with humans (Sartory, Rachman, & Grey, 1982) has suggested that fear can be reinstated by
aversive events that occur before, during, and after sessions, despite long periods following the termination of treatment (Rachman, 1989). In any case, DA’s data suggest that her symptoms of depression fluctuated with episodes of panic attacks which coincided with severe family problems during the early part of the follow-up period. During the last 3 weeks of follow-up, her family problems had resolved and she had no further episodes of panic. Her scores on the Beck Depression Inventory, and on the anxiety/depression and subsidiary avoidance scales declined and remained low and relatively stable.

In summary, 9 of 10 patients displayed treatment gains as measured pre- and post-treatment on independent assessor’s ratings, and on self-report questionnaires as well as on the Symptom Checklist-90. One subject in series two failed to show adequate clinical improvement on any of the post-treatment measures. The percentage change scores suggest that the treatment received by subjects in each series produced similar behavioral changes on the global measures. The sole exception was the independent observations of the investigator and assessor on the Global Assessment of Severity Scale which indicated that the average score of subjects in series one was lower than than the score of subjects in series two at post treatment. The positive change in a work and social adjustment exceeded that of subjects in series two by 13%. This finding is
consistent with the results found on four of the five scales on the Fear Questionnaire. The average score of subjects in series one were slightly lower than those of subjects in series two at 3 weeks follow-up.

**Within Session Measures**

At the beginning and end of each treatment session, subjects rated their general level of anxiety. Figure 9 shows that for subjects in both series, pre-session anxiety scores tended to be higher than or at the same level as post-session anxiety scores during sessions in all treatment phases. The single exception was one subject in series two (CP) who had consistently higher post-session relative to pre-session anxiety scores during multiple-session exposure.

Visual inspection of individual subject data suggests that most subjects displayed higher anxiety scores before and after the first two or three treatment sessions during cognitive therapy and during cognitive therapy with brief exposure (series one). Higher anxiety scores at the beginning of treatment may be related to subjects becoming familiar with the therapeutic procedure and the therapist.

Figure 9 shows that pre- and post-session anxiety scores were variable across all phases of the study. For this reason, the scores were averaged to yield one pre-session score and one post-session score for each treatment phase for each subject.
Figure 9.

The pre- and post-session anxiety scores for each subject in series one (PD, JD, MB, CF, and BC) displayed on the left side of the figure and in series two (CP, DA, SN, AB, and AP) displayed on the right side of the figure. Anxiety was rated on a 9-point scale (0 = not at all anxious to 8 = extremely anxious). The X axis indicates the number of treatment sessions in each series. Series one subjects received a total of 12 sessions equally divided across the three treatment phases; whereas, series two subjects received a total of eight sessions equally divided across two treatment phases.

The dotted vertical lines on each frame separate the treatment phases which are indicated by the numbers on the tops of PD’s and CP’s graphs. The treatment phases for subjects in series one were: (1) cognitive therapy, (2) cognitive therapy with brief exposure, and (3) multiple-sessions exposure. For subjects in series two, the treatment phases were: (1) cognitive therapy and (2) multiple-sessions exposure.
Following implementation of the cognitive therapy component, the pre- and post-session anxiety scores of each subject declined in the following manner with the exception of CP’s score: PD = 3.8 to 3.3, JD = 2.8 to 1.5, MB = 2.5 to 0.3, CF = 3.8 to 2.0, BC = 0.3 to 0.0 for subjects in series one, and CP = 4.5 to 5.0, DA = 4.0 to 0.3, SN = 3.0 to 2.0, AB = 3.5 to 3.3, and AP = 3.8 to 3.3 for subjects in series two. After subjects in series one received the cognitive therapy with brief exposure component, their scores decreased as follows: PD = 2.3 to 2.0, JD = 3.0 to 1.5, MB = 1.5 to 0.0, CF = 2.5 to 1.5, and BC = 0.0 to 0.0. Finally, after implementation of the multiple-exposure component, each subject’s pre- and post-session anxiety score decreased (with the exception of CP’s score) as follows: PD = 1.3 to 0.8, JD = 1.8 to 1.5, MB = 0.8 to 0.3, CF = 2.5 to 2.3, BC = 0.0 to 0.0 for subjects in series one, and CP = 2.0 to 3.8, DA = 1.8 to 0.8, SN = 0.5 to 0.0, AB = 1.0 to 0.5, and AP = 2.8 to 2.5 for subjects in series two. Thus, the results indicate that pre- and post-session anxiety scores of subjects (with the exception of CP) tended to decline within each treatment phase and across the treatment phases.

At the beginning of the first cognitive therapy session, subjects provided details of the worst scenario that could possibly occur during a panic attack. Most subjects reported fears of losing control or going crazy
during a panic attack (see Table 1 for descriptions of each subjects' feared consequence). Subjects then rated their scenarios for how much they believed that their fears would actually come true on a 9-point scale (0 = none to 8 = fully believe) at the beginning of cognitive therapy and at the end of the final multiple exposure session. Prior to the first cognitive therapy session, subjects in both series rated their beliefs very high. The ratings for subjects in series one were: PD = 6, JD = 6, MB = 8, CF = 8, and BC = 8 or an average score of 7.2 or 80%. For subjects in series two, the ratings were: CP = 8, DA = 6, SN = 6, AB = 7, and AP = 7 or an average score of 6.8 or 76%. At the end of the final multiple exposure session, the ratings declined substantially. The ratings for subjects in series one were: PD = 0, JD = 2, MB = 1, CF = 0, and BC = 0 or an average score of 0.6 or 1%. For subjects in series two, the ratings were: CP = 5, DA = 0, SN = 2, AB = 0, and AP = 1 or an average score of 1.6 or 18%. CP was the only subject who continued to strongly believe that he might lose control if he had a panic attack.

At the beginning of the first session of the cognitive therapy phase, subjects in series one were instructed to perform one hyperventilation trial. Subjects then rated the similarity of the effects of hyperventilation to their naturally occurring panic attacks on the 9-point scale (0 =
not at all similar to \( 8 = \) exactly the same as). The ratings for subjects in series one were: \( PD = 4, \ JD = 7, \ MB = 6, \ CF = 4, \) and \( BC = 4 \) or an average score of 5.0 or 56%.

During each of the four multiple exposure sessions, all subjects were instructed to perform four hyperventilation trials. Following the first and the last hyperventilation trial, subjects in both series rated the similarity of the effects of hyperventilation to their naturally occurring panic symptoms. After the first hyperventilation trial, subjects in series one again reported an average similarity rating of 5.0 (individual subject scores were identical to the first rating). The ratings of subjects in series two were: \( CP = 8, \ DA = 7, \ SN = 8, \ AB = 4, \) and \( AP = 6 \) or an average score of 6.5 or 72%.

Following the last hyperventilation trial, similarity ratings for subjects in series one were: \( PD = 2, \ JD = 4, \ MB = 3, \ CF = 2, \) and \( BC = 2 \) or an average score of 2.6 or 29%, and \( CP = 8, \ DA = 4, \ SN = 6, \ AB = 0, \) and \( AP = 3 \) or an average score of 4.2 for subjects in series two or 47%. CP was the only subject who continued to rate the effects of hyperventilation as being very similar to his panic attacks.

Following each hyperventilation trial, subjects in both series rated the extent to which they feared their bodily sensations on a 9-point scale (0 = not at all anxious to \( 8 = \) extremely anxious). Table 4 shows the fear
### Cognitive and Exposure Treatments

**Table 4**

**Ratings and Means of Fear of Bodily Sensations After the First Hyperventilation Trial**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cognitive Therapy with Brief Exposure</th>
<th>Multiple-Session Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Series Number</td>
<td>Number</td>
</tr>
<tr>
<td>PD</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>JD</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>MB</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
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<tr>
<td>BC</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| CP      | 2             | 1      |          |   | 6   | 3 | 2 | 3 |   |   |   |
| DA      | 2             | 2      |          |   | 6   | 6 | 3 | 7a |   |   |   |
| SN      | 2             | 3      |          |   | 2   | 4 | 2 | 2 |   |   |   |
| AB      | 2             | 4      |          |   | 2   | 4 | 0 | 0 |   |   |   |
| AP      | 2             | 5      |          |   | 4   | 4 | 3 | 1 |   |   |   |
|         |               |        |          |   | M 4.0 | 4.2 | 2.0 | 2.6 |   |   |   |

**Note:** The dash indicates that subjects in series two did **not** receive the cognitive therapy with brief exposure component.

*a DA had a car accident immediately prior to the session.*
of bodily sensations ratings for each subject and the mean rating for subjects in each series following the first hyperventilation trial for each session.

Visual inspection of the individual subject data suggests that ratings of fear of bodily sensations tended to decline more consistently over sessions for subjects in series one than for those in series two. This was also reflected in the average ratings for each series. The variability in fear of bodily sensations ratings of subjects in series two was also apparent in the number of hyperventilation trials completed by subjects.

During the first session of multiple-session exposure, subjects in series one completed all four trials with the exception of one patient (JD who had the highest fear of bodily sensations rating of subjects in both series). However, all subjects in series two failed to complete the four trials. Nevertheless, series two subjects increased their rate of compliance to complete hyperventilation trials over the three remaining exposure sessions. Thus, the cognitive therapy with brief exposure component implemented for subjects in series one may have contributed to reduced fear of bodily sensations over sessions, and facilitated compliance to complete all hyperventilation trials in this phase.

In summary, the results of the within session measures lead to the following four major conclusions. First,
subjects in both series showed higher than or equivalent pre- and post-session anxiety scores during treatment phases with the exception of one subject. Second, subjects' ratings of their beliefs in their fears about having a panic attack declined substantially from pre cognitive therapy to post multiple-session exposure with the exception of one subject. Third, repeated hyperventilation trials reduced ratings of both the similarity of their effects to naturally occurring panic attacks (except CP) and the fear of the bodily sensations in subjects in both series (except CP). Finally, subjects in series one showed better compliance to complete the four hyperventilation trials during the first session of multiple exposure relative to subjects in series two.

Evaluation of Treatment Outcome

At 6 weeks follow-up, subjects anonymously completed a questionnaire giving their perspective of treatment outcome. Subjects rated the following: the severity of their symptoms compared to pretreatment on a 5-point scale (1 = much worse to 5 = much better), satisfaction with treatment on a 4-point scale (1 = indifferent or mildly satisfied to 4 = very satisfied), and the extent to which treatment met their needs on a 4-point scale (1 = none of my needs have been met to 4 = almost all of my needs have been met).

Average ratings of symptom severity, satisfaction, and
needs met were similar for subjects in both series. For subjects in series one, the average scores were: 4.6 (range 4 - 5) for symptom severity, 3.6 (range 2 - 4) for satisfaction, and 3.2 (range 2 - 4) for needs met. For subjects in series two, the average scores were: 5.0 (range 5 - 5) for symptom severity, 4.0 (range 4 - 4) for satisfaction, and 3.8 (range 3 - 4) for needs met.

Subjects in each series also ranked ordered the treatment components from the most to the least helpful (e.g., the most helpful was ranked 1, the second most helpful 2, and so on until all of the activities were numbered). Subjects in both series were given identical forms except that subjects in series one were required to rank order the two additional subcomponents that they received during the cognitive therapy with brief exposure phase. The subcomponents of the treatments were described as follows: (1) explanations of how panic attacks develop (i.e., the model), (2) the sessions in which we repeatedly focused on catastrophic thoughts, (3) the sessions in which you had one brief trial of overbreathing to experience anxiety-like bodily sensations, and then we focused on how those sensations related to catastrophic thoughts (for subjects in series one only), (4) encouragement to practice facing situations that produced feared bodily sensations between treatment sessions (for subjects in series one only), (5) the sessions in which you did several trials of
overbreathing practice to experience anxiety-like bodily sensations in order to learn that those unpleasant feelings are not harmful, and (6) encouragement to practice overbreathing at home.

The results indicated that subjects in both series rated the cognitive therapy component (i.e., learning about the relationship between cognitions and bodily sensations during panic attacks using the diagram of the model developed by Clark, 1986) as the most helpful aspect of the treatment program. Learning that they could recreate anxiety-like bodily sensations through repeated hyperventilation trials either in the therapist’s office or at home was ranked least helpful. However, two subjects in series one rated the single overbreathing trial combined with cognitive therapy the second most helpful aspect of treatment.

In summary, subjects’ evaluative responses of treatment outcome were very high. This suggests that they all found the treatment helpful in alleviating their symptoms.
DISCUSSION

The purpose of this study was to examine the effects of cognitive and exposure components of cognitive-behavioral treatment to determine if treatment would be more effective by additional emphasis on cognitive change or by emphasis on exposure to feared interoceptive cues. Discussion of the major findings will focus first on the effectiveness of each treatment component on individual subjects and then on the overall effects of the series of treatments on each group of subjects.

