THE PROCESS OF CHANGE DURING THREE INTerventions FOR CLAUSTROPHOBIA

By

RICHARD BOOTH

B.A.(Mod.), Trinity College, Dublin, 1978
M.Sc., University of Strathclyde, Glasgow, 1980
M.Sc., Trinity College, Dublin, 1981
M.Psych.Sc., University College, Dublin, 1983

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

in

THE FACULTY OF GRADUATE STUDIES
(Department of Psychology)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
August 1990
© Richard Booth, 1990
In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of **PSYCHOLOGY**

The University of British Columbia
Vancouver, Canada

Date **31st AUGUST 1990**
ABSTRACT

The purpose of this study was to investigate the process of change during three interventions for claustrophobia, and to provide descriptive data about this fear. Forty-eight participants, recruited from the community through the local media, were randomly assigned to one of four groups: exposure to the locked test closet used for assessment, exposure to the sensations of anxiety (interoceptive exposure), modification of underlying negative cognitions, or a control group. All interventions were given over three sessions. The exposure group proved superior to the control on a wide range of measures. In the cognitive group, scores of reported fear and panic, but not predictions of fear or heart rate, were lowered, an important finding since this group had no exposure to the closet during training. The interoceptive group made some modest gains, but these did not translate into reduction in fear scores. An analysis of the timing of fear reduction, and of treatment generalization, provided some clues as to the mechanism of change. Structured interviews provided data on aspects of the fear including its onset, patterns of current avoidance, and common salient cognitions. The results are discussed in the light of recent findings on panic disorder.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Table of contents</td>
<td>iii</td>
</tr>
<tr>
<td>List of tables</td>
<td>v</td>
</tr>
<tr>
<td>List of figures</td>
<td>v</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>vi</td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td>APPROACHES TO ANXIETY</td>
<td>4</td>
</tr>
<tr>
<td>Exposure</td>
<td>11</td>
</tr>
<tr>
<td>Cognitive approaches</td>
<td>19</td>
</tr>
<tr>
<td>Interoceptive exposure</td>
<td>25</td>
</tr>
<tr>
<td><strong>METHODOLOGIES</strong></td>
<td>28</td>
</tr>
<tr>
<td>CLAUSTROPHOBIA</td>
<td>35</td>
</tr>
<tr>
<td><strong>THE PRESENT STUDY</strong></td>
<td>46</td>
</tr>
<tr>
<td><strong>METHOD</strong></td>
<td>60</td>
</tr>
<tr>
<td>SAMPLE SELECTION</td>
<td>60</td>
</tr>
<tr>
<td><strong>MEASURES</strong></td>
<td>61</td>
</tr>
<tr>
<td>APPARATUS</td>
<td>68</td>
</tr>
<tr>
<td><strong>PROCEDURE</strong></td>
<td>68</td>
</tr>
<tr>
<td><strong>HYPOTHESES</strong></td>
<td>74</td>
</tr>
<tr>
<td>EXPERIMENTARY STUDY:* HYPOTHESES.</td>
<td>74</td>
</tr>
<tr>
<td>A PHENOMENOLOGICAL STUDY OF CLAUSTROPHOBIA: OUTLINE</td>
<td>78</td>
</tr>
<tr>
<td><strong>RESULTS</strong></td>
<td>79</td>
</tr>
<tr>
<td>EXPERIMENTAL STUDY</td>
<td>79</td>
</tr>
<tr>
<td>PHENOMENOLOGICAL STUDY</td>
<td>98</td>
</tr>
<tr>
<td>The Sample</td>
<td>98</td>
</tr>
<tr>
<td>Pre-Interview Questionnaires</td>
<td>100</td>
</tr>
<tr>
<td>Cognitions and Physical Sensations</td>
<td>104</td>
</tr>
<tr>
<td>Structured Interviews</td>
<td>107</td>
</tr>
<tr>
<td><strong>DISCUSSION</strong></td>
<td>122</td>
</tr>
<tr>
<td><strong>DIRECTIONS FOR FURTHER RESEARCH</strong></td>
<td>150</td>
</tr>
<tr>
<td><strong>CONCLUSION</strong></td>
<td>154</td>
</tr>
</tbody>
</table>
LIST OF TABLES

TABLE 1
Summary and timing of assessment.................................. 67

TABLE 2
Means and standard deviations for seven variables
pre- and post- intervention........................................ 83

TABLE 3
Univariate ANCOVAs on post-intervention differences
between the four groups........................................... 84

TABLE 4
Significance of the differences between the three interventions and the control group......................... 85

TABLE 5
Means and standard deviations for seven variables
at pre-intervention, post-intervention, and at
follow-up.......................................................... 88

TABLE 6
Univariate ANCOVAs on differences between the three intervention groups, for time, and group x time, at
post-intervention and follow-up................................. 89

TABLE 7
Predicted anxiety at six time points during fear reduction................................................................. 93

TABLE 8
Planned comparisons on the timing of change in the three interventions................................................. 95

TABLE 9
Selected findings from the structured interview.... 109

LIST OF FIGURES

FIGURE 1
Predicted anxiety at six time points during fear reduction................................................................. 94
ACKNOWLEDGEMENTS

I take pleasure in acknowledging the help of a variety of people. The 48 participants often showed great courage in taking part, and their interest in the study at times revived a sagging spirit. I appreciated the help and support of my colleagues Debbie Sansom, Lori Taylor, Cindy Lopatka, and Steve Taylor. The assistance of Maureen Whittal was invaluable. Dimitri Papageorgis was painstaking in his editorial advice. But, above all, I wish to express my gratitude to my supervisor Jack Rachman who, in many ways, made the years during which this was written both happy and memorable.
INTRODUCTION

In 1980 a conference was held in Albany, New York, to discuss the most promising directions for behavioural approaches to anxiety disorders (see Barlow & Wolfe 1981). One of the main recommendations was that there should be far less emphasis on straightforward outcome studies, which have done little to enhance our knowledge of why certain treatments appear to be more effective than others. This call for a greater emphasis on process variables has been less heeded in studies of simple phobias than other anxiety disorders. If it was felt that at least in this area an efficacious treatment had been developed, and that such work would consequently be of little value, then such a conclusion would have been premature indeed. Not only are there serious limitations to our knowledge of what underlies performance-based procedures, but there is controversy over how such techniques can be further developed. Even at the time of that conference in Albany, it was recognized that improvement rates in the treatment of simple phobia had been overestimated. Mavissakalian and Barlow (1981) pointed out that if one takes account of those unwilling or unable to complete treatment (their estimate is 25%), as well as those who are unimproved as a result of treatment, successful interventions number less than one in two, hardly a statistic to encourage complacency. There is no evidence to suggest more optimistic current figures.
This study starts with the premise that process research is called for in the study of simple phobias for both practical and theoretical reasons. The focus will be on claustrophobia, a simple phobia yet sharing common features with some of the more widespread anxiety disorders. Though the former are generally considered to be impervious to cognitive intervention, claustrophobia may be unusual in the strength with which associated cognitions are held (see Rachman, Booth, & Whittal, 1988), and so may be less resistant to cognitive modification. Barlow (1988) has even stated that claustrophobia may be a case of panic disorder with more limited avoidance, a suggestion which opens up intriguing possibilities. In particular, it heightens curiosity about the role of cognitions in simple phobias as opposed to panic disorder, where they have been more commonly implicated (see Beck 1987, Clark 1987). No less is the interest in the physical sensations of anxiety, particularly with the suggestion that exposure to such sensations can add much to psychological treatments of panic disorder (Barlow & Cerny, 1988).

In contrast to treatment outcome studies, the intention will be to look at shorter interventions and study change at a variety of points. In this study one of three interventions is given to volunteer participants, two of which, in isolation, are far from what a clinician would
usually propose, and about whose effect one can as yet only speculate. The first is one which focuses exclusively on cognitions, challenging and attempting to change the frightening thoughts which the subjects report, but without the usual accompanying exposure and behavioural assignments. The second is interoceptive exposure in which the subjects are exposed to their feared sensations of anxiety (such as heart racing and dizziness brought on by overbreathing), again without contact with the feared stimulus. The third intervention, and the only one which involves contact with a claustrophobic situation, is the standard protocol for exposure in which the subject is exposed to increasingly anxiety-provoking cues ordered on an individualized hierarchy. A control group is included in which subjects are assessed at two points, but without any intervention. While the latter two groups offer a base from which to gauge change, it is emphasized that the study aims not to focus on which of the three is the most effective, but on the changes that take place in each of the groups. By monitoring change at different points and with different methods during the interventions, and, in addition, through the inclusion of descriptive data, it is hoped to better understand what underlies the fear, what contributes to its modification, and the manner in which fear reduction occurs.
APPROACHES TO ANXIETY

A striking feature of the psychological literature on anxiety is the strength of the theoretical approaches which are often daring, imaginative, and stimulating. Alas, the studies stimulated by such theories have not been similarly imaginative and, more seriously, the resulting data have too seldom been supportive, a not inconsiderable drawback to any theory. This review of psychological approaches does not set out to be exhaustive, but rather aims to introduce concepts that will be discussed throughout the study. A good example, though not one often mentioned, is Easterbrook's (1959) concept of "narrowing of attention" during emotional arousal. He proposed not only that attention narrowed as emotion became more intense, but that cues relevant to the emotion became more salient at the expense of concurrent attention to irrelevant stimuli. It is not uncharacteristic in the field that some 30 years later, there is still relatively little known about the relationship between the intensity of emotion and cognition. The common clinical observation that severe anxiety and panic seem to exert a numbing effect on competing rational cognitive activity is beyond dispute but, further than this, more complexities have been noted in the relationship than clear findings (Gilligan & Bower, 1984).
A link from this to more contemporary theorizing can be found in the work of Barlow whose outstanding recent work (1988) will be frequently referred to in this study. An important construct in his approach is that of "anxious apprehension" which is not unrelated to Easterbrook's observations. Barlow suggests that the perception of physiological sensations is a cue to self-focused attention, particularly of a self-evaluative nature. He goes further by suggesting that these concerns are almost always negative, that they are matched by an increase in the intensity of the prevailing emotion, and that there is a failure to habituate to external stimuli in this attentional mode (see also Scheier, Carver & Matthews, 1983).

A second historical landmark after Easterbrook was appraisal theory outlined by Schachter and Singer in 1962. They proposed that generalized arousal would be appraised depending on the context in which it occurred. Theirs has been an influential train of thought, though the theory as a whole has been heavily criticized. The original experiment has never been successfully replicated (e.g. Marshall & Zimbardo, 1979); unexplained arousal tends to be always reported negatively; and, most damaging of all, reports and behaviour associated with anxiety can clearly occur in the absence of arousal (Barlow & Mavissakalian, 1981).
There is, nevertheless, a link between appraisal theory and the work of Aaron Beck (e.g. Beck & Emery, 1985), although the latter is more accurately seen as a theory of anxiety disorders rather than a theory of anxiety. His theorizing is confined largely to instances where danger is misperceived or exaggerated. He has taken the structure from his very successful work on depression, and for the most it appears to transfer well. The problems are seen as being focused on hypervalent cognitive schemata where reality is continually interpreted as dangerous. States of anxiety are thus associated with thoughts and images relevant to danger. Therapy is directed at finding and correcting the distortions in the processing of this information. A weakness of the model is not that clients have to be trained to find their automatic thoughts (a not unreasonable assumption) but that it can be difficult to "disprove" that there are underlying cognitions - at what point can it be accepted that a client could experience non-cognitive anxiety? While it is already clear that anxious patients do selectively perceive threat more often than nonanxious patients, and that automatic thoughts of threat are often reported, two points often raised in relation to the theory are also likely to be important issues here. The first is whether anxious cognitions always do precede the anxiety. Evidence is by no means clear and the argument that the preceding automatic thoughts or schemata have simply not been discovered is, as mentioned, less than convincing. A
second possibility is that the automatic thoughts are merely epiphenomena, and that both they and the anxiety response have a cause that lies elsewhere (Beidel & Turner, 1986; Hallam, 1985).

Self efficacy, one of the central tenets of Bandura (1977), shows the importance which he also places on the role of cognitions in anxiety. He has theorized that increasing one's sense of self efficacy or competence in mastering a feared situation leads to successful anxiety reduction treatments. He observed that direct behavioural experience and accomplishments probably constitute the most powerful means of increasing one's sense of self confidence and efficacy, but that other procedures (information, watching others perform successfully) can contribute to the perception. All of these various inputs then summate to produce self efficacy. Barlow (1988) points out that the construct is limited in that it only predicts performance. Others have been rather harsher, notably Borkovec (1978), who suggested that self efficacy is more a reflection of change than its mediator. However it is a concept that has stimulated a great deal of research, much of it supportive (Williams & Rappoport, 1983).

Lang's (1985) "bioinformational approach" is rather harder to evaluate since it has not yet generated much data. At this point, at least it can be said that it numbers some
important admirers (Barlow, 1988; Pritchard, 1990; Seligman, 1987). Emotion is conceptualized as "action tendencies" stored in memory and accessed in a variety of ways, all of which involve the processing of information. It cleverly bypasses the requirement of an intervening cognitive appraisal since "meaning propositions" (which are basically cognitive interpretations) are only one type of proposition among many, none of which are seen as essential antecedents. Meaning, context, arousal and a host of other propositions all contribute to the likelihood that an emotion will be accessed. Weak or incomplete matching of propositions may only lead to part of the response, but if most propositions are matched then an emotion can be accessed at a strong level, even if one proposition is completely missing. It is a theory in construction and, as stated, as yet only weakly supported. A further shortcoming is an overreliance on psychophysiological recording as the primary dependent variable. It is, though, highly creative and imaginative and another theory to which I will have cause to refer.

There is likely to be more interest in Lang's work with the interest being generated by Barnard and Teasdale's latest paper (1990) which analyzes the relationship between cognition and affect using similar representational and information processing constructs. In this framework, too, there is an emphasis on different forms of mental representation encoding information: nine different types of
information are specified which can contribute to the production of emotion. A major implication of such a system is that there is a distinction between two levels of meaning. The first is labelled "propositional" which can be expressed in the form of statements that can be evaluated as true or false. The second is termed "implicational", where code patterns also include elements derived directly from sensory sources. While the former is often the focus of attention in cognitive therapy, Barnard and Teasdale argue that attempts to modify the latter are likely to be more successful, and call on cognitive therapists to incorporate some of the more experientially oriented psychotherapeutic strategies (Greenberg & Safran, 1987).

These are all, at least in a loose sense, cognitive theories of anxiety, certainly the most popular current focus. It should not be thought that cognitions are thus the accepted core of anxiety. On the contrary, as shall be seen in a later section, experimental attempts to isolate the contribution of cognitive procedures have almost invariably been disappointing. There are also many theories which ignore or downplay the cognitive role, notably Zajonc's (1980) non-cognitive view of arousal.

The only such theory to be outlined here is the work of Seligman on "preparedness". Seligman and Hager in 1972 put forward the interesting notion that genetic endowment
provides a specialized associative apparatus that determines how readily an organism can be influenced by experience. According to the principle of preparedness, organisms are biologically constructed, through evolutionary selection, to associate certain events more easily than others. They learn biologically primed associations with minimal output, but the unprepared associations painstakingly if at all. While substantial evidence can be marshalled to support biological preprogramming in subhuman species, verification of innate preparedness in humans is much more complicated than it might at first appear. The theory, while stimulating, is undergoing elaboration (see McNally, 1987) but it is still widely held that at least some part of the fear response may be innate.

The purpose of this selective overview has been to introduce concepts that will be used in this study. Others will also be introduced but in the context of the three major approaches to anxiety: exposure to the feared situation, cognitive therapy and, most recently, exposure to the feared sensations.
Exposure

In trying to convey the current status of what is understood about exposure, I am reminded of a recent Irish Prime Minister noted as an academic, rather than well suited to the cut and thrust of politics. He used to be regularly lampooned for dismissing practical ideas because he was uncertain how they would work in theory. A similar problem arises with exposure. No one doubts that it works, but it is still not clear how its effects are achieved (Foa & Kozak, 1986).

It had seemed quite straightforward for a period of time, both how fear was learned and how it could best be reduced. In the 1950s it was very strongly argued that all phobias were learned simply through traumatic conditioning (e.g. Wolpe, 1958). The success of behaviour therapy with phobias strengthened this assumption about etiology. By the late 1960s, however, it was becoming clear that traumatic conditioning alone could not account for the genesis of phobic reaction, since conditioning could not accommodate several facts about clinical phobias. Among other objections, these were the selectivity of phobias, the failure of phobias to extinguish despite repeated exposure to the CS, and the fact that fears and phobias can be acquired through simple provision of information as well as vicariously (Rachman 1977, 1978).
The explanations for why exposure should work seemed to be similarly straightforward. The principles of both habituation and extinction each appeared to have strong cases. However among a host of other shortcomings, the theory of habituation cannot account for much of the data on the return of fear (e.g., see Craske & Rachman, 1987). Similarly, proponents of "extinction" have difficulty in explaining a series of points, such as anxiety reduction occurring even though subjects are allowed to escape from the feared situation before maximum anxiety has been reached (Rachman et al, 1986). Neither have more recent theories proved more satisfactory. Barlow is perhaps being unnecessarily harsh when he says of "toughening up", a biological model of fear reduction, that "it has little theoretical meat" and is no more than a "description of processes". However he has more grounds to say of all three theories: "In addition to poor specification of what is "learned" during exposure, none easily accommodates the notion of anxiety as a construct of three relatively independent response systems".

It must then be asked what has become of the notion that fear can be learned by process of association. In certain circles it appears to have become almost unfashionable to acknowledge that fear can be learned in such a way. Bandura (1986), notably, gives it scant
attention. This seems unfortunate, for within a remarkably short space of time a variety of techniques based on this principle have helped large numbers of people. (Just how recent a phenomenon it is, is illustrated in the fact that one of its most vociferous proponents, Isaac Marks, did not even list exposure in the index of his major book in 1969). After tentative beginnings with Meyer in London in 1963, and a further decade characterized by limited enthusiasm, exposure has achieved broad acceptance as a powerful technique.

Rather than tediously outlining the paradigm of classical fear conditioning, I favour Barlow's approach in which he gives an example to refresh it in memory, namely the widespread acquisition of conditioned nausea in cancer patients undergoing chemotherapy (e.g., Redd & Andrykowski, 1982). That these patients develop moderate to severe nausea reactions to "neutral stimuli" associated with nursing staff administering the therapy, is an excellent example of this fundamental law of learning. Among factors that seem to account for conditionability in these patients is the strength of the nausea-producing properties of the drug (the UCS) and the intensity of the initial reaction. But given an appropriately powerful combination, an intense fear can be conditioned in just a single trial.
However, a common finding on questioning phobic individuals is that, particularly with more simple fears, it is quite unusual for them to have had such a clear learning experience. This poses a problem unless one is to adopt an extreme position such as that phobics primarily pick up their fears vicariously. The discrepancy has been ingeniously explained by Barlow (1988). He argues that the fears are conditioned not by a traumatic event but by a "false alarm". An example is provided in a retrospective study of driving phobics by Munjack (1984). Though six of his 30 subjects reported a traumatic incident, such as a collision, that appeared to cause their fear, twice that number reported no such incident. For no reason that they could identify, they had "panicked" while driving and now feared driving again because of the possibility of having further unexpected panic attacks. It is exactly this sort of false alarm, when of a sufficient intensity, that causes learning to occur and causes the individual to be anxious in the presence of the (or a similar) object or situation in which the first false alarm occurred. The model has not been fully worked through by Barlow, but he does believe that a false alarm is likely to become a learned alarm if the context is "prepared" in some way. The example he gives is situations from which escape may be difficult, of more than passing relevance to claustrophobia, the focus of this study.
Most research on false alarms has taken place with panic-disordered patients. It is clear that "internal" cues can become associated with false alarms and that they can come to signal the possibility of another false alarm. Whether such internal cues can serve a similar function in simple phobias is not yet known; it had certainly been assumed that only external cues can play this role. There is a variety of evidence to show that patients with panic disorder do fear interoceptive cues (Reiss et al, 1986; van den Hout et al, 1987), but one needs to reflect on how fear could become associated with external or internal cues. Barlow maintains that during a false alarm, unlike a true one, "attention may be allocated in many different ways, since there is no obvious cause for alarm". If one experiences a false alarm at home, it is more likely that attention will be focused on internal cues associated with the false alarm. On the other hand, if one experiences the full effects of a false alarm while unable to escape, then the largest share of attention is likely to be directed at the "trapped" situation. Barlow is clear that most of those who experience false alarms are unlikely to fear one or the other exclusively, but are likely to be apprehensive about a varying mixture of internal and external cues. Thus it is far from safe to presume, for example, that claustrophobics will necessarily fear only external cues and agoraphobics only internal cues, although such a trend may appear. It is not, however, fully clear why a claustrophobic should feel
"safe" in a range of situations in which the agoraphobic would not.

Norton et al (1986) have pointed out that many more people seem to experience alarms (false and learned) than those who actually present with clinical disorders. One possibility that Barlow proposes is that the alarms simply may not be of sufficient intensity to result in clinical complication. But another and more likely possibility is that people who develop full-blown panic or phobic disorders, are specifically susceptible to developing anxiety over their alarms because of a combination of individual biological and psychological factors. Among the factors he suggests are biologically based stress reactivity, perceptions of unpredictability and uncontrollability of the alarms or other negative events, and poor coping skills or social support.

