ANXIETY DISORDERS

Psychological and Biological Perspectives

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Edited by

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To Margaret, Stephen, and Marnie, the
fun we have balances life's anxieties
BRIAN F. SHAW

To Icek, Mania, and Anne, for
providing all the right ingredients
ZINDEL V. SEGAL

In memory of my father
T. MICHAEL VALLIS

To Marlene, Blanche, Rafael, David,
and Daniel, with love
FRANK E. CASHMAN

FOREWORD

Anxiety is one of those entities which everyone "knows", but
which ultimately resists simple objective description. The essence of
the phenomenon is its subjectivity. True it has its well documented
associated physiological events: the increased pulse rate and blood
pressure, sweating, and so on, but each of these phenomena may also be
part of physical exertion, fear, or even pleasurable excitement.
They cannot fully define the sense of threat, danger, collapse,
malignancy in greater or smaller amount, in greater or lesser locali-
sation, with more or less objective evidence for its validity that
characterises the particular psychological pain we all recognize as
anxiety.

It is precisely the essential subjectivity of anxiety and its
association with an enormous range of experience that makes it difficult
to assign to it well-defined diagnostic labels of the kinds so carefully
described by Dr. Spitzer in his chapter on classification. His
chapter ranges from the extreme dread of "Panic Disorders", to the
diffuse terror of the environment which used to be labelled "Agoraphobia"
(and is still so called in the day to day pragmatic usage of many
clinics) and is not assimilated to the class of phobias with the
label "Social Phobias". He also addresses the "Simple Phobias" which
are perhaps the most readily labelled of the many varieties of anxiety.
They are associated with very particular events or things. They
demonstrate the shading from realistic fear, to the pathological and
irrational dread of clinically significant anxiety. While they may
have a connection with objectively frightening stimuli - airplanes do
after all crash from time to time, one should be careful at great
heights, dogs have been known to bite people - it is clear that the
objective validity of the fear cannot account for the degree of
painful terror experienced by the phobic person. And the DSM-III
committees must have had a relatively easy time with the category
"Simple Phobias".

But even if the labelling of these disorders was simple the
great mystery of nonrational, at times paralyzing, terror remains.
It contains a conscious or unconscious notion of an arbitrary and
potentially damaging universe, close to that negative perception of
things which characterizes the hopelessness of depressive disorders.
In their chapter Drs. Swinson and Kirby have attempted to separate
the anxiety syndromes from the depressive syndromes. They are subtle
and ingenious in their argument, yet in the end they recognize that
while anxiety and depression may be discrete states, they are braided
together in many conditions of psychic dysphoria.

Drs. Lang and Insel in their chapters describe the objective phenomenology accompanying anxiety. Dr. Insel finds his point of entry in the anxiolytic drugs. He proposes that the information gained through pharmacologic and receptor physiology studies "has provided a bridge between the molecular and behavioural realm". While he recognizes that the territory on either end of the bridge remains essentially unmapped, he expands his argument to take in the potentially exciting work on Na Lactate and adrenergic dysregulation which as he admits, still leaves unanswered the mystery of how these biochemical and pharmacological events are transduced into fear laden thoughts and feelings of dread. Similarly Dr. Lang in his chapter on "anxiety and memory" attempts to map the transformation of physical events to subjective experience. He draws on many models including the recent cybernetic metaphor of information processing and memory.

It is obvious that anxiety is part of the repertoire of normal defence. Not only in the psychoanalytic sense of an unconscious mechanism, but in the more usual sense of a measure of wariness essential for survival. Dr. Beck explores the distortions of the normative functions of anxiety. He relates a Darwinian substrate of necessary fears (necessary in the sense of protective) to their maladaptive generalization and misapplication in patients. Characteristically, he uses metaphor to understand by analogy things which cannot be operationally described and in his hands the metaphor is a useful and sensible guide to understanding the protean manifestations of anxiety. He elaborates his awareness of how anxiety colours affective, perceptual, behavioural, and cognitive functions.

A variety of therapeutic strategies are approached in other chapters. Each approach (self-control skills, the behavioural techniques of exposure in its various forms, and pharmacological agents) represents attempts to grapple with the subtleties of anxiety in its clinical presentation.

If the problem were more clearly defined and the pathophysiology more neatly understood, the wide variety of treatments would probably not be necessary. But in the meantime as the field awaits clarification and specific therapies for specific pains, this book reflects what is known and gives a sense of the heuristic strategies used by leaders in the field to gain a theoretical and curative grip on the pains of pathological anxiety.

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PREFACE

Anxiety disorders continue to dominate much of the attention of
mental health researchers in the 80's. Epidemiologic shocks have
been felt across North American to the extent that the media, government
and general public, want more information. In the United States,
the reorganization of the National Institute of Mental Health reflected
these concerns with the creation of the Anxiety and Affective Disorders
Branch.

What new knowledge has been discovered that gives rise to this
attention? Scientific work like other types of epistemology follows
trends. Scientists are on the firmest footing when their theories
and/or interventions receive empirical confirmation. As you will see
in this volume our new knowledge about anxiety disorders has grown
dramatically in the past five years. Theoretical developments and
empirical research continue to challenge and alter our conceptualization
and treatment of anxiety. We have tried to capture some of the
excitement generated by this new work as well as to inform the reader
of these developments.

This volume evolved out of a scientific meeting held at the Clarke
Institute of Psychiatry, University of Toronto, Toronto, Canada. The
meeting was designed to provide an overview of the major advances
in this rapidly developing field and to debate several controversial
issues. The chapters that emerged from this process reflect these
goals. Many of the ideas and findings presented are new but in
themselves lead to controversies that should stimulate future research.
We paid attention to the traditional areas of concern to clinicians
(assessment, therapeutic management) but in particular looked to
challenge the reader's conceptualization of these pervasive disorders.

BRIAN F. SHAW

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PROPOSED REVISIONS IN THE DSM-III CLASSIFICATION OF ANXIETY DISORDERS
BASED ON RESEARCH AND CLINICAL EXPERIENCE[*]

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INTRODUCTION

Mental disorders with some form of anxiety as the predominant
feature have been recognized since antiquity although the approach of
grouping them together into a single diagnostic class called Anxiety
Disorders was first taken only a few years ago in the Third Edition
of the American Psychiatric Association's Diagnostic and Statistical
Manual of Mental Disorders (DSM-III; American Psychiatric Association,
1980). In this paper we review the background to the DSM-III classifi-
cation of Anxiety Disorders for adults and discuss problems with the
diagnostic criteria that have recently become apparent, as well as
possible solutions to these problems. A reexamination of how these
important categories are defined is timely since in May 1983 a Work
Group to Revise DSM-III was appointed by the American Psychiatric
Association. This Work Group will consider modifications in the
criteria for the various disorders and is scheduled to complete the
revision, DSM-III-R, in 1986.

BACKGROUND

As is well known, the developers of DSM-III decided to base the
classification on shared descriptive features when etiology was
unknown, rather than on presumed etiologies. The consequence of this
approach was abandoning the traditional diagnostic class of neuroses,
which according to DSM-II included categories that shared a common
cause: unconscious conflict arousing anxiety and leading to the
maladaptive use of defense mechanisms that results in symptom formation.

In DSM-III the individual DSM-II neuroses were reclassified with
other diagnostic categories that shared their essential descriptive
features. Depressive Neurosis (renamed Dysthymic Disease) joined
the Affective Disorders; the two types of Hysterical Neuroses were
subsumed under Somatoform and Dissociative Disorders, and Depersonali-
zation Neurosis joined Dissociative Disorders. The low energy of

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Neurasthenic Neurosis apparently led to its demise. The remaining Neuroses, Anxiety Neurosis, Phobic Neurosis, and Obsessive Compulsive Neurosis are all characterized by anxiety being either the predominant symptom, or experienced if the individual attempts to master the symptoms. These last three DSM-II categories, two of which were further subdivided in DSM-III, were joined by the new category of Post-traumatic Stress Disorder, which also always involves symptoms of anxiety, to constitute the DSM-III diagnostic class of Anxiety Disorders.

The elimination of Neurosis as a diagnostic class from the DSM-III classification was extremely controversial. However, since the publication of DSM-III, with only a few exceptions (Frances & Cooper, 1981; Lopez-Ibor & Lopez-Ibor, 1983), researchers and clinicians seem to have accepted the basic utility of the concept of Anxiety Disorders as a diagnostic class.

Examples of this acceptance include the large number of recent studies in which investigators have used the DSM-III criteria for describing samples of patients with Anxiety Disorders (Klein & Rabkin, 1981; Barlow & Beck, 1985), the proliferation of specialized clinical services organized to treat these disorders, the convening of two major conferences on the subject (Anxiety Disorders, Panic Attacks, and Phobias, 1982; Anxiety and the Anxiety Disorders, 1983) and the decision of the 1984 Scientific Program Committee of the American Psychiatric Association to have a major section of its Annual Review program devoted to the subject of Anxiety Disorders. In addition, the DSM-III classification of Anxiety Disorders has stimulated and generated new research questions and issues.

OVERVIEW OF THE DSM-III ANXIETY DISORDERS

Table 1 lists the eight specific DSM-III Anxiety Disorders, plus the residual undefined category of Atypical Anxiety Disorder. To facilitate understanding of the historical origins of these disorders, they will be discussed in four groups.

TABLE 1

DSM-III Classification of Anxiety Disorders

Phobic disorders (or Phobic neuroses)

    Agoraphobia with panic attacks
    Agoraphobia without panic attacks
    Social phobia
    Simple phobia

Anxiety states (or Anxiety neuroses)

    Panic disorder
    Generalized anxiety disorder
    Obsessive compulsive disorder (or Obsessive Compulsive Neurosis)

Post-traumatic stress disorder

    Acute
    Chronic or Delayed

Atypical anxiety disorder

1. Phobic Disorders

The essential feature of each phobic disorder is a persistent and irrational fear of a specific object, activity, or situation, that results in a compelling desire to avoid the dreaded object, activity, or situation (the phobic stimulus). The fear is recognized by the individual as excessive or unreasonable.

In partial accordance with the classification of phobias proposed by Marks (1970), DSM-III subdivided the Phobic Disorders into three types based on differing symptomatology, age at onset, sex ratio, and treatment response: Agoraphobia (marked fear of being alone or being in public places from which escape might be difficult or help not available in case of sudden incapacitation), Social Phobia (fear of situations in which the individual may be exposed to scrutiny by others), and Simple Phobia (fear of situations other than those subsumed by Agoraphobia and Social Phobia, such as fears of animals and heights).

Based on Klein's observation that most cases of Agoraphobia begin following the development of what he calls "spontaneous panic attacks" (Klein 1981), the typical form of the disorder was called Agoraphobia with Panic Attacks. In order to provide a category for cases of Agoraphobia in which there was no history of panic attacks (although it was not clear if such cases existed) another subtype was added, Agoraphobia without Panic Attacks.

2. Anxiety States

The syndrome of recurrent panic attacks has been recognized as a separate disorder as far back as 1871 when Da Costa described the "irritable heart" and later in 1894 when Freud (1962) first applied the name Anxiety Neurosis to the syndrome, separating it from the category of Neurasthenia. However, in DSM-II, Anxiety Neurosis was applied to individuals who experienced generalized anxiety, whether or not it also occurred in discrete attacks of panic which were assumed to be merely symptomatic of the more severe form of the same disorder. This same conceptualization is expressed in the Ninth Revision of the International Classification of Disease (ICD-9) in which the category Anxiety States includes "Various combinations of physical and mental manifestations of anxiety, not attributable to real danger and occurring either in attacks or as a persisting state" (World Health Organization, 1978, p. 35).

Because in the early 1960s Klein (1964) had demonstrated that imipramine blocks recurrent panic attacks and later showed that imipramine has no apparent effect on phobic anxiety that is not associated with panic attacks (Zitrin, Klein, & Woerner, 1978), it was decided that there should be a separate category in DSM-III for conditions characterized by recurrent panic attacks. Therefore, the DSM-II category of Anxiety Neurosis was divided into two categories. The first category, Panic Disorder, requires recurrent panic attacks (in the absence of Agoraphobia), and corresponds to Freud's "Anxiety Neurosis". The diagnostic criteria for Panic Disorder in DSM-III were based on the Feighner criteria for Anxiety Neurosis (Feighner et al., 1972). The second category was newly created for those cases that using DSM-II would have been given the diagnosis of Anxiety Neurosis yet did not have recurrent panic attacks. This category is called Generalized Anxiety Disorder (GAD) in DSM-III and is for conditions in which there is generalized, persistent anxiety of at least one month's duration, without the specific symptoms of any of

the other Anxiety Disorders. When this residual Anxiety Disorder category was created, no one was quite sure how prevalent such a condition was and whether it would have a differential treatment response from Panic Disorder.