The Major Findings

The three components (i.e., cognitive therapy, cognitive therapy with brief exposure, and multiple-session exposure) employed in this study produced the following clinically significant changes: (1) The cognitive therapy component reduced distress and avoidance in at least one of the three specific situations in 6 of 10 subjects. Of these six subjects, three patients also showed decrements in anxiety/depression scores. (2) The cognitive therapy with brief exposure component reduced distress and/or situation specific avoidance in all of the five subjects who received this component. Of these five subjects, two patients also showed reductions in anxiety/depression following cognitive therapy with brief exposure. (3) The multiple-session exposure component produced additional decrements in distress and/or avoidance in 7 of 10
subjects. (4) The number of subjects in series one who showed clinically significant change on the weekly measures following the cognitive therapy with brief exposure component vs. the multiple-session exposure component were equivalent with exception of the distress scores. On the distress scale, treatment effects were observed in 4 of 5 subjects after cognitive therapy with brief exposure and 2 of 5 subjects after multiple-session exposure. (5) At 6 weeks follow-up, patients had maintained their treatment gains on the majority of the weekly measures.

The two series of treatments employed in this study produced the following five major findings: (1) Nine of 10 subjects responded favorably to the respective series of treatments. (2) Following implementation of the cognitive therapy with brief exposure component (series one) and the multiple-session exposure component (series two), more subjects in series one responded to the former component than subjects in series two did to the latter component on 4 of the 5 weekly measures. In addition, at 3 weeks follow-up, subjects in series one showed slightly more treatment gains than subjects in series two on 4 of the 5 weekly measures, and on the Daily Diary and post-phase evaluation measure. (3) All subjects gave high evaluative ratings to the effectiveness of the treatments on measures of satisfaction, needs met, and the extent to which the treatment reduced their anxiety symptoms. (4) Subjects
reported that they benefited more from learning about the relationship of cognitions and interoceptive cues in panic attacks with the model than from experiencing repeated exposure to feared bodily sensations. (5) Retrospective reports of panic attack frequency were substantially higher than concurrent measures of panic attacks.

**The Effects of the Treatment Components**

There are a number of possible factors which may have contributed to the effectiveness of the individual treatment components for some subjects but not for others. One contributing factor to the effectiveness of the cognitive therapy component for the six individuals may have been the differences in patient pretreatment characteristics. These six subjects had slightly higher pretreatment Beck Depression scores and Spielberger State anxiety scores. They also tended to display slightly higher pretreatment anxiety/depression scores on the Fear Questionnaire relative to the remainder of subjects in the study. Moreover, 4 of these 6 subjects (PD, JD, CP, and DA) displayed the highest scores on the majority of the Symptom Checklist-90 subscales at the pretreatment evaluation. Thus, it is possible that the subjects who had higher levels of anxiety and depression, and experienced a greater number of general psychiatric symptoms were more reassured by the cognitive therapeutic component than were other patients.
The notion that cognitions can be affected by didactic material reassuring patients that they will not go crazy or lose control is similar to the findings of Gitlin et al. (1985). Although Gitlin and colleagues did not measure general psychiatric symptoms, their subjects reported that the reassurance they received from education about panic attacks changed their catastrophic misattributions of symptoms. Patients in the present study made similar comments. Anecdotal evidence from subjects’ verbal reports suggests that those who responded positively to cognitive therapy were very relieved when reassured that intense anxiety would not result in craziness or loss of control.

Most patients who suffer from Panic Disorder with Agoraphobia experience associated general psychiatric symptoms (e.g., Barlow, 1988; Chambless & Goldstein, 1981, Mathews et al., 1981). The provision of education as to the source of symptoms likely not only affects the frequency of panic attacks (Gitlin et al., 1985), but also affects associated symptomatology. Some evidence for the latter conclusion was shown in DA’s weekly scores on the Beck Depression Inventory (the only subject in the study whose depression was monitored weekly), and on the distress, primary and subsidiary avoidance and anxiety/depression scales, as well as her panic attack frequency. Following the introduction of the cognitive therapy component, DA’s Beck Depression scores immediately
decreased to the normal range, and her scores on the other scales decreased sharply. Panic attack frequency also declined from 10 panic attacks during pretreatment baseline to two panic attacks during treatment. Similar post-treatment change in associated symptomatology was found by Johnston, Troyer, and Whitsett (1988). However, these investigators used a package treatment, so the symptom changes cannot be attributed solely to the cognitive component of treatment. In contrast, the findings of the present study indicate that both panic attack frequency and associated symptoms can be affected by the provision of educational material about panic attacks.

Visual inspection of individual subject data suggests that the subjects who showed behavioral changes on the weekly measures following cognitive therapy also tended to have higher anticipatory anxiety scores relative to the remaining subjects prior to treatment. Five of these six subjects displayed at least a 50% reduction in anticipatory anxiety scores. (CP failed to show a decrease in anticipatory anxiety.) Although it is unclear how much change can be attributed to the cognitive component because decrements in anticipatory anxiety were not immediately apparent, other investigators (e.g., Klosko et al., 1987) have reported that anticipatory anxiety is quite resistant to change. In their study, anticipatory anxiety was still present after 15 weeks of cognitive-behavioral treatment.
Although Klosko et al.'s (1987) subjects received only one session of cognitive therapy (i.e., rationale for treatment and education about panic attacks), elements of cognitive therapy consisting of didactic material and self-monitoring automatic thoughts were integrated with other components in subsequent sessions. Accordingly, it is possible that in the present study, the more intensive cognitive therapy (i.e., the additional three sessions focusing solely on cognitive aspects of anxiety) produced a more rapid change in anticipatory anxiety for some subjects.

All subjects rated the cognitive therapy component as the most helpful aspect of treatment despite the fact that not all subjects responded to the cognitive component. The discrepancy between favoring the cognitive component and failing to show an immediate response to it may reflect an inability to identify critical components of treatment. Both the cognitive therapy with brief exposure and multiple-session exposure components produced behavioral changes in a high proportion of subjects. However, subjects were either unaware of the impact of brief or multiple exposure to feared interoceptive cues, or because of a high preference for cognitive strategies, were unwilling to acknowledge the benefits of exposure, or both. There is also the possibility that because subjects were given the cognitive therapy component first in the series
of treatments, they believed that it might be the most important and beneficial component, and rated it accordingly.

Although subjects who were responsive to cognitive therapy showed changes in distress and avoidance on weekly measures, most behavioral changes were not observed on either the Daily Diaries (i.e., anticipatory anxiety, generalized avoidance, and generalized anxiety), or the post-phase evaluation measure (i.e., anxiety, somatization, and phobic anxiety) until after the implementation of either cognitive therapy with brief exposure or multiple-session exposure. This suggests that the Daily Diary and the post-phase evaluation measures were not as sensitive as the weekly measures for evaluating clinical change.

In summary, all subjects rated cognitive therapy as the most beneficial component of treatment. However, clinically significant effects following cognitive therapy were observed in only those subjects who displayed the highest depression, state anxiety, and anticipatory anxiety scores, and tended to experience multiple general psychiatric symptoms. The major factor that contributed to the effectiveness of cognitive therapy was likely the reassurance that patients received that they were not about to lose control or go crazy from experiencing panic attack symptoms. Discussion of the overall effects of the cognitive therapy with brief exposure and the multiple-
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session exposure components follows in the next section.

The Overall Effects of the Series of Treatments

The weekly measures, the Daily Diary, and the post-phase evaluation measure findings suggested that the multiple exposure component seems more effective when preceded by the cognitive therapy with brief exposure component than when not preceded by this phase based on comparisons between series. The series one effects were observed in a greater proportion of subjects and produced a higher percentage of behavioral change. There are several possible factors which may have contributed to this finding.

One factor might be the extra treatment sessions provided to subjects in series one during implementation of the cognitive therapy with brief exposure component. However, the four additional treatment sessions could not completely account for the differential effectiveness of the components observed at 3 weeks follow-up. The major argument against attributing differential effectiveness to the extra treatment sessions is that the differences in the effectiveness of the two components was apparent on the weekly measures immediately after each group of subjects had received the respective treatment components; more subjects responded to cognitive therapy with brief exposure (series one) than to multiple-session exposure (series two). The question of whether the single hyperventilation
trial or the additional cognitive therapy sessions is more important in promoting change is a matter for further research.

A second possible contributing factor to the greater effectiveness of series one is that the treatment programmed the somatic events and cognitive aspects of anxiety within a single session for subjects in series one, but not for those in series two. Combining the somatic and cognitive elements may have provided subjects in series one with a more vivid demonstration of naturally occurring panic attacks, thereby facilitating exposure to the aversive somatic/cognitive complex involved in panic attacks. Clark (1986) has argued that one of the crucial factors in treatment success is the patient’s awareness of the connection between hyperventilation (or other processes which produce changes in bodily sensations) and panic anxiety. The cognitive therapy with brief exposure phase implemented in series one focused heavily on changing the subject’s catastrophic thoughts. The focus was maintained both following the hyperventilation experience, and during discussions about panic attacks and episodes of intense anxiety that subjects had recorded on their diaries. Thus, the somatic and cognitive elements of anxiety combined within the hyperventilation demonstration coupled with discussions of everyday anxiety experiences likely produced more treatment gains than sessions of exposure to
interoceptive cues alone. This conclusion is consistent with Levis' (1982) hypothesis that simultaneous exposure to a large number of conditioned stimuli or the total CS complex should yield a superior treatment outcome.

A third possible contributing factor to the greater effectiveness of cognitive therapy with brief exposure is that subjects in series one were encouraged to confront difficult situations between sessions in order to both generate the bodily sensations associated with anxiety, and to observe closely their sensations to identify the associated catastrophic thoughts. While subjects in series two were also encouraged to do homework exercises during the multiple-session exposure phase, the task was of a different nature. That is, they were instructed to simply practice hyperventilation exercises at home (away from the safety cues of the investigator and the clinic), since it was not reasonable to ask subjects to hyperventilate in public. Thus, both groups of subjects received encouragement to do homework exercises and reported completion of these tasks on their daily diaries. However, subjects in series one extended their homework exercises to public situations, thereby adding another dimension to exposure---in vivo exposure to environmental stimuli. Thus, the type of exposure exercises associated with each treatment component differed and may have also contributed to the differential effectiveness of the components.
Finally, the greater effectiveness of cognitive therapy with brief exposure may have also been due to the failure of subjects in series two to complete the four hyperventilation trials during the first multiple exposure session and/or to adequately ventilate on the hyperventilation trials. Consequently, the effects of interoceptive exposure were diminished. Clark and Hemsley (1982) found substantial individual differences in response to 2 min of hyperventilation both in magnitude and in type of response (i.e., physiological measures of heart rate, and somatic and affective ratings). While Clark and Hemsley attributed some of the variability to the degree to which individuals increased their ventilation, they commented that mood state and confidence in the therapist may also affect subjects' ability to increase ventilatory responses. These factors may also partially account for CP's failure to respond to the treatment outcome measures. This subject reported that the hyperventilation exercises were quite demanding because he was concerned about having a full-blown panic attack and losing control of his emotions. He also had the highest state anxiety score and was the only patient to display higher post- than pre-session anxiety scores during multiple-session exposure. Furthermore, he frequently queried the investigator about the possibility of joining a group for the treatment of anxiety disorders. He reported that he wanted to talk with
other patients with similar fears and possibly develop some social relationships. Approximately 6 months after he completed the present study, he requested and was given group therapy for residual anxiety problems.

The fact that CP showed treatment gains on the distress and avoidance scales, but not on the post phase evaluation and global measures may reflect the nature of the measuring instrument or the time at which the measurement was obtained. The distress and avoidance measures targeted very specific behaviors and were assessed weekly; whereas, the other measures evaluated more general aspects of anxiety and were assessed infrequently.

In summary, the slightly greater effectiveness of the cognitive therapy with brief exposure component over the multiple-session exposure component was likely due to programming the somatic and cognitive aspects of anxiety within the same session. Clark (1986) contends that the hyperventilation demonstration is important in facilitating treatment gains even though Clark et al. (1985) tend to attribute treatment success to the breathing retraining component of therapeutic package. However, the possibility exists that the type of homework exposure exercises associated with each treatment component may have enhanced the effects of cognitive therapy with brief exposure. In addition, subjects in series two may not have adequately ventilated on the hyperventilation trials and, therefore,
failed to receive the full benefits of interoceptive exposure during the multiple-session exposure phase.

Retrospective Report vs. Concurrent Monitoring

The unexpected finding of the present study was subjects' retrospective reports of panic attack frequency and the actual number of attacks recorded during the pretreatment monitoring. Similar large discrepancies between retrospective reports and concurrent measures of panic attack frequency have recently been reported (e.g., Margraf, Taylor, Ehlers, Roth, & Agras, 1987; Rapee, Craske, & Barlow, 1988). Rapee et al. (1988) reported that subjects tended to recall far more panic symptoms during the initial interview than they recorded over an equivalent period of time. A weekly average of 7.5 panic attacks were reported during the interview compared to only 2.3 panic attacks per week during the self-monitoring period. Moreover, the frequency of dramatic symptoms such as going crazy, fear of dying, or losing control was especially high in retrospective reports of panic attacks (Margraf et al., 1988).

Three factors may have interacted to produce the large discrepancy between retrospective report and concurrent monitoring. First, individuals may distort their reports of panic attack frequency because of "faulty" memory. That individuals tend to distort the frequency of events is not surprising since verbal reports which occur after an
event would not be under as strong stimulus control as those which occur during or immediately after the event, particularly when strong emotional responses are involved (Skinner, 1957).