If these points cast a rather new light on the method of fear acquisition, then there is still the question of fear reduction to consider. Though the theoretical wrangling seems set to continue, at least there is agreement that the broad method of exposure works. Debate now focuses on questions such as whether a person should be strongly encouraged not to escape from a feared situation during exposure (see de Silva & Rachman, 1984; Rachman et al, 1986), how intensive exposure should be (Jansson & Ost,
1982) and what is the best role for the therapist (Mathews et al, 1981).

These may seem rather peripheral questions for a technique that has shown itself so powerful, but it is salutary to look more closely at rates of clinical improvement after treatment with exposure. Though statistics are less readily available for a simple phobia such as claustrophobia, the figures from agoraphobia give some cause for concern. For agoraphobia, and there is no reason to suppose that it is untypical, closer analysis has shown that there are many examples of failure, relapse and limited clinical improvement. Jannson & Ost (1982) estimate that the median dropout rate from exposure-based treatments is 12%. Furthermore, data reporting success rates of 60-70% are also reflecting the fact that 30-40% of all agoraphobics who complete treatment fail to benefit. Of the remaining 60-70%, a substantial percentage may not reach clinically meaningful levels of functioning. For example McPherson et al (1980) reported that among clients who showed some improvement following behavioural treatment, only 18% of those contacted at follow-up rated themselves as being completely free of symptoms. Finally Munby & Johnson (1980) observed relapses occurring in as many as 50% of clients who had benefited clinically, although many subsequently returned to their previous level of improvement.
What emerges, then, is that though they appear to have a complex etiology, very little interest has been shown in the actual mechanism and process of change in simple phobias. An unfortunate position promises to be maintained: any progress is likely to come about like most previous developments - serendipitously.
Cognitive approaches

If exposure is effective for a range of anxieties for uncertain reasons, then cognitive approaches can be seen as a polar opposite. There are extremely clear reasons why they should work but, for the most part, they have been remarkably ineffectual. One would have thought that techniques which have worked well with mood disorders, notably depression (Beckham & Leber, 1985), should transfer to anxiety disorders where cognitive features have also been quite conspicuous. However, such approaches have not, in any sense, matched the promise that might be implied from the amount of theoretical interest. Marks (1988) is characteristically adamant in his conclusions. "Challenging irrational beliefs, cognitive or rational restructuring, and current types of self-statement rehearsal are largely redundant for the relief of phobic problems". Other major reviews have come up with similar conclusions (see Last 1987). Early studies were altogether more promising, however, and some would argue that signs of a return of such promise are emerging once again.

Cognitive interventions for anxiety have a long, if not always venerable history. Associated names in this century might range from the French psychiatrist Emil Coué (1922) to Dale Carnegie (1948) and Norman Vincent Peale (1960). Much of the earliest controlled research did not take place until
the early 1970s and was in fact not unrelated to the latter two authors. It was Meichenbaum's investigation into why such generalized prohibitions or exhortations tend to fail, that was one of the paths to his subsequent influential work on self instructions. His work with Cameron as far back as 15 years ago set the ground for much that was to follow. Their research focused on reducing fears by modifying what clients say to themselves. They compared a treatment group who received only self-instructional rehearsal with one that in addition received "application training" in the form of exposure to electric shock. The former group initially appeared to do well but as demands were increased, their anxiety rose precipitously. In contrast, the subjects who had an opportunity to use the self-controlling statements in confronting the electric shock, significantly reduced their fears following treatment. They concluded that "saying the 'right' things to yourself may not be a sufficient condition for change". One may have to try out these self-statements gradually in real situations that are similar to the criterion task "for any effect to be noted". Optimism was further fostered through the apparent effect of cognitive procedures on animal phobias, test anxiety, and public-speaking anxiety (see Rachman & Wilson 1980).

When the focus shifted away from student subjects participating for course credit, the results were not nearly so promising. Emmelkamp et al (1978) set up the first
clinical trial, using agoraphobics as subjects. Their study had several notable methodological features including a cross-over design and the fact that both interventions, one cognitive and one exposure based, were administered in groups. The results were quite clear-cut. Prolonged exposure in vivo proved to be a clearly superior form of treatment to cognitive restructuring on a host of measures; the latter in fact produced only very slight improvements at all.

Biran and Wilson (1981a) used a methodology which in certain respects resembled Emmelkamp's. Though their study included a wider range of phobics, it was again a comparison of cognitive and exposure methods. Their "cognitive restructuring" intervention was very similar, involving the same three elements of relabeling, rational restructuring of irrational beliefs, and self-instructional training. As previously, this proved no match for the performance based techniques which led to a series of durable (six month follow-up) behavioural gains. Exposure also proved highly successful for subjects who had failed to benefit much from the cognitive treatment. In all cases these treatment effects did generalize to daily life. It was interesting, too, that subjects in the exposure condition, but not in the cognitive one, displayed an overall reduction in physiological reactivity at posttest.
The same authors' next study (1981b) appeared to give restructuring a more sporting chance. To begin with they chose scriptophobia, the fear of writing or signing documents in front of people. Apart from highly circumscribed avoidance behaviour, this problem also entails a more generalized social anxiety about being exposed to the scrutiny of other people. With such an evident preoccupation with social consequences, this seems a more promising arena for encouraging more positive and rational self-statements. Exposure was here compared with both cognitive restructuring alone and cognitive restructuring with exposure. Though with a very small number of subjects (N=3), they concluded that cognitive restructuring alone did not produce changes beyond baseline levels, and "it does not appear to be a necessary adjunct" to in vivo exposure for producing behavioural change.

These examples were by no means isolated. Cognitive restructuring did not enhance the effectiveness of exposure in vivo in the treatment of either obsessive patients (Emmelkamp et al, 1980) or agoraphobics with a fear of driving (Williams & Rapport, 1980). The latter researchers also carried out a larger-scale study (1983) in which they sampled participants' cognitions during the behavioural avoidance task to verify that their cognitive treatment was being implemented. They concluded that at both posttreatment and follow-up, cognitive treatment was adding nothing to
exposure on its own. Results from these and similar studies helped to set the tone for Marks' review (1987). He unearthed 32 studies involving cognitive approaches to phobic problems. Of these he found that 22 were negative, six equivocal and just four positive. Two of the last were relatively slight (student subjects, no follow-up etc.), leaving just Butler et al's (1984) study on social phobics and Kendrick et al's (1982) study on pianists with performance anxiety to give any indication that there might be some contribution to be made by cognitive interventions. This led to his very limited concession that "perhaps cognitive methods can play a small role in helping some social phobics". Given the weighting in his overall tally, however, his conclusion is hardly surprising. "The abundance of cognitive research has yielded a lean therapeutic harvest in comparison with that of exposure alone, which is a better way to improve most phobias. In the great majority of studies, cognitive methods alone had little effect and combined with exposure failed to enhance the amount or speed of improvement".

A curious and disappointing feature of the review is that it overlooked or omitted some important studies. In a later study Emmelkamp (1982) found that while the effects of exposure dissipated somewhat between posttreatment and follow-up, the self-instructional group continued to improve. Interestingly, both Marshall (1985) and
Mavissakalian (1983) also found the while self-instruction contributed little to exposure at posttreatment, its efficacy increased during follow-up. One possibility, then, was that measurement was not going on long enough and perhaps neither were the interventions. Vallis and Segal (1986) suggested that the cognitive interventions might be too brief and that this brevity might account for the findings of a "sleeper effect" for the cognitive coping strategies just mentioned. They put forward that it is perhaps only after treatment has stopped that subjects get to employ the techniques more fully, with the result being an increase in effectiveness from post-treatment to follow-up.

The second group of studies that Marks has ignored are those on panic disorder. In his defence, many of these appeared after he went to press, though it is still surprising that he gave no inkling of the dramatic findings that were emerging.
**Interoceptive exposure**

An important distinction made by Barlow (1988) is between exteroceptive and interoceptive exposure. The former refers to the traditional approach, during which subjects are confronted with their feared object or situation. The reasons for this and some of its theoretical implications have already been discussed. The numbers of studies yielding information in the second area are, as yet, very small. The idea is simple and novel, although Barlow feels that others may have used the technique unwittingly. The principle is to expose the individual not to a feared object or situation but to feared sensations. It is a treatment method shared by Clark (1987) and Beck (1988), if in a much less prominent role, and in the area of panic disorder, at least, it has been used as part of a larger package with dramatic success. Barlow does not overstate the case when he says that if recent results are confirmed by additional research and replication, "it will be one of the most important and exciting developments in the history of psychotherapy".

In a recent study by Beck (1988), panic was eliminated in 16 subjects who prior to treatment had been having more than four panics a week. Clark et al (1985, 1990) have shown similar results in a number of patients suffering from panic either with or without agoraphobia. Their early results have held up impressively in a follow-up of more than two years. Klosko et al (1988) have shown that this new treatment shows
a much broader pattern of positive therapeutic change than a group receiving alprazolam (Xanex).

The most advanced study thus far has been by Barlow (1988). He is currently collecting data on an unusual subsample of patients with panic disorder in that they do not show substantial avoidance behaviour. They are randomly allocated to one of four groups. The first is a waiting-list condition. The remaining three are all centred on systematic structured exposure to feared internal sensations. To this common base, cognitive procedures are added to one group, relaxation training to a second and a combination of the two to the third. The numbers are as yet too small to permit a comparative analysis, but the very encouraging preliminary data suggest that the combined treatment seems to be producing therapeutic effects that are superior on some measures to either the somatic or cognitive treatments alone.

Several points arise from these exciting if, as yet, preliminary data. The first is to ask what are the active ingredients of this treatment which includes a variety of elements including respiratory control, basic education on the origins of somatic symptoms, and exposure to anxiety-provoking situations. Barlow looks to have already gone some way to answering this question for himself by placing interoceptive exposure at the heart of all his three
treatment groups. While this plays a part in Clark's approach (1987), he tends to focus more on the cognitive components; interoceptive exercises are used merely as tools to change cognitions. This is an important distinction in their theoretical approaches, but, since their practical style is similar, it does not make it easy to assess the influence of either cognitive modification or interoceptive exposure in the reduction of panic. It also leaves the question unanswered as to the effect of interoceptive exposure on phobias. This has only been addressed in one study, unpublished, and with a sample of just three subjects.

Rygh and Barlow (1986), in a tantalizingly small study, linked true and false alarms to interoceptive and exteroceptive exposure. They proposed that an individual whose phobia arose after an unexpected panic might respond to interoceptive exposure without any imaginal or in vivo exposure to their feared object. On the other hand, those with nonpanic etiologies would respond best to exteroceptive exposure. It is difficult to determine anything from the mixed results of such a tiny sample. The importance of the study is that for the first time it raised the question of whether interoceptive exposure could be usefully applied to fears other than panic disorders. Seen in that light, an intriguing question had been put forward and the initial results did not seem discouraging.
METHODOLOGIES

There are a great variety of ways in which one could carry out research in an area such as claustrophobia, and it is worth looking briefly at some of the strengths and limitations of six designs.

The first of these are studies which are, for the most part, descriptive. An example would be Beck et al’s (1974) study which was one of the first to look at the cognitive components of generalized anxiety disorder. They were able to identify common themes such as fear of death, social rejection, or failure. A decade later Hibbert (1984) took that work a little further, interviewing subjects not only about the content of their anxious thoughts, but also including questions on frequency, intensity, clarity and credibility. From both studies it is abundantly clear that anxious people overestimate personal risk, the latter study also making important observations on the sequence of events, with physical sensations being seen to precede thoughts, which in turn preceded episodes of anxiety. It is interesting that though many journals tend to shun descriptive studies, in many areas of psychology they are being called for increasingly. In therapy process research, indeed, it is currently considered something of a priority (see Garfield & Bergin 1986). Far from being derided, it would seem at least useful to include careful descriptive
An important distinction is between constructive and component designs. In constructive designs, one element is added to an empirically proven technique and then compared against this technique alone. Component designs are used to isolate the potency of particular elements from a treatment package of known efficacy. There are many examples of the former, mixed between those that add little except to the unnecessarily long list of outcome studies, and those that really contribute important points. An example of the latter is the study by Marchione et al (1987). They randomly assigned a group of agoraphobics to one of three cognitive behavioural treatments: cognitive therapy plus graduated exposure, progressive deep muscle relaxation plus graduated exposure, versus graduated exposure alone. It was interesting that those in the combined treatment groups showed not only the most rapid, but the most stable improvements across the three systems. Features such as assessment at mid-point, as well as at the end of treatment help to take exclusive focus away from the single question of which treatment is the most effective. The emphasis on this single question, to the exclusion of how an intervention is causing an effect, has been the shortcoming of these designs and contributed to a great deal of work having minimal value. It causes little wonder that those at

data in a higher percentage of studies focused on experimental questions.
the Conference in Albany, cited earlier, were so adamant in discouraging studies that focused only on outcome.

Component analysis, on the other hand, aims to find out as much as possible about a single approach. An outstanding example is the work of Vallis (1984). His focus of interest was Meichenbaum's Stress Innoculation Training. This general treatment approach can be divided into three distinct procedural phases (Education, Skills Acquisition, and Application). In an attempt "to examine the independent and interactive role of each phase", Vallis included all procedural phases, and systematically varied each of them in a study with eight treatment conditions. The study's strength stems from its dealing with a subject matter about which a great deal is already known, and whose efficacy, in comparison to other interventions, has already been established. This is clearly not a technique with which to open an investigation into a relatively uncharted area.

The fourth design to be discussed is treatment consonance, well illustrated in the work of Ost and his colleagues (1981, 1982, 1984). In response to clinicians' difficulty in assessing how individual clients will respond to specific treatments, they used the Three-System-Model (isolating behavioural, physiological, and cognitive components) as a basis for matching individual client to most appropriate treatment. With social, claustrophobic, and
finally agoraphobic clients, they investigated whether "physiological" and "behavioural" reactors would achieve more benefit from a method suited to their response pattern than one which was not. This is not the only way that clients could be subdivided, but it was a reasonable decision, and in two of their three studies yielded promising results. There was much discussion about this approach which has been favourably reviewed, but relatively few studies followed in which individuals were selected for treatment on the basis of their "unique anxiety profiles". The reasons for this are not based on any doubts of the merits of the approach but its practical difficulties. These include the fact that it is only the physiological component that is easily measured and identified (see Hugdahl 1981), and that it is difficult to compare change across response systems. Further, the notion of a "consonant" treatment has not been easy to satisfy: Is paradoxical intention likely to suit many cognitive responders?; is exposure a method for best changing behaviour or cognitions? While there are many reasons to suggest that it is premature to be offering individually tailored treatments, it is certainly an important goal, and the inclusion of attempts to predict outcome could be made more often. It may be more viable, too, if a less rigid interpretation is made of consonance, isolating for example not just quantitative but qualitative differences. Rather than comparing degrees of cognitive reactors, it might seem more profitable to look at the
particular style of cognitive misinterpretation or dysfunction and choose a treatment accordingly (for example stress inoculation as opposed to breaking of links). More could also be made of the observations often noted in these studies. Why should it be the case that "cognitive" subjects tend to have a greater potential for improvement regardless of treatment (Mackay & Liddell, 1986)? They also suggested that treatments might be "mixed", as in teaching subjects to bring their physiological response down to a level at which cognitive control might be exerted. It is intriguing, too, that Michelson (1986) should note a "temporal lag" with "consonant status appearing to manifest its moderating function in a delayed fashion, increasing its influence as treatment progresses".

A fifth approach is characterized by the work of D.A. Clark (1988). Highlighting the almost exclusive focus on cognitive treatment, he has shown a concern that further progress will be impeded without "concomitant advances in the methodology utilized to assess the cognitive constructs purported to mediate maladaptive responding". He is thus one of a number of workers (see also Ingram & Kendall, 1986; Kendall & Hollon, 1981) working to improve the assessment of relevant constructs. His recent review (1988) is a solid attempt to develop an empirically based model of cognitive assessment. Such an approach yields immediate and useful information on the strengths and limitations of different
forms of assessment. It also raises pointers such as the need to look not only at the presence or absence of cognitions, but their emotional intensity, the degree of belief in which they are held, and the difficulty with which they are controlled.

It is in the light of these five approaches that work on the "process" of change can best be seen. In part it involves the inclusion of what has already often appeared in studies, such as noting discordance and focusing on maintenance and generalization rather than merely immediate outcome. It is an approach fraught with some risk. It could deteriorate into trying to make something of a murky mass of data without clear hypotheses. The approach, however, need not slide into such an abyss. The principle is to go further than asking a single question by asking multiple questions, each carefully specified and clearly hypothesized. The result aims to give a rather fuller and more descriptive picture of how change takes place. An example, though on a small scale, is Last et al's series of studies (Last, 1984, 1985) looking at the effects of a variety of treatments on the cognitions of phobic subjects, and how these in turn related to treatment efficacy. After studying the results of their multiple measures, the reader is left in no doubt that if assessment is only taken prior to and after treatment, the conclusions drawn are likely to be very simplistic. These are studies which lack the neat ends that it might be
comforting to find, but their detail, if not always easy to interpret, comes across as valuable and authentic. After an overview of work already carried out in the area of claustrophobia, this theme will be taken up again.
CLAUSTROPHOBIA

Claustrophobia may not seem the most pressing area for clinical research. Very few claustrophobics attend for treatment and the subject has attracted only a very small literature. In Marks' (1987) voluminous "Fears, Phobias and Rituals", as much is written on the subject as on aversion to the skins of peaches; there is rather more on the fear of butterflies. Yet in the NIMH collaborative epidemiological study, simple phobias were found to be the most prevalent of all mental disorders in women (Robins et al, 1974). Of these, claustrophobia is among the most common (Costello, 1982) with estimates ranging from 5% to 13% of women in the general population reporting it as an intense fear (Agras et al, 1969; Kirkpatrick, 1984). The highest frequency of fear is reported in the age group 18 to 25. The reason claustrophobia is not seen more frequently at the clinic appears to be influenced by two factors which have nothing to do with the significance of the problem. Claustrophobics are often not motivated to seek treatment because they can cope with the problem in a way that not all phobias permit: they simply avoid. Secondly, it has become apparent that most either do not think that this is a problem that could be treated, or that their disability would not be sufficiently serious to merit professional attention (Ost, 1982). Matching this lack of enthusiasm to seek professional attention has been a general lack of research interest.
Indeed, it has received so little attention that one could attempt that very rare task, the exhaustive literature review. It is possible that claustrophobia will become an important focus of interest since the results of studies on panic disorder raise vital questions about other fears. Claustrophobia is hardly the least of these with its interesting links to both panic disorder and simple phobias, a theme taken up in the next section. In this section it will be shown that it has not always been a testing ground for such important questions, although in recent years there have been some findings of interest.

The literature on claustrophobia brings up a sometimes curious assortment of studies. These range from questions of demand characteristics (Miller & Bernstein, 1972) and the efficacy of imaginal procedures (Knapp et al., 1978), to papers in the psychoanalytic tradition (e.g., Gehl, 1973). The bulk of the work, however, is made up of clinical studies applying behavioural methods to the treatment of claustrophobia. As Ost has lamented in an excellent review (1982), these are for the most anecdotal or experimental single-case studies. He could have been harsher in his criticisms for it is rarely the findings or imaginative approach that linger in the mind after reading these studies, but other questions entirely. How did Leitenberg and his colleagues (1968, 1970) persuade an individual to endure over 1300 trials? How did Gatchel (1977) overlook
that by giving 14 hours of biofeedback training in an enclosed cubicle within the laboratory, that he was also giving his subject extensive exposure to the phobic situation? What real-life situation were Spelz and Bernstein (1979) preparing their subject for, by having as the goal of treatment that the subject should be able to remain relatively relaxed wearing a surgical mask, his head at the wrong end of a fully-zipped sleeping bag, with both his hands and feet tied?

Ost's (1982) point is well taken that it would be quite impossible to draw any general conclusions from these and similar studies. The number of subjects described had been very small, and at that time no controlled treatment outcome study had yet been published. He also noted that the encouraging results "must be considered against the fact that treatment failures are rarely published".

Ost's own controlled group study on claustrophobia (1982) is outstanding not just in this area but in the behaviour therapy literature as a whole. It is part of a series which gives due prominence to individual differences, as was discussed in the previous section. He classified claustrophobic subjects into "behavioural" or "physiological" reactors and then studied the effect of a behaviourally focused method (exposure) or a physiologically-focused method (applied relaxation). With
this sample, though not later with agoraphobics (1984), "the results supported the hypothesis that greater effects are achieved when the method used fits the patient's response pattern than when it does not".

Ost and Hugdahl (1981) were also curious about the ways in which phobic patients (animal, social, or claustrophobic) acquired their fears. They were particularly interested in investigating whether psychophysiological responses were more likely to be prominent in those who attributed their phobias to conditioning experiences. They similarly questioned whether those with higher subjective reports would be more likely to have acquired their fears vicariously or through the transmission of information. They did not find a clearcut relationship between the ways of acquisition and anxiety components (thus failing to support Rachman's 1978 hypothesis), nor did the conditioned and indirectly acquired phobias differ in severity. There were, however, other interesting findings. Of the 23 claustrophobics in their sample, over 2/3 reported that their problem had been acquired as a result of a conditioning experience (a higher figure than for the other two fears in the report). In laboratory testing these subjects had a significantly larger increase in heart rate than those who had acquired their fears indirectly. In comparison to those with the other two fears, the
claustrophobics showed more physiological reactions, had more negative thoughts, and engaged in more worrying.