3. Obsessive Compulsive Disorder

The developers of the DSM-III classification initially were unsure under what diagnostic rubric to put the time-honored category of Obsessive Compulsive Disorder. Eventually it was subsumed under the Anxiety Disorders with the rationale that even though the predominant symptoms are obsessions or compulsions rather than anxiety itself, anxiety is almost invariably experienced if the individual attempts to resist the obsessions or compulsions. In addition, most patients with the disorder also experience anxiety apart from the obsessions and compulsions.

4. Post-traumatic Stress Disorder (PTSD)

This category was first referred to as Traumatic Neurosis (Keiser, 1968), and was included in DSM-I as Gross Stress Reaction. However, it had no direct counterpart in DSM-II despite experience with delayed forms of the disorder resulting from concentration camp experiences during the Second World War. The criteria for the DSM-III category were developed with the help of clinicians who were involved in treating Vietnam War veterans. According to clinicians who study patients experiencing trauma associated with civilian life, such as the trauma of rape or physical assault, the essential clinical features of the disorder are apparently the same regardless of the trauma.

PROBLEMS AND PROPOSED SOLUTIONS FOR DEFINING THE DISORDERS

Despite extensive field testing of the DSM-III criteria prior to their official adoption, experience with them since their publication in 1980 has revealed, as expected, many instances in which the criteria are not entirely satisfactory and need to be revised. The following is a discussion of problems that have been identified by investigators, including ourselves, in the application of the Anxiety Disorders diagnostic criteria. Case examples are presented to illustrate the points discussed, frequently the very cases that directed attention to a particular problem.

Hierarchic Structure of the Classification

A case example is Ms. G., a 48 year old mother of three children admitted to the hospital for her third episode of severe depression, which met the DSM-III criteria for Major Depression with Melancholia. She reported that, with each of the three depressions, she began to have terrifying panic attacks once the depression had begun, which she believed were triggered by the thought that she would never recover. She claimed that she has never had a panic attack when she has been in a non-depressed state. Her description of individual panic attacks fulfilled the inclusion criteria for Panic Disorder.

In DSM-III the diagnostic classes are hierarchically organized on the assumption that a disorder high in the hierarchy may have symptoms found in disorders lower in the hierarchy, but not the reverse. The hierarchic structure of the classification is operation-alized by exclusion criteria so that a diagnosis (in this case the "excluded diagnosis") is not given if its inclusion symptoms are

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considered to be a symptom of a more pervasive disorder (the "dominant disorder").

Do the panic attacks of Ms. G. have any diagnostic significance? According to the DSM-III criteria for Panic Disorder, this diagnosis is not given if the panic attacks occur only in the course of, that is, are judged "due to" an episode of Major Depression. According to DSM-III, and perhaps usual clinical practice, the panic attacks would be regarded as merely associated symptoms of the Affective Disorder and of no diagnostic significance.

Data from the NIMH sponsored Epidemiologic Catchment Area Program (ECA; Regier et al., 1982) have called into question the fundamental assumptions that form the basis of many of the DSM-III hierarchies, and particularly those for the Anxiety Disorders. Boyd et al., (1984) using data from this project found that the presence of a dominant disorder (e.g., Major Depression) greatly increased the likelihood of the presence of a related excluded syndrome (e.g., panic attacks), as would be predicted by the DSM-III hierarchies. However, there was also a tendency for the presence of any DSM-III syndrome to increase the likelihood of the presence of almost any other DSM-III syndrome.

Other research has also challenged the validity of the DSM-III hierarchic principle that gives Affective Disorders precedence over Anxiety Disorders. Leckman and colleagues (1983), in a large case-control family study of depression found that the presence of a history of panic attacks in the probands, whether associated with a major depressive episode or occurring at other times, increased the family prevalence of depression, alcoholism, and other anxiety disorders. These data suggest that research, and perhaps clinical practice as well, might be improved by eliminating some of the DSM-III diagnostic hierarchies that prevent the joint diagnosis of different syndromes when they occur together in one episode of illness.

There are other problems with some of the hierarchic principles embodied in the exclusion criteria for the Anxiety Disorders. Some exclusion principles are not applied consistently. For example, a psychotic disorder in DSM-III, such as Schizophrenia, explicitly takes precedence over all of the Anxiety Disorders except Social Phobia and Post-traumatic Stress Disorder. Yet it is not at all clear why Schizophrenia should pre-empt a diagnosis of Agoraphobia or Panic Disorder but not of Social Phobia. In addition, some of the exclusion criteria confuse differential diagnostic issues with hierarchic issues. Thus, the DSM-III exclusion criteria for Agoraphobia list Obsessive Compulsive Disorder and Paranoid Personality Disorder. These two diagnoses are noted because it was recognized that individuals with Obsessive Compulsive Disorder and Paranoid Personality Disorder are sometimes afraid to go out of their houses alone. The need for a differential diagnosis of the symptom of fear of going out of the house should not be confused with a hierarchic principle, since the fear of leaving the house because of a fear of sudden incapacitation (the hallmark of Agoraphobia) is not a symptom of Obsessive Compulsive Disorder or Paranoid Personality Disorder.

We have agonized long and hard over the problem of the DSM-III hierarchies, attempting to identify general principles for diagnostic hierarchy that will avoid many of the problems previously noted, yet will not reduce the classification of mental disorders to a list of symptom complexes or syndromes. We propose (and the Work Group to Revise DSM-III will consider) that the following principles for diagnostic hierarchy be consistently applied to all of the DSM-III

categories:

Principle #1: When a syndrome has a known organic
etiology, the diagnosis of an organic mental disorder
takes precedence over the diagnosis of that syndrome
outside of the class of organic mental disorders.
For example, a manic syndrome that is judged to be due
to the use of Amphetamines would be diagnosed as an
Amphetamine Induced Organic Mental Disorder rather than
as an Affective Disorder; a persecutory delusional
syndrome judged to be due to a brain tumor would be
diagnosed on Axis I as an Organic Delusional Syndrome
(with the brain tumor noted on Axis III) rather than as
a Paranoid Disorder. This hierarchic principle is
fundamental to virtually all classifications of mental
disorder.

Principle #2: A symptomatically more pervasive disorder
pre-empts the diagnosis of a less pervasive disorder that
is based on a symptom that is part of the essential features
of the more pervasive disorder. According to this principle,
a patient with Schizophrenia who has persecutory delusions
or hallucinations would not also be diagnosed as having a
a Paranoid Disorder. Similarly, a patient with both manic
episodes and major depressive episodes would not be given
diagnoses of both Bipolar Disorder and Major Depression.

Principle #3: A diagnosis is not given if its essential
features are typically associated features of another disorder
whose essential features are also present. According to this
principle, chronic dysphoric mood is such a typical associated
feature of such chronic disorders as Alcohol Dependence, Agoraphobia,
and Obsessive Compulsive Disorder that an additional diagnosis of
Dysthymic Disorder would not be given. Another example would be
the presence of generalized anxiety during an acute psychotic
episode; Generalized Anxiety Disorder would not be diagnosed
in addition to the psychotic disorder. This is the most problematic
principle because it requires knowledge about the relative frequency
of associated features in any given diagnosis.

As can be seen in the Appendix the revised exclusion criteria
are unambiguous, and with the exception of the residual category of
Generalized Anxiety Disorder, far simpler than the DSM-III criteria.
Furthermore, the revised criteria remove the hierarchical principle
of a major depressive episode excluding a diagnosis of an anxiety
disorder, a principle that the ECA data have called into question.
As a consequence, many of the previously excluded diagnoses would,
with the revised criteria, be regarded as complications of the dominant
diagnosis.

One important consequence of these principles would be that
Affective Disorders would no longer pre-empt a concurrent diagnosis of
an Anxiety Disorder. As applied to Ms. G., this would mean that both
Major Depression and Panic Disorder, which in her case could be
thought of as a complication of each major depressive episode, would
be diagnosed.

The application of these principles would also mean that Generalized
Anxiety Disorder could be given as an additional diagnosis to an
individual who concurrently has a depressive disorder. This would
respond to the criticism of Shader and Greenblatt (1981) that DSM-III

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does not recognize the validity of mixed anxiety-depressive disorders. It is also in accord with the findings of a recent study by Finlay-Jones and Brown (1981) in which it was found that individuals who had experienced both severe loss and severe danger developed mixed depression/ anxiety states. The application of the traditional diagnostic hierarchy to these cases would have obscured the mixed nature of the disorder.

What would happen to the combination category of Agoraphobia with Panic Attacks with the adoption of the proposed hierarchic principles? We believe that there is sufficient clinical evidence that Agoraphobia is usually a complication of recurrent panic attacks to justify the following revision in the DSM-III classification of Agoraphobia and Panic Disorder: the category of Agoraphobia without Panic Attacks would be unchanged but the diagnosis of Panic Disorder and Agoraphobia with Panic Attacks would be combined into a single category of Panic Disorder that would have three subtypes:

Panic Disorder, Uncomplicated
Panic Disorder, with Limited Phobic Avoidance
Panic Disorder, with Agoraphobia (extensive Phobic Avoidance)

This revision would acknowledge the central role of panic attacks in the typical development of Agoraphobia. It would also provide a subtype of Panic Disorder for cases in which the individual avoids one or more activities because of a fear of having panic attacks (e.g., going into restaurants) yet the phobic avoidance is not as extensive as would be the case with Agoraphobia. There is no satisfactory way to diagnose such cases according to DSM-III.

Another case example is a 42 year old housewife with a history of panic attacks and agoraphobia who was unable to leave her home unless accompanied by her husband or a friend even though she had not actually had a panic attack for several years.

A current problem with the DSM-III classification of Agoraphobia with Panic Attacks is that there is no way to indicate the common clinical condition in which, with psychopharmacologic treatment, (or with time), panic attacks have remitted but phobic avoidance behavior of the Agoraphobia persists. A new convention could be adopted that would allow for indicating any disorder in remission, so that with the new principles such cases would be diagnosed as: Panic Disorder with Agoraphobia (panic attacks in remission).

<div align="center">PROBLEMS DEFINING THE INDIVIDUAL DISORDERS</div>

Agoraphobia

The problems of defining agoraphobia may be seen in the following case example. A 37 year old former teacher complained of panic attacks of 11 years duration which made it impossible for him to work outside of the home. During the last few years he had accommodated himself to his illness by organizing his life so that he rarely had to leave his house. He had assumed responsibility for taking care of his children while his wife was away at work, he prepared the family meals, and spent several hours each day lifting weights.

According to DSM-III, in order to give a diagnosis of Agoraphobia there must be increasing "constriction of normal activities until the fears (of being alone or in public places) or avoidance behavior dominate the individual's life." Clinically, there seems little doubt that Mr. M. has Agoraphobia. However, since he has made a new

life for himself inside his home, it is not clear whether, strictly speaking, the fears or avoidance behavior now "dominate" his life. The ambiguity inherent in the word "dominate" had led to the following proposed rephrasing: " ... numerous important activities are avoided or endured with dread." With this proposed revision, Mr. M.'s illness clearly meets the criteria for Agoraphobia.

Agoraphobia without Panic Attacks

This category requires further study and we are only aware of two papers that have commented specifically on it. In a reliability study of 60 consecutive outpatients at an Anxiety Disorders Clinic, there were 23 cases of Agoraphobia with Panic Attacks but not a single case of Agoraphobia without Panic Attacks (Di Nardo et al., 1983) raising the issue of the validity of the category. On the other hand, according to Klein (in press), Agoraphobia without Panic Attacks is regularly associated with episodic autonomic symptoms, primarily light-headedness and gastrointestinal distress. If Klein's observation is confirmed, the issue is whether these autonomic symptoms are fundamentally different from panic attacks or are merely minor forms of panic attacks that do not justify a separate diagnostic category.

Social Phobia

Another case example is Mr. S., a 43 year old construction manager and father of two who sought treatment because "I seem to be afraid of everything and I have been this way since I was a kid." Two months ago his symptoms intensified when he began a new job that required him to have more interaction with other employees. On detailed questioning it turned out that his fears all involved situations in which he believed others might think him incompetent or might be angry with him. For example, he was afraid to change the oil in his car because a new neighbour next door might see him and think that he did not know what he was doing. He was afraid that while driving his car he might stop at an intersection and another driver would be annoyed with him for stopping. When he first was introduced to someone he would be so anxious that he could hardly talk. He also complained of numerous physical manifestations of anxiety, such as muscle tension, palpitations, and trouble concentrating.