Second, self-monitoring may be reactive (i.e., changes the subject's behavior due to the measurement process) and, therefore, affect the number of panic attacks recorded. Barlow, Hayes, and Nelson (1984) and Hersen and Barlow (1976) have commented that previous research has shown that self-monitoring of target behavior can be reactive despite the absence of a treatment intervention. Generally, the reactive behavioral change is in a therapeutic direction such that the targeted problem behavior tends to decrease (Barlow, Hayes, & Nelson 1984). In the present study, it is likely that both the weakening of stimulus control due to the passage of time and the introduction of reactivity process due to the implementation of self-monitoring contributed to the discrepancy between retrospective and concurrent diary monitoring.

A third contributing factor to the discrepancy between retrospective and concurrent reports of panic attack frequency is that subjects may exaggerate panic symptoms because they are unable to discriminate between full-blown panic attacks and high fluctuating anxiety. In the present study, subjects were given both a definition of a full-blown panic attack and a definition of an episode of
intense anxiety or near panic during the intake interview. Subsequently, subjects were instructed to begin recording each type of anxiety on the appropriate diaries immediately after the interview. Thus, the self-monitoring procedure may have forced subjects to initiate a discrimination between the two types of anxiety, and thereby reduced the number of reported panic attacks.

Although similar rates of decline in panic frequency to those of Margraf et al. (1987) and Rapee et al. (1988) were obtained, subjects in the present study reported fewer panic attacks at intake and considerably less during the pretreatment baseline than those in previous studies. These differences may have been due, in part, to the degree of agoraphobic avoidance associated with the Panic Disorder in the different subsamples. Patients who display associated phobic avoidance may experience fewer panic attacks because they avoid fear provoking stimuli (e.g. Barlow & Beck, 1984; Thyer & Himle, 1985). One of the criteria for participation in the present study was a moderate degree of phobic avoidance; whereas, subjects in the Margraf et al. (1987) and Rapee et al. (1988) studies primarily suffered from Panic Disorder without agoraphobic avoidance.

In summary, the large discrepancies between retrospective and concurrent measures of panic attacks observed in this study are consistent with that reported in
previous research. Subject’s reports of panic frequency may be affected by the passage of time, the reactivity process, and the type of self-monitoring procedure used in the study. Although the rate of decline in panic attack frequency was similar to those reported by other researchers, subjects reported fewer panic attacks during the pretreatment baseline in the present study. This may have been affected by the degree of agoraphobic avoidance required for participation in this study.

Despite the low panic attack frequency reported in the present study, the major characteristics of the small sample of panic attacks were remarkably similar to larger samples. For example, Margraf et al.’s (1987) subjects reported panic attacks with a mean duration of 25.3 min, intensity level of 5.6, and a mean number of panic symptoms of 3.3. Subjects in the present study reported a mean duration, distress level, and number of symptoms of: 29.6 min, 5.5, and 6.3, respectively. The greater number of panic symptoms reported in this sample may have been due to the fewer number of panic attacks. That is, when panic attacks occur more infrequently, patients may be more disturbed by their recurrence and report a greater number of symptoms than patients who experience several attacks a week.

Implications for Cognitive-Behavioral Treatment Approaches

This study demonstrated that cognitive and exposure
components are effective in reducing distress, avoidance, anticipatory anxiety, and general psychopathology in patients with Panic Disorder with Agoraphobia. To this investigator's knowledge, the present study represents the first attempt to evaluate both the cognitive aspects of treatment apart from exposure, and the additional emphasis on cognitive change or exposure to feared interoceptive cues. Moreover, no other investigation of this nature has attempted to precisely measure the contribution of anticipatory anxiety to the panic disorder syndrome.

The present study was based on Clark's (1986) cognitive model of panic attacks. However, the treatment procedure differed from that employed by Clark and other investigators of panic attacks in that it did not include the breathing retraining component considered to be one of the important factors in treatment success (e.g., Barlow & Cerny, 1988; Clark et al., 1985; Gitlin et al., 1985; Rapee, 1985; Salkovskis, Jones, & Clark, 1986; Salkovskis, Warwick, Clark, & Wessels, 1986). Although no attempt was made to assess the effects of paced breathing in this study, the results suggest that the symptoms characteristic of Panic Disorder with Agoraphobia can be substantially reduced without paced breathing if cognitive therapy and exposure to interoceptive cues are used.

Because the cognitive therapy with brief exposure component was only modestly more effective than the
multiple-session exposure component, the question of which treatment would be more clinically useful warrants further study. The findings of the present study and those of Gitlin et al. (1985) and Kenardy et al. (1988) suggest that patient preference for cognitive therapy reflected in education about panic attacks is likely an important factor in treatment success. Furthermore, not all patients may be able to tolerate multiple exposure trials to feared interoceptive cues. In the present study, one subject dropped out of treatment because she was unable to tolerate hyperventilation exposure. Thus, a combined treatment consisting of cognitive therapy and several trials of exposure to interoceptive cues may be the most acceptable and beneficial treatment for Panic Disorder with Agoraphobia.

The assessment of anticipatory anxiety of having additional panic attacks is an equally important factor in planning treatment. This aspect of panic anxiety is a critical feature of the syndrome which has only recently received attention (e.g., Brier et al., 1986; Klosko et al., 1987; Rapee, 1987; Street et al., 1989).

Theoretical Implications

Cognitive theorists (e.g., Beck, 1985) argue that panic anxiety is maintained by fear schemas or distorted cognitive sets. They contend that these cognitive aspects should be the main focus of change. An alternative
hypothesis is that the crucial element in treatment is exposure to the feared situation including exposure to interoceptive cues (e.g., Barlow, 1986a, 1988; Rapee, 1987). Recently, interoceptive cues have been the primary target for change.

In the present study, all subjects rated the cognitive therapy component as the most beneficial component of treatment. Yet, not all subjects responded to this component. Although distress and avoidance of one or more specific situations decreased in six subjects after cognitive therapy, all subjects rated the effects of hyperventilation similar to their naturally occurring panic attacks 6 weeks after they were first introduced to the educational material about panic attacks. An important finding was that the five subjects in series one gave identical ratings to the similarity of the effects of hyperventilation both after the single hyperventilation trial in the cognitive therapy with brief exposure phase, and after the first trial of the multiple-session exposure phase. This occurred despite the fact that these five subjects had received three additional cognitive therapy sessions. The emphasis on cognitive change during the additional sessions in the cognitive therapy with brief exposure phase was expected to change subjects' catastrophic thoughts related to panic attacks. However, the similarity of panic attacks ratings decreased for
subjects in both series only after they received all of the hyperventilation exposure trials during the multiple-session exposure component. This suggests that more exposure trials to interoceptive cues were necessary to reduce the similarity of the effects of hyperventilation to naturally occurring panic attacks.

Clark (1986) contends that the hyperventilation demonstration is crucial in promoting the patient’s cognitive awareness of changes in internal stimuli and there relationship to panic anxiety. Both the hyperventilation demonstration and the explanation of the sensations produced by the exercise are likely very important in the early stage of treatment. The finding of the present study that ratings of similarity to panic attacks declined only after several trials of hyperventilation exposure, however, suggests that more intense exposure to interoceptive cues may have a longer-term benefit than a single demonstration of exposure. This finding is consistent with Barlow’s (1988) view that additional exposure to feared interoceptive cues likely facilitates emotional processing of feared stimuli to produce longer-lasting treatment gains.

**Recommendations for Future Research**

The present study demonstrated that cognitive therapy combined with a hyperventilation exercise produces clinically significant effects. Additional treatment gains
were produced by exposure to interoceptive cues. Moreover, exposure to interoceptive cues may produce longer-lasting treatment gains. The present study leaves unanswered questions concerning how responsive patients with high depression, state anxiety, and multiple psychiatric symptoms would be to combined treatment. What are the long-term effects of combined treatment on anticipatory anxiety? Would patients find the combined treatment helpful and, if so, why? One subject in the present study dropped out of treatment because she was unable to tolerate the effects of hyperventilation exposure. Would dropouts be less likely to occur with combined treatment? Finally, what are the relative effects of combined treatment and homework exposure assignments? Future investigations should examine the long-term effects of cognitive therapy combined with multiple-exposure to interoceptive cues.
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Association for the Advancement of Behavior Therapy, New York: NY.


APPENDIX A

1. Reliability and Validity of Subject Selection Measures.
3. The Structured Clinical Interview Diagnosis for Panic Disorder (Spitzer, Williams, & Gibbon, 1987).
4. The Fear Questionnaire (Marks & Mathews, 1979).
5. The Global Assessment of Severity Scale (Mavissakalian, Michelson, & Dealy, 1983).
The Reliability and Validity of Instruments Used for Subject Selection

Subjects were selected for participation in the study based on their responses to the following five instruments: the Anxiety Disorders Interview Schedule - Revised (DiNardo & Barlow, 1988), the Structured Clinical Interview Diagnosis for Panic Disorder (Spitzer et al., 1987), the Fear Questionnaire (Marks & Mathews, 1979), the Global Assessment of Severity Scale (Mavissakalian et al., 1983), and the Beck Depression Inventory (Beck et al., 1961). The reliability and validity of the instruments are described below.

The original version of the Anxiety Disorders Interview Schedule (DiNardo, O’Brien, Waddell, & Blanchard, 1983) provided a differential diagnosis among the anxiety disorder categories and affective disorders in the American Psychiatric Association’s (1980) Diagnostic and Statistical Manual of Mental Disorder’s (DSM-III). The reliability for discriminating between specific anxiety disorders was kappa = .65 for Panic Disorder, kappa = .85 for Agoraphobia with Panic Attacks, and kappa = .57 for Generalized Anxiety Disorder. For discriminating between the anxiety disorders and affective disorders, the reliability was kappa = .70.

The Anxiety Disorders Interview Schedule - Revised was developed for the most recently revised edition of the American Psychiatric Association’s (1987) Diagnostic and
Statistical Manual of Mental Disorder's (DSM-III-R). The structured interview format is much improved. However, the reliability data on the revised version are not yet available.

In the present study, the Anxiety Disorders Interview Schedule - Revised was modified for the telephone interview of approximately 45 min duration. The interrater reliability for using other standardized structured interviews for diagnosing Panic Disorder with Agoraphobia in personal and telephone interviews was .69 to .84 (e.g., Paulsen, Crowe, Noyes, & Pfohl, 1988).

The Structured Clinical Interview Diagnosis for Panic Disorder (Spitzer, Williams, & Gibbon, 1988) provides a systematic evaluation of DSM-III-R criteria for Panic Disorder with or without Agoraphobia. The instrument is currently being used in a large collaborative Panic Disorder study sponsored by Upjohn Company involving more than 1100 subjects (Klerman, 1988). Although the reliability data on Panic Disorder are not yet available for citation (SCID Newsletter, personal communication, June 1, 1988), interrater reliability is reported for differentiating Generalized Anxiety Disorder and for differentiating depression from other psychiatric disorders (Riskind, Beck, Berchick, Brown, & Steer, 1987). As measured by Cohen's kappa, the reliability for Generalized Anxiety Disorder versus other diagnoses was .79. The
reliability for depression versus other disorders was .72.

The Fear Questionnaire (Marks & Mathews, 1979) includes a main target phobia which is individualized for each patient. (For the present study, two additional individualized target phobias [i.e., subsidiary avoidances] were added to the questionnaire to measure phobic avoidance in other situations). The questionnaire also includes five items measuring anxiety/depression, and three categories of clinical phobias: agoraphobia, social phobia, and blood injury phobia. Each clinical phobia category consists of five items.

The test-retest reliability based on 20 phobic patients with a retest interval of 7 days was .93 for the main target phobia, .82 for the anxiety/depression scale, and .82 for the three subscales combined. Based on the responses of 48 Agoraphobic patients at pre-treatment, after 4 and 8 wks, and a post-treatment, Mavissakalian (1986a) found that the validity of the instrument was good and that it was sensitive to therapeutic change.

The Global Assessment of Severity Scale (Mavissakalian et al., 1983) was used in an early study to discriminate the symptom severity of 21 Agoraphobics by two independent assessors (Marks & Gelder, 1965). These researchers report that disagreements occurred in 13% of the cases. Conversely, Mavissakalian et al. report consensual agreement on their total sample of 18 Agoraphobic
patients. These different results may be due to procedural differences. In the Marks and Gelder study, symptom severity was determined from patient records; whereas, in the Mavissakalian and Michelson study, symptom severity was determined by directly interviewing patients.

In the present study, the assessor and investigator independently rated symptom severity immediately after directly interviewing subjects. Consensual agreement was obtained on the ratings of 10 of 11 subjects during the pre-treatment interview. In the single case of disagreement, the lowest score was assigned to prevent a false-positive inclusion into the study. At 6 weeks follow-up, the interrater reliability was 100% following independent interviews with subjects.