In a recent questionnaire (Rachman, Booth, & Whittal, 1988), the conditioning explanation was also the most common (though subjects' recall and interpretation of their experiences is, as in the previous study, not an entirely satisfactory way of collecting data). Usually from either parental punishment or a sibling prank, a rather larger proportion than Ost (1978) reported -in his study some 37% by the age of 14- were able to detail early aversive experiences in an enclosed space which they saw as causally related to their current fear. (Ploeger's study of trapped miners is an interesting account of how this fear can become conditioned, see Rachman, 1989). This survey may not have been as well structured as the Ost (1981) questionnaire, and is at an early stage of formulation, but it has yielded some interesting questions and thrown up some problems. The focus was on the presence and influence of cognitions and the responses were variable. Some gave classic examples of catastrophic thoughts such as "there'll be an earthquake while I'm stuck in here". Some recorded thoughts of a more social nature ("it will be so humiliating to be seen this upset"), and embarrassment was almost as common a theme as entrapment. One subject said that her first panic in a situation was non-cognitive and the potential of thoughts was to cause a re-panic. This raises the question of whether
cognitions play a lesser role in fear that peaks very quickly. Another subject reported that being shut in brought back a lot of frightening childhood images, but that she had no worry of current harm. However, some reported having neither thoughts nor images. One reported having broken a cast on her leg eight times because she finds lack of movement "an impossibility", though she was quite unable to identify any relevant thoughts, catastrophic or not, on this or previous occasions. Several reported that at the peak of anxiety they do not think at all (or so they think!) which raises the interesting possibility that cognitions (severity and frequency) may be less likely to be noted once a certain level of anxiety has been reached.

There were a variety of points that were hardly surprising. Catastrophic beliefs were always a great deal stronger in the feared situation; outside it, they often held no credibility at all. Some found that distraction or breathing techniques were helpful, but self-induced cognitive therapy (such as "you are being ridiculous") had almost no effect. It was therefore somewhat puzzling that so many felt that cognitive therapy sounded to be a very promising approach and needed little or no encouragement to state that their thoughts were in fact at the root of their anxiety.
In many cases it was difficult to get recent examples simply because so much avoidance behaviour was engaged in. It was indeed striking just how effective current avoidant strategies are, as well as the lengths undergone to accomplish them. Though very few had ever considered treatment, some 50% said that they would take up the opportunity if they knew it was available.

The subjects included one outstanding example of picking up a fear vicariously. The father of a participant had had a traumatic experience trapped in a hot sauna with four others. The atmosphere "went really crazy" as the temperature increased until finally the door was axed in from the outside. She has a very strong image of what it was like, and in an enclosed space or in a crowd what increases her agitation more than anything else is an increase in temperature.

One of the main difficulties faced in setting up this study was to establish inclusion and exclusion criteria. It is not easy to define claustrophobia, and its overlap with agoraphobia further complicates the issue. Fear of enclosed spaces in agoraphobics has been described as "usual" by Johnston et al (1984), and in Doctor's survey (1982) only 17% of agoraphobics found closed-in spaces to be "no problem". At one extreme, being confined in an enclosed space (claustro = closed) such as a locked room, does not
pose a problem. But waiting in line at a supermarket is surely not always indicative of claustrophobia as Rachman has indicated (1989). It could signify a range of fears depending on the precise cognitions. The habit of classifying fears by situation is surely no longer appropriate, particularly those which are open to multiple interpretation. If one were to include a broader assessment of phobias one would be able to improve on the DSM III-R (1987). It currently only allows simple phobias as a residual category, to be employed only when agoraphobia and social phobia have been ruled out. Inclusion of cognitions in assessment might encourage a more flexible diagnosis.

One of the few groups to define the distinction between claustrophobia and agoraphobia was Neiger and his associates (1981) in their factor analysis of personality and fear variables in phobic disorders. They do so on the basis of three points. Firstly, claustrophobics never have trouble walking out in the fresh air while agoraphobics do, if such a walk takes them away from home; secondly, the claustrophobic's difficulties remain unaffected by distance from home, while agoraphobic problems are aggravated by increasing distance from home or "safe place"; thirdly, the presence of a "safe person" does not help to reduce the likelihood of claustrophobic manifestations, in contrast to agoraphobic difficulties. While this is at least an attempt
at defining differences, it is not at all clear how the two groups were actually distinguished in their study.

What one can conclude safely is that many agoraphobics have fears of closed spaces, but the reverse is not always found since some claustrophobics have isolated focal fears. One must be cautious in going further than this as is illustrated by Ost et al (1984) in an unusually unsubstantiated series of remarks. They write that "a well-known characteristic of agoraphobia is that the agoraphobics are more concerned with the fear itself (i.e. panic attacks), more than the actual situations where this reaction could be triggered. The claustrophobic is more afraid of the closed space per se than of his/her own reactions in the situations. The tendency to completely avoid the phobic situations may be much stronger in agoraphobics compared to claustrophobics, who often find ways to render the situation more safe, e.g. by leaving doors unblocked or using the stairs instead of the elevator". Not only are safety signals a noted factor of agoraphobics, but most would argue (e.g., Rachman, 1989) that far from being frightened of an enclosed space, rather the claustrophobic is frightened of what might befall him there. This in fact is surely one of the linking rather than distinguishing factors of the two disorders.
Many of these issues have been raised in Rachman's (1989) chapter on claustrophobia which, though short, is one of the lengthiest pieces in the whole area. It certainly has many strengths. Putting panic in an experimental setting, without lactate or its equivalents, opens up many exciting possibilities (Rachman & Levitt, 1985; Rachman, Levitt, & Lopatka, 1988). The "links" between bodily sensations and cognitions are very interesting and the discussion of sensitization, symbolic fear and exposure is extremely important. Of the last he asks the vital question as to whether it achieves its effects directly and independently, or through the influence of fearful cognitions. He sums up much of our current knowledge when he states that "at present our grasp of the reduction of claustrophobia is an uneasy mixture of an effective behavioural procedure for reducing fear and a groping towards a cognitive explanation for the process by which the changes occur".

There are two points Rachman brings up that are particularly worth noting. He states firstly that "it is possible that the human fear of enclosed spaces is a vestigial fear of being trapped in a way that prevents escape when threatened" but fails to elaborate on this question. Might this make it more likely that there could be a non-cognitive quality to fears in claustrophobia? Secondly, while it seems plausible that the person's fear is not of the external circumstance, it is not convincing that
the critical feature is "the significance of internal stimulation". The misinterpretation of bodily sensations does not seem to play the same critical role in claustrophobic panics, and Rachman's sticking so close to Clark is likely to prove hard to hold on to outside an area such as agoraphobia. Maladaptive thoughts can surely centre on avoidance or escape from the phobic situation, without focusing on the physiological changes accompanying anxiety.

Looking back at previous studies on claustrophobia one can still chart many developments in behaviour therapy. For almost a decade there was a lull in this area but in the last two or three years, it has become an area of interest once again. This interest focuses on three areas: the laboratory induction of panic, the role of cognitions in anxiety, and the use of interoceptive exposure for anxieties other than panic disorder. These are all addressed in the next section in which specific questions are formulated.
THE PRESENT STUDY

In this section the aim will be to bring together and outline the issues which will be addressed in this study, and lay out the interventions and measures that will be used.

In the literature review, much mention has been made of the apparent success of current treatments for panic disorder. The reverberations of such a dramatic finding have received very little consideration, perhaps not surprisingly since the findings themselves are still quite tentative. The first question that is considered here centres on interoceptive exposure which some investigators, such as Barlow (1988), would see as the lynch pin of the new approach. It will be of great interest to see how this intervention will benefit claustrophobics. They, too, it will be noted from previous work, are prone to experience panics in an experimental setting. However, with much less experience of panic in everyday settings it remains to be seen if they will find the technique useful. Will any gains be diminished in the face of far more potent external cues than those typically referred with panic disorder? Will it be possible to find exercises that will bring on sensations resembling those that are experienced during claustrophobic panic? Can it work without the backing of experience or training in the feared situation? There are many questions
surrounding the application of interoceptive exposure to an anxiety other than panic disorder.

A second notable part of the treatment for panic disorder is that in all the major centres in which it is practiced, there is a strong cognitive component. Some researchers such as Clark (1987) have, over time, moved to strengthen and enlarge this component. This is surprising in that the cognitive contribution had largely been written off as having little to contribute in the anxiety disorders. It was considered a particularly fruitless exercise if the fear had been conditioned. This was a finding backed not only by most theorists but by the bulk of the evidence in the literature. Cognitive approaches were particularly ineffectual with the strongly conditioned simple phobias, while of some, if limited, value to fears with less of a conditioning component such as social phobias. It now appears that the cognitive contribution is a crucial ingredient in the successful treatment of panic disorder, at least as practiced by the Oxford group (Hawton et al, 1989). If this finding holds firm, then there would have to be a reappraisal both of what groups might benefit from a cognitive intervention, and of how this can be predicted. Panic disorder, after all, is likely to have a particularly strong conditioning history, whether this be linked to either situations or physical sensations. A highly conditioned fear may not then be a good basis for excluding
a cognitive intervention. It may be that another basis for predicting the potency of cognitive interventions will emerge such as, for example, the strength with which associated dysfunctional cognitions are held. Claustrophobia would again appear to be a good testing ground.

This last point helps to make it clear that a better understanding of a fear such as claustrophobia, will be of importance in the reappraisal that seems likely to be necessary after the dust has settled on the treatment of panic disorder. Much can learned and suggested from the senses in which claustrophobia and panic disorder are really similar, and the significance of the ways in which they differ.

But even without the results from panic disorder, there would be no shortage of questions to ask of comparative interventions for claustrophobia. This is an ideal format in which to study the mechanisms of change. Rachman and Whittal (1989) have referred to trying to catch such mechanisms "in a glass jar". The ambitions here would be somewhat more modest, and particularly relate to monitoring changes across self-reported anxiety, cognitions and physical sensations. How do changes in these systems compare between the three interventions? What is the difference in timing of their effect?
Turning now to methodology, it can be noted that some researchers have favoured varying the behavioural options by having a variety of tasks to perform (such as Mavissakalian et al.'s [1983] "course" for agoraphobics that becomes increasingly difficult). Rachman and his associates (1987, 1988), however, have found it more useful to have a short standardized test with, at most, a choice between several "levels" of the same task. The latter option was favoured here. The chief measure of anxiety is thus a series of self-reports. While the claustrophobic may find it easier than the agoraphobic to avoid the smaller range of situations associated with alarms, the advantage for the researcher is that within the narrower range of situations, the claustrophobic will receive many more cues for panic. It is thus an excellent testing ground for subjective reports of anxiety and panic.

There is general consensus, too, that research in this area will be unable to stretch either its theoretical or applied wings without physiological assessment. The method by which this should be done is hotly debated although heart rate is usually recognized as the most reliable marker (Liebowitz et al., 1985). Since the advent of ambulatory monitoring (see Freedman et al., 1985; Taylor et al., 1983), physiological assessment in a laboratory setting might seem limited, but there are important questions that can be answered in such a setting. If the cognitive intervention is
effective, for example, is it that it leads to a marked reduction in heart rate, or a lower probability of misinterpreting the same level of physiological response?

In the area of self-reported cognitions and sensations the pioneers have been Chambless and her associates (1984). They have developed questionnaires that have proved a solid foundation for research in this area. The Agoraphobic Cognitions Questionnaire (ACQ) has items pertaining to catastrophic thoughts about the results of anxiety, while the Body Sensations Questionnaire (BSQ) is a list of physical sensations associated with anxiety that clients frequently report to be disturbing. There have been some variations on scoring the ACQ, though the most common means has been to rate each thought from "never occurs" to "always occurs". For the BSQ the subject is allowed more latitude as to how the sensations are perceived, with choices from "not frightened or worried by this sensation" (score of 1), to "extremely frightened by this sensation" (score of 5). The scores on individual items, whether indicating merely presence or including perception, are summed and expressed as either a total or an averaged score.

The importance of outcome has thus far been downplayed, but that is not to say that it is to be totally ignored. However, in place of a comparison of the different groups on a single measure, there will be greater focus on which
treatment generalizes better and how each fares over time. One of the clearest statements on the risks and limitations of a single point of measuring change was made by Bandura (1978). He is both critical that the effects of psychological procedures "are often judged in terms of undifferentiated outcomes akin to cure rates" and points out that any behaviour is likely to "vary markedly in different environmental settings toward different people and at different times". In place of such undifferentiated outcomes, he appeals for the more analytic questions of whether a method induces psychological change, whether the changes generalize across situations and response systems, and whether the changes are maintained over time. As he states, "the retirement of amorphous, inadequately measured outcomes is long overdue". Such a design promises to be of particular relevance in this study since cognitive interventions often seem to improve their efficacy even after treatment has ceased (e.g. Marshall, 1985), and yet have fared less well in reducing anxiety in unfamiliar settings (Biran & Wilson, 1981).

At this point the interventions will be clarified. The first intervention comes easily to mind: it is one aimed solely and exclusively at cognitions. The client's anxiety-provoking thoughts will be elicited, and training will follow showing how such cognitions might be countered. The major point is that there will be no exposure to the feared
situation. It seems almost certain that such an intervention will be less successful than direct contact with the feared situation but it is not clear why. Is it that one needs evidential experience for a cognition to change? Is it that in an anxious situation the physiological arousal is too high to allow cognitive techniques to be put into action? It would certainly be of great interest to establish whether cognitions can be changed without exposure, and what effect this is likely to have on the other two systems both over time and across other situations. Teasdale (1988) has called for such an intervention in panic disorder, but it is only since this study was initiated that there has been any sign of a response (P.M. Salkovskis, personal communication, April 1990).

One point should be made clear about this intervention. It is not proposed for a moment that this is how cognitive therapy should ideally be carried out. There is not a single style of cognitive therapy that would aim to change cognitions in this manner, i.e. without including exposure to the feared situation. Beck and Emery (1985) state unequivocally that simple phobias are not a suitable target for cognitive interventions since "the cognitive set is activated with a minimum of primary and secondary appraisals", and the cognitive responses are "reflexive", "automatic" and "far removed from voluntary control and appraisal". It is to exposure that Beck looks to move
clients from what he terms reflexive to reflective thinking. Bandura (1977), too, is adamant that cognitive processes are induced and altered most readily "by experience of mastery arising from effective performance". One of the freedoms of this style of study is to be able to include an intervention to see what happens, without believing that it can necessarily match other interventions.

It is important to decide on the style of this cognitive intervention. As theories and practice have developed and proliferated, it no longer makes sense to group "cognitive approaches" as if they were a single phenomenon. There is certainly a stark contrast between the approach of Meichenbaum and Beck, for example. The former will lead to a variety of coping self-instructions, the latter to identification and countering of dysfunctional thoughts. It is this second approach which will be used here. It is one that has been clearly specified (see Beck & Emery, 1985) and has transferred relatively well from the same authors' work on depression.

The second group is also relatively easy to select. Barlow's decision to desensitize patients to the "sensations" of exposure, rather than to particular situations was so ingeniously simple that once seen it was astonishing that it had not been used years previously. Barlow (1988) does give an interesting account of some very
early examples of this approach which he believes were either misinterpreted or ignored. Wolpe (1958) used CO₂ inhalations but saw them only as a means of facilitating relaxation. Orwin's (1973) "running treatment" also inadvertently exposed subjects to the somatic cues of panic. Little, too, was made of some early case reports by Lum (1976) and Latimer (1977). Thus it was not until the mid-1980s that workers such as Clark (1985), Salkovskis et al (1984), Ley (1985), Rapee (1987) and Barlow (1988) came to use interoceptive exposure, though it was as often used to test specific hypotheses than as a deliberate focus of desensitization. For many of the reasons mentioned in the previous paragraph, it is more likely to be effective practiced in vivo, but much can be learned from studying its effects when it is applied without the benefit of exposure. Indeed researchers such as Clark (1990) have expressed grave doubt that it could exert any significant effect on its own, other than when opportunity might be provided to challenge a cognition.

To some extent it is tempting to have just these two groups so as to facilitate within-group analysis, but on balance there are distinct advantages to having groups with which rates of change might be compared. An obvious choice is to have an exposure group, even if this brings about some difficulties. The main limitation is the risk that the inclusion of exposure would detract from the process
emphasis of the study; it would be all too easy for the reader to note that this was the most effective intervention (the almost certain outcome) and so miss the important detail of the changes in the three interventions. A second important point is that it is not easy to administer a "pure" form of exposure in practice, as Wilson (1986) has reported. When he required therapists to foster exposure without explaining clients' reactions, challenging dysfunctional thoughts, or addressing issues related to response prevention, they reported how difficult it was to adhere to the treatment protocol. While his experience suggests that any form of mute exposure would be impractical, early pilot work for this study suggests that it is possible to give very much less emphasis to cognitions. Since there is exposure to a feared stimulus both before and after the interventions, a control group is also included controlling for the effect of these assessments over the time period of the interventions.

Another important issue is subject selection. This is a topic which needs to be considered dispassionately since its discussion often tends to generate more heat than light. More study is required of the type carried out by Emmelkamp et al (1986) which looked specifically at the external validity of analogue outcome research. The use of college students is the commonest source of criticism since they do appear to be more strongly influenced by factors such as
demand characteristics and expectancy of therapeutic gain (Emmelkamp et al. 1975) than clinical patients. It is possible (and again this is open to testing) that cognitive interventions are more effective with intelligent students who can adapt more easily to cognitive demands. A third area of difference is that student subjects are likely to react with a much slighter degree of arousal than clinical subjects (Lader, 1967). Since several authors (Biran & Wilson, 1981; Rachman & Wilson, 1980) have suggested that cognitive restructuring is only likely to be effective for low physiological reactors, this again would be a limitation in studying solely student volunteers. There are, as yet, limited data on the question but Borkovec's view (1976) is still widely quoted, if not yet supported with clear data: "As long as the physiological component is strongly present in the individual's immediate anxiety reaction, simple manipulations of the other two components (i.e. cognitive and overt-behavioural) will be ineffective, or at very least, inefficient". The sterner tests are thus likely to be found with clinical patients.

There remain a few concepts about which a few words should be said. With regard to the measurement of the three systems, the position put forward by Lang in 1964 still makes good sense. He warned that neither verbal, motor nor somatic concepts could be used to define fear on their own since each could give out a false lead. Though widely used,
it is a system that has invited criticism. Schwartz (1978) considers that it is arbitrary to focus on three dimensions and, moreover, misleading since it implies that they are somehow separate and ignores "the novel, interactive or emergent property that patterns acquire". Peterson's (1984) concern is that the resulting increase in the number of measurements increases the probability of chance findings and can lead to an emphasis on a few variables that best fit one's preconceptions. With the number of hypotheses in this study, this is an important point to bear in mind. However valid these cautions, the triple response system is not yet bettered and is now firmly established in the field. As Hollandsworth (1986) wrote: "As long as the triple modes way of viewing things is presented as a tentative and even flawed construct with specific uses and definite limitations, then one need not apologize for its simplicity or practical applicability".

It had been hoped to investigate further Barlow's notion of true and false alarms. It is a distinction which he makes on the basis of a retrospective interview. Though in a general sense it is possible to establish that there are such events as false alarms, it becomes much more difficult on an individual basis to determine the causes of a person's learned response. In this study it is anticipated that subjects will show a range of avoidance and panic experience. Rather than getting embroiled in differentiating
claustrophobia from agoraphobia, subject selection will be based solely on the degree of anxiety experienced in the closet in the laboratory. Though assessed and used, subjects' avoidance or levels of experienced anxiety in other situations will not be a basis for inclusion in, or exclusion from, the study.

A final construct to be briefly discussed is sensitivity to symptoms of anxiety. Whether or not they are likely to be misinterpreted, the question must be answered as to how physical sensations are triggered in the first place. A hypothesis proposed by Shear (1988) is that panic vulnerability might result from "transient, nonspecific peripheral physiological changes which occur more frequently in panic patients". However, she finds little evidence for a primary disturbance in such physiological activity. This then suggests that those susceptible to a panic attack are perhaps particularly sensitive to noticing their bodily sensations. A way of measuring such sensitivity is with Reiss' (1986) Anxiety Sensitivity Index and the relation between this and interoceptive exposure will be particularly noted.

It is stressed that process research is not proposed as being atheoretical. Practice and theory in the field of anxiety disorders have tended to remain quite far removed from each other: advances in practice have rarely been
derived from theory. What is needed is some clear evidence which can have bearing on more than one theorist. It is in trying to meet such a need that the following study has been planned, and emphasis placed on the importance of descriptive as well as experimental data.
METHOD

1. SAMPLE SELECTION

Forty-eight participants were selected from the community after extensive advertising in local radio and newspapers. This publicity stressed (a) that the focus of the study would be on the fear of small enclosed spaces, although fears of larger spaces, such as aircraft or shopping malls, might also be evident; (b) that participants would be trained over three visits in a particular coping strategy; (c) that this was a research study in which participants neither paid nor were paid; and (d) that confidentiality was assured. It was explained that having filled out some questionnaires, answered a variety of questions, and taken part in the three session intervention, a minimum of a further hour would be devoted solely to answering queries and giving advice specifically tailored to the needs of each participant.

Criteria for exclusion.

Exclusionary criteria were (a) those currently in treatment for a mental disturbance or with a history of psychosis; (b) those suffering from a major illness including any cardiovascular disorder (such as hypertension) or respiratory disease (such as asthma or bronchitis); (c) those taking medication (other than minor tranquilizers)
that could not be discontinued; and (d) those who were either pregnant or (e) epileptic.