In DSM-III a Social Phobia is defined as a persistent, irrational fear of, and compelling desire to avoid, a situation in which the individual is exposed to possible scrutiny by others and fears that he or she may act in a way that will be humiliating or embarrassing. According to this definition, Mr. S. would seem to have many Social Phobias, yet the text states that "generally an individual has only one Social Phobia." This statement was added to the text because the descriptions of prototypical cases usually involved isolated phobias, such as fear of eating in public or writing in the presence of others. However, the category is apparently commonly applied to patients who, like Mr. S., have multiple social situations they fear and avoid (Amies, Gelder, & Shaw, 1983; Falloon, Lloyd, & Harpin, 1981). There seems to be no valid reason to exclude such cases from the diagnosis, provided that the basic fear is of humiliation or embarrassment rather than, for example, as might be seen in cases of Paranoid Personality Disorder, fear of being harmed. Therefore, in the proposed revision, the criteria state that the diagnosis is appropriate even when the phobic situations are numerous and pervasive.

A further case example is Mr. T., a fourth year medical student, who came to the Student Health Service complaining of intense anxiety

whenever he had to present a patient to his attending staff. For days
before a presentation he would ruminate about the possibility that he
would be unable to speak coherently and that his anxiety would be
obvious to everyone. Recognizing that it would hurt his career if he
attempted to avoid case presentations, he always forced himself to go
through with them, usually finding that he was not as anxious as he
expected to be.

Does Mr. T. have a Social Phobia? According to DSM-III there
has to be a "compelling desire to avoid" the phobic situation. This
leaves unclear the issue of whether the diagnosis can or should be
given to individuals who dread entering the phobic situation, but
force themselves to do so nevertheless. We propose changing this
criterion (which is also in Simple and Agoraphobia) to the requirement
that "the activity is avoided or endured with dread."

Mr. T.'s public speaking phobia raises the issue of whether or
not public speaking phobia should be classified separately from the
other Social Phobias. Almost all individuals experience anxiety when
speaking before a large group of people or to a small group if their
performance is being evaluated. Thus, anxiety about public speaking
is extremely common and "normal" anxiety about public speaking is on
a continuum with phobic anxiety and in this way differs from the
other Social Phobias (e.g., of eating and writing in public) which
tend to be extremely rare and discontinuous with normal experience.
In addition, individuals with public speaking phobia usually show
little evidence of other psychopathology, whereas clinical experience
indicates that individuals with other Social Phobias usually have
considerable associated personality pathology.

Simple Phobia

A case example is Ms. B., a 55 year old woman in good physical
health who, during a community survey, admitted that she avoided
crossing any streets that were more than two lanes wide because "I
might fall down and be hit by a car." For many years she had avoided
such streets and had changed her shopping and visiting habits so that
she could avoid wide streets. She acknowledged that her fear of
falling was unreasonable, but denied that this fear and the resulting
avoidance activity caused her any distress.

According to DSM-III an individual with Simple Phobia (and
Social Phobia) must have "significant distress because of the disturb-
ance." Yet it is clinically well known that some individuals, such
as Ms. B., with phobic avoidance of an important activity, may deny
any distress because they have altered their lives to adjust to their
incapacity. In the proposed change, this criterion would state that
"the (feared) activity is important in the context of the individual's
life circumstances, or the fear of the activity causes significant
distress." According to this revised criterion, the diagnosis of
Simple Phobia would clearly apply to Ms. B.'s case.

Panic Disorder

A case example is Ms. F., a 50 year old woman who was presented
to a case conference. She complained of panic attacks that almost
always occurred, according to her, only when she was either in crowds,
or enclosed places such as on buses, cars or elevators, situations
that, whenever possible, she avoided. Typically she would start to
feel uneasy in anticipation of entering one of these situations.
Once in the situation, after a few minutes to up to an hour, a panic

attack would begin, or it might not occur at all. She denied ever
having an attack while at home. The staff was divided as to the
diagnosis. Some argued that her panic attacks were not "spontaneous"
since they occurred only in certain situations, and therefore the
diagnosis was Simple Phobia. Others argued for a diagnosis of Panic
Disorder.

We agree with the diagnosis of Panic Disorder. The basis for
this confusion is the statement in DSM-III that in Panic Disorder the
panic attacks are "not precipitated only by exposure to a circumscribed
phobic stimulus." The purpose of this statement is to exclude from
the diagnosis of Panic Disorder panic reactions that inevitably occur
in response to a specific phobic stimulus, such as the panic reaction
that an individual with a morbid fear of heights experiences in such
a situation. Ms. F. is predisposed to having a panic attack in
certain situations, but unlike an individual with a true Simple or
Social Phobia, she does not always have an attack in the feared
situations. Furthermore, when she does have an attack, it does not
occur immediately upon exposure to the phobic stimulus, but rather
after a variable period of time. In the revised criterion for Panic
Disorder the differential with a panic reaction to a circumscribed
phobic stimulus is clarified by the statement that the attack must
occur at "times other than ... immediately before or upon exposure to
a situation that always causes anxiety or avoidance."

In our experience, in interviewing patients with a chief complaint
of anxiety, there is rarely difficulty in distinguishing true panic
attacks from periods of intense anxiety. When there is difficulty,
examination of the temporal course of the anxiety experience usually
clarifies the situation. In true panic attacks the peak intensity of
the experience is always reached within a few minutes. Therefore, in
the revised criteria we have added a statement that "the peak intensity
of the experience (must be) reached within ten minutes from its
onset." This requires that clinicians ask, if the patient has not
described the temporal course of the onset of the attack, "How long
does it take from when it begins to when it is the worst?"

Generalized Anxiety Disorder

As already noted, GAD is a new category in DSM-III, with a
description not based on systematic studies. According to DSM-III,
it is possible to meet the criteria for the disorder with only relatively
transient (one month) complaints of anxiety. The duration requirement
of only one month makes it difficult to distinguish this category
from relatively transient stress reactions, and investigators who
have studied this category have generally limited their sample selection
to individuals who have had the symptoms of the disorder for much
longer periods of time (Cloninger, Martin, Clayton, & Guze, 1981;
Raskin, Peeke, Dickman, & Pinsker, 1982). We propose that the duration
requirement be changed to six months, during which time the individual
has experienced either "nervousness or anxiety", "worry", or "inability
to relax." We recognize that our proposal to change the duration
requirement to six months is based on clinical judgment only and its
validation needs research confirmation.

Another problem with the DSM-III criteria is that by only requiring
a single anxiety symptom from each of three out of four areas, an
individual who only has "jumpiness", "feeling on edge", and "worry",
satisfies the symptom criteria. In order to better define a syndrome,
the new criteria require the presence of at least six of an 18-item
index of commonly associated symptoms taken from those currently
listed in the DSM-III criteria.

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Finally, as discussed previously, we propose that GAD no longer be considered residual to all other specific Anxiety Disorders. It is recognized that individuals with circumscribed anxiety syndromes, such as Social or Simple Phobia, frequently do not have generalized anxiety. When they do, recognition of an associated GAD might have important treatment implications. Therefore, we propose that GAD only be excluded by those Anxiety Disorders in which persistent anxiety is usually present, i.e., Agoraphobia, Obsessive Compulsive Disorder, and Post-traumatic Stress Disorder.

Obsessive Compulsive Disorder

During the development of DSM-III, there was a proposal to subdivide this category according to the presence of obsessions alone, or obsessions and compulsions. As Insel (1982) has noted in a provocative article, the heterogeneity of the disorder was recognized by Sir Aubrey Lewis (1936) who described "obsessionals" as distinct from "compulsives." However, the proposal for two separate categories in DSM-III was not accepted, since at that time, there did not seem to be a compelling reason for making this subtype distinction. More recently, Barlow's review of psychosocial treatments of Anxiety Disorders (Barlow & Beck, 1985) indicates that whereas behavioral treatments are often effective when both obsessions and compulsions are present, this is not the case when only obsessions are present. This finding suggests the value of subtyping the disorder.

Post-traumatic Stress Disorder

This category has been the focus of much recent research, particularly as the category applies to Vietnam veterans (Frye & Stockton, 1982; Atkinson, Henderson, Sparr, & Deale, 1982). Based on their experiences with Vietnam veterans, Hough and Gongla (1982) have suggested that the DSM-III criteria can be improved by including symptoms of the disorder that are listed in DSM-III as associated features, such as rage, explosions of aggressive behavior, fear of aggressive behavior and impulsive behavior, in the diagnostic criteria themselves.

Horowitz et al. (1980) has reported a study of PTSD in individuals experiencing the death of someone close to them and individuals who had sustained personal injuries by violence, accidents or illnesses. In this study, completed prior to the publication of DSM-III, individuals were apparently included even if the stress was not outside the range of normal experience (e.g., bereavement). Apparently the same distinctive syndrome of reexperiencing the trauma is often present even when the traumatic event is not outside the range of normal experience. This raises the question of whether DSM-III is correct in stating that the essential feature is "the development of characteristic symptoms following a psychologically traumatic event that is generally outside the range of usual human experience ... such as simple bereavement (or) chronic illness ..." Perhaps the criteria for PTSD should be modified to allow the inclusion of cases in which the characteristic symptoms follow a trauma, such as bereavement, that is within the range of usual human experience.

Anxiety Syndromes Due to Known Organic Factors

In DSM-III, the discussions of the differential diagnoses of Panic Disorder and GAD note the need to consider organic etiologies for these syndromes, such as the taking of stimulants (e.g., amphetamine or caffeine). Yet in the DSM-III classification there is no category

for anxiety syndromes caused by such organic factors. Mackenzie and Popkin (1983) have suggested the addition of a category of Organic Anxiety Syndrome, with text and criteria that are parallel to the category of Organic Affective Syndrome.

CONCLUSION

The DSM-III concept of Anxiety Disorders has been widely accepted and the diagnostic criteria for the separate disorders have facilitated much needed research in this area. Problems in the definition of the disorders and their hierarchical interrelationships have been discussed.

There are many other diagnostic issues relevant to Anxiety Disorders that have not been discussed here. One issue that has plagued nosologists and clinicians for many decades is the relationship between anxiety and depressive states (Gurney et al., 1972; Klerman, 1980; Foa & Foa, 1982). The Anxiety Disorders tend to be chronic and patients often develop depressive symptoms in reaction to the chronic incapacity caused by the Anxiety Disorders. In such patients it is unclear to what extent these depressive symptoms constitute true superimposed depressive illness or merely reactive demoralization. Similarly, patients with episodic or chronic depressive illness often have anxiety symptoms. Does this represent a superimposed Anxiety Disorder or merely reactive anxiety symptoms? Prospective follow-up and family studies are necessary to resolve these issues.

In future research of Anxiety Disorders, diagnostic reliability will be facilitated by the availability of two new standardized diagnostic interview schedules that can be used for diagnosing all of the DSM-III Anxiety Disorders: the Anxiety Disorders Interview Schedule (ADIS) (Di Nardo et al., 1983) and the Structured Clinical Interview for DSM-III (SCID) (Spitzer & Williams, 1983a; 1983b).

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APPENDIX

Proposed Diagnostic Criteria for the Anxiety Disorders
Section of DSM-III-R

Note: These criteria represent the draft proposal as of July, 1985. In several instances they incorporate changes that were made after the accompanying paper was written and that are not in accord with the text. For example, the DSM-III category of Agoraphobia without

Panic Attacks is now represented by the proposed category of Limited Symptom Attacks with Phobic Avoidance. Further changes are also expected. For example, under consideration is classifying Post Traumatic Stress Disorder as a Dissociative Disorder rather than as an Anxiety Disorder.

ANXIETY DISORDERS

PANIC DISORDER

A. At some time during the illness at least three panic attacks (discrete periods of intense discomfort or fear) that were unexpected, i.e., did not occur immediately before or upon exposure to a situation that almost always caused anxiety.

B. Either the three attacks occurred within a three-week period, or one or more attacks were followed by a period of at least a month of persistent fear of having another attack.