The Beck Depression Inventory has been employed in over 1000 research investigations in the past 25 years. According to Beck (1967), the mean depression classifications are: minimal 10.9 (SD = 8.1), mild 18.7 (SD = 10.2), moderate 25.4 (SD = 9.6), and severe 30.0 (SD = 10.4). Beck, Steer, & Garbin (1988) reviewed the studies (involving 30 or more patients) that focused on the psychometric properties of the Beck Depression Inventory. The following conclusions were drawn on the reliability and the validity of the instrument: (1) The 10 studies which assessed the reliability of the instrument produced Pearson product-moment correlation coefficients ranging from 0.48
to 0.86 for psychiatric patients and 0.60 to 0.83 for nonpsychiatric subjects. (2) To determine content validity, the Beck was compared to DSM-III (1980) criteria. Six of the nine DSM-III criteria were well reflected in the Beck Depression Inventory. Two criteria (i.e., losses in appetite and diurnal sleep variations) are partially addressed in the Beck, while one of the criteria (i.e., psychomotor activity and agitation) is absent from the inventory. According to Beck et al. (1988), the questions on increases in appetite and variations in sleep patterns were deliberately excluded because they occur relatively infrequently in severely depressed individuals, but very frequently in normals. Thus, their inclusion would result in a high rate of false-positives. Agitation was also deliberately omitted because it is a behavior that can be directly observed by the clinician and was considered to be inappropriate for a self-report measure.

Copies of the five instruments used for subject selection are included in the remainder of this Appendix. The questionnaires and self-rating scales are: the Anxiety Disorders Interview Schedule - Revised (DiNardo & Barlow, 1988) that was modified for the telephone interview, the Structured Clinical Interview Diagnosis for Panic Disorder (Spitzer et al., 1987), the Fear Questionnaire (Marks & Mathews, 1979), the Global Assessment of Severity Scale (Mavissakalian et al., 1983), and the Beck Depression Inventory.
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Inventory (Beck et al., 1961).
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THE ANXIETY DISORDERS INTERVIEW SCHEDULE-REVISED-MODIFIED-VERSION
FOR TELEPHONE INTERVIEW TAKEN FROM DINARDO & BARLOW, 1988

Patient's Name_________________________ Phone____________________
Address_________________________________________----------------
Current Date______________ Referral Date______________

PANIC DISORDER WITH LIMITED AVOIDANCE

1. Can you give me an idea of what sorts of problems you have had lately?
-------------------------------------------------------------
-------------------------------------------------------------
-------------------------------------------------------------

2. Have you have had any type of treatment for these problems or similar problems recently or in the past?
   Yes____ No_____ If yes, describe what type of treatment.
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

3. Have you had times when you have felt a sudden rush of intense fear or anxiety or feeling of impending doom?
   YES____   NO____

4. What kinds of bodily sensations or symptoms do you experience when you have these feelings or attacks?
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   Any trouble:  catching your breath________________________
   smothering___________________________________________
   choking sensations___________________________________
   chest pain or discomfort_______________________________
   heart racing________________________________________
   dizziness, lightheadedness or unsteady feelings___________
   numbness or tingling sensations________________________
   Other________________________________________________
5. Can you tell me about the very first time that you experienced a panic attack? Tell me some of the details such as where you were, what you were doing at time of the attack, the kind of bodily sensations that you felt, and what you were thinking.

6. Can you identify any places, people, events, or medical reasons (e.g., asthma) for these attacks either before or during the attack?  
   YES___  NO___

7. Approximately how many minutes do these attacks last?

8. How many times in a week do you experience these attacks?

9. Do you have any physical problems that you or your regular doctor thinks might cause these attacks (i.e., inner ear problems, hypoglycemia, problems with your thyroid, heart, or joints)?

10. In what situations do you have these attacks?

11. Do you ever avoid going places or doing things because of these attacks?  
    YES___  NO___
12. What kinds of situations or things do you avoid?

13. What is the major fear that you want treated?

14. Could you tell me a specific situation that you might avoid because of fear or other unpleasant feelings.

15. On a scale of 0 to 8, how much do you avoid that situation because of your major fear?

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>never avoid it</td>
</tr>
<tr>
<td>1</td>
<td>avoid it sometimes</td>
</tr>
<tr>
<td>2</td>
<td>avoid it about 50%</td>
</tr>
<tr>
<td>3</td>
<td>avoid it most of the time</td>
</tr>
<tr>
<td>4</td>
<td>avoid it almost always</td>
</tr>
<tr>
<td>5</td>
<td>avoid it always</td>
</tr>
</tbody>
</table>

16. How long ago did these attacks start?

17. Were you under a lot of stress in your life when these attacks started? Could you tell me a little about it?

CURRENT MEDICATIONS

1. Are you currently taking any medications? YES____  NO____

2. What kind of medications are you taking? Purpose of each?

ALCOHOLISM AND DRUG ABUSE

1. Have you ever tried to cope with your anxiety by using alcohol? What about using drugs?

   YES____  NO____  When?____________  How much?____________
MAJOR DEPRESSIVE EPISODE

1. Did you ever have a period of time when you felt depressed, sad, hopeless, or lost interest in almost all of your usual activities?
   YES___  NO___

2. Have you ever been hospitalized for these feelings?
   YES___  NO___

3. Have you been feeling this way nearly every day for the last two weeks?
   YES___  NO___

SOCIAL PHOBIA

1. In social situations where you might be observed or evaluated by others do you feel fearful?
   YES___  NO___

2. Are you overly concerned that you may do and/or say something that might embarrass or humiliate yourself in front of others, or that others may think badly of you?
   YES___  NO___

3. Do you try to avoid these situations all together?
   YES___  NO___

4. What kinds of social situations do you usually avoid?

POST TRAUMATIC STRESS DISORDER

Do you remember any extremely stressful, life threatening, or traumatic event such as serious physical injury, physical or sexual abuse, rape, assault, or combat which happened to you prior to your experiencing anxiety or the other problems you’re having?

YES___  NO___  Which of these do you recall?_________

OBSESSIVE-COMPULSIVE DISORDER

Are you bothered by thoughts or images that keep recurring to you that are unreasonable or nonsensical that you can’t stop from coming into your mind? This is not the same as worrying about things that might happen. I mean things like repetitive thoughts about hurting or poisoning someone, or shouting obscenities in public, or horrible images such as your family involved in a car accident.

YES___  NO___
NON-ORGANIC PSYCHOSIS

1. Has there ever been a period of time when you had strange or unusual experiences such as:
   Hearing or seeing things that other people didn't notice?       YES____ NO____

2. When did this occur and what was it like?

3. Have you ever been hospitalized for this problem?
   YES____ NO____

==========================================================================

DISPOSITION OF CASE

1. Accepted for intake.       YES____ NO____

2. Inform patient that we require a medical referral from their physician providing details of their general health and any significant medical conditions prior to treatment. Request that they ask their physician to send a letter of referral to Dr. John Walker, H-4, Dept. of Psychiatry, St. Boniface General Hospital, Wpg., MB, R2H 2A6.

3. Patient scheduled for appointment with intake therapist
   Yes____ Date scheduled________________
   No_______ If no, why?_____________________________________

4. Additional comments_____________________________________

                           ________________________________
                           ________________________________
                           ________________________________
                           ________________________________
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THE STRUCTURED CLINICAL INTERVIEW DIAGNOSIS FOR PANIC DISORDER
(SPIZTER ET AL., 1987)

<table>
<thead>
<tr>
<th>PANIC DISORDER</th>
<th>PANIC DISORDER CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever had a panic attack, when you <strong>suddenly</strong> felt frightened, anxious or extremely uncomfortable?</td>
<td></td>
</tr>
<tr>
<td>IF YES: Tell me about it. When does that happen? (Have you ever had one when you didn't expect to at all?)</td>
<td></td>
</tr>
</tbody>
</table>

Have you ever had four attacks like that in a four week period?

IF NO: Did you worry a lot about having another one? (How long did you worry?)

When was the last bad one (expected or unexpected)?

Now I am going to ask you about that attack. What was the first thing you noticed? Then what?

During that attack...

...were you short of breath? (Have trouble catching your breath?)

...did you feel dizzy, unsteady, or like you might faint?

...did you heart race, pound, or skip?

...did you tremble or shake?

<table>
<thead>
<tr>
<th></th>
<th>shortness of breath (dyspnea)</th>
<th>dizziness, unsteady feelings,</th>
<th>palpitations or accelerated heart rate (tachycardia)</th>
<th>trembling or shaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>?</td>
<td>1 = absent or false 2 = subthreshold 3 = threshold or true</td>
<td>1 = absent or false 2 = subthreshold 3 = threshold or true</td>
<td>1 = absent or false 2 = subthreshold 3 = threshold or true</td>
<td>1 = absent or false 2 = subthreshold 3 = threshold or true</td>
</tr>
</tbody>
</table>

? = inadequate information 1 = absent or false 2 = subthreshold 3 = threshold or true
During that attack...

...did you sweat? (5) sweating ? 1 2 3

...did you feel as if you were choking? (6) choking ? 1 2 3

...did you have nausea or upset stomach or the feeling that you were going to have diarrhea? (7) nausea or abdominal distress ? 1 2 3

...did things around you seem unreal or did you feel detached from things around you or detached from part of your body? (8) depersonalization or derealization ? 1 2 3

...did you have tingling or numbness in parts of your body? (9) numbness or tingling sensations (paresthesias) ? 1 2 3

...did you have flushes (hot flashes) or chills? (10) flushes (hot flashes) or chills ? 1 2 3

...did you have chest pain or pressure? (11) chest pain or discomfort ? 1 2 3

...were you afraid that you might die? (12) fear of dying ? 1 2 3

...were you afraid you were going crazy or might lose control? (13) fear of going crazy or of doing something uncontrolled ? 1 2 3

AT LEAST FOUR "C" SYMPTOMS ARE CODED "3" 1 3

NOTE: ATTACKS INVOLVING FOUR OR MORE SYMPTOMS ARE PANIC ATTACKS; ATTACKS INVOLVING FEWER THAN FOUR SYMPTOMS ARE LIMITED SYMPTOM ATTACKS (SEE "AGORAPHOBIA WITHOUT HISTORY OF PANIC DISORDER", P. 7).

? = inadequate information 1 = absent or false 2 = subthreshold 3 = threshold or true
When you have bad attacks, how long does it take from when it begins to when you have most of the symptoms? (Is it often less than ten minutes?)

Just before you began having panic attacks, were you taking any drugs, stimulants or medicines?

IF YES: Did you keep having the attacks after you stopped? (For how long?)

Were you physically ill? (What did the doctor say?)

IF YES: Did you ever have these attacks when you weren't (taking any drugs or medicines, physically ill?)

D. During at least some of the attacks, at least four of the "C" symptoms developed suddenly and increased in intensity within ten minutes of the beginning of the first "C" symptom noticed in the attack.

E. It cannot be established that an organic factor initiated and maintained the disturbance (e.g., Amphetamine or Caffeine Intoxication, hyperthyroidism)

NOTE: Mitral valve prolapse may be an associated condition, but does not preclude a diagnosis of Panic Disorder.

NOTE: CODE "3" IF SUBSTANCE USE OF PHYSICAL ILLNESS WAS NOT ETIOLOGIC TO PANIC ATTACKS.

PANIC DISORDER CRITERIA
A, B, C, D, AND E, ARE CODED "3"
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PANIC DISORDER SUBTYPE

IF NOT OBVIOUS FROM OVERVIEW:

Have there been situations or places that you avoided because you were afraid that you might have an attack?

(Tell me all the things you avoided, or could do only when someone was with you, or by forcing yourself.)

What about...

...being at home alone?

...shopping alone in a big store?

...walking far from home alone?

...crossing busy or wide streets alone?

...being alone in a crowded place—like a movie theatre, a church, or a restaurant?

...using public transportation—like a bus, train, or subway—or driving a car?

IF NOT OBVIOUS: What effect did avoiding (AGORAPHOBIC SITUATIONS) have on your life?

WITH AGORAPHOBIA

Fear of being in places or situations from which escape might be difficult (or embarrassing), or in which help might not be available, in the event of a panic attack. (Include cases in which persistent avoidance behavior originated during an active phase of Panic Disorder, even if the person does not attribute the avoidance behavior to fear of having a panic attack.)

As a result of this fear, the person either restricts travel or needs a companion when away from home, or else endures agoraphobic situations despite intense anxiety. Common agoraphobic situations include being outside the home alone, being in a crowd or standing in a line, being on a bridge, traveling in a bus, train, or car.

<table>
<thead>
<tr>
<th></th>
<th>PANIC DISORDER</th>
<th>PANIC DISORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WITHOUT</td>
<td>WITH</td>
</tr>
<tr>
<td>AGORAPHobia</td>
<td>AGORAPHobia</td>
<td></td>
</tr>
</tbody>
</table>

? = inadequate information 1 = absent or false 2 = subthreshold 3 = threshold or true
**Chronicity of Panic Disorder**

IF UNCLEAR: During the past month, how many panic attacks have you had?

<table>
<thead>
<tr>
<th>Has met symptomatic criteria for Panic Disorder during past month, i.e., at least 4 panic attacks OR persistent fear of having a panic attack (or agoraphobic avoidance).</th>
</tr>
</thead>
<tbody>
<tr>
<td>?</td>
</tr>
</tbody>
</table>

When did you last have (ANY SX OF PANIC DISORDER)?