Criterion for inclusion.

The criterion for inclusion was tied to the specific demands of the study rather than on the basis of any general claustrophobic or more general fear survey. Subjects who reported a fear score of more than 50 (on a Visual Analogue Scale [VAS] of 0-100) after two minutes exposure to the laboratory test-closet were, for the purposes of this study, defined as claustrophobic. Such a score is above the 99th percentile of the UBC student population sampled over the last two years (Rachman, Booth, & Whittal, 1989).

2. MEASURES

The assessment was made up of three sets of dependent measures (seven in all) that were given at different intervals throughout the study. A summary of these measures and the intervals at which they were administered is presented in Table 1.
ASSESSMENT I

The first part of the assessment consisted of a single measure administered at pre-intervention, post-intervention, and at follow-up:

The Anxiety Sensitivity Index (Reiss, 1986)

This is a measure of anxiety sensitivity, which Reiss et al (1986) have defined as "an individual difference variable consisting of the belief that the experience of anxiety causes illness, embarrassment or additional anxiety". Anxiety sensitivity is likely to have important consequences, including motivation to avoid anxiety-provoking stimuli, but its importance in this study is that it is considered likely "to increase alertness to stimuli signalling the possibility of becoming nervous". The scale has 16 items specifying negative consequences to the experience of anxiety. These consequences include additional anxiety or fear, illness, embarrassment and loss of control. Subjects rate each item from "very little" (scored as 0) to "very much" (4 points). An individual's Anxiety Sensitivity Score is the sum of scores on the 16 items.

Reiss et al (1986) have provided evidence of the psychometric properties of the scale, demonstrating its reliability and validity. While it is similar to other "fear
of fear" scales, it is the first to have been shown to measure something different from that measured by conventional anxiety scales, thus validating the distinction between anxiety and anxiety sensitivity. It is important to note that though high scores on the scale are more strongly associated with agoraphobia than with other anxiety disorders, results from studies reported in the same article clearly contradict the view of a unique association.

ASSESSMENT II

The second part of the assessment was made up of five measures and focused on the Behavioural Approach Test (BAT) at pre-intervention, post-intervention, follow-up, and at a test of generalization in a second enclosed space. Before entering the laboratory closet, subjects predicted the peak level of fear that they were likely to experience, using a 0-100 Visual Analogue Scale (VAS).

While they were in the closet (for a period of two minutes), their heart rate was measured by a pulsemeter attached to their earlobe with readings taken every 15 seconds. A heart rate measure was also taken for a similar length of time before the BAT, when subjects were asked to sit quietly with their eyes closed (resting heart rate).
After the BAT, subjects reported their level of fear (VAS 0-100), as well as whether or not they panicked. Subjects also filled in: (a) a Negative Cognitions Checklist, noting not only which commonly reported negative thoughts were brought to mind, but the degree to which they were believed (0-100%) while in the closet; and (b) a Physical Symptoms Checklist, including the unpleasantness (0-100%) of any symptoms experienced. The scales for cognitions and sensations are reduced to a single score for each, by multiplying each item endorsed by its accompanying percentage and summing the total.

Both scales are derived from questionnaires devised by Chambless et al (1984): the Agoraphobic Cognitions Questionnaire and the Body Sensations Questionnaire. The authors have demonstrated the reliability of these measures on clinical samples, as well as their discriminant and construct validity. They draw attention to the stability of scores prior to treatment, and to their sensitivity to change with treatment. Changes made for this study are additions relevant to claustrophobia, notably cognitions relating to entrapment, and the omission of items not endorsed by claustrophobics ("I am going blind"; "I will hurt someone"). While previously used with this group (see Rachman & Levitt, 1986), no psychometric data is yet available on these adapted questionnaires.
When the post-intervention assessments had been completed, participants were asked to go a second room where there was an even smaller test-closet, used to assess how the effects of each intervention had generalized. Unlike the first closet, it was soundproof and had no button with which to signal the return of the experimenter. The time period was also changed from two minutes to "a time, randomly drawn, between two and four minutes", although this was always two and a half minutes in practice. Participants were asked to make a set of predictions about how anxious they would feel in this second closet under six conditions (from doors open and light on, to door of room closed, closet locked and light off), using a Visual Analogue Scale 0-100 ("no fear to terrifying fear"). They were then asked to select and carry out one of these conditions.

ASSESSMENT III

An aim of this study was to monitor change more frequently than by simply recording before/after measures. Since there could be no exposure to the closet during training for two of the groups, it was not possible to take regular measures of heart rate, physical sensations, and cognitions in the feared setting. Assessment before and after each session of training was thus confined to self-report measures, of which anxiety prediction was considered the most central. Thus, once again using a Visual Analogue
Scale, at the beginning and end of each training session, subjects were asked to predict how anxious they would feel if they were to go in the closet for a two minute period.
Table 1

**Summary and timing of assessment**

**MEASURES**

<table>
<thead>
<tr>
<th>Assessment I</th>
<th>(Anxiety Sensitivity Index)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment II</td>
<td>(Predict/Report Anxiety)</td>
</tr>
<tr>
<td></td>
<td>(Report panic)</td>
</tr>
<tr>
<td></td>
<td>(Heart Rate)</td>
</tr>
<tr>
<td></td>
<td>(Negative Cognitions Checklist)</td>
</tr>
<tr>
<td></td>
<td>(Physical Sensations Checklist)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment III</th>
<th>(Predict anxiety)</th>
</tr>
</thead>
</table>

**TIMING OF ASSESSMENT**

<table>
<thead>
<tr>
<th>Assessment I</th>
<th>PRE-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment II</td>
<td>POST-TEST</td>
</tr>
</tbody>
</table>

- Intervention: End of Session 1
- Beginning and end of Session 2
- Beginning and end of Session 3

<table>
<thead>
<tr>
<th>Assessment III</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Assessment I</th>
<th>FOLLOW-UP</th>
</tr>
</thead>
</table>

| Assessment II  | POST-TEST         |

<table>
<thead>
<tr>
<th>Assessment III</th>
</tr>
</thead>
</table>

Eight weeks
3. APPARATUS

The laboratory "closet" used in this study was a sturdy but well-ventilated filing cabinet, 7' x 4' x 2', placed in a small dark room. After the closet door had been locked, the experimenter shut the door of the outside room leaving it in darkness. The only light came from a small switch inside the closet which, if pressed, signalled for the experimenter to return.

The room used for generalization was borrowed from a clinic where it was used as a mobile hearing laboratory. Its dimensions were 6' x 2' x 2' and the seat and all its usual equipment had been removed.

The pulse meter used to assess heart rate was a Sanyo HRM-97E. This works through a photo-electric pulse sensor clipped to the earlobe, yielding a digital display showing both time and pulse rate. Its range is from 38 to 200 beats a minute and it is accurate to within 3% on each beat.

4. PROCEDURE

Subjects responding to radio and newspaper advertising were screened for certain exclusionary criteria (see above) over the telephone. Those invited to come to the clinic were
given the pre-intervention interview and questionnaires, and
the assessment package which included the BAT. At this first
and all subsequent testing points, the predictions, reports,
as well as leading subjects to and from the closet, were all
carried out by an experimenter blind to subject conditions,
and who took no part in any of the interventions.

The instructions for the BAT were "high demand". That
is to say that after subjects had briefly seen the closet
and it had been explained that they would be asked to stay
in it for a period of some two minutes, they were told that
"only if they really needed to" should they press a button
illuminated in the closet, which would signal the
experimenter to let them out immediately. Practice use of
the button was discouraged. Subjects who refused to
participate if the door was locked, were encouraged to take
part with both doors shut, but neither locked. They were
assured on the ethical consent form that they were not in
any way obliged to take part, and could withdraw from the
study at any time. Those subjects who did not stay in the
closet for the two minutes were not necessarily excluded
from the study. The minimum requirements were that they stay
in for at least 30 seconds at the first assessment, and were
willing to stay in for the same length of time at all
subsequent BATs. Similarly, those on whom the door was not
locked, went into the closet under identical conditions at
all subsequent assessments.
Subjects whose reported fear was more than 50 (on a VAS of 0-100) were asked to participate in the study. Those with lower fear levels were told that their anxiety in this situation was lower than that currently being studied. They were then given at least an hour's counselling about their own fears and how these might best be handled, as well as the opportunity to ask any questions.

Subjects included in the study were randomly assigned to one of the four groups: (a) exteroceptive exposure (b) interoceptive exposure (c) a pure cognitive intervention. (d) a control group

In the exteroceptive exposure group, there was an explanation of how a fear is learned, and how humans seem to be particularly susceptible to picking up certain fears of which claustrophobia is a good example. The bulk of the time was spent discussing what we know about exposure and implementing an appropriate programme. A hierarchy was created for each individual so that exposure could proceed from the less to the more feared items (e.g. door wide open with the light on, to door locked light off) over the three sessions of the intervention. All exposure took place in the same closet that was used for assessment.
In the interoceptive group, the explanation of fear acquisition emphasized how easily one can pick up fear not merely of situations, but of sensations related to anxiety. A hierarchy was formed in a similar fashion to the exteroceptive group, but of sensations rather than situations. Subjects were given brief exposure to a range of exercises (some pioneered by Zarate, Personal Communication, March 1989) which bring on the physical sensations likely to be experienced when anxious. These included underbreathing (through a straw with nose held), overbreathing, spinning and running on the spot. The exercises identified by the individual as closely resembling those experienced while in the closet, formed the sensations hierarchy. They were ordered from least to most anxiety-provoking and were practiced for increasingly extended periods of time, in isolation, and in combination with one closely following another. To maintain a maximum emphasis on exposure to the sensations, related coping strategies such as hyperventilation training (with features such as paced respiration) were not included. Other than in answer to direct enquiry, neither was there explicit mention made of cognitions, nor the cognitive links between such sensations and catastrophic misinterpretations.

In the cognitive group, it was emphasized in the initial explanation how important thoughts could be in the provocation of anxiety. Subjects learned how to identify
automatic thoughts, and discussed those experienced during the assessment and how these might have contributed to their anxiety. With the use of methods such as flashcards and the third chair (trying to persuade an "imagined other" out of their own irrational thinking), the aim was for clients to learn, without exposure, to identify and deal with logical errors in thinking as a way of reducing anxiety. Information sheets were provided to help the process of learning how to rationally dispute thoughts related to physical sensations ("links" such as "I feel dizzy therefore I am likely to faint"; "I feel breathless and so I am in danger of suffocating") as well as those without such an association ("What happens if I am forgotten/trapped in here"?).

In all three interventions, the first training session took place immediately following the pre-test assessment, and the post-test assessment took place immediately following the third training session. Assessments and interventions were thus carried out within three visits, the first some two hours long, the second shorter at just over an hour, and the third again about two hours since it also included the test of generalization. Instructions at the outset included the directive that as far as possible participants should not seek out claustrophobic experiences while the study was in progress.
All three interventions were given by the same therapist who had worked for three years as a clinical psychologist, as well as having received extensive supervised experience in cognitive-behavioural therapy. Pilot sessions were all taped and discussed to improve the efficiency of all three interventions. Once the study started, every third session was taped so that checks could be made on treatment integrity (see Appendix K).

A date was set some six to eight weeks after the third visit for a return appointment. It was explained to subjects that they would be asked to fill out the assessments and re-enter the closet for one final time. This would be followed by up to an hour of discussion of the study, preliminary findings, implications for their own fears, as well as any questions that they should like to ask. Participants were given a written and verbal explanation of the aims and procedures of the study at that time.
HYPOTHESES

EXPERIMENTAL STUDY: HYPOTHESES

The hypotheses stem from four questions which are posed below.

Set 1. Do the three interventions differ from the control group at post-test?

It was thought that there would be some improvement in the scores of the control group, in addition to the effect of regression to the mean. Therapist contact, brief exposure to a stimulus that may well not be the top of their anxiety hierarchy, likely overprediction in view of their widespread avoidance, as well as allaying of additional fears (distrust of the experimenter, etc.), were all considered likely to lead to some reduction in scores even in the absence of an intervention. Nevertheless, for these interventions to be shown to be effective, they should show significant change over and above such improvement. It was hypothesized that on six of the seven variables (predicted fear, reported fear, reported panic, negative cognitions, unpleasant sensations and heart rate) that the three interventions would be superior to the control group. Since the Anxiety Sensitivity Index reflects a general rather than a specific reaction to anxiety, it was thought that only the interoceptive intervention was likely to reduce scores on this measure significantly. Specifically, the predictions were that:
The three interventions would bring about a more marked reduction on six variables than the control group. On the seventh (the Anxiety Sensitivity Index), the interoceptive group alone would show a reduction in scores compared with the control group.

Set 2 Do the three interventions differ from each other at post-test and follow-up?

It was anticipated that the exposure group would be equal or superior to the other two groups on all but the Index of Anxiety Sensitivity. More interest would focus on how the other two interventions relate to exposure and each other. The cognitive intervention would be expected to influence reported cognitions and to reduce reported panic even at post-test. In addition it has been proposed that the cognitive group is likely to have a "sleeper" effect, continuing to reduce, or hold constant, predictions and reports of anxiety during the follow-up period, in place of the usual degree of return of fear. The interoceptive group on the other hand, with its exclusive focus on physical sensations, would be expected to reduce the reported unpleasantness of physical sensations and scores on the Anxiety Sensitivity Index. Specifically the predictions were that:
The exposure and cognitive groups would show reduction on scores of reported panic and negative cognitions.

The exposure group would show greater reduction in scores of predicted and reported fear and heart rate at post-test than the other two groups, but by follow-up the cognitive group would also be superior to the interoceptive group on these measures.

The exposure and interoceptive groups would show more reduction in scores on physical sensations than the cognitive group.

The interoceptive group would show a greater reduction in scores on the Anxiety Sensitivity Index than either of the other two groups.

Set 3 Is there a difference in the rate at which fear is reduced in the three groups (measured at six points)?

This third set of hypotheses is focused on changes in self-report anxiety that occur before and after individual sessions of the intervention. The most important question concerns the timing at which the effects of an intervention become apparent. It has been argued that the cognitive and
interoceptive groups are likely to show a reduction in anxiety, only after subjects have had the chance to check out what they have learned in the post-test BAT. Thus it was predicted that gradual changes in self-report predicted anxiety should be evident in the exposure group over the three training sessions, the largest decrement coming during the second session (the longest period of exposure). On the other hand, little such change should be seen in the other two groups until the measure is taken after the post-test BAT. Specifically the predictions were that:

At the third of six measuring points, there would be a reduction in predicted fear in the exposure group. At the sixth measuring point, there would be a reduction in the cognitive and interoceptive groups on the same measure.

Set 4 Do the four groups differ on measures related to generalization?

A feature of this study is its consideration of generalization. After the post-intervention assessment participants rate a second enclosed space under six different conditions, and choose one of six "levels" under which they would enter it for a short period of time. It is predicted that the three interventions would be superior to the control group on these two measures of generalization.
A PHENOMENOLOGICAL STUDY OF CLAUSTROPHOBIA: OUTLINE

In addition to the experimental study, and as part of the emphasis on process, opportunity was also taken to collect descriptive data. It was hoped that much could be learned of the nature of claustrophobia from this information since so little is known about this fear. As a preliminary step, it was intended to establish some facts about the sample. The next step was to look at the results of the questionnaires on both cognitions and sensations to see which were the most commonly endorsed items, before moving to the results of the structured interviews which included information on the onset of the fear, likely precipitating events, as well as areas of current avoidance. The sort of issues on which illumination was sought, were such as whether this is a fear that can be split cleanly between fear of suffocation and fear of entrapment, whether, as in agoraphobia, security seems to be gained from the presence of others, and what are the major cognitive themes of this fear.
RESULTS

In this main section of the results, the data are presented for the four sets of hypotheses after two issues have been briefly discussed.

**Alpha level** The setting of an alpha level is an important decision. Clinicians have perhaps too often favoured a liberal bias without appropriate justification. Since this is exploratory research, however, where conclusions will be tentative and as part of a series of studies will be fully tested again, the risk of Type I errors need not have the overriding importance it must assume in some circumstances. Indeed if power is overly reduced, there is a risk that important threads might not be noted and duly followed up. An alpha of .05 is considered appropriate.

**Missing data** Two subjects attended only the first session (one in the exposure and one in the interoceptive group). In one case, domestic problems necessitated the postponing of her second visit for such a long period that it fell outside the time boundaries set. In the other, the individual was offered a job outside Vancouver and did not want to delay getting all possible information about claustrophobia before her departure. These participants were replaced. The only other complication was that one subject (from the interoceptive group) refused to go into the closet
at follow-up and so was unable to complete three of the measures at that point. The reasons for her refusal were clear and expressed fully. She had panicked on the previous trial, her heart was already racing at the prospect of going in again, and she had no desire to have another panic. In an excellent article on attrition (Howard et al, 1986) it is pointed out that giving her either a mean score or omitting her from the study would be quite misleading. The recommendation for this instance, which was duly followed, was to give her the same high scores which she had endorsed on the previous occasion on these four measures.

**Question 1.** The predictions for the first question were that the three interventions would bring about a more marked reduction on six variables than the control group. On the seventh, (the ASI), the interoceptive group alone would show a reduction in scores compared with the control group.

A one-way MANCOVA (covarying out the pre-intervention scores) was performed to test for an overall effect and was significant (Pillais) $F(49, 259) = 2.35, p < .001$. Means and standard deviations for all seven variables are presented in Table 2 and covariance-adjusted means are presented in Appendix L.

A series of univariate ANCOVAs were then performed on the post-intervention differences, one for each of the seven
dependent variables, the pre-test scores again being
covaried out. The results are presented in Table 3. For six
of the seven variables these ANCOVAs were significant:
predicted fear, negative cognitions, unpleasant physical
sensations at $p < .001$, reported fear at $p < .01$ and reported
panic and heart rate at $p < .05$. More finely grained analyses
were thus warranted. For each of these main effects found to
be significant, follow-up multiple comparisons were
conducted using Dunnett’s procedure (since the control group
was being compared with all other groups), with the
necessary adjustment for the covariate (see Kirk, 1982,
p.735). These comparisons are presented in Table 4.

The results show that the exposure group was lower than
the control group on scores of predicted and reported fear,
heart rate, negative cognitions, unpleasant physical
sensations (all at $p < .01$) and reported panic ($p < .05$). The
cognitive group had lower scores on negative cognitions and
physical sensations (both at $p < .01$), and reported fear and
panic ($p < .05$). The interoceptive group had lower scores on
negative cognitions and physical sensations (both at $p
< .05$).

The exposure group showed a broad and expected
reduction in scores in relation to the control group. In the
cognitive group, it is of note that the reports of fear,
rather than its prediction, were significantly reduced and
that heart rate remained unchanged. Changes in the interoceptive group were more modest, and only those in reported cognitions and sensations during the assessment reached statistical significance. There was no support for the prediction that ASI scores in the interoceptive group would be reduced.
| Variable                          | Pre     | Post    | | Mean   | SD     | Mean   | SD     |
|----------------------------------|---------|---------| |        |        |        |        |
| **PREDICTED FEAR**               |         |         | |        |        |        |        |
| CONTROL                          | 87.33   | (17.2)  | | 67.33  | (22.2) |
| EXPOSURE                         | 84.83   | (14.5)  | | 25.00  | (24.9) |
| INTERO                           | 82.58   | (21.1)  | | 51.33  | (26.6) |
| COGNITIVE                        | 83.16   | (22.7)  | | 49.83  | (10.7) |
| **REPORTED FEAR**                |         |         | |        |        |        |        |
| CONTROL                          | 76.50   | (17.2)  | | 52.59  | (33.2) |
| EXPOSURE                         | 78.83   | (15.8)  | | 15.92  | (20.4) |
| INTERO                           | 78.25   | (13.8)  | | 34.41  | (32.5) |
| COGNITIVE                        | 75.33   | (19.4)  | | 21.00  | (12.0) |
| **REPORTED PANIC**               |         |         | |        |        |        |        |
| CONTROL                          | 1.92    | (0.79)  | | 1.75   | (0.87) |
| EXPOSURE                         | 2.00    | (0.74)  | | 1.08   | (0.29) |
| INTERO                           | 1.58    | (0.52)  | | 1.50   | (0.67) |
| COGNITIVE                        | 2.33    | (0.62)  | | 1.25   | (0.45) |
| **NEGATIVE COGNITIONS**          |         |         | |        |        |        |        |
| CONTROL                          | 273.42  | (247.2) | | 251.00 | (244.3) |
| EXPOSURE                         | 300.75  | (215.5) | | 18.83  | (32.9) |
| INTERO                           | 187.58  | (187.0) | | 81.33  | (128.5) |
| COGNITIVE                        | 244.25  | (180.6) | | 29.50  | (40.7) |
| **PHYSICAL SENSATIONS**          |         |         | |        |        |        |        |
| CONTROL                          | 396.00  | (375.1) | | 259.50 | (254.2) |
| EXPOSURE                         | 286.92  | (230.7) | | 38.00  | (39.2) |
| INTERO                           | 360.67  | (233.4) | | 126.83 | (135.4) |
| COGNITIVE                        | 386.17  | (263.8) | | 69.92  | (64.6) |
| **MEAN HEART RATE**              |         |         | |        |        |        |        |
| CONTROL                          | 99.67   | (23.4)  | | 97.08  | (18.2) |
| EXPOSURE                         | 93.25   | (23.9)  | | 79.50  | (12.4) |
| INTERO                           | 93.58   | (20.3)  | | 87.75  | (11.3) |
| COGNITIVE                        | 98.58   | (24.9)  | | 90.83  | (23.1) |
| **ASI**                          |         |         | |        |        |        |        |
| CONTROL                          | 29.58   | (5.4)   | | 25.33  | (10.6) |
| EXPOSURE                         | 23.08   | (7.2)   | | 18.67  | (5.8)  |
| INTERO                           | 24.16   | (13.0)  | | 20.41  | (10.5) |
| COGNITIVE                        | 27.16   | (8.6)   | | 23.92  | (9.3)  |
Table 3

Univariate ANCOVAs on post-intervention differences between the four groups (pre-assessment scores covaried out)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>F value (3, 43)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted fear</td>
<td>7.64</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Reported fear</td>
<td>4.82</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Reported panic</td>
<td>3.99</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Negative cognitions</td>
<td>8.81</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Unpleasant physical sensations</td>
<td>6.73</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>3.39</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Anxiety Sensitivity Index</td>
<td>0.26</td>
<td>&gt;.05</td>
</tr>
</tbody>
</table>
Table 4

Significance of the differences between the three interventions and the control group (Dunnett's t values with adjustment for the covariate)

<table>
<thead>
<tr>
<th></th>
<th>Exposure</th>
<th>Cognitive</th>
<th>Interoceptive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted fear</td>
<td>4.70**</td>
<td>1.85</td>
<td>1.66</td>
</tr>
<tr>
<td>Reported fear</td>
<td>3.51**</td>
<td>2.94*</td>
<td>1.76</td>
</tr>
<tr>
<td>Reported panic</td>
<td>2.93*</td>
<td>2.55*</td>
<td>0.65</td>
</tr>
<tr>
<td>Cognitions</td>
<td>4.66**</td>
<td>4.12**</td>
<td>2.76*</td>
</tr>
<tr>
<td>Sensations</td>
<td>3.94**</td>
<td>3.81**</td>
<td>2.90*</td>
</tr>
<tr>
<td>Heart rate</td>
<td>3.17**</td>
<td>1.28</td>
<td>1.35</td>
</tr>
<tr>
<td>ASI</td>
<td>0.67</td>
<td>0.15</td>
<td>0.32</td>
</tr>
</tbody>
</table>

The critical t values were 3.09 for p < .01 and 2.44 for p < .05.