C. At least four of the following symptoms developed during at least one of the attacks:

    (1)   shortness of breath (dyspnea) or smothering sensations
    (2)   choking
    (3)   palpitations or accelerated heart rate (tachycardia)
    (4)   chest pain or discomfort
    (5)   sweating
    (6)   faintness
    (7)   dizziness, lightheadedness or unsteady feelings
    (8)   nausea or abdominal distress
    (9)   depersonalization or derealization
    (10) numbness or tingling sensations (paresthesias)
    (11) flushes (hot flashes) or chills
    (12) trembling or shaking
    (13) fear of dying
    (14) fear of going crazy or doing something uncontrolled

D. During at least some of the attacks, at least four of the "C" symptoms occurred within ten minutes of the beginning of the first "C" symptom noticed in the attack.

E. Not sustained by a known organic factor (e.g., Amphetamine Intoxication, Caffeine Intoxication, Hyperthyroidism).

NOTE: Mitral Valve Prolapse may be an associated condition but does not rule out a diagnosis of Panic Disorder.

Panic Disorder Subtypes

1. Panic Disorder without Phobic Avoidance
2. Panic Disorder with Limited Phobic Avoidance (significant phobic avoidance or endurance despite intense anxiety)
3. Panic Disorder with Agoraphobia (generalized travel restrictions, often needs a companion away from home, or markedly altered life style)

If no panic attacks during last 6 months specify: (no current panic attacks)

LIMITED SYMPTOM ATTACKS WITH PHOBIC AVOIDANCE (AGORAPHOBIA WITHOUT PANIC ATTACKS

A. Fear of being outside the home alone or in public places because of the possibility of developing a symptom that is incapacitating, such as dizziness, loss of bladder or bowel control or cardiac distress.
B. Never had an unexpected panic attack, as defined in criteria A, C, D, and E of Panic Disorder.
C. As a result of A, there are either travel restrictions, need for a companion when away from home, or altered life style, or there is endurance of phobic situations despite intense anxiety.

Specify: becoming dizzy or falling, loss of bladder or bowel control, cardiac distress or other.

SOCIAL PHOBIA

A. A persistent and compelling desire to avoid one or more situations in which the individual is exposed to possible scrutiny by others and fears that he or she may behave in a way that will be humiliating or embarrassing.
B. The individual is not afraid of behaving in this way when he or she is alone, that is, what the individual fears will happen occurs only when he or she is exposed to possible scrutiny by others, or if it occurs while alone, causes little or no distress.

NOTE: SOCIAL PHOBIC SYMPTOMS THAT HAVE DEVELOPED SECONDARY TO PANIC DISORDER DO NOT MEET THIS CRITERION.

C. During some phase of the illness, exposure to the specific phobic stimulus (or stimuli) almost invariably provokes an immediate anxiety response.
D. The situation(s) is avoided, or endured with intense anxiety.
E. The fear or the avoidant behavior causes marked distress or interferes with social or occupational functioning.
F. Recognition by the individual that his or her fear is excessive or unreasonable.
G. The phobic stimulus (or stimuli) is unrelated to the content of the obsessions of Obsessive Compulsive Disorder or to a Psychosexual Dysfunction.

Specify: speaking, eating, writing, generalized, or other.

SIMPLE PHOBIA

A. A persistent fear of a circumscribed nonsocial stimulus (object or situation).
B. During some phase of the illness, exposure to the specific phobic stimulus (or stimuli) almost invariably provokes an immediate anxiety response.
C. The object or situation is avoided or endured with intense anxiety.
D. The fear or the avoidant behavior causes marked distress or interferes with social or occupational functioning.
E. Recognition by the individual that his or her fear is excessive or unreasonable.
F. The phobic stimulus is unrelated to the content of the obsessions of Obsessive Compulsive Disorder.

Specify: animal, closed spaces, heights, blood/injury, or other.

OBSESSIVE COMPULSIVE DISORDER

A.   Either obsessions or compulsions:

Obsessions: (1), (2) and (3):
   (1) Recurrent, persistent ideas, thoughts, impulses or images
   that are experienced as intrusive, unwanted, and senseless or
   repugnant (at least initially).
   (2) The individual attempts to ignore or suppress them or to
   neutralize them with some other thought or action.
   (3) The individual recognizes that they are the product of his
   or her own mind and not imposed from without (as in thought
   insertion).

Compulsions: (1), (2) and (3):
   (1) Repetitive, purposeful and intentional behaviour that is
   performed according to certain rules or in a stereotyped fashion.
   (2) The behavior is not an end in itself, but is designed to
   neutralize or prevent extreme discomfort or some dreaded event
   or situation. However, either the activity is not connected in
   a realistic way with what it is designed to neutralize or prevent
   or it is clearly excessive.
   (3) Recognition by the individual that the behavior is excessive
   or unreasonable.

B.   The obsessions or compulsions cause marked distress or interfere
with the individual's social or occupational functioning.

Specify: without phobic avoidance, with limited phobic avoidance,
          with limited phobic avoidance, with extensive phobic avoid-
          ance

GENERALIZED ANXIETY DISORDER

A.   A period of six months or longer during which the individual has
been bothered more days than not by anxious mood (nervousness) or
worry about possible misfortune to self or others.
B.   Not occurring only during the course of another Axis I disorder
in which anxiety is often an associated feature, such as a psychotic
disorder, an Affective Disorder, a Substance Dependence Disorder or
another Anxiety Disorder.
C.   At least six of the following eighteen symptoms are present some
of the time when anxious:

   Motor Tension
   (1) trembling, twitching, or feeling shaky
   (2) muscle tension, aches or soreness
   (3) restlessness
   (4) easy fatigability

   Autonomic Hyperactivity
   (5) shortness of breath or smothering sensation
   (6) palpitations or accelerated heart rate (tachycardia)
   (7) sweating, or cold clammy hands
   (8) dry mouth
   (9) dizziness or lightheadedness
   (10) nausea, diarrhea or other abdominal distress
   (11) flushes (hot flashes) or chills
   (12) frequent urination
   (13) trouble swallowing or lump in throat

Vigilance and Scanning
(14) feeling keyed up or on edge
(15) exaggerated startle response
(16) difficulty concentrating or mind going blank because of
     anxiety
(17) trouble falling or staying asleep
(18) irritability

D.   Not sustained by a specific organic factor (e.g., Hyperthyroidism,
Caffeine Intoxication).

ANXIETY DISORDER NOT OTHERWISE SPECIFIED (NOS)

Examples:
1. Extensive phobic avoidance of public places or of being alone
without a history of either panic attacks or limited symptom attacks.
2. Panic attacks limited to a single situation (e.g., supermarkets)
but they do not invariably occur in that situation.
3. Currently has extensive phobic avoidance and a prior history of
Panic Disorder but the individual claims that the current phobic
avoidance is unrelated to a fear of having panic attacks.
4. Recurrent limited symptom attacks without phobic avoidance.

POST-TRAUMATIC STRESS DISORDER

A.   An event that is outside the range of usual human experience and
that is potentially psychologically traumatic, e.g., serious threat
to one's life or personal physical integrity, destruction of one's
home or community, or seeing another person who is mutilated, dying,
or dead, or the victim of physical violence.
B.   During some phase of the illness, the traumatic event is persistently
reexperienced in at least one of the following ways:
     (1) recurrent and intrusive distressing recollections of the
     event without any awareness of environmental stimuli that trigger
     the reaction
     (2) recurrent distressing dreams of the event
     (3) sudden acting or feeling as if the traumatic event were
     recurring (includes a sense of reliving the experience, illusions,
     hallucinations, and dissociative [flashback] episodes, even
     those that occur upon awakening or when intoxicated)
     (4) physiologic reactivity or intense psychological distress at
     exposure to events that symbolize or resemble an aspect of the
     traumatic event (e.g., a woman who was raped in an elevator
     breaks out in a sweat when entering any elevator)
C.   During some phase of the illness, persistent avoidance of stimuli
associated with the trauma or numbing of responsiveness (not present
before the trauma), as indicated by at least two of the following:
     (1) deliberate efforts to avoid thoughts or feelings associated
     with the trauma
     (2) deliberate efforts to avoid activities or situations that
     arouse recollections of the trauma
     (3) inability to recall an important aspect of the trauma (psycho-
     genic amnesia)
     (4) markedly diminished interest in significant activities
     (5) feeling of detachment or estrangement from others
     (6) restricted range of affect, e.g., "numbing", unable to have
     loving feelings
D.   During some phase of the illness, persistent symptoms of increased
arousal (not present before the trauma) as indicated by at least two
of the following:
     (1) difficulty falling or staying asleep

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         (2) irritability or outbursts of anger
         (3) difficulty concentrating
         (4) hypervigilance
         (5) exaggerated startle response
E.   B, C, and D symptoms all occurred during the same six-month period.

THE DIFFERENTIATION OF ANXIETY AND DEPRESSIVE SYNDROMES

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Since Freud (1895) differentiated anxiety neurosis from the other neurotic disorders there has been debate about whether this particular entity exists separate from other nosological entities. Recent interest in the clear delineation of psychiatric states from each other has had impetus from a number of directions. These include the examination of the rates and criteria for the diagnosis of schizophrenia across countries (Carpenter, Strauss, & Bartko, 1973), the development of specific criteria for the diagnosis of psychiatric disorders (Feighner et al., 1972), and the introduction of diagnostic systems which rely on definite criteria (e.g., DSM-III, American Psychiatric Association, 1980). All of these developments force greater precision in psychiatric diagnosis and classification. They are relevant mainly because of changes in treatment techniques and the increasing ability of clinicians to be able to match specific treatments to specific clinical problems.

Anxiety research has come to the fore in the last few years and it appears to be the most recent wave in psychiatry's development following on the immense amount of research conducted in the area of affective disorders in the last 15-20 years. Although considerable effort has gone into the separation of affective and anxiety disorders from each other this notion of differentiation is rejected by many authors. Cleghorn (1970) offered the opinion that the terms "anxiety neurosis" and "depressive neurosis" should be discarded and in their place there should be an "anxiety-depressive syndrome". He based this on the finding that the symptoms of each state seldom occur without the symptoms of the other and that psychotropic drugs affecting one state usually affect the other also.

Recently, Hamilton (1981) has summarized the occurrence of symptoms in anxiety states and in depressive states. There are interesting differences between the sexes but it is clear that depressed mood occurs very commonly (71 and 95%) in anxiety disorders and that anxiety symptoms occur in 86 to 96 of males and females respectively with depressive illness (see Table 1).

The differentiation of anxiety from depression may be considered in a number of ways. The concepts may be distinguished with reference

to symptoms or with reference to the broader classification of a
syndrome. Notably the symptoms of one disorder may be present despite
a diagnosis of the other disorder. Alternatively, it is now possible
to diagnose both disorders concurrently. In this chapter we will
discuss these alternate combinations.

DIFFERENTIATION OF ANXIETY FROM DEPRESSION AT THE SYMPTOM LEVEL

Although the difference between anxiety and depression as symptoms
may seem self evident it is dangerous for the clinician to take at
face value a patient's complaint of either symptom. It is not unusual

TABLE 1

The Commonest Symptoms in Anxiety States and Depressive Illness

Anxiety

WOMEN	(%)	MEN	(%)
Anxious Mood	100	Anxious Mood	100
Tension	94	Tension	100
Autonomic	94	Depressed Mood	95
General Somatic	88	Insomnia	95
Depressed Mood	71	Cognitive	84

Depression

WOMEN	(%)	MEN	(%)
Depressed Mood	100	Depressed Mood	100
Loss of Interest	99	Loss of Interest	99
Anxiety (psychic)	96	Anxiety (psychic)	96
General Somatic	91	Insomnia (initial)	86
Anxiety (somatic)	86	Anxiety (somatic)	86

for patients referred for an assessment at the Anxiety Disorders
Clinic at Toronto General Hospital to complain of anxiety but on
further questioning reveal that they are referring to a change in
feeling state toward sadness and low energy. Similarly, patients
complaining of depression may on further questioning explain that
they feel afraid and are experiencing bouts of autonomic overarousal.

Sir Aubrey Lewis (1934) in his clear, succinct writings comments
about anxiety that "The relation of anxiety to depression is intimate."
Lewis quotes Mapother's (1926) description of three kinds of depression
"Grief finding cause for unhappiness in the past, far which seeks
them in the future, and a simple sense of wretchedness about the
present." Delmas (as quoted by Mapother, 1926) further confounded the
expectancy aspects of anxiety and the retrospective aspects of depression
by writing "The melancholic delusional state rests on anxiety because
anxiety always exists in some degree when there is a delusional
state, and as anxiety is the painful emotional state concerned with
harm to come. Melancholic delusions are always directed towards the
future even when the melancholic seems to have them about the past."