<table>
<thead>
<tr>
<th>Number of months prior to interview when last had a symptom of Panic Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
</tr>
</tbody>
</table>

**Severity of Panic Attacks:**

1 **Mild:** During the past month, either all attacks have been limited symptom attacks (i.e., fewer than four sx/s), or there has been no more than one panic attack.

2 **Moderate:** During the past month, attacks have been intermediate between "Mild" and "Severe".

3 **Severe:** During the past month, there have been at least eight panic attacks.

4 In Partial Remission: Intermediate between "In Full Remission" and "Mild".

5 In Full Remission: During the past six months, no panic or limited symptom attacks.

**Severity of Agoraphobia Avoidance:**

1 Never had agoraphobic avoidance.

2 **Mild:** During past month, some avoidance (or endurance with distress), relatively normal lifestyle, e.g., travels unaccompanied when necessary, such as to work or to shop; otherwise avoids travelling alone.

3 **Moderate:** During past month, avoidance results in constricted lifestyle, e.g., able to leave house alone but not able to go more than a few miles unaccompanied.

? = inadequate information  1 = absent or false  2 = subthreshold  3 = threshold or true
| 4 Severe: | During past month, avoidance results in being nearly or completely housebound or unable to leave house unaccompanied. |
| 5 In Partial Remission: | No current agoraphobic avoidance, but some agoraphobic avoidance during the past six months. |
| 6 In Full Remission: | No current agoraphobic avoidance and none during the past six months. |

*Past Five Years*

<table>
<thead>
<tr>
<th>Approximate percentage of time during past five years that any symptoms of Panic Disorder were present.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Not at all (0%)</td>
</tr>
<tr>
<td>2 Rarely (e.g., 5-10%)</td>
</tr>
<tr>
<td>3 A significant minority of the time (e.g., 20-30%)</td>
</tr>
<tr>
<td>4 About half the time</td>
</tr>
<tr>
<td>5 A significant majority of the time (e.g., 70-80%)</td>
</tr>
<tr>
<td>6 Almost all the time (e.g., 90-100%)</td>
</tr>
<tr>
<td>9 Unknown</td>
</tr>
</tbody>
</table>

How old were you when you first started having a lot of panic attacks (or worried all the time that you might have one?)

Age at onset of Panic Disorder (at least four attacks over a four-week period or one or more attacks followed by persistent fear of having another attack) (CODE 99 IF UNKNOWN)

?=inadequate information 1=absent or false 2=subthreshold 3=threshold or true
THE FEAR QUESTIONNAIRE (MARKS & MATHEWS, 1979)

Your Initials: ___________________________ Date: ___________________________

1. Describe in your own words on the line below the major fear that you want treated:

   ________________________________________________________________

2. Circle a number from the scale below to indicate how distressing this fear is to you.

   0 1 2 3 4 5 6 7 8
   not at all slightly moderately very extremely
   distressing distressing distressing distressing distressing

3. Do you currently avoid any situations because of the major fear that you want treated?
   Circle one: YES or No

   Choose a number from the scale below to indicate how much you would avoid each situation listed below because of fear or other unpleasant feelings. Then, write the number you chose in the space opposite each item.

   0 1 2 3 4 5 6 7 8
   never sometimes avoid it avoid it always avoid it
   it it of the time the time it

   ** Your major fear that you described above ........................................
   1. Injections or minor surgery.........................................................
   2. Eating or drinking with other people...........................................
   3. Hospitals.................................................................
   4. Travelling alone by bus.........................................................
   5. Walking alone in busy streets...................................................
   6. Being watched or stared at......................................................
   7. Going into crowded stores....................................................... 
   8. Talking to people in authority...................................................
   9. Sight of blood.................................................................
   10. Being criticized...................................................................
   11. Going alone far from home......................................................
   12. Thought of injury or illness.....................................................
   13. Speaking or acting to an audience.............................................
   14. Large open spaces.............................................................
   15. Going to the dentist............................................................
   16. Visiting a person who is seriously ill or dying..........................
   17. Encountering things which remind you of death......................

   Tot.: _______ Ag.: _______ Bl.: _______ Soc.: _______ D.: _______ M.F.: _______

If you avoid any other situations because of the major fear that you want treated, list these situations and choose a number from the scale above to indicate how much you avoid them.

   18. .....................................................................................................
   19. .....................................................................................................
Cognitive and Exposure Treatments

Choose a number from the scale below to indicate how often you experience the following. Write the number in the space opposite each item.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>never</td>
<td>rarely</td>
<td>sometimes</td>
<td>often</td>
<td>most of the time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Feeling unhappy or depressed.
2. Feeling irritable or angry.
3. Feeling tense or panicky.
4. Upsetting thoughts coming into your mind.
5. Feeling you or your surroundings are strange or unreal.
6. Worries about your own death.
7. Worries about the deaths of people close to you.
8. Worries about having a serious illness or injury.
9. Worries about someone close to you having a serious illness or injury.
10. Thoughts of a painful illness or death.
11. Feeling anxious or depressed when you encounter things which remind you of death.

Now, we would like you to rate the same items again. This time, do NOT think about how often they happen. Instead, think of how much you are troubled by them when they happen. Write the number in the space opposite each item.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardly at all</td>
<td>Slightly troublesome</td>
<td>Moderately troublesome</td>
<td>Definitely troublesome</td>
<td>Extremely troublesome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Feeling unhappy or depressed.
2. Feeling irritable or angry.
3. Feeling tense or panicky.
4. Upsetting thoughts coming into your mind.
5. Feeling you or your surroundings are strange or unreal.
6. Worries about your own death.
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8. Worries about having a serious illness or injury.
9. Worries about someone close to you having a serious illness or injury.
10. Thoughts of a painful illness or death.
11. Feeling anxious or depressed when you encounter things which remind you of death.
THE GLOBAL ASSESSMENT OF SEVERITY SCALE (MAVISSAKALIAN et al., 1983)

Rating to be completed by therapist and assessor, independently before treatment and at 6 weeks follow-up.

Circle the score that indicates the patient's current level of functioning with respect to work and social activities.

1. Son. no complaints and normal activity.

2. symptoms complained of by patient but not interfering with normal work or social activities.

3. symptoms interfering with normal work or social activities.

4. normal work or social activities interfered with markedly but not prevented or radically changed.

5. normal work or social activities either radically changed or prevented.
THE BECK DEPRESSION INVENTORY (BECK ET AL., 1961)

BECK INVENTORY

Name ___________________________ Date ___________________________

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY. Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1 0 I do not feel sad.
1 1 I feel sad.
1 2 I am sad all the time and I can’t snap out of it.
1 3 I am so sad or unhappy that I can’t stand it.

2 0 I am not particularly discouraged about the future.
2 1 I feel discouraged about the future.
2 2 I feel I have nothing to look forward to.
2 3 I feel that the future is hopeless and that things cannot improve.

3 0 I do not feel like a failure.
3 1 I feel I have failed more than the average person.
3 2 As I look back on my life, all I can see is a lot of failures.
3 3 I feel I am a complete failure as a person.

4 0 I get as much satisfaction out of things as I used to.
4 1 I don’t enjoy the things I used to.
4 2 I don’t get real satisfaction out of anything anymore.
4 3 I am dissatisfied or bored with everything.

5 0 I don’t feel particularly guilty.
5 1 I feel guilty a good part of the time.
5 2 I feel quite guilty most of the time.
5 3 I feel guilty all of the time.

6 0 I don’t feel I am being punished.
6 1 I feel I may be punished.
6 2 I expect to be punished.
6 3 I feel I am being punished.

7 0 I don’t feel disappointed in myself.
7 1 I am disappointed in myself.
7 2 I am disgusted with myself.
7 3 I hate myself.

8 0 I don’t feel I am any worse than anybody else.
8 1 I am critical of myself for my weaknesses or mistakes.
8 2 I blame myself all the time for my faults.
8 3 I blame myself for everything bad that happens.

9 0 I don’t have any thoughts of killing myself.
9 1 I have thoughts of killing myself, but I would not carry them out.
9 2 I would like to kill myself.
9 3 I would kill myself if I had the chance.

10 0 I don’t cry any more than usual.
10 1 I cry more now than I used to.
10 2 I cry all the time now.
10 3 I used to be able to cry, but now I can’t cry even though I want to.

11 0 I am no more irritated now than I ever am.
11 1 I get annoyed or irritated more easily than I used to.
11 2 I feel irritated all the time now.
11 3 I don’t get irritated at all by the things that used to irritate me.

12 0 I have not lost interest in other people.
12 1 I am less interested in other people than I used to be.
12 2 I have lost most of my interest in other people.
12 3 I have lost all of my interest in other people.

13 0 I make decisions about as well as I ever could.
13 1 I put off making decisions more than I used to.
13 2 I have greater difficulty in making decisions than before.
13 3 I can’t make decisions at all anymore.

14 0 I don’t feel I look any worse than I used to.
14 1 I feel I look worse than I used to.
14 2 I feel I look as bad as I used to.
14 3 I feel I look even worse than I used to.

15 0 I can work as well as before.
15 1 It takes an extra effort to get started at doing something.
15 2 I have to push myself very hard to do anything.
15 3 I can’t do any work at all.

16 0 I can sleep as well as usual.
16 1 I don’t sleep as well as I used to.
16 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
16 3 I wake up several hours earlier than I used to and cannot get back to sleep.

17 0 I don’t get more tired than usual.
17 1 I get tired more easily than I used to.
17 2 I get tired from doing almost anything.
17 3 I am too tired to do anything.

18 0 My appetite is as good as it used to be.
18 1 My appetite is not as good as it used to be.
18 2 My appetite is much worse now.
18 3 I have no appetite at all anymore.

19 0 I haven’t lost much weight, if any, lately.
19 1 I have lost more than 10 pounds in the past year.
19 2 I have lost more than 10 pounds by eating less.
19 3 I have lost more than 15 pounds.

20 0 I am no more worried about my health than usual.
20 1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
20 2 I am very worried about physical problems and it’s hard to think of much else.
20 3 I am so worried about my physical problems that I cannot think about anything else.

21 0 I have not noticed any recent change in my interest in sex.
21 1 I am less interested in sex than I used to be.
21 2 I am much less interested in sex now.
21 3 I have lost interest in sex completely.
APPENDIX B

The Treatment Rationale and Patient Consent Form
Cognitive and Exposure Treatments

THE TREATMENT RATIONALE AND PATIENT CONSENT FORM

Panic Disorder/Agoraphobia: Evaluation of a New Treatment Program

This program, for the treatment of panic disorder/agoraphobia, is a research project conducted by Ms. Vivienne Rowan through the Anxiety Disorders Clinic in the Department of Psychiatry at St. Boniface General Hospital. The purpose of the project is to evaluate a combined treatment involving cognitive behavior therapy and breathing retraining. The treatment program has been specifically designed to help people overcome problems with panic attacks and phobia. While this treatment has been evaluated in Europe and the United States and found to be very helpful, it is not widely available elsewhere in Canada.

Medical Referral. Before treatment begins, you will be required to have a medical referral from your physician providing details of your general health and any significant medical conditions such as heart or lung problems.

Treatment Program. Behavior therapy has been found to be an effective method of helping many people with anxiety problems. In this treatment program, we will be assessing your thoughts and feelings about anxiety, teaching you cognitive coping strategies to deal with these anxious thoughts and feelings, using over-breathing techniques to demonstrate how easily anxious thoughts, feelings, and panic symptoms can be created and managed in the therapist's office, and teaching you paced breathing and how to approach anxiety producing situations. Although these techniques will create some feelings of anxiety which, in some cases, may progress to a panic attack, the procedure can help you learn to control anxiety and panic in your everyday life. There is research evidence to suggest that this form of therapy is a safe and effective way of treating panic attacks; however, cognitive behavior therapy combined with breathing retraining requires additional, detailed research. Ms. Rowan will be meeting with you for approximately one hour twice a week throughout the treatment phase of the study. After treatment, you will be seen at weeks 1, 4, 7. Sessions will be conducted in the McEwen Building at St. Boniface General Hospital.

Research Component

In order to provide effective treatment programs, it is necessary for us to evaluate carefully the problems and responses to treatment of individuals involved in our programs. The more we understand panic attacks and phobias, the more effectively we can treat them.

Measures. You will be required to fill out daily diaries throughout your entire treatment program so that we can evaluate your response to treatment continuously. In addition, you will be required to complete a package of questionnaires periodically during the course of and following the termination of your treatment program so that we can assess your response to treatment.
Research Personnel. Treatment will be conducted primarily by Ms. Vivienne Rowan, a graduate student in the Clinical Psychology Program at the University of Manitoba. She is experienced in providing treatment for various types of anxiety problems. Ms. Rowan is supervised by a clinical psychologist, Dr. John Walker from St. Boniface Hospital and by faculty advisors, Drs. Robert Tait and Stephen Holborn from the Psychology Department at the University of Manitoba. In addition, Ms. Rowan will be assisted by another graduate student in the Clinical Psychology Program who will be conducting a brief screening procedure to determine your suitability for participation in the study.

PATIENT CONSENT

I, ________________, have been informed of the nature of the panic disorder/agoraphobia research project by _______________________________ and consent to participate in it.