**p < .01  *p < .05
Question 2 The second question focused on the differences between the three groups at post-intervention and follow-up. The control group was not included in these analyses since it did not continue to follow-up.

A two-way between-within MANCOVA was first carried out (the pre-intervention scores are covaried out) on the three groups at post-intervention and follow-up. That is the between-groups factor was treatment group (three levels), and the within-groups factor was measurement time (two levels). The results were Group: Pillais $F (14, 42) = 1.77, p > .05$; Group by Time: Pillais $F (14, 56) = 1.97, p < .05$; Time: Pillais $F (7, 27) = 3.2, p < .05$. Means and standard deviations are presented in Table 5.

A series of univariate ANCOVAs, with the same between-within design as noted above, were then performed on each dependent measure for group by time, and for time. The results are presented in Table 6. Since the multivariate main effect for group was non-significant (as noted above), none of the group main effects were examined in these univariate ANCOVAs.

In no case was there a statistically significant group x time interaction. For four of the variables there was an effect for time. Averaged across groups from post intervention to follow-up, scores were lower at the latter
point for predicted fear and on the ASI, but scores were higher on reported fear and heart rate.

Overall there was no support found for the specific predictions for this question all of which involved group x time interactions.
Table 5. **Means and standard deviations for seven variables at pre-intervention, post-intervention, and at follow-up**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre</th>
<th>Post</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predicted Fear</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>84.83 (14.5)</td>
<td>25.00 (24.9)</td>
<td>22.41 (21.5)</td>
</tr>
<tr>
<td>Intero</td>
<td>82.58 (21.1)</td>
<td>51.33 (26.6)</td>
<td>47.50 (28.7)</td>
</tr>
<tr>
<td>Cognitive</td>
<td>83.16 (22.7)</td>
<td>49.83 (10.7)</td>
<td>28.50 (22.9)</td>
</tr>
<tr>
<td><strong>Reported Fear</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>78.83 (15.8)</td>
<td>15.92 (20.4)</td>
<td>27.00 (27.0)</td>
</tr>
<tr>
<td>Intero</td>
<td>78.25 (13.8)</td>
<td>34.41 (32.5)</td>
<td>39.08 (33.8)</td>
</tr>
<tr>
<td>Cognitive</td>
<td>75.33 (19.4)</td>
<td>21.00 (12.0)</td>
<td>34.58 (30.5)</td>
</tr>
<tr>
<td><strong>Reported Panic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>2.00 (0.74)</td>
<td>1.08 (0.29)</td>
<td>1.25 (0.45)</td>
</tr>
<tr>
<td>Intero</td>
<td>1.58 (0.52)</td>
<td>1.5 (0.67)</td>
<td>1.5 (0.67)</td>
</tr>
<tr>
<td>Cognitive</td>
<td>2.33 (0.62)</td>
<td>1.25 (0.45)</td>
<td>1.25 (0.45)</td>
</tr>
<tr>
<td><strong>Negative Cognitions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>300.75 (215.5)</td>
<td>18.83 (32.9)</td>
<td>57.75 (83.8)</td>
</tr>
<tr>
<td>Intero</td>
<td>187.58 (187.0)</td>
<td>81.33 (128.5)</td>
<td>99.42 (118)</td>
</tr>
<tr>
<td>Cognitive</td>
<td>244.25 (180.6)</td>
<td>29.50 (40.7)</td>
<td>22.16 (27.1)</td>
</tr>
<tr>
<td><strong>Physical Sensations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>286.92 (230.7)</td>
<td>38.00 (39.2)</td>
<td>54.20 (79.9)</td>
</tr>
<tr>
<td>Intero</td>
<td>360.67 (233.4)</td>
<td>126.83 (135.4)</td>
<td>155.25 (180.8)</td>
</tr>
<tr>
<td>Cognitive</td>
<td>386.17 (263.8)</td>
<td>69.92 (64.4)</td>
<td>55.42 (80.7)</td>
</tr>
<tr>
<td><strong>Mean Heart Rate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>93.25 (23.9)</td>
<td>79.50 (12.4)</td>
<td>80.25 (13.6)</td>
</tr>
<tr>
<td>Intero</td>
<td>93.58 (20.4)</td>
<td>87.75 (11.3)</td>
<td>98.08 (17.5)</td>
</tr>
<tr>
<td>Cognitive</td>
<td>98.58 (24.9)</td>
<td>90.83 (23.1)</td>
<td>96.33 (23.2)</td>
</tr>
<tr>
<td><strong>ASI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>23.08 (7.2)</td>
<td>18.67 (5.9)</td>
<td>17.08 (5.6)</td>
</tr>
<tr>
<td>Intero</td>
<td>24.16 (13.0)</td>
<td>20.41 (10.5)</td>
<td>19.25 (11.9)</td>
</tr>
<tr>
<td>Cognitive</td>
<td>27.16 (8.6)</td>
<td>23.92 (9.3)</td>
<td>19.33 (10.9)</td>
</tr>
<tr>
<td></td>
<td>TIME F (1,33)</td>
<td>GRP X TIME F (2,33)</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Predicted fear</td>
<td>4.96*</td>
<td>2.12</td>
<td></td>
</tr>
<tr>
<td>Reported fear</td>
<td>6.16*</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>Reported panic</td>
<td>0.48</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>Negative cognitions</td>
<td>2.65</td>
<td>1.73</td>
<td></td>
</tr>
<tr>
<td>Unpleasant sensations</td>
<td>1.42</td>
<td>1.08</td>
<td></td>
</tr>
<tr>
<td>Heart rate</td>
<td>7.77*</td>
<td>1.95</td>
<td></td>
</tr>
<tr>
<td>ASI</td>
<td>5.71*</td>
<td>1.11</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05
Question 3 In the third question, the hypothesis was that the timing of the reduction in fear predictions would be different between the three interventions. There would be a reduction in the scores of the exposure group at time three, and in the cognitive and interoceptive groups at the sixth time point.

The time periods were as follows:

Time 1: After the first assessment, before introduction to the intervention, day 1.

Time 2: Before the main session of the intervention, day 2.

Time 3: After the main session of the intervention, day 2.

Time 4: Before the final session of the intervention, day 3.

Time 5: After the final session of the intervention, day 3.

Time 6: After the post-intervention assessment, day 3.

Means and standard deviations of the three groups at the six time points are presented in Table 7 and the means are graphed in Figure 1.

The experimental design was a 3 x 6 between-within analysis of variance, with three levels of the between factor (treatment group) and six levels of the within factor
(time point). To test if the assumption of sphericity had been violated, a Mauchly sphericity test was carried out (Chi square = 56.84, df = 14) and was significant at $p < .001$. The Greenhouse-Geisser correction was thus used (hence the change in the degrees of freedom) on the repeated measures ANOVA, $F(6.65, 109.77) = 3.48, p < .01$. Analysis was then carried out for simple main effects for each group. The results were: for the exposure group $F(3.33, 109.77) = 28.60, p < .01$; for the cognitive group $F(3.33, 109.77) = 11.48, p < .05$; for the interoceptive group $F(3.33, 109.77) = 10.47, p < .05$.

Since these were significant for all three groups, it was justified to test the significance of the three pairwise comparisons on which the predictions focused. Since these had been specified a priori (the difference between time 2 and time 3 in the exposure group, and between time 5 and time 6 in the other two groups) and since they were orthogonal, planned comparisons were used. Because the assumption of sphericity had been violated, separate error terms were calculated for each contrast. The data are presented in table 8. Within each group the largest mean reduction came at these predicted points, and in each case reached statistical significance: in the exposure group $F(1, 11) = 20.97, p < .001$; in the cognitive group $F(1, 11) = 27.56, p < .001$; in the interoceptive group $F(1, 11) = 8.94, p < .025$. 
The predictions were thus confirmed. Not only were fear predictions reduced, but the timing of these reductions were as hypothesized. In the exposure group, the reduction after the longest period of that intervention was statistically significant; in the cognitive and interoceptive groups the reduction after the second assessment, which included a further two minutes in the test-closet, was also significant. The lower level of significance attained in the interoceptive group reflects once again the larger standard deviation in that group.
Table 7

**Predicted anxiety at six time points during fear reduction**
(re-test between time 5 and time 6)

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
<th>Time 4</th>
<th>Time 5</th>
<th>Time 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exposure</strong></td>
<td>70.25</td>
<td>57.25</td>
<td>29.00</td>
<td>23.50</td>
<td>16.25</td>
<td>9.00</td>
</tr>
<tr>
<td></td>
<td>(22.27)</td>
<td>(26.52)</td>
<td>(24.29)</td>
<td>(14.07)</td>
<td>(14.06)</td>
<td>(7.86)</td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
<td>60.25</td>
<td>65.75</td>
<td>48.33</td>
<td>49.58</td>
<td>44.17</td>
<td>21.67</td>
</tr>
<tr>
<td></td>
<td>(23.89)</td>
<td>(21.48)</td>
<td>(19.92)</td>
<td>(22.81)</td>
<td>(15.64)</td>
<td>(20.15)</td>
</tr>
<tr>
<td><strong>Interoceptive</strong></td>
<td>72.42</td>
<td>61.67</td>
<td>50.42</td>
<td>54.17</td>
<td>54.17</td>
<td>28.25</td>
</tr>
<tr>
<td></td>
<td>(15.87)</td>
<td>(14.82)</td>
<td>(17.89)</td>
<td>(20.87)</td>
<td>(22.42)</td>
<td>(30.11)</td>
</tr>
</tbody>
</table>
PREDICTIONS OF FEAR AT 6 TIME POINTS

Legend
- ■ EXPOSURE
- □ COGNITIVE
- ● INTEROCEPTIVE
**Table 8**

**Planned comparisons on the timing of change in the three interventions (Question 3)**

<table>
<thead>
<tr>
<th>Contrast</th>
<th>Mean Difference</th>
<th>$\text{MS}_{\text{res}}$</th>
<th>$F_{(1, 11)}$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure Time 2-Time 3</td>
<td>28.25</td>
<td>228.38</td>
<td>20.97</td>
<td>$p&lt;.001$</td>
</tr>
<tr>
<td>Cognitive Time 5-Time 6</td>
<td>22.50</td>
<td>110.23</td>
<td>27.56</td>
<td>$p&lt;.001$</td>
</tr>
<tr>
<td>Interoceptive Time 5-Time 6</td>
<td>25.92</td>
<td>450.95</td>
<td>8.94</td>
<td>$p&lt;.025$</td>
</tr>
</tbody>
</table>
Question 4.

The predictions for the fourth question were that the three interventions would be superior to the control group on the two measures of generalization, carried out using a second enclosed space. The first measure was a sum of fear predictions, the second the highest level (from a choice of six) at which participants would be prepared to enter this enclosed space. The means and standard deviations were as follows:

**FEAR PREDICTIONS**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>124.50</td>
<td>74.99</td>
</tr>
<tr>
<td>Exposure</td>
<td>182.67</td>
<td>86.56</td>
</tr>
<tr>
<td>Interoceptive</td>
<td>212.92</td>
<td>141.96</td>
</tr>
<tr>
<td>Control</td>
<td>281.17</td>
<td>126.52</td>
</tr>
</tbody>
</table>

**SITUATION CHOSEN**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>4.42</td>
<td>1.16</td>
</tr>
<tr>
<td>Exposure</td>
<td>4.83</td>
<td>0.94</td>
</tr>
<tr>
<td>Interoceptive</td>
<td>4.42</td>
<td>1.38</td>
</tr>
<tr>
<td>Control</td>
<td>3.33</td>
<td>1.37</td>
</tr>
</tbody>
</table>

A one-way MANOVA was carried out with the two dependent variables noted above (Fear Predictions and Situation Chosen). The result of this was significant, Pillais $F$ (6, 88) = 3.85, $p < .01$. Univariate ANOVAS were then conducted: for Fear Predictions $F$ (3, 44) = 4.14, $p < .05$ and for the Situation Chosen $F$ (3, 44) = 3.29, $p < .05$. 
In the subsequent multiple comparisons (using Tukey’s method), statistical significance was reached only for the largest pairwise difference among the means in both cases. With a critical $q$ of 3.79 ($p < .05$) and 4.7 ($p < .01$), for Fear Predictions the largest difference was between the cognitive and the control group, $q = 4.89, p < .01$. The next largest difference was between the exposure and control groups where $q$ at 3.08, $p > .05$. For the Situations Chosen, the largest difference between means was between exposure and control where $q = 4.29, p < .05$. The next largest difference was between the control and both the interoceptive and cognitive groups where $q = 3.11, p > .05$.

Overall, the single difference between groups for Fear Predictions was that the cognitive group made lower predictions than the control group; for the Situation Chosen the exposure group chose a higher level of difficulty than the control group.
PHENOMENOLOGICAL STUDY: DESCRIPTIVE DATA

THE SAMPLE

Since so little work has been carried out using claustrophobic subjects, there are few yardsticks against which to compare this sample. The only other study with more than two dozen subjects at least provides some comparison point for the group who took part in this research. Of the 34 patients who completed Ost's study (1982), the great majority were female (30), the average age was 36 years old, and the average duration of their phobias was 16.8 years (range 4-54 years). All were outpatients at the Ulleraker Mental Hospital in Sweden, and had as their major presenting complaint anxiety in and avoidance of "closed spaces such as elevators and toilets". It is not clear whether any advertising had been carried out to encourage their participation, since it is stated that "the overwhelming majority (of those who had previously sought treatment) would have applied for treatment earlier had they only known that there were treatments, other than pharmacological, available."

The subjects in the UBC claustrophobia study were not outpatients of a psychiatric hospital but community volunteers, solicited through advertising in the media. As in the Swedish study the majority were women (42 of 48), with an average age of 42 years. This is again an older
sample than might have been expected from the distribution of the fear described in the literature review. The reasons for this are unclear. It may be that women in this age group are the most likely to hear about such studies and have the time to take part in them. It would be easy in any case to presume that this sample might be less seriously claustrophobic than the outpatient group, but there is no evidence to support this. A similar proportion of this sample (17 of 48) had previously sought professional treatment (psychiatry, psychology, hypnosis). Almost half the sample had had some form of panic attack outside a claustrophobic situation, although few were currently having such attacks. One can further relate the two groups in that in both studies subjects were asked to go in to a claustrophobic setting for a limited time. Ost's setting was certainly more benign in that it was lit, not overly cramped, subjects were sitting, and they both locked and could unlock the door during the ten minute trial. This contrasts with the UBC study in which subjects were locked, standing, in a small closet within a small dark room for a period of two minutes. Nevertheless, even allowing for the difference in demand, the heart rate changes hardly suggest that this is the less fearful sample. The average heart rate increase in the Swedish study (from resting rate to experimental setting) was 7 bpm, with the highest just 15 bpm. In the UBC study the mean increase was 25 bpm and the highest an increase of 82 bpm. From this index alone, it can
be seen that this is a group with a high level of claustrophobic fear, even if imbalanced towards older women with the fear. It is proposed to look at the results of the questionnaires they filled in and their interviews in more depth.

PRE-INTERVENTION QUESTIONNAIRES

All subjects filled in three questionnaires - the Anxiety Sensitivity Index, the Chambless Agoraphobic Mobility Inventory, and a pilot Claustrophobia Questionnaire - the means and standard deviations of which are presented from the initial pre-intervention interview.

The Anxiety Symptoms Index (ASI)

Set out in the order of the strength of response (using a scale where 0 = "very little", up to 4 = "very much") the results were as follows:

<table>
<thead>
<tr>
<th>ASI</th>
<th>MEAN</th>
<th>STD.DEV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to stay in control of my emotions</td>
<td>3.4</td>
<td>0.9</td>
</tr>
<tr>
<td>It is important to me not to appear nervous</td>
<td>2.8</td>
<td>1.2</td>
</tr>
<tr>
<td>It scares me when I feel faint</td>
<td>2.5</td>
<td>1.0</td>
</tr>
<tr>
<td>It scares me when I become short of breath</td>
<td>2.5</td>
<td>1.2</td>
</tr>
<tr>
<td>It scares me when my heart beats rapidly</td>
<td>2.4</td>
<td>1.1</td>
</tr>
<tr>
<td>It scares me when I feel shaky (trembling)</td>
<td>1.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Experience</td>
<td>Mean 1</td>
<td>Mean 2</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>It scares me when I am nauseous</td>
<td>1.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Unusual body sensations scare me</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>It embarrasses me when my stomach growls</td>
<td>1.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Other people notice when I feel shaky</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>It scares me when I am nervous</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>When I notice that my heart is beating rapidly, I worry that I might have a heart attack.</td>
<td>1.0</td>
<td>1.3</td>
</tr>
<tr>
<td>It scares me when I am unable to keep my mind on a task</td>
<td>0.9</td>
<td>1.0</td>
</tr>
<tr>
<td>When my stomach is upset, I worry that I might be seriously ill</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>When I cannot keep my mind on a task, I worry that I might be going crazy.</td>
<td>0.6</td>
<td>0.9</td>
</tr>
<tr>
<td>When I am nervous, I worry that I might be mentally ill</td>
<td>0.6</td>
<td>0.9</td>
</tr>
</tbody>
</table>

Of symptoms that are found frightening, it is heart rate, faintness, and becoming short of breath that are the most prominent. However, the two highest scoring items reflect a different construct, and one with a more social element, namely the importance of staying in control of emotion and the importance of not appearing nervous.

**The Agoraphobic Inventory**

Items from the Agoraphobic Inventory are presented only where the mean is above 2 (with 1 = "never avoid", 2 = "rarely avoid", 3 = "avoid about half the time", 4 = "avoid most of the time" and 5 = "always avoid").
<table>
<thead>
<tr>
<th>PLACES</th>
<th>WHEN ALONE (Mean, Std dev)</th>
<th>WHEN ACCOMPANIED (Mean, Std Dev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enclosed spaces</td>
<td>3.4 (1.4)</td>
<td>3.0 (1.4)</td>
</tr>
<tr>
<td>Elevators</td>
<td>3.1 (1.4)</td>
<td>2.6 (1.4)</td>
</tr>
<tr>
<td>Parking garages</td>
<td>2.4 (1.4)</td>
<td>1.8 (1.2)</td>
</tr>
<tr>
<td>Heights</td>
<td>2.3 (1.4)</td>
<td>2.0 (1.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RIDING IN</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subways</td>
<td>2.6 (1.5)</td>
<td>2.4 (1.5)</td>
</tr>
<tr>
<td>Airplanes</td>
<td>2.3 (1.5)</td>
<td>2.1 (1.4)</td>
</tr>
</tbody>
</table>

Though several of the sample had high agoraphobic scores, this was uncommon. On only the six items above was there a mean score of above 2.0 and, with the exception of heights, these are the five that have clear associations with, or are more accurately conceived of as claustrophobia.