Lewis (1934) defined anxiety as an unpleasant affective state with the expectation, but not certainty, of something unpleasant happening. He defined depression quite simply as unhappiness combined with a feeling of illness about the unhappiness. With a little judicious questioning of patients it is usually not difficult to differentiate between the two symptoms or to conclude that they are both occurring simultaneously. At a symptom level then there is usually little, if any, doubt about the occurrence of anxiety or depression.

DISTINCTION BETWEEN ANXIETY AND DEPRESSIVE DISORDERS

Psychiatrists and other clinicians are more usually concerned with making diagnoses related to the constellation of symptoms with which their patients present. Unless they are involved in a research study examining the epidemiology or familial distribution of a disorder the usual reason for making an accurate diagnosis is so that effective treatment can be instituted as quickly as possible.

We will examine the distinction between anxiety states and depressive disorders from 7 points of view:

    i.   The nosological standpoint
   ii.   Epidemiology
  iii.   Factor analytic studies differentiating the two disorders
   iv.   Studies indicating association between the disorders
    v.   Effects of treatment
   vi.   Models of anxiety disorder development
  vii.   Data from our own studies of anxiety disorders

In chapter one of this volume Spitzer & Williams (1986) discussed developments in the DSM-III classification system but we would like to draw attention to a few points relating to the impact of DSM-III diagnostic rules on clinical practice. It was noticeable from a survey of diagnostic habits carried out in Toronto that the DSM-III categories most widely adopted were the affective disorder categories and the category of borderline personality disorder (Swinson & McCormick, 1981). The vast majority of affective diagnoses made were described in terms of precise DSM-III labels. The other diagnostic groups were labelled in terms of many varied classificatory systems. These included DSM-I and II, ICD 8 and 9 and some unique diagnoses that did not appear in any recognized classification.

The labels and concepts of major affective disorder and major depressive episodes have clearly made a great deal of sense to clinicians. It may be, however, that the diagnostic certainty produced by the DSM-III criteria allow for a degree of false certainty if it is used as a 'cook-book' rather than as a guide for clinical judgment. DSM-III is hierarchically arranged and, although multiple diagnoses are permissible on Axis I, there are certain restrictions on this practice which appear to affect diagnostic practice in the area of affective and anxiety disorders.

The structure of DSM-III calls for the presence of certain symptoms that form the entry criteria for a particular disorder, the associated symptoms and certain exclusion criteria. The exclusion criteria for the depressive disorders are as follows:

Major Depressive Episode: Not due to any Organic Mental Disorder or Uncomplicated Bereavement;

Cyclothymic Disorder: Not due to any other mental disorder, such as partial remission of bipolar disorder;

Dysthymic Disorder: If the disturbance is superimposed on an existing mental disorder, such as obsessive compulsive disorder or alcohol dependence, the depressed mood, by virtue of its intensity or effect on functioning, can be distinguished from the individual's usual mood.

In the anxiety disorder section for the categories of agoraphobia, social phobia, panic disorder, generalized anxiety disorder and obsessive compulsive disorder the same exclusion criterion is in force - Not due to another mental disorder such as Major Depression.

In DSM-III then, anxiety symptoms are used as the basis for the diagnosis of an anxiety disorder in the absence of a major depressive episode. This convention may or may not be shown to be correct, but it appears likely to have a marked effect on diagnostic practice and to cause clinicians to underdiagnose anxiety disorders.

EPIDEMIOLOGY OF ANXIETY AND AFFECTIVE DISORDERS

Recently, data have been published relating to the Epidemiological Catchment Area (ECA) Program in the US. Lifetime (Robins et al., 1984) and six month (Myers et al., 1984) prevalence rates for diagnosis in 15 DSM-III categories have been obtained in a sample of about 3,500 subjects per site. The reported data are from three sites in New Haven, Baltimore and St. Louis.

The lifetime prevalence rates for affective and anxiety disorders across the three sites are reported in Table 2. Both anxiety and affective disorders show high prevalence over lifetime in all sites with the Baltimore site showing an extraordinarily high prevalence of phobic anxiety disorder.

TABLE 2

Lifetime Prevalence Rates Within ECA Study Areas

Disorder	New Haven	Baltimore	St. Louis
Affective Disorder	9.5[a]	6.1	8.0
Manic Episode	1.1	0.6	1.1
Major Depressive Episode	6.7	3.7	5.5
Dysthymia	3.2	2.1	3.8
Anxiety Disorder (incl. Somatoform)	10.4	25.1	11.1
Phobia	7.8	23.3	9.4
Panic	1.4	1.4	5.1
Obsessive Compulsive	2.6	3.0	1.9
Somatization	0.1	0.1	0.1

[a] Numbers refer to percentage (%) data

The six month prevalance rates for the three sites are reported in Table 3.

TABLE 3

Six Month Prevalence Rates (%) for ECA Study Sites

Disorder	New Haven	Baltimore	St. Louis
Major Depressive Episode	3.5	2.2	3.2
Manic Episode	0.8	0.4	0.7
Phobia	5.9	13.4	5.4
Panic	0.6	1.0	0.9
Obsessive Compulsive	1.4	2.0	1.3

The interviewers for the ECA study were non-clinicians who were trained in the use of a structured interview, the Diagnostic Interview Schedule (DIS; Robins, Helzer, Croughan, & Ratcliff, 1981). The questions in the anxiety disorders section of the DIS are quite limited. It is possible that rational fears that some people reported related to going outside in unsafe areas were recorded as clinically significant diagnoses. It is also likely that the rates for the phobic disorders in Baltimore have been artificially inflated by this error.

The group from Yale (Leckman, Merikangas, Pauls, Prusoff, & Weissman, 1983) who were involved in the ECA study, have investigated the relationship between anxiety and depressive disorders in adults and the occurrence of the same disorders in their children.

In the first reported study Leckman, Weissman, Merikangas, Pauls, & Prusoff (1983) used a case controlled family study of lifetime psychiatric diagnosis among relatives of individuals with major depression. They examined the effect of major depression alone in the probands versus major depression plus an anxiety disorder in the probands. It was found that the relatives of individuals with major depression combined with anxiety are at a greater risk of developing major depression than are the relatives of people with only major depression. This held true whether or not the anxiety disorder was temporally associated with the depression or was separate with regard to time course.

In a second study (Leckman, Merikanges et al., 1983) it was reported that 77 of 133 depressed probands displayed anxiety syndromes that met the DSM-III criteria for agoraphobia, GAD or panic. In two thirds of the 77 cases the symptoms were associated with depressive episodes. In investigating the risk to the first degree relatives it was found that the relatives of probands who had major depression and panic disorder had a greatly increased risk of developing major depression, panic disorder, and/or alcoholism compared with the relatives of probands who had major depression without anxiety disorder.

In a further study Weissman, Leckman, Merikangas, Gammon, & Prusoff (1984) examined the children of probands with major depression with or without specific anxiety disorders. They were compared with

the children of a matched psychiatrically normal control group.
Depression in the proband conferred an increased risk of depression
in the children but depression plus panic or agoraphobia conferred an
even greater risk of depression and of an anxiety disorder in the
children. Panic disorder in the parents increased the risk of separation
anxiety in the children by a three fold factor. These findings
suggest a relationship between depression and some of the anxiety
disorders. They also suggest a relationship between adult panic
disorder and agoraphobia and the transmission of anxiety disorders to
some of the children of such adults.

<div align="center">ANXIETY AND DEPRESSION AS SEPARATE DISORDERS</div>

Factor Analytic Studies

Although it appears to be almost universally agreed that the
symptoms of anxiety and depression frequently co-exist and that the
syndromes fairly commonly co-exist, a considerable amount of research
has gone into trying to find evidence for distinctions between the
two syndromes.

Derogatis, Klerman and Lipman (1972) in a series of studies
investigated 641 anxious patients and 241 depressed neurotics who
completed the Symptom Distress Check List (Derogatis, Lipman, Covi, &
Rickels, 1971). The results were factor analysed and revealed five
symptom dimensions. Three factors proved to be constant across the
two groups. These were somatisation, obsessive compulsive and inter-
personal sensitivity factors. In the anxious neurotics, an anxiety
dimension was isolated that did not occur in the depressives. The
diagnosis of depressive neurosis was found to be associated with the
presence of symptoms of dysphoric mood, feelings of futility, helplessness
and decreased interest. Poor appetite and suicidal thoughts were
associated solely with the depressive group.

In a series of studies since 1972 Roth and his colleagues in
Newcastle have conducted factor analytic studies on the symptomatology
of anxious and depressed patients (Roth, Gurney, Garside, & Kerr,
1972; Gurney, Roth, Garside, Kerr, & Schapira, 1972; Roth & Mountjoy
1982; Mountjoy, Roth, Garside, & Leitch, 1977). In the first study
of 68 anxious patients and 62 depressed patients a bimodal distribution
of the two groups was found. This was along the first component
derived from principal component analysis followed by discriminant
function analysis of the anxiety and depressive symptoms.

In a second study of 117 patients with anxiety or depressive
neuroses, Mountjoy et al. (1977) took pains to exclude endogenous
disorders which had not been excluded from the first study. A structured
interview and seven rating scales were used. It was again found by
principal component analysis followed by discriminant function analysis
that the two groups could be clearly separated. Analysis of the
rating scales also produced a bimodal distribution of scores into a
depressed and an anxious group. Of interest was the finding that
scores on the Hamilton Anxiety Scale (Hamilton, 1959) clustered with
the depressive element. The most powerfully discriminating symptoms
were depressed mood and suicidal tendencies on one hand versus psychic
anxiety with gastrointestinal and somatic tension on the other end.

An anxiety/depression diagnostic scale has been derived from
these studies (see Table 4).

Follow-up studies conducted by the Newcastle group have confirmed

that the two groups have statistically different natural histories and that when further episodes of psychiatric illness occurred in the patients studied they tended to be true to the original diagnosis.

TABLE 4

Anxiety Depression Diagnostic Scale: Standardized Discriminant Function Coefficients

Panic Attacks	+0.53
Physical Stress	+0.30
Compulsions	+0.27
Condensed Anxiety Symptoms	+0.25
Situational Phobias	+0.24
Condensed Childhood Neurotic Traits	+0.16
Suicidal Tendencies	−0.24
Depressed Mood	−0.68

ANXIETY AND DEPRESSION AS PART OF A SINGLE DISORDER

The unitary view of anxiety and depression has been expressed by many clinicians and researchers. In the view of this group the two disorders overlap to such a marked degree that differentiation is artificial and fruitless.

Anxiety and depressive symptoms are considered by many to occur at different stages of the same disorder (Woodruff, Guze, & Clayton, 1972; Clancy, Noyes, Hoenk, & Slymen, 1978). Thus Woodruff et al. (1972) found depressive symptoms to occur as anxiety neurosis became a chronic disorder. Clancy (1978) in his study found that depressive symptoms occur both before and after the development of panic attacks. Many authors have supported the view that depressive mood comes and goes during the course of an anxiety disorder (Snaith, Bridge, & Hamilton, 1976; Mendel & Klein, 1969; Buglass, Clarke, Henderson, Kreitman, & Presley, 1977; Brier, Charney, & Heninger, 1984).

Strian and Klicpera (1984) have described a series of studies in which they find anxiety and depression to occur almost always concurrently. In their patients, the depressive and the anxiety neurotics had very similar levels of anxiety but the depressive neurotics had a higher level of depression. This finding is in keeping with work reported by other workers (Prusoff & Klerman, 1974; McNair & Fisher, 1978; Rickels, Downing, & Stein, 1979).

Bowen and Kohut (1979) observed 55 agoraphobics in a general hospital psychiatric practice. They found that 91% of the patients were diagnosed as suffering from either a unipolar or a bipolar affective disorder. They reported that anxiety and phobic symptoms tend to mask the presence of affective disorders.

A great deal of attention has been paid of late to the role of panic attacks in the genesis and maintenance of anxiety disorders. Klein (1981) has expressed the view that panic attacks experienced over a period of time give rise to the development of anticipatory

anxiety, phobic avoidance, hypochondriacal complaints, generalized
anxiety and demoralisation or depression. Klein and his colleagues
(Houshang, Zitrin, & Klein, 1984) have also shown that antidepressant
medication, particularly imipramine, can be very effective in reducing
the frequency and severity of panic attacks and phobic avoidance.
Similar findings have been reported with monoamine oxidase inhibitors
and with alprazolam, a triazolobenzodiazepine which has anxiolytic
and antidepressant properties (Sheehan et al., 1984). The evidence
from therapeutic trials using antidepressant medication suggests that
anxiety and depressive disorders are closely allied.