I understand that the project is an evaluation of the effects of cognitive behavior therapy combined with breathing retraining for the treatment of panic disorder/agoraphobia as described above.

Voluntary Participation

I understand that my participation is voluntary and that I may withdraw at any time that I wish with no penalty. If I wish, an alternate form of treatment will be arranged. However, I also understand that I am requested not to start any other form of treatment for anxiety without first discussing it with the staff involved in this treatment program. In addition, I agree to inform Ms. Rowan of any other medical or psychological treatment initiated during the course of this treatment program.

Confidentiality

I have been further informed that personal information regarding my treatment is confidential and may only be shared with the therapists and supervisors at St. Boniface General Hospital or the University of Manitoba involved in my treatment or the research project. The evaluation information gathered during the program will be used for research purposes; however any details that may reveal my identity will be excluded from any research reports. I also understand that a brief assessment and treatment report will be sent to the physician or agency that referred me for treatment of anxiety and panic.

______________________________  ______________________________
SIGNATURE                  DATE

______________________________
WITNESS
APPENDIX C

1. The Rationale for Cognitive Therapy.

Cognitive and Exposure Treatments

The Rationale for Cognitive Therapy

During the cognitive therapy phase, subjects were given a diagram of the model of "A Cognitive Approach to Panic" (Clark, 1986) and the rationale for treatment. The model describes panic anxiety as a vicious circle that is triggered, primarily, by internal stimuli (thoughts, images and normal physiological activity) which create apprehension and increased bodily sensations. The person perceives the bodily sensations as threatening an impending catastrophe such as a heart attack. As the cycle proceeds, their anxiety may escalate to the level of a full-blown panic attack. The rationale was presented to subjects as described below.

This model proposes that a wide range of things or factors appear to provoke panic attacks. The provoking factors can be external (such as a supermarket for a person who has previously had an attack in that situation), but more often they are internal factors (thoughts, images or body sensations). If the factors are perceived as posing an immediate threat, a state of apprehension results. The state of apprehension is accompanied by a wide range of thoughts and bodily sensations. If these internal factors are interpreted in a catastrophic manner, a further increase in apprehension occurs. This results in
a further increase in thoughts, images, and body sensations which continues on in a vicious circle until it culminates in a panic attack.

**Types of Panic Attacks**

The model can deal with different types of attacks: (1) panic attacks which are preceded by a period of heightened anxiety, and (2) attacks which appear to "come out of the blue". With panics that are preceded by a period of heightened anxiety, two types of attacks can be distinguished. In the first case, the heightened anxiety that precedes that attack is concerned with thoughts in anticipation of having an attack. This often happens when a person experiences an attack in a situation (such as a supermarket) where they have previously panicked. When entering such a situation, they tend to become anxious by thinking that they are going to have another attack. Then, they selectively focus on their body; notice an unpleasant body sensation; interpret this as evidence of an impending attack; and consequently activate the vicious circle which produces the attack. In other cases, the heightened anxiety which precedes an attack may not be connected with thoughts in anticipation of having an attack.
For example, a person may become nervous as a consequence of discussing an emotional topic during a dispute with a spouse, notice his or her bodily reaction to the argument, catastrophically interpret these sensations, and then panic.

In the case of panic attacks which seem to come out of the blue", the trigger for an attack often seems to be the perception of a bodily sensation which itself emotional state (excitement, anger) or by some quite innocuous event such as suddenly getting up from a sitting position (dizziness, palpitations), or physical exercise (breathlessness, palpitations), or drinking coffee (palpitations). Once perceived, the bodily sensation is interpreted in a catastrophic manner, and then a panic attack results. In such attacks, people often fail to distinguish between the triggering body sensation and the subsequent panic attack, and so perceive the attacks as having no cause and coming "out of the blue". This is understandable given the person's general beliefs about the meaning of an attack. For example, if a person believes that there is something wrong with his/her heart, that person is unlikely to view a heart palpitation which triggers (and becomes part of) a panic
attack as different from the attack itself. Instead, he/she is likely to view both the heart palpitation and the attack as aspects of the same thing - a heart attack or near miss. This type of explanation for the occurrence of spontaneous panic attacks can also be applied to night time attacks, in which the person wakes up in a panic.

Sleep studies have shown that we monitor the external world for personally significant sounds while asleep (e.g., someone whispering our name or the sound of a crying child), and we often have our sleep disturbed or may be woken up by such sounds. It seems reasonable to suppose that we also monitor our internal environment for significant events. If this is the case, then a person who is concerned about his/her heart might have a panic attack triggered by a palpitation which was detected and misinterpreted during sleep. He/she would then wake up in the middle of an attack. In other cases, some people wake up in a panic attack when they have been dreaming of having an attack.

**Which Sensations are Misinterpreted?**

The diagram that we have draw with your thoughts, images, bodily sensations, and things that trigger panic in you suggests that the
misinterpretation of bodily sensations which are similar to symptoms of anxiety is always involved in the vicious circle which culminates in panic attacks. However, other sensations can also play a role in panic, particularly as triggering stimuli. I have already mentioned sensations such as breathlessness and palpitations which sometimes are produced by innocuous events or positive emotions. In addition, occasionally panic attacks are triggered by sensations which, initially, are not part of an anxiety response. For example, feelings of dizziness and disorientation when suddenly getting up from a sitting position are not usually symptoms of anxiety. However, if you are concerned about the possibility of fainting, or losing control, or some kind of physical illness then dizziness and disorientation could trigger a panic attack in you. You might interpret these feelings as a sign of losing control of your body and become anxious. This would further reinforce your belief that there is something seriously wrong with your physical health such as a brain tumor. These kinds of thoughts activate a vicious circle of misinterpretation which increases the symptoms of faintness and disorientation and finally
culminates in a panic attack.

So far we have focused on misinterpretation of sensations which arise from the perception of internal physical processes (e.g. palpitations). These are the most common sensations involved in the production of panic attacks. However, sensations which arise from the misperception of normal mental processes can also contribute to the vicious circle which culminates in a panic attack. For example, for some people the belief that they are about to go crazy is partly based on moments when their mind suddenly goes blank or they experience difficulty in thinking. These moments are interpreted as evidence of impending loss of control over thinking and consequent insanity. It is also important to know that for some people, the panic-triggering sensations and their interpretations of those sensations remain fairly constant across time. But, for other people, both the sensations and interpretations change over time. For example, some people appear to have a rather vague belief that they are going to suffer from some serious illness. This kind of belief leads them to misinterpret a wide range of bodily sensations. The particular misinterpretations will vary depending on which
bodily sensations are noticed, what illnesses they have information about, and what illnesses they have been able to discount.

To summarize what we have discussed in terms of the model, it is important for you to understand that the symptoms you experience during a panic attack can be triggered by internal or external factors. Usually, the factors that trigger panic are internal processes such as thoughts, images, and normal bodily sensations. Often people who have panic attacks do not understand what triggers their attacks. They only know that they are beginning to feel apprehensive that something very frightening is about to happen to them. This sets off thoughts of impending doom. They then focus on their bodily sensations (dizziness, twinges of nausea, difficulty in breathing and so on). By focusing your attention to your body in this way, every little sensation is a signal to you that you are going to have a panic attack. You see, you worry so much about having an attack that you misinterpret normal physiological activity as a sign of an attack. In other words, your thoughts and images about previous panic attacks combine with your present perception of the slightest
bodily sensation which you, in turn, misinterpret as signalling another panic attack. The way to stop this process is to try and identify the things that make you feel apprehensive in the first place. What are the triggers?

Over the next few sessions, we will be reviewing your panic attack diaries and episodes of near panic so that we can work together to identify the thoughts, images, and bodily sensations that trigger apprehension which you misinterpret and causes you to think that you will have a panic attack. This treatment will focus mainly on your thinking patterns about panic attacks.
THE MODEL OF A COGNITIVE APPROACH TO PANIC (CLARK, 1986)

Trigger Stimulus (internal or external)

Perceived Threat

Interpretation of Sensations as Catastrophic

Body Sensations

Apprehension
APPENDIX D

The Rationale for the Physiological Effects of Hyperventilation/Overbreathing.
The Rationale for the Physiological Effects of Hyperventilation/Overbreathing

During the cognitive therapy with brief exposure phase, subjects in series one were given a rationale explaining the physiological effects of hyperventilation after undergoing the "diagnostic test". The rationale was presented to subjects as described below.

Often when people begin to feel apprehensive in various situations or while performing different activities, it is because they are overbreathing. Overbreathing can produce a variety of physical sensations which are not unpleasant in themselves, but can be frightening particularly if they happen when there is no obvious explanation for them. The most common bodily sensations are pins and needles, various feelings in the head or face, dizziness, hot and cold flushes, tight muscles, feeling faint, visual disturbance, palpitations and heart racing, shakiness and other feelings in various parts of the body. Different people get various combinations of these symptoms at different intensities. The same person can get different patterns of symptoms at different times depending on factors such as how tired they are, how long it is since they last ate, how frequently they
exercise, and so on. Overbreathing or hyperventilation involves taking in more air than your body requires when you are breathing. When someone overbreathes, they reduce the amount of carbon dioxide \((\text{CO}_2)\) in their lungs. Because there is a balance between \text{CO}_2 in the blood and \text{CO}_2 in the lungs, this causes \text{CO}_2 to pass out of the blood. Overbreathing therefore results in a substantial reduction in \text{CO}_2 in the blood. This is important for two reasons: (1) because breathing is controlled by \text{CO}_2 levels in the blood and (2) because \text{CO}_2 is part of the blood buffer system.

As \text{CO}_2 goes down, the decrease in \text{CO}_2 is sensed by an area of the brain, which begins to reduce the urge to breathe. The process is very sensible because a decrease in \text{CO}_2 is usually a sign of too much breathing. If overbreathing continues and \text{CO}_2 decreases to lower levels, the reduction in the urge to breathe increases to compensate for the overbreathing. In some cases, if overbreathing becomes too strong, \text{CO}_2 decreases to the extent that the urge to breathe may stop for a period of between a few seconds and two minutes. This happens because your breathing system is designed to return breathing
to normal. The "shut down" in breathing is totally harmless. However, if someone is worried about their breathing, it is very frightening.

A pattern which appears to operate in some people who overbreathe is that, as CO₂ decreases and breathing begins to shut down a little, they notice the shutdown, and interpret the sensations catastrophically (e.g., as a sign that they are about to stop breathing totally and die). This type of worry makes them focus on their breathing, and they try to overcome the perceived difficulty in breathing by breathing more which, in turn, tightens the chest muscles. If they continue to fight the "shutdown" by increasing their overbreathing, the result of the process confirms their worst fears (i.e., their breathing does stop for a few seconds). They often believe that if they had not forced themselves to breathe again, they would have died. If, on the other hand, the person just allows themselves to breathe the way their body tells them to, their breathing soon returns to normal. Difficulty with overbreathing can lead to the person constantly focus on their breathing. The attention to breathing can have two effects: (1) you will notice more irregularities in your
breathing (simply because you are now more aware of it), and (2) your awareness to breathing itself will produce more irregularities, particularly increased breathing. To summarize how overbreathing affects you, it is important for you to understand that the feelings you experience during overbreathing are not harmful to you. Your body makes adjustments when you overbreathe such as when you are participating in physical exercise. It is a normal bodily process. But, if you attend to your breathing as a sign of an impending panic attack rather than a normal body process, you will notice irregularities in your breathing which may then trigger a panic attack. Over the next few sessions, you will be working on the activities and situations in your daily life that make your breathing rate increase and lead you to think that you are going to have a panic attack. This part of treatment will focus on helping you to learn that an increase in breathing while doing many different activities is not harmful. It is a normal body process which has gone on all your life. You simply attend to it more now and worry about it as a sign of a panic attack.
APPENDIX E

The Rationale for Graduated Exposure to Interoceptive Cues.
The Rationale for Graduated Exposure to Interoceptive Cues

At the beginning of the multiple-exposure session phase, subjects were given a rationale which emphasized that panic attacks could be treated directly by graduated exposure to the uncomfortable bodily sensations experienced during panic attacks. The rationale was presented to subjects as described below.

There are a wide range of factors that may trigger panic attacks in your everyday environment. The factors that trigger panic attacks are usually internal bodily sensations such as breathlessness or heart palpitations. To avoid experiencing internal sensations that seem to be related to panic attacks, many people avoid doing things that they previously enjoyed such as jogging, or dancing, or even taking a walk.

Recently, it has been found helpful to teach people to cope with the unpleasant feelings that they experience during panic attacks. In order to overcome the fear of bodily sensations related to panic attacks, we have developed a treatment procedure which involves graduated exposure to your bodily sensations through the use of overbreathing. Overbreathing practice involves gradually increasing the rate and depth of your
breathing over a number of sessions in order to experience bodily sensations similar to those that you feel during panic anxiety. The technique is designed to help you adapt to bodily sensations in a slow and controlled way so that they will not be as frightening when they happen in your everyday life. The goal of overbreathing practice is to help you learn to cope with the unpleasant bodily sensations that you associate with anxiety so that you will no longer be frightened by these feelings.
The Rationale for the Physiological Effects of Hyperventilation/Overbreathing.
The Rationale for the Physiological Effects of Hyperventilation/Overbreathing

During the multiple-exposure session phase, subjects were given the rationale described below. For subjects who had previously completed the cognitive therapy with the hyperventilation demonstration (brief exposure) phase, this was a review to ensure that they understood the physiological effects of overbreathing.