**The Claustrophobic Inventory**

The study was taken as an opportunity to pilot a scale measuring the extent and degree of claustrophobic anxiety. The means are from a scale where 1 = "not anxious", 2 = "slightly anxious", 3 = "moderately anxious", 4 = "very anxious", 5 = "extremely anxious" and the standard deviations are in brackets.
<table>
<thead>
<tr>
<th>Situation</th>
<th>Alone</th>
<th>Accompanied</th>
</tr>
</thead>
<tbody>
<tr>
<td>In an elevator at a time when there is a strong likelihood of a power cut.</td>
<td>4.6 (0.9)</td>
<td>4.3 (0.9)</td>
</tr>
<tr>
<td>At the furthest point from an exit on a tour of an underground mineshaft.</td>
<td>4.6 (1.0)</td>
<td>4.4 (1.0)</td>
</tr>
<tr>
<td>Locked in a small dark room without windows for 15 mins.</td>
<td>4.2 (1.0)</td>
<td>3.5 (1.4)</td>
</tr>
<tr>
<td>Standing for 15 minutes in a straitjacket.</td>
<td>4.0 (1.3)</td>
<td>3.8 (1.5)</td>
</tr>
<tr>
<td>Standing in the middle of the third row at a packed concert, realizing that you will be unable to leave until the end of the show.</td>
<td>3.7 (1.2)</td>
<td>3.5 (1.5)</td>
</tr>
<tr>
<td>In a public toilet and the lock jams.</td>
<td>3.7 (1.2)</td>
<td>3.1 (1.3)</td>
</tr>
<tr>
<td>Locked in a small well lit room without windows for 15 mins.</td>
<td>3.5 (1.3)</td>
<td>2.9 (1.4)</td>
</tr>
<tr>
<td>In the back of a small two-door car with a person either side of you, and all the windows fogged up.</td>
<td>3.5 (1.4)</td>
<td>3.3 (1.5)</td>
</tr>
<tr>
<td>In a crowded skytrain which stops between stations.</td>
<td>3.4 (1.4)</td>
<td>3.0 (1.4)</td>
</tr>
<tr>
<td>Back of a crowded bus.</td>
<td>2.8 (1.4)</td>
<td>2.4 (1.3)</td>
</tr>
<tr>
<td>In the centre of a full row at a cinema.</td>
<td>2.5 (1.4)</td>
<td>2.3 (1.4)</td>
</tr>
<tr>
<td>In the middle of a long line at a supermarket.</td>
<td>1.4 (0.9)</td>
<td>1.3 (0.7)</td>
</tr>
</tbody>
</table>
In a barber's / hairdresser's chair  1.3 (0.8)  1.2 (0.6)

It can be noted how little reassurance is gained by being accompanied, in striking contrast to agoraphobia where the presence of a trusted friend can dramatically reduce anxiety. The higher scores are all situations from which escape would be difficult.

COGNITIONS AND PHYSICAL SENSATIONS

The mean cognitions and sensations are presented for all four groups at pre- and post-intervention and for the three interventions without the control at follow-up.

COGNITIONS

<table>
<thead>
<tr>
<th>Did you think that....</th>
<th>PRETEST (N=48)</th>
<th>POSTTEST (N=48)</th>
<th>FOLLOW UP (N=36)</th>
</tr>
</thead>
<tbody>
<tr>
<td>You were trapped</td>
<td>9.0</td>
<td>4.75</td>
<td>5.0</td>
</tr>
<tr>
<td>You were going to lose control</td>
<td>7.5</td>
<td>3.75</td>
<td>3.67</td>
</tr>
<tr>
<td>You had been forgotten in the room</td>
<td>6.25</td>
<td>1.5</td>
<td>3.0</td>
</tr>
<tr>
<td>You were going to act foolishly</td>
<td>5.5</td>
<td>2.25</td>
<td>2.0</td>
</tr>
<tr>
<td>You might suffocate</td>
<td>5.5</td>
<td>2.25</td>
<td>1.0</td>
</tr>
</tbody>
</table>
You were going to run out of air to breathe  
5.25  2.25  2.0

You were going to pass out  
5.25  1.25  1.0

The walls were closing in  
4.75  2.5  .67

You were in danger  
4.0  1.25  1.33

You were going to fall  
2.25  1.25  1.33

You were going to have a heart attack  
1.25  0.25  0.0

Other (typically fire, earthquake or concern about demands being secretly increased)  
1.0  1.0  2.0

You were going to choke to death  
0.25  0.0  0.0

One can note that the cognition of entrapment was the most common with suffocation being present very much less frequently. The fears of losing control or acting foolishly, highlighted in the ASI, are again prominent.

<table>
<thead>
<tr>
<th>PHYSICAL SENSATIONS</th>
<th>Mean(max=12)</th>
<th>PRETEST (N=48)</th>
<th>POSTTEST (N=48)</th>
<th>FOLLOW UP (N=36)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palpitations or accelerated heart rate</td>
<td>9.0</td>
<td>5.75</td>
<td>5.67</td>
<td></td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>8.25</td>
<td>4.25</td>
<td>4.67</td>
<td></td>
</tr>
<tr>
<td>Trembling or shaking</td>
<td>7.0</td>
<td>2.75</td>
<td>2.0</td>
<td></td>
</tr>
</tbody>
</table>
Dizziness, light headedness, or unsteady feelings | 6.5 | 3.25 | 2.33
Tightening muscles | 5.0 | 4.0 | 3.0
Sweating | 4.75 | 3.25 | 1.67
Too warm | 4.25 | 3.25 | 3.0
Flushes, hot flashes or chills | 4.25 | 0.75 | 0.33
Faintness | 3.75 | 1.0 | 0.5
Dry mouth | 3.5 | 2.0 | 1.33
Depersonalization or derealisation | 2.5 | 1.25 | 1.0
Tearful | 2.25 | 1.0 | 0.33
Feeling sick, abdominal distress, or any form of nausea | 2.0 | 1.0 | 0.0
Numbness or tingling sensations | 2.0 | 0.5 | 0.0
Choking or smothering sensations | 1.5 | 1.75 | 1.33
Headache | 1.5 | 1.25 | 0.33
Chest pain or discomfort | 1.25 | 0.5 | 0.33

The most common sensations of increased heart rate, shortness of breath, trembling and dizziness are signs characteristic not only of anxiety but panic disorder, where they are symptoms that are commonly misinterpreted.
STRUCTURED INTERVIEWS

Structured interviews (see Appendix A for the complete protocol) provided important material for therapy in all three groups. They also provided information on many aspects of the fear. Some of the responses are presented in a table (see table 9). However most are not of the sort or length that allows for such presentation, and so are set out with a rather fuller commentary than would be usual, to help convey the most salient points.
Table 9  Selected findings from the structured interview

The questions asked during the structured interview are presented in Appendix A. Many of the questions required participants to give detailed answers. Ten of those that do not require such elaborations are presented here.

1. Do you remember any claustrophobic experiences from your childhood?  
   Yes 30  No 18

2. Do you remember being claustrophobically fearful as an adolescent?  
   Yes 16  No 32

3. Do you feel that there was a single event in your adult life which precipitated your current claustrophobia?  
   Yes 28  No 20

4. Have you had panic attacks other than in a claustrophobic setting?  
   Yes 21  No 27

5. Is the fear getting better or worse?  
   Better 11  Stable 22  Worse 15

6. Have you had claustrophobic dreams?  
   Yes 16  No 32

7. Have you used alcohol or medication on a regular basis as a means of coping with your fear?  
   Alcohol 4  Medication 13  Both 4  Neither 27

8. Do you know others who have this fear?  
   Yes 30  No 18

9. Have you previously sought treatment for claustrophobia?  
   Yes 17  No 31

10. Do you think that suffocation/access to air contributes to your fear of enclosed spaces?  
    Major 23  Minor 17  No 8
AVOIDANCE

The two most frequently reported areas of claustrophobic avoidance in the past have been elevators and flying, reflecting presumably not only prevalence but the type of avoidance most likely to lead to professional attention. Both were heavily endorsed by this sample. A substantial minority would not use elevators under any circumstances. A greater number were prepared to use them under certain conditions: particular elevators in the company of particular people at particular times. Flying has been seen by some as a distinct fear, but in this sample it would seem consistent with other claustrophobic fears. Peak fear was often reported either as the door was shut or after the plane had landed and the doors had still not been opened. Being in the air, or concerns about the safety of flying, were far less prominent responses. It would be interesting to investigate whether these claustrophobics are representative of flying phobics as a whole, or are a subgroup with clear distinguishing characteristics.

Other commonly avoided settings were carwashes, putting one’s head under water, activities underground (such as underground parking or a tour of a winery), crowds, sleeping in the dark or without access to fresh air, locking doors, tight clothing or jewelry, getting stuck in a traffic jam, sitting in the middle of a row in a theatre or cinema, or in the back of a two door car. Some of the reasons that these
particular situations may be found so unpleasant are reviewed in the discussion.

Far less commonly reported to date are a whole range of fears which have health or safety repercussions. Some 40% of this sample reported that they could not conceive of undergoing a CAT scan, at least without being strongly sedated which is discouraged for this procedure. This is consistent with reports from UBC Health Sciences Hospital (Paty, Personal Communication, 1989,) which suggest that about 5% of those recommended for a scan refuse the option, even if the results might have important implications for their health. Two had turned down surgery because of the fear of waking up and being constrained in the bed, two others had removed drips from their arm so that they could leave "if they had to". The dentist is another area of concern for some, particularly now that there is more routine use of the rubber dam. The presence of dental equipment in the mouth that cannot be quickly removed not only prevents a hasty exit, but can make breathing difficult, a subject addressed below. A report of the premature removal of the cast off a limb, and the alarmingly common refusal to wear a seat belt, are just two further instances in which this fear was shown to have health implications.
ONSET

In many cases it is not possible to determine the age at which any phobia starts, and claustrophobia is no exception. In this sample, there were those who reported a clear precipitating event late in their adult life which they saw as incontrovertibly marking the start of their fear. However, there were a greater number who have memories of childhood incidents whose importance and impact, even if vivid, were not easy for them to assess. It might help if one had access to information on such early memories from a non-claustrophobic sample to provide at least some point for comparison. The most typical experience in the 30 from this sample who did report some childhood memories was some form of parental punishment, or a childhood game or prank. Others reported not incidents but just a feeling of great discomfort to have had, for example, the blankets pulled over their head, or to have had to wear a gas mask during the war.

Infrequently there were signs of thoughts more common in later life. "I can still recall the hideously embarrassing sight of seeing a child vomit. Though I was only five, I determined that I would always try to be near a door to ensure that I would never attract that sort of attention in public". Early misinterpretations had their own variations such as the woman who recalled wondering if her
lungs had holes in them so ineffectual was her breathing when she was anxious. It will be for later study to analyze the differences and similarities between childhood and adult claustrophobia, and to answer specific questions such as the age at which one develops the capacity to misinterpret sensations catastrophically.

It is striking that more than half of this group reporting childhood claustrophobia did not see this as being the start of the fear, insofar as they were relatively free of it during their childhood and into their adolescence. It was more common that the fear was seen to develop seriously early in adult life, and the childhood experience was seen as at most a vulnerability factor. Adult precipitants appeared to be indistinguishable between those who had and who had not had claustrophobic memories or concerns.

ADULT PRECIPITATING EVENT

The descriptions of what was seen by many as the precipitating event for their claustrophobia evoked the most arousal during the interview and were narrated in the most detail. Examples give some flavour of the different categories.
There were, firstly, some incidents which very many people, whether or not predisposed to claustrophobia, are likely to have found very frightening. One woman recovering from an anaesthetic came to consciousness strapped to the bed and in all sorts of restrictive bandages and plaster. The first thing she heard, and this in the dead of night, was a cry of "fire" from what later transpired to be a delirious patient beside her. Many might also empathize with the discomfort of the subject on a Turkish airlines flight from Istanbul which aborted take-off on three successive occasions. Passengers had then to stay on the plane as mechanics, whose demeanour did little to inspire confidence, tinkered with the engine before it taxied out yet again.

The initial response of others made an unpleasant situation a frightening one. A subject reported being in an elevator on her own. It jammed and the light went out. She remained reasonably controlled until she went to press the buttons and was unable to locate them (it turned out that at this point she was on her knees) and then started to panic. Included here also are those who found themselves in threatening but probably not objectively dangerous situations. "I was eight months pregnant and in New York. I got on a subway along with about half the rest of the city on their way to watch a ball game. After five minutes I just had to get out of that crowd".
The third group can be distinguished in that they were doing something that they had done on many previous occasions, fitting into Barlow's category of false alarm. "I had never minded being in elevators in the slightest. But one day I got on one in Eatons and just suddenly had to get off. I was amazed as there was nothing leading up to it; it came right out of a clear blue sky". Another example is someone who had flown frequently in the forces. Years later and with no anticipatory anxiety, she boarded a plane for a holiday in Europe. She reported that it hit her like a hammer when she caught a glimpse of the inside of the plane (what she described as that "no way out" look).

And there is, finally, the group on whom the fear crept up quietly. Some can identify no precipitating incident at all. Others can identify a precipitant but one that had a slow-acting effect. "At the time my husband withdrew support, I started to find my own car feel very tight, I became a bit uncomfortable in the bathroom, mildly bothered by bridges, and aware for the first time of just how small elevators were".

Through all these groupings run some common threads. The first is one noted in the genesis of many fears, namely stress, which is certainly evident here. Loss, for example, was mentioned commonly although in some quite unusual forms. "The day I heard that my mother's illness was terminal, my
bedroom seemed so small and stuffy and close". Not all the stressors have such clearly negative overtones. For many their first panic was while on holiday, for others it was while pregnant. "I had been into that mall often before but never had it been this crowded, and being seven months pregnant I just felt so vulnerable. Suddenly I knew that I had to get out". Two holiday locales are particularly common. The first is camping, either in a tent or in a recreational vehicle. The second is while climbing to the top of a tall building such as the Vatican or St Paul's Cathedral in London. While the combination of breathlessness and difficulty of escape seem likely to be implicated in the second case, the reason for the former is not clear although one could speculate a variety of possible explanations.

Some observations about these "critical incidents" are, firstly, that most are not objectively dangerous situations: a sudden realization of one's vulnerability in a packed theatre or a train stopping between stations. Further, the period of entrapment is often very short. Thirdly, the pattern of onset has much in common with that for agoraphobia or for the onset of panic disorder. All three points will be taken up in the discussion.
TYPICAL SUBSEQUENT CLAUSTROPHOBIC EVENTS

Though avoidance is the strategy of choice for almost all fears, it is striking how successfully this can be carried out for claustrophobia. One can insist or arrange to be on the aisle seat, walk up stairs instead of using an elevator, miss out on underground tours. However, it is not always possible to anticipate how a situation will develop (notably on a holiday where accurate prediction can become much more difficult), and there are occasions when one feels pressured by others or in some way cannot avoid an enclosed situation. Most people can thus readily come up with examples of subsequent times on which they felt in some way trapped. In many cases these events follow closely those described as first incidents, but invite further comment.

With regard to the length of time the anxiety can last, it has already been pointed out that anxiety is usually reduced quickly by escape from the situation. Where people have been unable to leave a situation, they have generally been surprised by the speed at which their anxiety has gone down. There are however some stark exceptions. One woman felt that her panic hardly abated throughout the course of a 12 hour flight, during which she did not eat or even dare go to the toilet. The subject mentioned already who had been trapped in an elevator in which the light had gone out, crouched in the corner motionless for an hour. In both cases
they were in a state of shock for more than a day later. This raises two points. The first is that even when the worst does happen, it takes a very different form from that which most claustrophobics anticipated: most commonly they freeze, physically and mentally, rather than blindly go out of control as they would fear. If action is taken at this point, it tends to be highly goal directed. "When I got locked in the toilet someone sensed my desperation and tossed in a screwdriver to give me something to do while they sought help. I was like a person possessed, and within five minutes I had the rusty screws and rivets out, and had removed the door before they returned with assistance". The second point was that many in the study reported a delayed shock of quite distressing proportions. It would be a mistake to underestimate the gravity of the reactions; in many cases people are correctly predicting severe reactions rather than catastrophizing in some faulty or exaggerated way. "I knew if I went in that closet that I would be shattered for the rest of that day; and that is exactly how it was".

Sifting through the descriptions, one comes across two themes not common in other fears. The first is that of disorientation. A reason why night-time claustrophobic panics occur is that a person may wake up in a strange place and be unable to see either where he or she is or to work out where the exits are. As with entrapment, this is the
sort of instance in which it is difficult to work out whether related catastrophic cognitions are causal or epiphenomenal.

A second is an increase in temperature. This can lead to particular cognitions, notably fainting, but seems also to be associated with non-cognitive discomfort: some subjects take short showers because of the unease they feel as the temperature increases, without reporting accompanying anxious thoughts.

A third theme that has been touched on, and is one of the most intriguing of this fear, is that of suffocation. Rachman (1989) subtitled his chapter on claustrophobia "The Fear of Suffocation", so prominent was this cognition. One speculation was that those with claustrophobia could be split into those who fear entrapment and those who fear suffocation. In this study the dichotomy has been clear but not quite along these lines. Instead it is more accurate to refer to entrapment with or without suffocation, the latter being the most common but by no means the exclusive cognition for those for whom breathing can become so uncomfortable. It is important to consider why this particular cognition should be so prominent.

One reason for the vulnerability to this feeling not previously mentioned in the literature was a sensitivity to
air and breathing, even outside a claustrophobic situation. Some half dozen had had accidents to their nose which either started or exacerbated their sensitivity to air, an observation not previously noted. A further seven reported that the presence of their allergies could greatly increase the probability of their having a panic. While many in the group disliked the feeling of a rapid change in their breathing, for those with breathing difficulties this is a particularly frightening feeling and one they are very keen to avoid. At its most extreme, and this in several cases, individuals will not stay in hotel rooms in which the windows cannot be opened, and will stay for a minimum length of time in places where they feel the air could either be "stale" or limited. "When I am in the skytrain I literally crane my neck to try and get the air above everyone else". "In crowded elevators I can get agitated if people are talking too much as I feel that they are just using up the air quicker." The importance of "fresh" air is shown by the subject who always carries around a Vicks inhalant with her so that she can smell "freshness" around her nose whenever she needs it.

It may be shown that such sensitivity to the quality, amount, and rate of intake of air is biologically based, showing up in CO₂ tests as well as exercises such as straw breathing. But cognitions, too, may play at the very least a contributory role for those who may be biologically
vulnerable. It is suggested that specific cognitions may be generated the first occasion an individual panics and are easily accessed, and found difficult to dispute at subsequent high levels of anxiety. There do seem to be examples where people initially, if quite erroneously, felt that there was a risk of running out of air. An example is the subject who found herself on a flight, which after a safe landing took some time to taxi to the terminal. The captain announced that both passengers and stewardesses should return to their seats. As a regular flier she knew that this was not normal procedure. She suddenly sensed that there was no air coming out of the vents. Her mind turned immediately to the possibility of suffocation as she started to hyperventilate, desperately concerned that she might not be getting enough air. When the door was opened a minute later she felt fine and thought no more about it. However, since this event, it is thoughts relating to air and suffocation which are the most likely to be summoned in any claustrophobic setting. The progression in the development of this fear thus takes in many of the stages that appear to be prominent in many cases in this study: There were certain vulnerabilities in that it was a time of high stress (her husband had a terminal disease); a situation was misinterpreted (the sound of the shutting off of the pressurization system) and exacerbated by her own hyperventilation; she then developed a fear in which this cognition was the most likely to be accessed when a certain
level of anxiety had been reached; she developed a pattern of avoidance of entrapment consistent with places where she felt air might be a problem. Yet, and this is perhaps why claustrophobia still fits into the strict definition of a phobia, she knows that the fear is quite without foundation and that she will not actually run out of air. Neither reassurance nor the provision of information are thus any guarantee for improvement.

There are further points to be considered from the structured interviews, but these are tied in with observations from all four groups and the discussion of the experimental data in the following section.
DISCUSSION

A main aim of this study was to see if two interventions, pared to a pure form and without the usual addition of exposure, could produce a reduction in a simple phobia in ways that would have been thought decidedly unpromising even several years ago. The answer was broadly in the affirmative, and gives encouragement to trying out the techniques that have worked so well with panic disorder in other anxiety disorders, including simple phobias. Within this main objective was the wish to study the mechanism with which change was brought about by these methods, using a control and an exposure group to provide benchmarks against which to assess the timing and areas of change. Inevitably with such small numbers, such a search yielded a more meagre harvest, though one by no means without interest. A second aim was to find out more about claustrophobia and, without qualification, this was a fruitful quest.

Since this study was initiated, Barlow has published the results of his treatment study on panic disorder (Barlow, Craske, Cerny, & Klosko, 1989) which found 80% success rate for his central treatment approach. This consisted of exposure to somatic sensations associated with panic attacks, as well as some cognitive therapy directed at salient catastrophic thoughts. Clark has also finished his major trial (1990) reporting even slightly higher treatment success with very much more emphasis on correcting cognitive
misinterpretations than on interoceptive exposure. There is no doubt that the addition of these techniques to exposure alone has done much to improve treatment outcome. As had been predicted, there is now increasing theoretical interest on the effect that either is likely to have on its own. For example, within the realm of panic disorder, two studies have recently been set under way to assess the effect of a purely cognitive intervention (J. Magraf, personal communication, March, 1990; P.M. Salkovskis, personal communication, April, 1990) with promising results. Van den Hout (1989) has also used inhalation of CO₂ over eight intensive sessions as a way of exposing subjects to sensations very similar to their own naturally occurring panic attacks. While they became very much less anxious about the induction, the effect did not generalize to naturally occurring panic, opening up some speculation as to what are the likely strengths and limitations of such a treatment. It is certainly no less timely than it was at the time the study was initiated, to consider how an abbreviated form of these two approaches would fare with the more situationally cued panic and anxiety evident in claustrophobia.