In many patients suffering from major affective disorder it has
been found that they have an abnormal response to the substance
dexamethasone. In normals the administration of dexamethasone causes
a suppression of the body's production of cortisol. In about 80% of
patients with depressive illness the suppression is blunted and the
levels of circulating cortisol remain within the normal non-suppressed
range. Curtis, Cameron, and Nesse (1982) examined the response of
panic and agoraphobic patients to dexamethasone and found, in contrast
to the affective disorder group that very few of the panic patients
were non-suppressors. They suggested that the antipanic properties
of imipramine and MAOI's are separate from their antidepressant
properties.

Pollitt and Young (1971) in their studies of the action of MAOI's
in anxious and depressed groups of patients found little difference
in the symptomatology of the two groups but noted that the older patients
had typical syndromes and the younger ones tended to be atypical.
Pollitt and Young concluded that anxiety states responsive to MAOI's
are a form of depression and that the clinical picture is largely
determined by the patients' chronological age. Hays (1964), and
Gersh and Fowles (1979) suggested that anxiety and depressive neurosis
are stages of affective disorder with the ratio of anxiety and depressive
symptoms varying over time and the diagnosis depending upon when the
patient is seen. In Gersh and Fowles' (1979) review of Roth's et
al. (1972) study they found that 65% of Roth's anxious patients
reported episodic depression and said that over time Roth's anxious
and depressed groups looked more and more alike.

Cassidy, Flanagan, and Spellman (1957) and Kerr, Schapira, and Roth
(1969) reported the frequent occurrence of panic attacks in primary
depression and manic depressive illness. Noyes, Clancy, Hoenk, and
Slymen in Iowa (1980) found that 44% of patients with anxiety neurosis
developed secondary depression. Dealy and colleagues (1981; Dimes, 1981)
in a replication study found that 33% of their group of anxious
neurotics developed secondary depression. Sixty-four percent of
those who developed depression had a history of panic attacks compared
with 29% of those who did not develop depression. Dealy's conclusion
was that secondary depression and anxiety neurosis resemble each
other and are distinct from unipolar depressions in terms of family
history.

Many researchers, typified by Cleghorn (1970), have suggested
that the separate anxiety and depressive neuroses be replaced by a
single "anxiety-depression syndrome". The neuroses largely disappeared
in DSM-III. Depressive neurosis became dysthymic disorder and anxiety
neurosis was divided into the phobic disorders and the anxiety states.

Goldberg (1976, 1982) used the General Health Questionnaire to
assess symptomatology in anxiety and depression. He was unable to
reproduce the factors described by Roth and Mountjoy (1982) and was unable

to find any principal component analysis that separated anxiety and depressive symptoms into two distinct dimensions.

In our own research we have found that anxiety and depressive symptoms frequently co-exist. From a total of 300 contacts at the anxiety disorders clinic we excluded all patients who had a history of affective disorder predating the onset of anxiety symptoms. By means of the SCID (Spitzer & Williams, 1983) we identified 60 patients with panic disorder and variable degrees of phobic avoidance. Of these 12 (20%) had a history of past major depression beginning after the onset of panic disorder. The mean age of onset of anxiety was 27 years and of the depression 33 years. Four of the 60 met the criteria for the diagnosis of current Major Depressive Episode with mean age of onset at 34 and anxiety onset at 29. Six of the 60 had a history of depressive symptomatology not meeting Major Depressive Episode criteria and 5 of the 60 had current depressive symptoms. Three of the 60 had simultaneous onset of anxiety and depression at age 21.3.

In an ongoing survey of "Cured Agoraphobics" we utilized the SCID to detect the occurrence of depression in our sample of 37 subjects who had completed a series of assessment scales. In 9 of the 37 subjects the onset of anxiety preceded the onset of depression. In this group the mean age of onset of anxiety was 22.4 and of depression was 30.4 years. In 5 of the 37, the onset of depression preceded the onset of anxiety. The mean age of onset being 21.5 and 29.75, years respectively. Three of the 37 experienced a simultaneous onset of anxiety and depression at age 27.6. In a small sample (16) of patients with GAD with no past history of other anxiety disorders and no history of panic attacks only one patient had a history of past Major Depressive Episode and one met current Major Depressive Episode criteria. In our experience GAD is a rather rare condition.

LIFE EVENTS, ANXIETY AND DEPRESSION

One of the striking findings in our work with panic and agoraphobic disorder has been the occurrence of traumatic life events at the time of onset of the panic and at the time of presentation for treatment. Clinical examples are shown on the two life-lines below (Table 5).

TABLE 5
Life Events of Two Patients

PATIENT A	1953	Brother killed in car accident
		Pregnant
		Onset of specific fear of the dark
	1966	Brother diagnosed with cancer and subsequently died
	1967	Breast surgery
		Father diagnosed with Parkinson's Disease
	1969	Father hospitalized
	1974	Father died
	1975	Gall bladder surgery
		Onset of panic attacks
		Onset of depressive episode
	1977	Mother ill
		Sought psychiatric help
	1979	Husband diagnosed with cancer
	1980	Breast cancer surgery
	1981	Sister diagnosed with cancer
	1982	Brother died