Often when people begin to feel apprehensive in various situations or while performing different activities, it is because they are overbreathing. Overbreathing can produce a variety of physical sensations which are not unpleasant in themselves, but can be frightening particularly if they happen when there is no obvious explanation for them. The most common bodily sensations are pins and needles, various feelings in the head or face, dizziness, hot and cold flushes, tight muscles, feeling faint, visual disturbance, palpitations and heart racing, shakiness and other feelings in various parts of the body. Different people get various combinations of these symptoms at different intensities. The same person can get different patterns of symptoms at different times depending on factors such as how tired they are, how long
it is since they last ate, how frequently they exercise and so on.

Overbreathing or hyperventilation involves taking in more air than your body requires when you are breathing. When someone overbreathes, they reduce the amount of carbon dioxide (CO₂) in their lungs. Because there is a balance between CO₂ in the blood and CO₂ in the lungs, this causes CO₂ to pass out of the blood. Overbreathing therefore results in a substantial reduction in CO₂ in the blood. This is important for two reasons: (1) because your breathing is controlled by CO₂ levels in the blood, and (2) because CO₂ is part of the blood buffer system.

As CO₂ goes down, the decrease in CO₂ is sensed by an area of the brain, which begins to reduce the urge to breathe. The process is very sensible because a decrease in CO₂ is usually a sign of too much breathing. If overbreathing continues and CO₂ decreases to lower levels, the reduction in the urge to breathe increases to compensate for the overbreathing. In some cases, if overbreathing becomes too strong, CO₂ decreases to the extent that the urge to breathe may stop for a period of between a few seconds and two minutes. This happens because your
breathing system is designed to return breathing to normal. The "shut down" in breathing is totally harmless. However, if someone is worried about their breathing, it is very frightening.

A pattern which appears to operate in some people who overbreathe is that, as CO₂ decreases and breathing begins to shut down a little, they notice the shutdown, and interpret the sensations catastrophically (e.g., as a sign that they are about to stop breathing totally and die). This type of worry makes them focus on their breathing, and they try to overcome the perceived difficulty in breathing by breathing more which, in turn, tightens the chest muscles. If they continue to fight the "shutdown" by increasing their overbreathing, the result of the process confirms their worst fears (i.e., their breathing does stop for a few seconds). They often believe that if they had not forced themselves to breathe again, they would have died. If, on the other hand, the person just allows themselves to breathe the way their body tells them to, their breathing soon returns to normal. Difficulty with overbreathing can lead to the person constantly attending to their breathing. The attention to breathing can have two effects: (1)
you will notice more irregularities in your breathing (simply because you are now more aware of it), and (2) your awareness to breathing itself will produce more irregularities, particularly increased breathing.

To summarize what we will be doing in this part of treatment, the overbreathing exercises are way for you to learn that the sensations you experience during overbreathing are not harmful to you. Overbreathing will not cause you to have a heart attack, or go crazy, or lose control of your emotions. The overbreathing exercises are simply a way of showing you that you can recreate bodily sensations similar to those you experience during your panic attacks. By practicing overbreathing and facing feared bodily sensations, you will be able to overcome anxiety related to the bodily sensations which are involved in panic attacks. Over the next few sessions, we will be doing overbreathing exercises and you will be rating how you feel about your bodily sensations and fears of those feelings. Some of these exercises will be done at home so you can get used to the feelings in your everyday life.
APPENDIX G

1. The Reliability and Validity of Dependent Measures.
3. The Panic Attack Diary (Walker et al., 1985).
4. The Pre- and Post-session Anxiety Scale.
5. The Similarities Questionnaire (Clark et al., 1985).
6. The Fear of Bodily Sensations Scale.
8. The Social Desirability Scale (Crowne & Marlowe, 1960).
9. The Anxiety Sensitivity Index (Reiss, Peterson, & Gursky, 1986).
10. The Speilberger State Anxiety Inventory (Speilberger, Gorsuch, & Lushene, 1970).
The Reliability and Validity of the Dependent Measures

Five different classes of dependent variables were employed in the study: daily, weekly, within-session, pre- and post-phase evaluation, and pre- and post-treatment global measures. The reliability and validity (if available) of the instruments are described below.

The Daily Diary and the Panic Attack Diary were developed for use with patients being treated in The Anxiety Disorders Clinic at St. Boniface Hospital (Walker et al., 1985). Although data has been collected on approximately 100 subjects involved in various research projects, the reliability and validity on these measures are not yet available.

The pre- and post-session Anxiety Scale and the Fear of Bodily Sensations Scale were developed for the present study. No reliability or validity are available for these scales.

The Symptom Checklist-90 (Derogatis et al., 1973) is a 90-item self-report inventory which reflects nine primary symptom dimensions typically reported by psychiatric outpatients. The normative scores were developed from a sample of 48 obese normal females. The scores for each of the nine dimensions are: somatization = .72, obsessive-compulsive = .96, interpersonal sensitivity = .96, depression = 1.12, anxiety = .83, hostility = .68, phobic anxiety = .48, paranoid ideation = .73, and psychoticism =
The test-retest reliability from 96 outpatients tested one week apart produced coefficients ranging from .78 for hostility to .90 for phobic anxiety (Derogatis, 1977 cited in Tennen, Affleck, & Herzberger, 1985). Derogatis and Cleary (1977) tested the construct validity of the inventory on 1002 psychiatric outpatients and found it to be a valid indicator of the symptom dimensions with the exception of psychoticism. Some overlap was noted between paranoid ideation and both interpersonal sensitivity and phobic anxiety. However, the investigators suggest the magnitude of overlap was not sufficient to compromise the independence of the constructs. Conversely, Mitchell (1985) contends that Derogatis and Cleary’s findings make the independence of the symptom dimensions questionable.

The Social Desirability Scale (Crowne & Marlowe, 1960) measures behaviors which are culturally approved of and sanctioned, but are highly unlikely to occur. The authors report that a score of 16 or 17 reflects average adjustment. The test-retest reliability was evaluated on 39 undergraduate students who were tested one month apart: The correlation obtained was .89.

There is considerable support for the validity of the Social Desirability Scale if it is used as a trait measure of need for social approval (Crowne, 1979; Millham & Jacobson, 1978; Strickland, 1977). M. Kral (personal communication, June 30, 1989) reports that the scale
measures two dimensions of need for approval: how you actually view yourself, and how you think that others view you. High scores are suggestive of a strong need for social approval; whereas, low scores indicate less need for social approval. Kral interpreted the extremely low score displayed by CP in the present study as an individual who has a strong need for assistance for his presenting problems with anxiety.

The Anxiety Sensitivity Index (Reiss et al., 1986) was developed to determine individual expectations of negative outcomes resulting from anxiety such as illness or embarrassment. The psychometric properties of the scale were tested on two groups of college students and found to have a test-retest reliabilities of .75 (Reiss et al., 1986) and .88 (Peterson & Heilbroner, 1987). The scale's construct validity was tested on 23 Agoraphobics receiving cognitive-behavioral treatment (McNally & Lorenz, 1987). At post-treatment, the scores of the treated patients were equivalent to healthy normal subjects. Therefore, the investigators suggest that the scale is sensitive to cognitive-behavioral treatment effects and recommend that it be employed in treatment studies with subjects who experience panic attacks.

The Spielberger State Inventory (Spielberger et al., 1970) is a self-report instrument that assesses fear or worry at the time of measurement. The test-retest
reliability was assessed at intervals ranging from one hour to 104 days on working adults, military recruits, and college and high school students. The reliability coefficients ranged from .16 to .62. Corcoran and Fischer (1987) comment that the lower level of stability was expected since the scale is sensitive to situational factors present at the time of testing. The validity of the scale was found to range from .86 to .95 (Chaplin, 1984).

Copies of the five different classes of dependent variables (i.e., daily, weekly, within-session, pre and post-phase evaluation, and pre- and post-treatment global measures) employed in the study are included in the remainder of this Appendix. The questionnaires and self-rating scales are: the Daily Diary (Walker et al., 1985), the Panic Attack Diary (Walker et al., 1985), the Pre- and Post-session Anxiety Scale, the Similarities Questionnaire (Clark et al., 1985), the Fear of Bodily Sensations Scale, the Symptom Checklist-90 (Derogatis et al., 1973), the Social Desirability Scale (Crowne & Marlowe, 1960), the Anxiety Sensitivity Index (Reiss et al., 1986), and the Speilberger State Anxiety Inventory (Speilberger et al., 1970).
A panic attack is the sudden, unexpected onset of intense apprehension, fear or terror. Fill in the form immediately after your panic attack finishes.

Please circle the numbers of the bodily sensations or symptoms which occurred during your attack.

1. Shortness of breath or smothering sensations
2. Choking
3. Palpitations or accelerated heart rate
4. Chest pain or discomfort
5. Sweating
6. Faintness
7. Dizziness, lightheadedness or unsteady feelings
8. Nausea or abdominal distress
9. Feeling that you or your surroundings are strange or unreal
10. Numbness or tingling sensations
11. Flashes (hot flashes) or chills
12. Trembling or shaking
13. Fear of dying
14. Fear of going crazy or doing something uncontrolled
15. Desire to flee or escape
16. Difficulty thinking

List in order the numbers of the first 3 symptoms that you experienced: __ __ __

Did you expect that you might panic in this situation? Yes ___ No ___

Time Start: ___ Time Finish: ___

Where were you? ______ With whom? ______

What were you doing before the panic attack? ______

What were you thinking before the panic attack? ______

What did you do after the panic attack? ______

What did you change your plans? ______

What did people around you do? ______

How frightening or distressing were your symptoms? ______

Did you do anything to control or stop your panic attack? If yes, describe fully what you did. ______

How effective was it? ______

(see back of form for additional space)
<table>
<thead>
<tr>
<th><strong>DAILY DIARY</strong></th>
<th><strong>Initials</strong></th>
<th><strong>Day</strong></th>
<th><strong>Date</strong></th>
<th><strong>Upon</strong></th>
<th><strong>6:00</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. How anxious do you feel?</strong></td>
<td>0 1 2 3 4 5 6 7 8</td>
<td>not at all anxious</td>
<td>slightly anxious</td>
<td>moderately anxious</td>
<td>very anxious</td>
</tr>
<tr>
<td><strong>2. How worried are you about having a panic attack?</strong></td>
<td>0 1 2 3 4 5 6 7 8</td>
<td>not at all worried</td>
<td>slightly worried</td>
<td>moderately worried</td>
<td>very worried</td>
</tr>
<tr>
<td><strong>3. Are you avoiding any situations because of anxiety?</strong></td>
<td>0 1 2 3 4 5 6 7 8</td>
<td>none</td>
<td>some</td>
<td>moderate amount</td>
<td>alot</td>
</tr>
</tbody>
</table>

*Did you have a panic attack today? Yes __ (fill in Panic Diary) No __*

Did you experience feelings of a near panic today? Yes __ No __ If yes, how intense or strong were these feelings?

<table>
<thead>
<tr>
<th><strong>Did you do anything to control or stop your feelings of near panic?</strong></th>
<th>If yes, describe fully what you did.</th>
</tr>
</thead>
</table>

How effective was it? ____________________________________________________________

______________________________________________________________

If you have a major worry or stressful event that is troubling you today, describe it fully (use back of form if you need more space).

**Medication** Yes __ No __ **Alcohol** Yes __ No __

<table>
<thead>
<tr>
<th>Time?</th>
<th>Type?</th>
<th>Dosage?</th>
<th>Time?</th>
<th>Type?</th>
<th>Amount?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THE PRE- AND POST-SESSION ANXIETY SCALE

Patient's Initials_________________ Date_____________________

Therapist's Initials_______________ SESSION #_______________
=================================================================
Patient completes rating at the beginning and end of each session.

Pre Session:
How anxious do you feel?

0  1  2  3  4  5  6  7  8
not at all slightly moderately very extremely anxious anxious anxious anxious

=================================================================

Post Session:
How anxious do you feel?

0  1  2  3  4  5  6  7  8
not at all slightly moderately very extremely anxious anxious anxious anxious
THE SIMILARITIES QUESTIONNAIRE (CLARK ET AL., 1985)

Patient’s Initials____________________ Date____________________
Therapist’s Initials___________________ SESSION #______________

Choose a number from the scale below to show how similar the effects of overbreathing are to your panic attacks. Circle the number you choose.

0 1 2 3 4 5 6 7 8
not at all similar similar similar similar similar same

If the effects of overbreathing are not exactly the same as your panic attacks, please circle the number of the sentence below which best describes how they differed from your attacks. If sentences 2 and 3 are correct, circle both.