The main focus is inevitably on the interoceptive and cognitive approaches since so little is known about their effects. It would go against the grain adopted in this study to try and work out whether the cognitive or the
interoceptive approach was the more successful. This would in any case imply a range of assumptions that have not been tested, such as that both would be as likely to be showing an effect after the same length of intervention and after so short a time period. It would seem judicious to keep the spotlight off such a comparative emphasis. Discussion will start with the results from the four experimental questions.

The results of question 1 set the foundation for the study. One of the recent features of the treatment of phobias (Ost, 1989) is the increasing speed with which treatments are carried out. It is thus not surprising, that in under 90 minutes of explanation and experience, those in the exposure group should have undergone such a clear reduction in their fear to at least this enclosed situation. Without examining thoughts or decreasing sensitivity to sensations, it was possible to bring about a clear reduction on a battery of assessment measures, as compared with the control group. In the case of the latter, there was some reduction in the fear of some individuals, but for a greater number, scores remained relatively unchanged. The results of the "benchmark" groups were thus very much as expected.

The fact that reported fear and panic were both significantly reduced by entirely cognitive procedures is something of a milestone. As recently as 1987, in a major review, Last was writing off the role of cognitions in the
treatment of any phobias. These results would suggest that this is too hasty a judgment. Not only were these fear reports reduced, but after only this brief contact with the stimulus, confidence in that group was running high, with assured predictions being made about the generalization closet, evident from the results of question 4. Thus, though it was striking that this intervention had the anticipated effect on reducing the reports of panic, it would be wrong to assume that this was an isolated effect. Barlow (1990), among others, has warned that "measures of the percentage free of panic as the central measure of outcome may prove to be an overly optimistic gauge of therapeutic success". Whether cognitive components to treatment can be used to speed exposure in the treatment of certain phobias, or to make it more efficient, will have to be established, but the door to such research is now firmly opened. A disappointing feature was the lack of support for the notion of continued improvement over time as a result of a cognitive intervention. It is evident from the data on question 2 that one may have to be cautious in assuming that the effects of a cognitive intervention will invariably improve over time. Factors that make this more and less likely will have to be isolated.

It is important to note the measures not just on which the cognitive intervention did exert an effect, but on those on which it did not. There has been much discussion as to
whether successful cognitive procedures would result in better coping in the face of a stressor, or very much less anxiety even in its anticipation and approach. The lack of change on question 1 on both heart rate and prediction of fear, would suggest that for at least a number of subjects, their improvement did not come about before the second exposure, at the approach to which their fear levels and heart rate were still high. Their progress, at least as expressed in their own predictions of fear, was thus made during their re-exposure to the feared stimulus, which links with the results from question 3 discussed below.

In the interoceptive group, the statistically significant decrements in reported sensations and cognitions on question 1 were not matched by equivalent reductions in reports and predictions of anxiety and panic. Study of the large standard deviations in this group provides a likely explanation: this was an effective style of intervention for some but not for others; more than in the other two groups, some people responded little or not at all to this intervention. While Clark (personal communication April, 1990) and other supporters of the cognitive approach have written off interoceptive exposure as a decidedly inefficient way of changing thoughts and so anxiety, there is enough change shown here for it to warrant further study. In particular, it may prove that longer exposure to sensations will have more effect.
While the results of question 1 are quite clearcut, little emerges from question 2. The reduction in the total N from 48 to 36 effected by the ethically necessary exclusion of the control group at follow-up, has severe effects on statistical power. This is the more notable when one is searching for differences between the three groups as they move broadly in the same direction. One must, then, be particularly wary of making any deductions from the plethora of negative results. What one can take from these data are, however, important effect sizes for future research, since it is from the further study of group x time interactions that much will be learned. There are, too, several points which emerge which can be linked. The first is that the cognitive group, far from improving over time, had higher scores at follow-up than at post-intervention on measures such as reported fear. Secondly, averaged across all groups, while predictions of fear were reduced between post-intervention and follow-up, scores were higher on both reported fear and heart rate. These points are illustrative of the fact that there was an unusually high proportion of "underpredictions" at follow-up. While one might expect a "return of fear" in reported fear, this would usually also be expected in scores of predicted fear. A combination of the confidence gained during the intervention and at the second assessment, followed by, in most cases, continued avoidance of feared settings, led to inaccurate predictions
of fear. A way appears to have been accidentally found of boosting the natural incidence of underpredictions. This is an area of some theoretical interest, and may encourage speculation as to what makes underpredictions more likely, since there is increasing evidence to suggest that the clinician should try to avoid their occurrence (Rachman & Bichard, 1988; Rachman & Eyrl, 1990).

This leaves the results from question 3 to be discussed. These fell very much according to what had been hypothesized, with the fear predictions in the exposure group falling gradually, the largest reduction taking place at the longest session of exposure. In the cognitive group it was necessary to have the experience of the second exposure before predictions of anxiety were reduced. This raises a number of issues. Though it is not reflected in reduced scores, there is clearly some learning taking place to allow such a rapid reappraisal. It is not clear what this learning is, and precisely how this information is linked to the experience of exposure. An obvious implication is that the amount of exposure required could be greatly reduced with a suitable cognitive preparation. This may be particularly useful where it is difficult, expensive, or takes too much therapist time to set up frequent exposure sessions. Of interest, too, is that the pattern of reduction of anxiety in the interoceptive group is similar to the cognitive rather than the exposure group. These points will
be further discussed and linked to the qualitative results after some observations have been made about what took place during the running of the four groups.

CONTROL

For the most part, those in the control group were as anxious the second time as the first. It had been made clear to them that as part of the study they would be asked to go into the closet on two separate occasions and fill out the necessary forms. This was framed as positively as possible, by saying that this was the only group in which participants did not have to wait eight weeks to find out the preliminary findings of the study, and to get the sought-after information at the debriefing. In several cases, one in particular, the initial experience was not nearly as aversive as had been anticipated, and scores on a variety of measures were reduced on the second occasion. The most dramatic change is worth recording in detail. In this case a phobia of thirty years duration, with profound social implications, was eradicated by the four minutes of assessment. The particular subject even had the courtesy to telephone to say what an enormously successful intervention it had been! On the first occasion she had spent the entire two minutes with her hand directly over the buzzer, her eyes shut, and she had counted slowly (trying to blot out the nagging thought of what would happen if she was still counting at the end of two minutes). She arrived on the
second occasion with greater determination but no more confidence. As she entered the closet, she decided not to count, to keep her eyes open and to ignore the buzzer. After some seconds had passed, she began to feel the walls and deliberately turned her back to the door, making any chance of exit more difficult. When the trial ended she was brimming with confidence, and set off after the session to carry out a number of long-avoided activities. It is clear from this atypical example that it is possible for people to engineer their own fear reduction with minimal assistance.

EXPOSURE

This intervention was the most straightforward to carry out with the least verbal input. Most participants were surprised at the speed at which their fear was reduced and needed little encouragement that this was a useful path to pursue. The only doubts expressed were the common ones that while they might be progressing at a given level, they doubted if they could make similar progress at higher points on their hierarchy. It was interesting to note the difference in speed at which individuals' fear was reduced and to ponder on the implications of this. There was some indication that those who adjusted very quickly to the closet may have shown less generalized improvement, appearing not to process their fear reduction as effectively. There were also two instances where frightening thoughts not evident in the initial assessment emerged
during the intervention. Neither could be tackled and were weakly evident at the second assessment. For the most, however, it was striking how the cognitions disappeared without being specifically examined. It is not possible to say whether evidence was found to challenge them, or whether they were simply less likely to arise once anxiety had been reduced. The question remains an open one, too, as to whether exposure works solely through cognitive means as Clark has provocatively suggested (1990).

COGNITIVE

The major anxious cognition of the therapist was that participants would report high levels of anxiety without obvious supporting cognitions. This turned out to be unnecessarily catastrophic. Not only were cognitions duly reported, but participants had little difficulty in seeing the role they played in fuelling, if not necessarily creating, their fears. Pilot work had largely been carried out with students which was adequate preparation for only some points that arose.

A similarity with the student population was that there was evidence of a clear dual belief system. Almost all of these clinical volunteers recognized that the degree of belief in the thoughts that had come to mind in the closet, was grossly inflated in comparison with what they believed in discussion or on reflection later. The difficulty was in
getting the same reasoning to operate at the higher level of anxiety. This task was split clearly between thoughts which were relatively easy to challenge and thoughts which were not. In the first category were thoughts which were largely based on misinformation. Participants had never considered how much air one would need to survive in an enclosed space, and were interested to make an estimate before calculating the reality (a rough estimate was that they were well over a hundred times out in their estimates). They did not know how to work out if a space was airtight. They did not know that fainting results from one’s heart going slower and so could not happen if one’s heart was pumping from anxiety. Such information was useful and quickly and easily received. What had not been anticipated was that there would be a second set of cognitions in some individuals that proved to be very much more stubborn. In many cases they were far from random, but came from their personal experience or that of others close to them. Clark has suggested that one must tackle "idiosyncratic evidence", but has perhaps underplayed the significance of the circumstances under which this may have been learned. In several cases, it came as a surprise to subjects to recall incidents which had led them to believe the probability of a certain occurrence. To understand the basis for the belief was helpful to them.

A second point was that while it was relatively straightforward to help them to come up with convincing
counterarguments during the intervention, their concern was whether they would be able to summon such thoughts when they were back in the closet. The third session was spent speeding up their responses and making them easier to access. However, a therapeutic concern was that in some cases, the frightening thoughts were never accessed at all; coping statements were used almost like a mantra. While this seemed useful in the short-term, it seemed unlikely to be beneficial in the long-term. The clinician at this point might have encouraged subjects during training to imagine that they were in the situation, to bring on the frightening thoughts and then, and only then, to try and dispute them. However, it was felt that such imaginal exposure could be in conflict with the integrity of the way the intervention was to be conducted. If coping statements were being used in this manner, and subjects were being distracted from their typical thoughts, then this may help to explain why this cognitive group did not continue to improve over time: they were being distracted from their key cognitions rather than learning to challenge them. It would be expected that at a later point, their more usual, even almost automatic thought patterns, would return.
INTEROCEPTIVE

There has been almost nothing written on the practical problems of giving interoceptive exposure. It was at some points the most difficult intervention to administer. While it was not hard to convey the rationale, not all individuals felt comfortable engaging in these exercises, and, for example, expressed awkwardness or embarrassment despite efforts to put them at their ease.

Though the main exercise used in panic disorder is hyperventilation, breathing through the straw proved more similar to sensations that had been experienced in the closet, was easier to build up a tolerance to, and appeared to bring about more change. This may mean that there is a qualitative difference in panic in and out of an enclosed space.

It is still quite uncertain as to what the mechanism of change might be. It could be that one is at least doing something not previously tried, and which at least appears to make sense. It could be that one is getting less sensitive to a particular physical sensation. It could be that the exercises foster cognitive change. It is implicit in cognitive theory that panic can be reduced by either reducing triggering sensations or changing interpretations about them. It is still an open question as to whether the interoceptive intervention might operate, at least in some
cases, by the former mechanism, instituting change and reducing anxiety without accessing or changing cognitions. This would need to be established, as it would whether this would be a less powerful, or at least less generalizable, way of change. It remains an intriguing possibility that the interoceptive techniques are not just a different method to cognitive ones, but operate through different mechanisms.

CLAUSTROPHOBIA AND THE CLARK MODEL

A starting point for this research was the success of psychological interventions with panic disorder. Clark's model of treatment (1987) has aroused much professional attention, and it was of interest to note how easily it could be transferred to the sort of panic that can be observed in claustrophobia.

At the outset it should be said that one would not expect a mirror-image transfer. Panic disorder, by its DSM-III-R definition, involves a state of anxiety without obvious cause. This makes for a group that have proven to be ideally suited to training on reinterpretation of their sensations. It has not, and would not, be claimed that a claustrophobic or similarly cued panic occurs using the same mechanism. There are instances where there is complete overlap, but these are not the rule. For example, arousal
brought about for a variety of reasons in an enclosed space can indeed be misinterpreted as a sign of losing control, losing air, or some other frightening catastrophe. However, perceptions of threat in claustrophobia are less likely to arise from the misinterpretation of physical sensations than the misreading of external cues. It is clear that common cognitions triggering anxiety such as that one might be trapped, might become crushed, or might be at risk from some natural disaster are unlikely to be triggered by internal sensations. Such a change in emphasis to the misinterpretation of external triggers poses no conceptual leap or difficulty for the theory.

A second point is that while cognitions may play a role in the genesis of the fear, there is evidence that they may not be so important in its maintenance. In an unpublished paper, Lopatka and Levitt (1988) proposed the notion of a secondary phase of fearing the discomfort that has become associated with a fear. Thus, for example, while the fear of being crushed might initiate the first panic, this might set off a high degree of arousal in other enclosed spaces which need not be misinterpreted to be found very unpleasant. At present Clark sticks resolutely to the notion that there must be continued misinterpretation on every occasion on which there is a panic.
Whether claustrophobia provides the grounds for non-cognitive panic opens more controversial areas. What can be said is that conditioning at the very least plays a very much more prominent part than has been apparent in panic disorder. One can start with an example in which cognitions are initially apparent but then weaken or disappear. One subject in this study became very uncomfortable at a packed football game. A woman sat down beside her wearing overpoweringly strong perfume, and it suddenly seemed as if she was breathing just perfume and was not getting enough air. She felt terrible and wondered if she would throw up, finally becoming panicky and leaving. The smell of perfume in any crowded place is now sufficient itself to bring on a panic, even though there is now no reported cognition. Her concern when she considered joining a treatment group that followed the study, was not of the activities that might be demanded, but whether any of the other women might be wearing perfume.

Consistent with the role of conditioning is that it seems as if internal scanning plays a less prominent role in claustrophobia than in uncued panic. It is the external situation, whether or not cognitively interpreted, that brings on the sensations which in their turn can also be misinterpreted. Though some subjects have high ASI scores, it is much more remarkable to note their vigilance for external cues: the noise from above in the elevator, the
change in engine tone in a plane, which are either conditioned triggers or open the door to unwelcome cognitions.

One could go a stage further and speculate that in some instances there may have never been a cognition. There certainly does seem to be an intriguing non-cognitive nature to entrapment. An item on one questionnaire that invited horror from many was being in a straitjacket. Even if they were accompanied by a trusted friend who was not so restricted and who could have looked after their safety, they predict that they would feel very uncomfortable. The difficulty they have in expressing the foundations for this discomfort make it difficult to see how this can be fitted into neat cognitive terms.

An important observation in this study, however, and interestingly Clark (1990) has reported the same with agoraphobics, is that the thoughts so prominent in panic disorder, are often fleeting when there is the degree of avoidance as is evident here. The fact that the thoughts were so clearly reported in the cognitive checklist may give a misleading impression of their salience. Attention for the most part was very often not on these barely conscious thoughts, but instead on wanting desperately to get out of the situation. Subjects have to engage almost in a change of mental set if they are to focus not on their anxious
feelings, but on the underlying thoughts which fuel them and about which they might be very much less aware. The question can be posed that if one has to educate people as to what is fuelling their fear, then this would seem an unlikely rock on which the fear is founded. On the other hand, one is faced with the clear data from this study that a purely cognitive intervention, without doubt not administered to its optimal effect and for a very short time period, was able to bring about substantial effect in anxiety reduction.

What one is left with is that there are, firstly, negative thoughts and, secondly, sets of behaviours that prevent individuals from testing out their beliefs. These are requisites for a cognitive intervention and it is useful to know that they are so clearly evident in this phobia. This study suggests that addressing cognitive elements is likely to be a useful adjunct to mere exposure, but this will need to be tested. A variant of the model for panic disorder may well be transferable to this fear and, at least as importantly, claustrophobia may well provide in the future a testing ground for the Clark model. One that comes to mind is to provide very short periods of exposure which give opportunities to test critical negative beliefs. If these prove to be superior to longer periods of exposure not specifically tied to negative thoughts, then Clark's model and its emphasis on cognitions would indeed be demonstrated to be appropriate for getting to the root of this fear.
CLAUSTROPHOBIA AND THE BARLOW MODEL

It would be misleading to set Barlow up as being in opposition to Clark, since the similarities in their approaches are more striking than the differences. Moreover, most of their recent attention has focused on panic disorder and it is I, rather than they, who have transferred their approaches to a simple phobia. Nevertheless, the fact that Barlow has given a slightly different emphasis in his work does provide a different slant for discussion.

One characteristic of Barlow's approach has been his enthusiasm for the interoceptive model. Though a lot of questions remain as to the mechanism of its effect, the interoceptive exercises did make an impression on some important aspects of this phobia. Cognitive theorists will no doubt argue that this effect was brought about through cognitive means. The fact that the straw was by far the most effective of the set of exercises, would be explained as this being the one which was most likely to bring about cognitive change. At this point, the question cannot be answered with any degree of certainty. But even if this is the mechanism of change, then it must be seen as an exercise likely to produce change for at least some people. There are many areas in which it is difficult or expensive to get exposure (flying, underground mines), and increasing treatment generalization has always been a problem. At the
very least these exercises are likely to help plug such
gaps; if they work through mechanisms other than the
cognitive, then a whole new approach will have been opened
up.

It was of note that false alarms as Barlow described in
panic disorder also occur in claustrophobia. The numbers in
each group are too small to be even suggestive of trends,
but predicting the success of an interoceptive treatment on
how the fear was learned could open up new avenues of
therapeutic assessment. If it transpired that the experience
of false alarms was predictive of success from an
interoceptive treatment, then it might open the door to
categorizing phobias and other fears not by the specific
object feared, but by how, for example, the fear was
learned.
AN ANALYSIS OF CLAUSTROPHOBIA

A model specifically addressing claustrophobia can gain from borrowing ideas from theorists such as Clark and Barlow. However, in the final analysis an understanding of this fear must be built around the facts peculiar to it. There are points about the fear that run in parallel with other fears, and others that make it stand alone. Elements of both categories have implications for the study of other anxiety disorders.

It has become clearer as to what constitutes this fear. The single most important theme is escape from an enclosed space, hence the predominant cognition of entrapment. Other themes in part stem from this, since they tend to be reported only when exits are cut off. These include thoughts relating to air, such as those concerning suffocation, which are characteristic of this fear, but by no means always present. Since they rarely occur in the absence of entrapment, it may be best to think of claustrophobia as a fear of entrapment with or without suffocation.

Little light is shed on the notion of entrapment in this study. The structured interviews only served to confirm that this element of the fear does seem to have a non-cognitive element which is not easily explained. When claustrophobics are asked about physical restriction, or
even factors that induce discomfort such as low ceilings in underground parking, they are quite unable to link their fear to any particular thought. There are, too, multiple examples of reports of being unable to remove tight clothing or rings which are similar, in as far as that there is no clear catastrophic outcome that they can identify. One notion that has been advanced is that such feeling could represent another form of entrapment in their lives: trapped, for example, in a job or in a marriage. There is little evidence to support this. The single related finding in this study was that one member of the control group lost much of her claustrophobia (after the study but before debriefing) when a divorce settlement was reached that gave her financial independence. Though she reported that she felt very much less trapped on hearing of the settlement, and attributed her reduced avoidance to this feeling, there are alternate explanations such as a reduction in her general levels of stress.

There are other, more likely, explanations of entrapment than some form of symbolic significance. The first is that it is, at least in part, a vestigial fear. Preparedness, as discussed in the review of the literature, is certainly a factor in other common phobias, and a link to claustrophobia would not be inconsistent in that entrapment could also be seen as a threat to early man: a mechanism to avoid situations from which escape would be difficult would
certainly have had survival value. A clearer understanding of preparedness seems the most likely route of an improved understanding of this apparently non-cognitive aspect to the fear. A second possibility is that the feeling of entrapment is easily linked to early negative emotional experience. In three cases the feeling of entrapment reminded participants of when they had been separated from their parents as children. The panic of being utterly on their own, of fearing oneself abandoned, was what it was like for them to be trapped. It is uncertain whether they are merely describing a similar feeling or may be pointing to a possible mechanism of learning.

A theme that had not been painted as being as prominent in claustrophobia, was the fear of being seen to lose control of one's emotions. While this is by no means peculiar to this fear, there are indications from both the structured interviews and the Inventories, that it may play an unusually important role. This may help to explain why the presence of others offers so little support and why some participants, indeed, expressed a preference to being on their own if they were to find themselves trapped.

With regard to who picks up the fear, there do seem to be a host of vulnerability factors including childhood experiences, stress, sensitivity to breathing difficulties, and a concern about losing control particularly in front of
other people. These typically interact with a particular salient experience. This is most commonly a short period of entrapment in a situation that is not objectively dangerous such as a door jamming or an elevator stopping between floors. A result of the brevity of such experiences is that many claustrophobics have never actually had a claustrophobic panic. They have always managed to get out "just in time", and so are left with this nagging and fearsome doubt of what would have happened had they not been able to leave. Rather than a habitual misinterpretation of sensations leading to a panic, it seems more accurate to say that they hold assumptions about what they feel would happen if they could not make good their escape. These assumptions may be tied to the sensations that they have already started to experience but this is not necessarily the case, particularly in those who have had the briefest experience of entrapment. This lack of familiarity with panic is a feature that appears to set claustrophobia apart from those with panic disorder. There is no reason to suggest that this makes the fear any less intense.