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PATIENT B        Aged 17   Married
                      19   Spinal fusion, 10 months recuperation,
                           Separation and Divorce
                           Second marriage
                      25   Third marriage
                      28   Spinal fusion broke, 11 months spent in hospital
                      35   Owned own business
                      39   Trapped in a fire
                      44   By-pass surgery
                      49   Second by-pass surgery
                           Brother died, could not attend funeral
                      50   Death of niece, onset of panic attacks
                      51   Hospitalized for complications with surgery
```

Finlay-Jones and Brown (1981) examined the life events affecting 164 young women and used the (Present State Examination; Wing, Nixon, Mann, & Leff, 1977) to make their diagnosis. They concluded that severe loss predicted the onset of depressive illness, severe danger predicted anxiety disorders and a combination of loss and danger gave rise to mixed disorders. The impact of life events appears to have been underemphasized in the genesis of anxiety disorders. Finlay-Jones suggested that the reason for this was due to three factors. Firstly, there is a tendency to diagnose anxiety disorders only if there is no obvious life event precipitating the anxiety. Where an obvious life event has occurred anxiety disorders are often labelled "fears". Secondly, many anxiety states are chronic by the time the person presents for therapy and the precipitating events are not recalled. Thirdly, the possibility exists that anxiety disorders may follow on the experience of specific life stresses and that these distinctions are lost in a general assessment of stressful life events.

CONCLUSION

It appears that anxiety and depressive symptoms can be clearly distinguished one from the other, that the syndromes of affective disorder and anxiety disorder can also be clearly distinguished and that in some studies statistical separation of symptoms into anxiety and depressive syndromes can be accomplished. On the other hand anxiety and depressive symptoms commonly co-exist and may appear in the same patient at different periods of time. It is also apparent that both the anxiety and the depressive disorders respond to the same biological treatments.

One of the main reasons for the increased interest in anxiety disorders has been the rediscovery of the panic attack. This combined with the clear definition of panic attacks and of panic disorder in DSM-III has focussed attention on a highly distinctive psychopathological phenomenon. Panic attacks can occur in many psychiatric disorders but when they occur frequently and as the main symptom the diagnosis of panic disorder can be made.

Panic attacks are of particular interest to those investigators looking for ways of delineating various psychopathological entities because the attacks can be recreated in the laboratory situation by a number of provocation techniques. Pitts and McLure (1967) described the precipitation of panic attacks in some anxiety neurotics by means of lactate infusion. They and other groups have shown that panic patients have panic attacks precipitated in about 80% of cases whereas normal controls panic in less than 10% of cases. It is not clear why sodium lactate infusion causes the precipitation of panic attacks in susceptible subjects. There is evidence to support a number of

hypotheses including an interference with calcium channel conduction and the rate at which the locus coeruleus in the brain fires off impulses.

Whatever the mechanism is discovered to be, the fact that the phenomenon is readily reproducible allows for investigation into the relationship between anxiety and affective disorders and into the relationships between the individual subtypes of anxiety disorders. As was noted above it has been found by a number of investigators that patients with panic and agoraphobia frequently suffer from depressive illness either before or after the onset of the panic attacks. It is not yet known how many patients who present with affective illness have a previous history of anxiety disorder. In order to investigate one of the relationships between panic disorder and affective disorder it would be of great interest to expose a group of depressed patients who are off medication to the effects of lactate infusion. If few of them were to panic then this would be further evidence, along with the dexamethasone studies that the two groups differ at a biological level even though they share symptoms.

There are many questions that remain in the area of differentiating the two groups of disorder. At the beginning of this chapter we raised the possibility that the diagnostic conventions in current use might tend to mask the occurrence of anxiety disorder in the presence of affective disorder. It would be of value to investigate a series of patients diagnosed as primarily depressed and to reinterview them with an emphasis on the occurrence of anxiety syndromes predating the depression. There appears to be a tendency amongst clinicians to make a diagnosis based upon the current presenting symptoms and to view all previous reports of psychological distress within the context of the presenting diagnosis. Few clinicians spend as much time on getting an accurate history of the symptomatology of previous episodes as they do on the current episode. Despite the restrictions of faulty memory and retrospective bias a systematic enquiry into the previous histories of depressed patients might prove very valuable.

It would also be of interest to suspend the DSM-III convention for anxiety and affective patients in a research setting and allow both diagnoses to be made when patients met the criteria and then to follow the clinical progress across time with respect to both disorders. We do not know if such patients would tend to look more like affectively ill patients as time passed or if they would have discrete episodes of the two disorders or whether they would develop a mixed state.

The nature of generalized anxiety disorder is also very unclear. In our sample the number of patients meeting the criteria for the diagnosis was very small. By definition none of these patients had met the criteria for diagnosis of panic disorder and only one of them was found to have had an affective disorder. This suggests the possibility that panic disorder and affective disorder are more closely related than are GAD and affective disorder. It is also possible that the diagnostic criteria for GAD are so strict as to have produced a diagnostic artifact which might be due as much to personality structure as to any Axis 1 disorder. Little research has so far been reported on the impact of personality in the onset, symptomatology and course of the anxiety disorders.

Anxiety and depressive disorders are undoubtedly closely allied at a clinical level. There is a considerable amount of biological and clinical work to be done before it becomes clear whether there are distinctions between these two groups of disorder or whether they are different expressions of a single disorder whose expression

are different expressions of a single disorder whose expression
varies across time.

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THE NEUROBIOLOGY OF ANXIETY: A TALE OF TWO SYSTEMS

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When introducing the neurobiology of anxiety, there is an irres-
istable temptation to launch into a discussion of the neuropharmacology
of the benzodiazepines. Clearly one could seriously misrepresent
depression or schizophrenia by discussing the mode of action of anti-
depressants or phenothiazines. However, our understanding of the
mechanisms of benzodiazepine action has evolved so quickly and the
possible implications for clinical states seem so important that one
might be almost forgiven for putting the pharmacologic cart before
the clinical horse. Furthermore, in contrast to other psychopharmacologic
agents, there is now growing evidence that the same molecular systems
which mediate the therapeutic effects of benzodiazepines may be
involved in the generation of anxiety. So one might justly feel that
the neuropharmacology of the benzodiazepines is directly relevant to
a biological basis of anxiety (Ninan, Insel, Cohen, Skolnick, & Paul,
1982).

In this chapter recent developments implicating the benzodiazepine
receptor in animal studies of anxiety will be reviewed. This will be
followed by a discussion of the clinical psychobiological research in
the anxiety disorders. A review of panic disorder, one form of
anxiety disorder which exhibits some distinct genetic, physiologic,
and pharmacologic features will lead us away from the benzodiazepines
to a noradrenergic model of anxiety. The concluding point of this
chapter is that the benzodiazepine and noradrenergic systems offer
two possible neurobiological substrates for anxiety which can be
distinguished anatomically, phylogenetically, and behaviorally.

THE BENZODIAZEPINE RECEPTOR AND ANXIETY

Molecular Perspective

In 1977, two independent research teams, Squires and Braestrup
in Denmark and Mohler and Okada in Switzerland, described a brain
receptor which bound benzodiazepines with high affinity. This receptor
was saturable, stereoselective (i.e., bound only the functionally
active stereoisomers) and specific for benzodiazepines. Although
this receptor was evident throughout the mammalian line, it was
absent in species more primitive than bony fish (Nielsen, Braestrup,
& Squires, 1978). Initially, it was believed that benzodiazepines
worked by increasing the activity of the inhibitory neurotransmitter

γ-aminobutyric acid (GABA). More recently, GABA has been found to potentiate binding of the benzodiazepines by increasing the affinity of the benzodiazepine receptor for these drugs (Skolnick & Paul, 1982). A similar potentiating effect was demonstrated for permeable anions, such as chloride (Tallman, Paul, Skolnick, & Gallager, 1980). Putting these observations together, one might imagine a very simplified model, as shown in Figure 1, of a supramolecular complex in which the benzodiazepine receptor is linked to the GABA-A receptor and both mediate their actions through the chloride channel. Our current understanding is that the benzodiazepines work by binding to the benzodiazepine receptor in the presence of GABA leading to an increase in the GABA-mediated influx of chloride which makes the cell "hyper-polarized", i.e., less excitable.

Each of the components of this supramolecular complex has been investigated considerably in the past five years. We know now that the benzodiazepine receptor is probably a tetramer, that is, it consists of four proteins of 51,000 daltons each. This receptor appears to have multiple binding sites or "domains" as it binds not only classic benzodiazepines, such as diazepam, but also several novel compounds some of which have very weak intrinsic effects, such as RO 15-1788, as well as some which actually have effects just opposite to diazepam, such as β-carboline-3-carboxylic acid ethyl ester (β-CCE; Insel, Ninan, Aloi, Jimerson, Skolnick, & Paul, 1984). These different domains, which we will denote here as agonist, (i.e., anxiety reducing or anxiolytic), antagonist (i.e., blocking anxiolytic effects), and inverse agonist (i.e., anxiety inducing or anxiogenic) states probably also correspond to different conformations of the GABA receptor. The benzodiazepine receptor ligands are outlined in Table 1. The binding of agonists such as diazepam is potentiated by GABA, antagonists such as RO 15-1788 are not affected by GABA, and
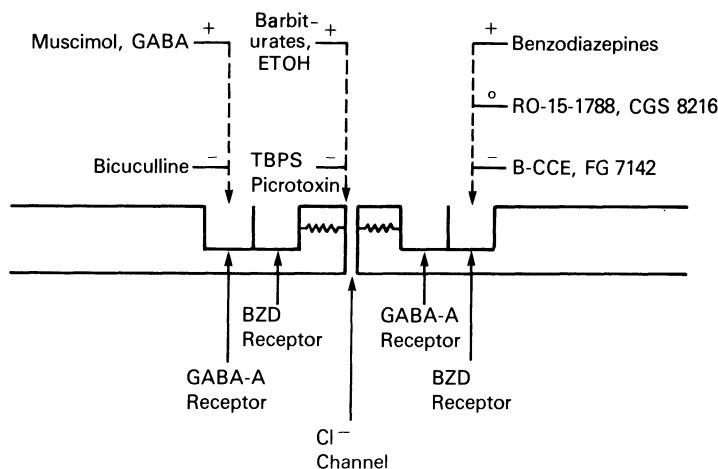
Fig. 1. Model of the benzodiazepine receptor-GABA-chloride ionophore complex. Anxiolytics bind to receptor proteins in this complex leading to an open conformation of the chloride ion channel and an influx of chloride ions.

TABLE 1

BENZODIAZEPINE RECEPTOR LIGANDS

Class	Example	GABA Effect	Behavioral Effect
Agonist	Diazepam, flunitrazepam	Affinity in presence of GABA	Anxiolytic
Antagonists	RO-15-1788, CGS-8216	Slight change	Little intrinsic action, precipitates agonist withdrawal, blocks agonist and inverse agonist effects
Inverse Agonists	β-CEE, FG-7142	Affinity in presence of GABA	Anxiogenic

inverse agonists such as β-CCE actually show a decrease in their binding affinity in the presence of GABA (Braestrup, Schmiechen, Neef, Nielsen, & Petersen, 1982). Presumably the benzodiazepine and GABA binding proteins are structurally linked in such a way that occupancy of one determines availability of the other.

The chloride ion channel is probably the final common pathway not only for GABA and benzodiazepine effects, but also for a number of other anxiolytics, including barbituates and possibly alcohol (Ticku, 1983). Using intracellular recording from mouse spinal cord neurons, Study and Barker (1982) have shown that benzodiazepines increase the frequency of chloride channel opening, thus leading to an increased influx of anions. By contrast, phenobarbital does not change the frequency, but increases the duration of openings, although ultimately having the same effect. These physiologic results are supported by receptor binding data suggesting a barbiturate binding site either in or on the chloride channel (Ticku, 1983). The recent development of a high affinity ligand which binds to a site on the chloride channel, [^{35}S]-t-butylbicyclophosphonothionate, TBPS, should open this part of the supramolecular complex to neuropharmacologic investigation (Squires, Casida, Richardson, & Saederup, 1983).

From Pharmacology to Pathophysiology

What do these various binding sites and receptors have to do with anxiety? Particularly since the benzodiazepines have several effects besides reducing anxiety, including muscle relaxant, anticonvulsant, and sedative effects, why should this supramolecular complex be relevant to anxiety? First, benzodiazepines are anxiolytics at doses below those needed for sedation or muscle relaxation. In addition, unlike the other effects of these drugs, tolerance either does not develop or develops only slowly to the anxiolytic effect (Tallman et al., 1980). More important, the affinity of a series of benzodiazepines for receptor binding, both in vitro and in vivo are highly correlated

with their relative clinical potencies as anxiolytics (Paul & Skolnick, 1981). Ex vivo studies have shown a high correlation between receptor occupancy and anticonflict effects in rodents (Braestrup, Nielsen, Honore, Jensen, & Peterson, 1983). Anticonflict effects (i.e., an increase in responding to a stimulus associated with both punishment and reward) are widely believed to correspond to clinical anxiolytic effects. These findings would support the hypothesis that the benzo-diazepine receptor mediates the anxiolytic actions of this class of drugs. A relationship between this receptor and anxiety is suggested from two other sorts of findings.

First, recent studies with the inverse agonist β-CCE and FG-7142 have shown that these compounds induce anxiety in normal volunteers (Dorow, Horowski, Paschelke, Amin, & Braestrup, 1983) and an anxiety-like syndrome in rhesus monkeys (Insel et al., 1984) (see Table 2). Volunteers who received FG-7142 described "severe anxiety associated with intense inner strain and excitation" and "impending fear of death or annihilation." In nonhuman primates inverse agonist effects, including behavioral, endocrine, and autonomic activation, can be blocked by diazepam or RO 15-1788, demonstrating that the receptor can have a role in anxiogenesis, as well as anxiolysis.

A second line of evidence from work with rodents further supports a role for this receptor in the pathophysiology of anxiety. Two groups of investigators (Lippa, Klepner, Yunger, Sano, & Beer, 1978; Soubrie, et al. 1980) have demonstrated that various forms of stress, including the conflict paradigm so widely used as an animal model of anxiety, induced significant changes in the number of benzodiazepine receptor binding sites in the cerebral cortex.

Why should the mammalian brain have a receptor for these various synthetic compounds? Certainly one implication of this line of research is that there is a family of endogenous ligands for the benzodiazepine receptor which are increased or decreased in anxiety states. Several investigators have sought to isolate one such substance. Perhaps the most promising candidate currently is a peptide which Guidotti et al. (1983) have named DBI, diazepam binding inhibitor.

TABLE 2

Symptoms of Generalized Anxiety Disorder and the Benzodiazepine Receptor Agonists and Antagonists[*]

	Benzodiazepines	β -CCE/FG 7142
Autonomic hyperactivity	↓	↑
Apprehensive expectation	↓	↑
Muscular tension	↓	↑
Vigilance and scanning	↓	↑

[*] From Insel et al. (1984)