1. I got the same sensations as I usually do during my panic attacks but they were less intense.

2. I got some sensations during and/or just after overbreathing which I usually do not get during my panic attacks.

The differing sensations were (please list the numbers of the symptoms from the panic attack diary)

3. I usually get some sensations during my panic attacks which I did not get during or just after overbreathing.

The differing sensations were (please list the numbers of the symptoms from the panic attack diary)
THE FEAR OF BODILY SENSATIONS SCALE

Patient's Initials_________________________ Date__________________________

Therapist's Initials______________________

SESSION #:__________________________ TRIAL #:__________________________

0 1 2 3 4 5 6 7 8
not at all slightly moderately very extremely

Circle a number on the scale above to indicate how much you felt an increase in fear or distress during or just after overbreathing.

0 1 2 3 4 5 6 7 8
not at all slightly moderately very extremely anxious

Circle a number on the scale above to indicate how anxious you feel at this moment.
THE SYMPTOM CHECKLIST-90 (DEROGATIS ET AL., 1973)

Instructions: Below are a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, please circle one of the numbers to the right that best describes HOW MUCH THAT PROBLEM HAS BOTHERED OR DISTRESSED YOU DURING THE PAST WEEK INCLUDING TODAY. Circle one number for each problem and do not skip any items. If you change your mind, erase your first choice completely. Please read the example below before beginning.

Example:

HOW MUCH WERE YOU BOTHERED BY:

<table>
<thead>
<tr>
<th></th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backaches</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Headaches</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Nervousness or shakiness inside</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Unwanted thoughts, words, or ideas that won't leave your mind</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Faintness or dizziness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Loss of sexual interest or pleasure</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Feeling critical of others</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The idea that someone else can control your thoughts</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Feeling others are to blame for most of your troubles</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Trouble remembering things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Worried about sloppiness or carelessness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Feeling easily annoyed or irritated</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Pains in heart or chest</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Feeling afraid in open spaces or on the streets</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
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<td>---</td>
</tr>
<tr>
<td>14. Feeling low in energy or slowed down</td>
<td>Not at All</td>
<td>A Little Bit</td>
<td>Moderately</td>
<td>Quite a Bit</td>
<td>Extremely</td>
</tr>
<tr>
<td>15. Thoughts of ending your life</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. Hearing voices that other people do not hear</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. Trembling</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. Feeling that most people cannot be trusted</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. Poor appetite</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. Crying easily</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. Feeling shy or uneasy with the opposite sex</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22. Feeling of being trapped or caught</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23. Suddenly scared for no reason</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24. Temper outbursts that you could not control</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25. Feeling afraid to go out of your house alone</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26. Blaming yourself for things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>27. Pains in lower back</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>28. Feeling blocked in getting things done</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29. Feeling lonely</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>30. Feeling blue</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>31. Worrying too much about things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>32. Feeling no interest in things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>33. Feeling fearful</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Cognitive and Exposure Treatments

<table>
<thead>
<tr>
<th></th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>34. Your feelings being easily hurt</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>35. Other people being aware of your private thoughts</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>36. Feeling others do not understand you or are unsympathetic</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>37. Feeling that people are unfriendly or dislike you</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>38. Having to do things very slowly to insure correctness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>39. Heart pounding or racing</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>40. Nausea or upset stomach</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>41. Feeling inferior to others</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>42. Soreness of your muscles</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>43. Feeling that you are watched or talked about by others</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>44. Trouble falling asleep</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>45. Having to check and double-check what you do</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>46. Difficulty making decisions</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>47. Feeling afraid to travel on buses, subways, or trains</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>48. Trouble getting your breath</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>49. Hot or cold spells</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>50. Having to avoid certain things, places, or activities because they frighten you</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>51. Your mind going blank</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>52. Numbness or tingling in parts of your body</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>53. A lump in your throat</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Feeling hopeless about the future</td>
<td>Trouble concentrating</td>
<td>Feeling weak in parts of your body</td>
<td>Feeling tense or keyed up</td>
<td>Heavy feelings in your arms or legs</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------на</td>
<td>------------------------</td>
<td>-----------------------------------</td>
<td>--------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td></td>
<td>Not at All</td>
<td>A Little Bit</td>
<td>Moderately</td>
<td>Quite a Bit</td>
<td>Extremely</td>
</tr>
<tr>
<td>54</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>55</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>56</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>57</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>58</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>59</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>61</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>62</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>63</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>64</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>65</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>66</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>67</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>68</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>69</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>70</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>71</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
72. Spells of terror or panic | 0 | 1 | 2 | 3 | 4
73. Feeling uncomfortable about eating or drinking in public | 0 | 1 | 2 | 3 | 4
74. Getting into frequent arguments | 0 | 1 | 2 | 3 | 4
75. Feeling nervous when you are left alone | 0 | 1 | 2 | 3 | 4
76. Others not giving you proper credit for your achievements | 0 | 1 | 2 | 3 | 4
77. Feeling lonely even when you are with people | 0 | 1 | 2 | 3 | 4
78. Feeling so restless you couldn't sit still | 0 | 1 | 2 | 3 | 4
79. Feelings of worthlessness | 0 | 1 | 2 | 3 | 4
80. Feeling that familiar things are strange or unreal | 0 | 1 | 2 | 3 | 4
81. Shouting or throwing things | 0 | 1 | 2 | 3 | 4
82. Feeling afraid you will faint in public | 0 | 1 | 2 | 3 | 4
83. Feeling that people will take advantage of you if you let them | 0 | 1 | 2 | 3 | 4
84. Having thoughts about sex that bother you a lot | 0 | 1 | 2 | 3 | 4
85. The idea that you should be punished for your sins | 0 | 1 | 2 | 3 | 4
86. Feeling pushed to get things done | 0 | 1 | 2 | 3 | 4
87. The idea that something serious is wrong with your body | 0 | 1 | 2 | 3 | 4
88. Never feeling close to another person | 0 | 1 | 2 | 3 | 4
89. Feelings of guilt | 0 | 1 | 2 | 3 | 4
90. The idea that something is wrong with your mind | 0 | 1 | 2 | 3 | 4
THE SOCIAL DESIRABILITY SCALE (CROWNE & MARLOWE, 1960)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true (T) or false (F) as it pertains to you personally. It's best to go with your first judgment and not spend too long mulling over any one question. Place a mark in the space next to each question. Take this test before reading further.

<table>
<thead>
<tr>
<th></th>
<th>T or F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Before voting I thoroughly investigate the qualifications of all the candidates.</td>
<td>1.</td>
</tr>
<tr>
<td>2. I never hesitate to go out of my way to help someone in trouble.</td>
<td>2.</td>
</tr>
<tr>
<td>3. It is sometimes hard for me to go on with my work if I am not encouraged.</td>
<td>3.</td>
</tr>
<tr>
<td>4. I have never intensely disliked anyone.</td>
<td>4.</td>
</tr>
<tr>
<td>5. On occasions I have had doubts about my ability to succeed in life.</td>
<td>5.</td>
</tr>
<tr>
<td>6. I sometimes feel resentful when I don't get my way.</td>
<td>6.</td>
</tr>
<tr>
<td>7. I am always careful about my manner of dress.</td>
<td>7.</td>
</tr>
<tr>
<td>8. My table manners at home are as good as when I eat out in a restaurant.</td>
<td>8.</td>
</tr>
<tr>
<td>9. If I could get into a movie without paying and be sure I was not seen I would probably do it.</td>
<td>9.</td>
</tr>
<tr>
<td>10. On a few occasions, I have given up something because I thought too little of my ability.</td>
<td>10.</td>
</tr>
<tr>
<td>11. I refuse to gossip at times.</td>
<td>11.</td>
</tr>
<tr>
<td>12. There have been times when I felt like rebelling against people in authority even though I knew they were right.</td>
<td>12.</td>
</tr>
<tr>
<td>13. No matter who I'm talking to I'm always a good listener.</td>
<td>13.</td>
</tr>
<tr>
<td>15. There have been occasions when I have taken advantage of someone.</td>
<td>15.</td>
</tr>
<tr>
<td>16. I'm always willing to admit it when I make a mistake.</td>
<td>16.</td>
</tr>
<tr>
<td>17. I always try to practice what I preach.</td>
<td>17.</td>
</tr>
<tr>
<td>18. I don't find it particularly difficult to get along with loutmouthed, obnoxious people.</td>
<td>18.</td>
</tr>
<tr>
<td>19. I sometimes try to get even rather than forgive and forget.</td>
<td>19.</td>
</tr>
<tr>
<td>20. When I don't know something I don't mind at all admitting it.</td>
<td>20.</td>
</tr>
<tr>
<td>21. I am always courteous, even to people who are disagreeable.</td>
<td>21.</td>
</tr>
<tr>
<td>22. At times I have really insisted on having things my own way.</td>
<td>22.</td>
</tr>
<tr>
<td>23. There have been occasions when I felt like smashing things.</td>
<td>23.</td>
</tr>
<tr>
<td>24. I would never think of letting someone else be punished for my wrong-doings.</td>
<td>24.</td>
</tr>
<tr>
<td>25. I never resent being asked to return a favor.</td>
<td>25.</td>
</tr>
<tr>
<td>26. I have never been liked when people expressed ideas very different from my own.</td>
<td>26.</td>
</tr>
<tr>
<td>27. I never make a long trip without checking the safety of my car.</td>
<td>27.</td>
</tr>
<tr>
<td>28. There have been times when I was quite jealous of the good fortune of others.</td>
<td>28.</td>
</tr>
<tr>
<td>29. I have almost never felt the urge to tell someone off.</td>
<td>29.</td>
</tr>
<tr>
<td>30. I am sometimes irritated by people who ask favors of me.</td>
<td>30.</td>
</tr>
<tr>
<td>31. I have never felt that I was punished without cause.</td>
<td>31.</td>
</tr>
<tr>
<td>32. I sometimes think when people have a misfortune they only got what they deserved.</td>
<td>32.</td>
</tr>
<tr>
<td>33. I have never deliberately said something that hurt someone's feelings.</td>
<td>33.</td>
</tr>
</tbody>
</table>
THE ANXIETY SENSITIVITY INDEX (REISS ET AL., 1986)

Your Initials_________________ Date______________

Please circle the number below which best describes you.

<table>
<thead>
<tr>
<th></th>
<th>very little</th>
<th>a little</th>
<th>some</th>
<th>much</th>
<th>very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to me not to appear nervous</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>When I cannot keep my mind on a task, I worry that I might be going crazy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It scares me when I feel 'shakey' (trembling)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It scares me when I feel faint</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It is important to me to stay in control of my emotions</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It scares me when my heart beats rapidly</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It embarrasses me when my stomach growls</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It scares me when I am nauseous</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>When I notice that my heart is beating rapidly, I worry that I might have a heart attack</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It scares me when I become short of breath</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>When my stomach is upset, I worry that I might be seriously ill</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It scares me when I am unable to keep my mind on a task</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Other people notice when I feel shakey</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Unusual body sensations scare me</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>When I am nervous, I worry that I might be mentally ill</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It scares me when I am nervous</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
THE SPEILBERGER STATE ANXIETY INVENTORY (SPEILBERGER ET AL., 1970)

Initials ______________________ Date ______________________

**DIRECTIONS:** A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not At All</th>
<th>Somewhat</th>
<th>Moderately So</th>
<th>Very Much So</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel calm</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I feel secure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I am tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I feel strayed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I feel at ease</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I feel upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I am presently worrying over possible misfortunes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I feel satisfied</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I feel frightened</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I feel comfortable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. I feel self-confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. I feel nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. I am jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. I feel indecisive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. I am relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. I feel content</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. I am worried</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. I feel confused</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. I feel steady</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. I feel pleasant</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX H

The Characteristics of Panic Attacks
The Characteristics of Panic Attacks

Despite the low frequency of panic attacks recorded during the study, the characteristics of the panic attacks were examined. The results were averaged across the 70 panic attacks to yield the following: (1) the mean distress level of the panic attacks on a 9-point scale (0 = not at all to 8 = extremely) was 5.5 (range 2 - 8), (2) the mean duration of the panic attacks was 29.6 (range 1 - 60) min, (3) the average number of expected vs. unexpected panics were 76% and 24%, respectively, (4) the mean number of panic attacks that occurred at home vs. away from home were 68% and 32%, respectively, (5) the mean number of panic attacks that occurred while subjects were accompanied vs. unaccompanied were 75% and 25%, respectively, (6) after having a panic attack, subjects changed their plans 74% of the time and continued on with their planned activities on 26% of the occasions, and (7) the mean number of panic attack symptoms that were checked from the list of 16 symptoms (see Appendix G for the symptoms listed on the Panic Attack Diary) were 6.3 (range 2 - 13).

The percentage of panic symptoms checked on the Panic Attack Diary over the total sample (n = 70) panic attacks were as follows: palpitations or accelerated heartrate 85%, desire to flee or escape the situation 61%, nausea or abdominal distress 58%, shortness of breath or smothering sensations 54%, trembling or shaking 52%,
dizziness, lightheadedness or unsteady feelings 41%, feeling that you or your surroundings are strange or unreal 32%, and going crazy or doing something uncontrolled 32%.

Subjects also listed the order of the first three symptoms that they noticed when their attacks began. The first symptom noticed was palpitations or accelerated heart rate (51%) followed by shortness of breath or smothering sensations (21%), and finally, nausea and abdominal distress (17%).