What may link the two disorders is that in neither does it now appear likely that the core is as simple a matter as a change in a physical sensation being greatly overinterpreted: an increase in heart beat, for example, leading to a belief such as that one may be about to have a heart attack. Apart from the fact that this is an extremely
uncommon association, it ignores the fact that such misinterpretations are not random. It has been striking in this study that the critical catastrophic beliefs are often stubborn because in some way they are based on experience. The nature of that experience may, after reflection or discussion, be easily explained in other terms, but the individual uses some information from an event in their past, often not consciously, to interpret their current situation. This cognitive link appears to be particularly likely to arise at a certain level of anxiety, the reasons for which one can as yet only speculate.

Therapists have, for the most, explored personal experiences that may lead to idiosyncratic negative beliefs, only as an aid to setting up appropriate experiments for clients to test their assumptions. While it is important for the client to be aware of the conditions under which any belief was formed, less attention has been given to the mechanism through which such thoughts come to be held. While it can often be straightforward to take therapeutic advantage of clear personal examples whose meaning has in some way been distorted, it is still not clear why certain experiences seem more likely to have been so influential in the first place. An example was a participant who feared that she might faint who had, on one occasion, fainted as a child. It did prove therapeutically useful for her to examine this incident and to see how it influenced her
present concerns in anxiety-provoking situations. On the other hand, much less is known about why certain incidents seem to trigger beliefs. This is surely no less worthy a topic of research. Even some more complex examples such as a subject who felt that she was losing control and drifting into a state of madness every time that she had a claustraphobic panic, could often be traced to particular personal experiences. Here again, though, it was not clear why this experience should have a certain effect at even moderate levels of anxiety in particular situations.

With regard to the treatment of the fear, this study was able to draw not only on the short interventions, but on treatment that took place after all the relevant data had been collected. All control subjects, and those who had made less progress than they wanted in the hour following the intervention, were offered further periods of therapy using all three strands of therapy together, rather than one exclusively. As one would have predicted, most made rapid, dramatic and durable progress. There was a subgroup who made much slower progress, itself an interesting area for investigation. Eight of these formed a group which met once weekly for six weeks. At the end of this time, only one was unable to face the initially unthinkable goal of the group, namely to be in an elevator with the power turned off, stuck between floors. Impressions from this group were that cognitive and interoceptive elements did indeed hasten
progress, and offered useful options when the effects of exposure alone appeared to be faltering.

One issue raised in this group was that of safety signals; perhaps something can be said about the nature of a fear from the safety signals used to defend against it. On the first day, group members sheepishly admitted to a range of medication, torches and even screwdrivers secreted in their handbags. This was characteristic of the larger group, many of whom had reported using similar aids. The most common one, as with so many of the anxiety disorders, is carrying around some form of medication. Perhaps because the fear is so very predictable that one does not have to make so many precautions, they appeared to be less commonly used than with some other fears. The range, however, was somewhat greater as it was not limited to tranquillizers but was at least as likely to include sleeping tablets, travel sickness medication, or some other such mild sedative. Other participants commonly looked for help with orientation (such as a torch), safety, and ease of breathing (decongestant sprays) apart from particular coping strategies such as a vigilance for and insistence on open doors, open windows and clear access to exits.

Though it is not unusual for phobias to have individualized patterns, there seems to be particular breadth and variety in the case of claustrophobia. Whereas
in panic disorder, recent emphasis has been on the role of cognitions in general and misinterpretations in particular, this is only one part of claustrophobia. There can be such misinterpretations of sensations, but there are also other cognitive elements such as fear of losing control or acting foolishly. Entrapment and disorientation are less clearly, and sometimes not at all, cognitive features of the fear. Further, there is the much more prominent role of conditioned features including sights, sounds, and smells. Indeed it is often difficult to categorize something such as disorientation as cognitive or conditioned, since it may have elements of both.

One final distinction is between panic and anxiety. The recent clinical emphasis on panic should not cloud the fact that panic is not a necessary feature of claustrophobia. As has already been mentioned, many with the fear have never actually panicked and, for some, this is not their worst catastrophe. The sheer discomfort of anxiety alone should not be minimized and may well be sufficient to cause and perpetuate avoidance. Claustrophobia may be a useful way of examining panic, but the two should not be equated: claustrophobia is primarily a phobia in which panic can occur under certain conditions.
DIRECTIONS FOR FURTHER RESEARCH

It seems almost inevitable in such preliminary research that many more questions have been raised than answered. There are no fewer avenues which now beckon for attention. One could choose to find out more about claustrophobia, more about the interventions and instruments used in this research, or use the model of claustrophobia to find out more about fear.

With regard to claustrophobia perhaps one of the most intriguing aspects left unsolved is the issue of entrapment. Claustrophobia does seem to be on the bridge between cognitive and non-cognitive fears, and further exploration of entrapment may lead to an improved understanding of what differentiates the two.

There would seem to be much value in investigating further the interventions used in this study. The interoceptive techniques could be used for a much longer period on a greater variety of anxiety disorders, to establish clearer conclusions as to their utility. The cognitive techniques could be expanded with, for example, the introduction of imaginal exposure to get more effective cognitive rehearsal. There is considerable scope also in testing different cognitive techniques (provision of information against more experientially oriented techniques,
for example) to explore Barnard and Teasdale's (1990) work on levels of meaning. At a later point it will be well worth investigating how both interoceptive and cognitive techniques interact with exposure. The clear implication from the data on the timing of change is that exposure treatment, even in phobias, could be speeded up by the addition of these methods.

There is also much scope for developing the measures used in this study. Perhaps those most urgently in need of attention are the cognitive measures. The psychometric properties of the Negative Cognitions Checklist must be established in light of the changes made to suit a claustrophobic rather than an agoraphobic population. Little is yet known about the effect of combining the frequency of beliefs with the degree to which they are believed, and how this might compare with the most single critical belief, frequency of beliefs, duration of beliefs; or other scores that have been used with scales similar to those adopted here. If ways could be developed to measure cognitions outside anxiety-provoking situations, this, too, would be very useful. Clark's Interpretations Questionnaire (1990) is at least a start in this direction. Even the timing of measurement must be taken into consideration. The greatest impact of the assessment was delayed in four participants. One, for example, had to turn on the heater in the car park to stop herself shaking in a warm summer day, while another
had to pull off the road to stop herself trembling. These are just the physical reactions reported. It would be interesting to know, too, of the cognitive reactions on a longer time-scale.

The model of claustrophobia seems a useful one for increasing our overall understanding of fear. There are questions related to the timing of fear through the life-span. In this study it was surprising, for example, that so little fear was reported in adolescence. One would have thought that this is the very time of life when one might very well be pressed to do things, often in the absence of safety signals, and when there might be very particular concerns about social embarrassment. Instead, what was found was evidence of the fear in childhood and then again in adulthood. Whether this is a re-emergence of the earlier fear, or whether the two are distinct is uncertain from these data.

Claustrophobia also seems a good way of studying the dual belief system (the fact that beliefs are so different when in the situation as opposed to far removed from it), slow and non-responders to treatment, and the prediction of what groups of people will respond to what sorts of treatment. There is no reason why the claustrophobic model should be confined to the laboratory format used in this study. Medical techniques such as magnetic resonance imaging...
(Quirk et al, 1989) allow a broad scope for research into this fear, and for use of the fear for further investigation.
CONCLUSION

One task of a conclusion is to put patterns and meaning on to a set of data. This is precisely what those with the fear try to do with the information at their disposal. One must be on guard for there is a risk for the researcher, too, that a similar path can be followed on which only certain items of information are used, others are discounted, at the same time one is unaware of yet other factors.

The first step is to consider the sample. A major important exclusionary criterion is that this is a sample screened for its good health. It is very possible that there is a whole subset of claustrophobics who have been excluded, the fate for example of three with Meunier's disease who were not included in this study. They are surely even more likely to misinterpret sensations and to be sensitive to any changes in their physical sensations. They are a group that merit study.

Acknowledging that this is a pre-selected sample, and that research volunteers may have certain distinguishing features from the wider claustrophobic population, it was yet possible to broaden and detail our understanding of the fear. Firstly, there were the results of the phenomenological study. It is unusual to give so much focus
to descriptive data, but this seems an important step in learning more about this fear. Though it may sometimes have been seen as trivial from a clinical perspective, this is a fear which can have profound social, health and even occupational implications. It is not merely that it is a nuisance to have to continually monitor one's exits and plan one's itinerary, but, in the more extreme cases, many travel and social opportunities, and in some cases even jobs, are turned down because of the fear. Not only are many options ruled out, but many participants in this study pointed out the effect on mood and self-esteem when their fears have been at their worst.

Claustrophobia is not a simple fear to categorize. There seems to be great variability to the emotional experience of being trapped and in some cases to the accompanying sensations. Its nature is not easy to pin down. With a wide range of conditioning histories and accompanying cognitions, there is huge variability in the situations that are avoided and in outcomes that are feared. What it does have in common with other phobias is that it is at least predictable, unlike panic disorder and to a lesser extent agoraphobia. This can be attributed to the very much more powerful conditioned factors which are such a feature of the phobia.
With regard to the experimental study, a major finding was that a purely cognitive procedure did reduce both reported fear and panic, and led to more confident predictions of a second enclosed space, in relation to a control group. The interoceptive intervention was not as successful in that it exerted an effect on a smaller proportion of participants in that group. Nevertheless, the timing of change was similar in both groups, the power of each intervention being maximized by even the briefest period of exposure. It is in this combination of cognitive and interoceptive techniques with exposure that much interest will lie. There would seem much to be gained from broadening exposure techniques and making them both quicker and more effective by such additions. There is ample evidence from the data of this study that this would be profitable with claustrophobia; further research will be necessary to see if this is an avenue that would be useful with other phobias.
REFERENCES


cognitive behavioral approaches. Behavior Modification, 2, 72-93.


APPENDIX A: STRUCTURED INTERVIEW

1. Do you remember any claustrophobic experiences from your childhood? Can you describe it/them in as much detail as possible?

2. Do you remember being fearfully claustrophobic as an adolescent?

3. What has been the course of this fear: Has it remained stable, spread, reduced etc.?

4. Do you feel that there was a single event in your adult life which precipitated your current claustrophobia?

5. Have you had recent claustrophobic experiences?
   If yes, choose a representative one and ask for recall of sensations what went through your mind at your most anxious, what was the worst you thought might happen

6. Currently what do you avoid doing/where do you avoid going? (Specifically ask about elevators, planes and under water).

7. Do you have or have you had dreams/nightmares about claustrophobia?

8. What is the most frightening situation that you could realistically envisage?

10. In general, what are the conditions that increase your fears in enclosed spaces (prompt: time, restriction of movement, others present, light/dark...).

11. In the past have you found any coping strategies helpful?

12. Have you/do you use or carry medication in certain situations? Have you used alcohol or medication on a regular basis as a means of coping with your fear?

13. When you are in an enclosed space do you reach your peak level of fear immediately or does it take some time? (If not immediately) How long?

14. Do you know anyone else who has these fears (prompt: family members/friends)?

15. Do you see a common theme (for example, a particular fear) running through your claustrophobic experiences?
16. Which term would you see as accurately describing your fear, entrapment or suffocation, or both? Do you think that suffocation/access to air contributes to your fear of enclosed spaces? If yes, ask for elaboration.

17. I am uncertain whether looking back you see the sort of situations you have described as being genuinely dangerous or just that they are very unpleasant?

18. Do you have your own theory which explains your claustrophobic fears?

19. Is the fear getting better, worse or remaining about stable?

20. Do you think that this is a fear that could be changed, or is it with you for life?

21. Have you ever sought treatment for claustrophobia? (If yes with what result; if no, was it ever considered?; what sparked the current enquiry?)

22. What are the sort of things you would most like to be able to do if this fear was reduced?

23. Panic: How frequently have you experienced panic in a claustrophobic situation? How frequently have you experienced panic in any other situation? How frequently have you experienced panic out of the blue?

24. Are there points you would like to make that we have not yet discussed?
APPENDIX B: ANXIETY SENSITIVITY INDEX

**ASI**

Instructions. Please respond to each statement by circling the number that applies to you. Try to be as accurate as possible. There are no right or wrong answers.

<table>
<thead>
<tr>
<th>very little</th>
<th>a little</th>
<th>some</th>
<th>much</th>
<th>very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

1. It is important to me not to appear nervous. 0-0-0-0-1-2-3-4
2. When I cannot keep my mind on a task, I worry
   that I might be going crazy. 0-0-0-0-1-2-3-4
3. It scares me when I feel "shaky" (trembling). 0-0-0-0-1-2-3-4
4. It scares me when I feel faint. 0-0-0-0-1-2-3-4
5. It is important to me to stay in control of my
   emotions. 0-0-0-0-1-2-3-4
6. It scares me when my heart beats rapidly. 0-0-0-0-1-2-3-4
7. It embarrasses me when my stomach growls. 0-0-0-0-1-2-3-4
8. It scares me when I am nauseous. 0-0-0-0-1-2-3-4
9. When I notice that my heart is beating rapidly,
   I worry that I might have a heart attack. 0-0-0-0-1-2-3-4
10. It scares me when I become short of breath. 0-0-0-0-1-2-3-4
11. When my stomach is upset, I worry that I might
    be seriously ill. 0-0-0-0-1-2-3-4
12. It scares me when I am unable to keep my
    mind on a task. 0-0-0-0-1-2-3-4
13. Other people notice when I feel shaky. 0-0-0-0-1-2-3-4
14. Unusual body sensations scare me. 0-0-0-0-1-2-3-4
15. When I am nervous, I worry that I might be
    mentally ill. 0-0-0-0-1-2-3-4
16. It scares me when I am nervous. 0-0-0-0-1-2-3-4
APPENDIX C: PREDICTION OF FEAR

INITIALS

TRIAL#

DATE

1. At its peak, how fearful do you think you will be in the test room? (place a mark on the line below)

Extremely fearful

Not at all fearful
INITIALS __________  TRIAL#

POST-TRIAL ESTIMATES

1. At its peak, how fearful were you in the test room? (place a mark on the line below)

Extremely ___________________________ Not at all fearful

2. Did you panic? Yes_______ No_______

IF NO
Did you come close to panicking? Yes_______ No_______
APPENDIX E: NEGATIVE COGNITIONS CHECKLIST

INITIALS _______ TRIAL#

Please check off any of the following thoughts or ideas you experienced while in the test room.

**DID YOU THINK THAT.....**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>you were going to pass out?</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>you were going to act foolishly?</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>you were going to have a heart attack?</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>you had been forgotten in the room?</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>the walls were closing in?</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>you might suffocate?</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>you were in danger?</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>you were going to lose control?</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>you were going to choke to death?</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>you were going to run out of air to breathe?</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>you were going to fall?</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>you were trapped?</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Did you think of unrelated frightening events (such as horror stories)?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Describe briefly....</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Other thoughts (please indicate)</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX F: PHYSICAL SENSATIONS CHECKLIST

INITIALS __________

Please check off any of the items that describe how you felt while you were in the test room.

1. ___ Shortness of breath
2. ___ Choking or smothering sensations
3. ___ Too warm
4. ___ Tightening muscles
5. ___ Palpitations or accelerated heart rate
6. ___ Dry mouth
7. ___ Relaxed
8. ___ Tearful
9. ___ Headache
10. ___ Chest pain or discomfort
11. ___ Sweating
12. ___ Faintness
13. ___ Dizziness, light headedness, or unsteady feelings
14. ___ Feeling sick, abdominal distress, or any form of nausea
15. ___ Depersonalization or derealization
16. ___ Numbness or tingling sensations
17. ___ Flushed, hot flashes or chills
18. ___ Trembling or shaking
19. ___ Other (please indicate)
APPENDIX G: GENERALIZATION TEST

GENERALIZATION

Instructions for this part of the assessment should be clearly presented in the following order:
1) The subject is invited to make a set of predictions about how anxious they think they would feel if they were to stay in the generalization closet.

It is emphasized 2) that this closet is soundproof (in answer to any queries state only that there is enough air for their needs, rather than getting drawn into discussion of whether it is airtight or not);

3) that the time period is no longer exactly two minutes but can now be between two and four minutes, this number being randomly drawn from a set of ten second intervals;

4) that there is no longer a buzzer and that any cry for assistance would not be heard;

5) that they are encouraged to try each situation as it is presented for a very short period (in the order of two seconds) to help them make accurate predictions. (When the sixth scenario is presented, explain that the door will not be locked in these practices since no difference will be felt or heard).

The predictions should be made on a scale from 0 - 100 where 0 denotes no fear and 100 signifies terrifying fear. The situations are as follows:
1. Outer door open, inner door open, light in room on.
2. Outer door closed, inner door open, light in room on.
3. Outer door closed, inner door open, light off.
4. Outer door closed, inner door closed, light in room on.
5. Outer door closed, inner door closed, light in room off.
6. Outer door closed, inner door locked, light in room off.

Fear predictions Willing to experience for two seconds (Y/N)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____ N/A

No of situation chosen _______
APPENDIX K : TREATMENT INTEGRITY

In any comparative treatment study, the question of treatment integrity looms large. In many similar studies there has been a grave risk of confusing the different strategies, and it has been imperative to show that no such blurring took place. In practice, it did not turn out to be difficult to demonstrate in this study. The three interventions were quite distinct, and this is clear from listening to the tapes. In only the exposure group were participants taken back to the assessment closet to work through a hierarchy of elements they feared. In only the interoceptive group were participants taken through a range of exercises to bring on sensations similar to those they experienced while anxious. In only the cognitive group did they examine fearful thoughts and learn how these could be disputed. The only ambiguity that arose was when those not in the cognitive group expressed cognitive change and sought discussion or support. In these instances, their observations were not ignored or dismissed, but neither were they encouraged or taken further.

What seems to have been a more important issue is one that cannot yet be answered: treatment efficacy. At this point it is not known whether in a cognitive intervention one should encourage clients to disprove cognitions for themselves, how important it is that they examine their own experiences which may have contributed to some of their common cognitions, and how important affect may be in cognitive change. There are similar grey areas in relation to the interoceptive techniques. It is simply not yet known whether the exercises should be practiced in short or long periods, in isolation or in combination, with or without modelling. Much is likely to emerge over the next years that will help to evaluate the extent to which these interventions were optimally administered.
### APPENDIX L: ADJUSTED MEANS AT POST-TEST (PRE-TEST COVARIED OUT) FOR QUESTION 1

<table>
<thead>
<tr>
<th></th>
<th>Observed mean</th>
<th>Adjusted mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREDICT FEAR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>49.83</td>
<td>50.18</td>
</tr>
<tr>
<td>Exposure</td>
<td>25.00</td>
<td>24.91</td>
</tr>
<tr>
<td>Interceptive</td>
<td>51.33</td>
<td>51.83</td>
</tr>
<tr>
<td>Control</td>
<td>67.33</td>
<td>66.58</td>
</tr>
<tr>
<td><strong>REPORTED FEAR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>21.00</td>
<td>21.52</td>
</tr>
<tr>
<td>Exposure</td>
<td>15.92</td>
<td>15.48</td>
</tr>
<tr>
<td>Interceptive</td>
<td>34.42</td>
<td>34.14</td>
</tr>
<tr>
<td>Control</td>
<td>52.58</td>
<td>52.78</td>
</tr>
<tr>
<td><strong>REPORTED PANIC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>2.75</td>
<td>2.85</td>
</tr>
<tr>
<td>Exposure</td>
<td>2.92</td>
<td>2.94</td>
</tr>
<tr>
<td>Interceptive</td>
<td>2.50</td>
<td>2.39</td>
</tr>
<tr>
<td>Control</td>
<td>2.25</td>
<td>2.24</td>
</tr>
<tr>
<td><strong>NEGATIVE COGNITIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>29.50</td>
<td>31.79</td>
</tr>
<tr>
<td>Exposure</td>
<td>18.83</td>
<td>3.29</td>
</tr>
<tr>
<td>Interceptive</td>
<td>81.33</td>
<td>101.51</td>
</tr>
<tr>
<td>Control</td>
<td>251.00</td>
<td>244.08</td>
</tr>
<tr>
<td><strong>UNPLEASANT SENSATIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>58.33</td>
<td>54.37</td>
</tr>
<tr>
<td>Exposure</td>
<td>34.67</td>
<td>46.37</td>
</tr>
<tr>
<td>Interceptive</td>
<td>106.17</td>
<td>107.44</td>
</tr>
<tr>
<td>Control</td>
<td>284.92</td>
<td>275.91</td>
</tr>
<tr>
<td><strong>HEART RATE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>90.83</td>
<td>89.56</td>
</tr>
<tr>
<td>Exposure</td>
<td>79.50</td>
<td>81.16</td>
</tr>
<tr>
<td>Interceptive</td>
<td>87.75</td>
<td>89.23</td>
</tr>
<tr>
<td>Control</td>
<td>97.08</td>
<td>95.21</td>
</tr>
<tr>
<td><strong>PREDICT FEAR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>23.92</td>
<td>23.04</td>
</tr>
<tr>
<td>Exposure</td>
<td>18.67</td>
<td>20.86</td>
</tr>
<tr>
<td>Interceptive</td>
<td>20.42</td>
<td>21.80</td>
</tr>
<tr>
<td>Control</td>
<td>25.33</td>
<td>22.64</td>
</tr>
</tbody>
</table>