Although this peptide has yet to be fully sequenced, extracts containing this peptide appear to have pro-conflict effects in rodents, suggesting that DBI may be anxiogenic. Undoubtedly other endogenous compounds will be found which bind to the benzodiazepine receptor. Beyond receptor binding, it will be important to determine whether each such candidate has a functional role in the mediation of anxiety or fearfulness or whether altered levels of such a compound might prove important in the genesis of pathologic anxiety. Of course, abnormalities in other compounds of the benzodiazepine-GABA-chloride-system, such as the local level of GABA or responsivity of the chloride channel, may ultimately prove to be even more important for clinical symptoms.

Anatomic Perspective

If the benzodiazepine-GABA-chloride complex is a molecular substrate for anxiety, then the location of this complex in the brain should provide a map of neural sites relevant to anxiety. Using in vivo autoradiography, it has been possible to map brain benzodiazepine receptors extensively at the light microscopic level (Young & Kuhar, 1980). These receptors are found in diverse regions throughout the forebrain and brainstem with the most dense regions including the olfactory bulbs, hippocampus, amygdala, cerebellum, and lamina IV of the cortex (see Figure 2). It is still not clear which of these sites are relevant to anxiolytic or anxiogenic effects as a ligand that is selective for just these effects has not yet been developed. In addition, the percentage of receptors that need to be occupied for a physiologic effect may be very low so that the autoradiographic map can be overinterpreted. Still this map suggests sites that might be tested with other methods. For instance, long before the discovery of benzodiazepine receptors, electrophysiologic stimulation of limbic regions in the cat suggested that the amygdala might be important as an anxiogenic region as low levels of stimulation induced arousal and high levels of stimulation led to a fear response (Kaada, 1972). Recently, Scheel-Kruger and Petersen (1982) have demonstrated that local injection of a benzodiazepine into the amygdala produced anti-conflict effects. Gray (1982), on the basis of a different kind of data, has recently suggested that the septo-hippocampal circuit functions as a comparator of inner and outer events and when a significant mismatch occurs, anxiety results. Indeed, electrical stimulation in selective sites of the hippocampus can also induce anxiety-like behavior.

In summary, research on the pharmacology, physiology, and anatomy of the benzodiazepine receptor has provided a bridge between the molecular and behavioral realms. A particular molecular model has been developed which appears to have both anxiolytic and anxiogenic importance. At the current time, the precise clinical correlates of this so-called anxiogenic or proconflict behavior are not clear.

THE BIOLOGY OF ANXIETY - CLINICAL PERSPECTIVE

Anxiety disorders are divided by DSM-III (American Psychiatric Association, 1980) into those which involve episodic, recurrent panic attacks, those with chronic anxiety without panic attacks, and those for which phobias and obsessive-compulsive symptoms are paramount. Although clinically these syndromes overlap considerably, a guiding hypothesis for research has been that they are discrete disorders with independent genetic histories, distinct physiologic alterations, or different pharmcologic responsiveness. Examples of the biologic separation of these disorders are found in Table 3.
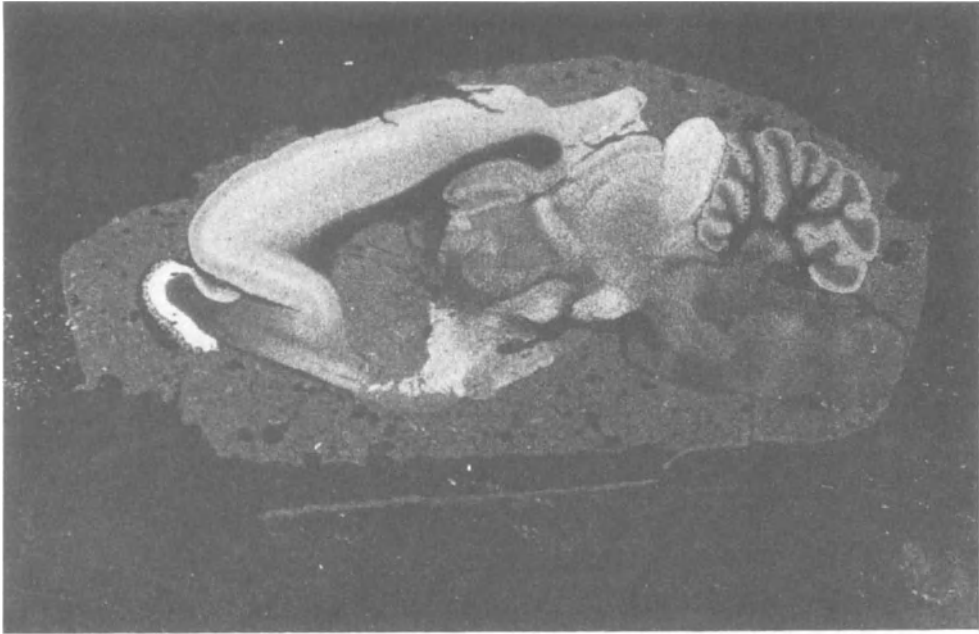
Fig. 2.   An autoradiogram of benzodiazepine receptors in rat
brain. Frozen 12 micron perfused sections were
incubated with ^{3}H-methylclonazepam, washed, dried,
and then exposed to tritium sensitive ultrafilm for
14 days. Areas of greatest receptor density in the
forebrain include hippocampus, amygdala, and lamina
IV of the cortex.

Biological factors that distinguish the syndromes of anxiety are
beginning to be identified. For example, patients with panic disorder,
unlike those with generalized anxiety, are often unresponsive to
benzodiazepines, yet improved on antidepressants (Sheehan, 1982).
Patients with obsessive-compulsive disorder, in contrast to those
with other anxiety disorders, resemble depressed patients on such
laboratory tests as the dexamethasone suppression test and sleep
electroencephalography (Insel, 1984). Rather than reviewing the full
range of such studies in each of the anxiety syndromes, this chapter
will focus on recent advances in the research of patients with panic
disorder. Studies of this syndrome suggest that it is biologically
distinct from generalized anxiety disorder. As most current hypotheses
implicate the noradrenergic rather than the benzodiazepine system in
the pathogenesis of panic disorder, the clinical studies will lead us
to a second neurobiologic system involved in what is clinically
labeled "anxiety."

Panic Disorder

Panic disorder presents either with or without agoraphobia.
Klein (1981) has conceptualized the evolution of panic disorder as
follows: The patient notes the sudden onset of overwhelming dread,
a feeling of impending doom, with concomitant dyspnea, tachycardia,
and diaphoresis. Most important, this attack is sudden and apparently

not precipitated by an external event, although it frequently occurs in a public setting. A succession of these attacks leads to anticipatory anxiety and ultimately may develop into agoraphobia. In the agoraphobic state, the patient avoids leaving home initially out of fear that the attacks may occur in public, but later as part of a chronic, restricted lifestyle. Although this progression occurs frequently, many panic disorder patients, perhaps half, never become agoraphobic (Di Nardo, O'Brien, Barlow, Waddell, & Blanchard, 1983). On the other hand, nearly all patients with agoraphobia describe a history of panic attacks (Di Nardo et al., 1983). Patients with generalized anxiety disorder will also describe episodes of intense anxiety, but unlike panic attacks these have a clear precipitant and do not arise suddenly from a nonanxious state. In addition to a more sudden onset, panic disorder patients complain of more autonomic symptoms (Anderson, Noyes, & Crowe, 1984). Developmental histories also distinguish patients with panic disorders from those with generalized anxiety disorder, as the former describe grossly disturbed childhood environments more often (Raskin, Peeke, & Dickman, 1982), and they may have a higher incidence of separation anxiety in childhood (reviewed by Gittelman, 1985).

TABLE 3

BIOLOGIC DISTINCTIONS IN THE ANXIETY DISORDERS

Diagnosis	Family History	DST[1]	Pharmacologic Induction	Pharmacologic Reduction
Panic Disorder (including agoraphobia)	Panic Disorder Alcoholism	Neg.	Lactate Yohimbine	Antidepressants
Obsessive-Compulsive Disorder	Depression(?)	Pos.	Naloxone (?)	Clomipramine
Generalized Anxiety Disorder	Non-Specific	Neg.	β-CCE(?)	Benzodiazepines

[1] DST indicates Dexamethasone Suppression Test

Genetic Factors and Panic Disorder

Several studies have suggested that panic disorder is generally distinct from other anxiety syndromes. In a family history study, Crowe and co-workers (Crowe, Noyes, Pauls, & Slymen, 1983) interviewed 278 first degree relatives of 41 patients with panic disorder and 262 first degree relatives of an equal number of surgical patients and hospital personnel controls. The morbid risk (an age adjusted incidence statistic) for definite or probable panic disorder was 24.7% among the relatives of the panic disorder patients, in contrast to 2.3% among the controls. Expressed another way, 25 of the 41 probands with panic disorder had a relative affected, (61%) compared to 4 of the 41 controls (9%). An equally important finding from this study was the low and nearly equal incidence of generalized anxiety disorder in both groups (morbid risk = 4.8% for panic disorder and 3.6% for controls). In preliminary data from a different study of patients with a 5-10 year history of agoraphobia and panic disorder, 50% of

41

the interviewed first degree female relatives had panic disorder, in contrast to 3% of the female relatives from probands with other anxiety disorders (Cloninger, Martin, Clayton, & Guze, 1981). Taken together these two reports would suggest that relatives of panic disorder patients are at risk for panic disorder, but not at risk for generalized anxiety. Conversely relatives of generalized anxiety disorder patients are not at risk for panic disorder.

Weissman and co-workers, in a series of reports (Leckman, Weissman, Merikangas, Pauls, & Prusoff, 1983; Weissman, Leckman, Merikangas, Gammon, & Prusoff, 1984) have described the incidence of anxiety disorders in the relatives of depressed patients who also met criteria for a DSM-III anxiety diagnosis. Again, the adult relatives of depressed patients with panic disorder have a tenfold higher incidence of panic disorder, and the relatives under age 18 have a sixfold higher incidence of separation anxiety than the relatives of depressed patients with generalized anxiety disorder. Although there are clear methodologic differences between these studies, all demonstrate that there is a high incidence of panic disorder in the relatives of patients with panic disorder.

Torgersen (1983) has recently published data from the Norwegian Twin Register which also supports a genetic component for panic disorder. The hypothesis for such a twin study is that a genetic trait should occur more commonly in both members of monozygotic pairs, whereas an environmental trait should occur with roughly equal frequency in both monzygotic and dizygotic pairs. Using a modification of the Present State Examination, Torgersen found that in nearly one-third of monozygotic pairs, but in none of the dizygotic pairs in which the proband had panic disorder, the co-twin met criteria for panic disorder. Twelve monozygotic pairs had a proband with generalized anxiety disorder, but in no case did the co-twin have a panic disorder diagnosis. This study was not blind and twin data are notoriously difficult to interpret because monozygotic twins probably share more similar environments than dizygotic twins (for instance, they are the same gender). Still it is the first such report using DSM-III criteria for panic disorder and clearly the data are consistent with the results from family history studies. Indeed, the current literature on panic disorders, while lacking an adoption study, suggests a genetic component for this disorder which rivals that reported for any other psychiatric syndrome.

Panic Disorder and Mitral Valve Prolapse

In addition to a possible genetic component, patients with panic disorder have also been distinguished by a high incidence of mitral valve prolapse (see Table 4). The mitral valve is the heart valve between the left atrium and left ventricle. For a variety of reasons, a leaflet of this valve may weaken or stretch in such a way that it flops backward or prolapses during contraction of the ventricle. Mitral valve prolapse is a common laboratory finding sometimes associated with palpitations or chest pain, but occurring in as many as 10% of asymptomatic volunteers. Studies of panic disorder patients reveal a higher incidence (15% - 47%) of mitral valve prolapse diagnosed by echocardiogram (Pariser, Pinta, Jones, Young, & Fontana, 1979; Kantor, Zitrin, & Zeldis, 1980; Crowe, Pauls, Kerber, & Noyes, 1981; Gorman, Fyer, Glicklich, King, & Klein, 1981; Mavissakalian, Salerni, Thompson, & Michelson, 1983). Although this finding raises more questions than it answers, it may explain the early observation of exercise tolerance or fatiguability in anxious patients. Crowe and colleagues (1981) found alterations in maximum O^2 consumption during exercise -- only

TABLE 4

MITRAL VALVE PROLAPSE (MVP) IN PATIENTS WITH PANIC DISORDER

Study	Panic Disorder Patients (MVP/Total)	Controls MVP/Total	Comment
Pariser et al. (1979)	8/17	--	No control group
Kantor et al. (1980)	8/25	2/25	All females; patients all agoraphobic
Crowe et al. (1981)	8/21	2/20	MVP patients had reduced exercise tolerance, no difference in family morbidity risk.
Gorman et al. (1981)	10/20	--	No difference in response to Imipramine
Mavissakalian et al. (1983)	7/46	--	No difference in clinical parameters
TOTAL	41/129 (31.8%)	4/45 (8.9%)	

in those panic disorder patients with mitral valve prolapse.

Is mitral valve prolapse etiologic in a subgroup of panic disorder patients? There are insufficient longitudinal data on the natural history of either panic disorder or mitral valve prolapse to answer this question fully. Certainly one possibility is that palpitations and chest pain, both of which occur in some mitral valve prolapse patients, predispose to the development of psychic symptoms of anxiety. However, other cardiac patients with palpitations and chest pain do not develop panic attacks (Kane, Woerner, Zeldis, Kramer, & Saravay, 1981). If mitral valve prolapse were etiologic, one might expect different rates of panic disorder in the relatives of these patients compared to a nonprolapsed panic group. Crowe et al. (1981) failed to find a difference in morbid risk for relatives of panic disorder patients with or without mitral valve prolapse. Nor is there any reason to suggest a different response to treatment in these patients (Gorman et al., 1981; Grunhaus, Gloger, & Birmacher, 1984). Certainly, an argument might be made that mitral valve prolapse is secondary to chronic autonomic stress as might be expected with recurrent panic episodes; however, greater levels of cardiovascular stress probably occur with healthy exercise. Clearly, further longitudinal studies will be necessary to resolve the relationship between the cardiac and psychiatric syndromes.

Pharmacology of Panic Disorders

Panic disorder patients may be distinguished from other anxiety disorders pharmacologically as well. Several studies have demonstrated

that Sodium (Na) lactate infused intravenously will precipitate panic
attacks in patients with panic disorder, but not in normal controls
(Pitts & McClure, 1967; Kelly, Mitchell-Heggs, & Sherman, 1971; Fink,
Taylor, & Volavka, 1969; Bonn, Harrison, & Rees, 1971). The drug
induced symptoms closely resemble a naturally occurring panic attack
(Liebowitz, Fyer, Gorman, Dillon et al., 1984) and they can be prevented
by treatment with antidepressants (Rifkin, Klein, Dillon, & Levitt,
1981). The mechanism for Na lactate's panic-inducing effect is not
yet clear. One hypothesis, that the effect is secondary to hyperven-
tilation, seems unlikely as patients do not always hyperventilate
following Na lactate infusion and hyperventilation does not by itself
induce panic symptoms (Gorman, Askanazi, Liebowitz, & Fyer, 1984). A
more likely explanation involves a disturbance in central acid-base
balance. Bicarbonate infusion and breathing 5% CO_2, both of which
induce cerebral hypercapnia and acidosis, lead to panic-like symptoms
(Grosz & Farmer, 1972; Gorman et al., 1984).

Is the Na lactate effect limited to panic disorder patients? No
published reports of Na lactate administration to patients with other
anxiety disorders are available yet. Some have suggested that the
response difference between panic disorder patients and normals could
be a quantitative rather than a qualitative one; perhaps panic symptoms
will arise if more Na lactate is infused into normals (Grosz & Farmer,
1972). The question remains why panic disorder patients would be
more sensitive than normals to Na lactate. One recent, surprising
finding is that those panic disorder patients who are sensitive to Na
lactate have a relative reduction in cerebral blood flow in the left
compared to the right parahippocampal gyrus (Reiman, Raichle, Butler,
Herscovitch, & Robins, 1984). If replicated, this finding would
demonstrate a structural abnormality which could lead these patients
to be neurophysiologically more sensitive to alterations in central
acid-base balance.

The original separation of panic disorder from generalized
anxiety resulted from Klein's (1981) observation that panic symptoms
responded to tricyclic antidepressants while anticipatory anxiety
responded to benzodiazepines. It is curious that although general
clinical lore teaches that benzodiazepines are not effective for
panic attacks, only one controlled study supports this conclusion.
McNair & Kahn (1981) found that imipramine was superior to chlordia-
zepoxide for the reduction of panic-like symptoms in 26 agoraphobics.
A recent report by Noyes, Anderson, Clancy, and Crowe (1984) actually
reported moderate improvement in panic attacks during a one-week
trial of high dose diazepam (30 mg) in 18 of 21 patients with panic
disorder and agoraphobia. The triazolobenzodiazepine, alprazolam,
has also been demonstrated to reduce panic attacks (Chouinard, Annable,
Fontaine, 1982). Whatever the status of the benzodiazepines, there
is a substantial literature of controlled reports suggesting that
tricyclics or monoamine oxidase (MAO) inhibitors are better than
placebo for reducing panic attacks (Zitrin, Klein, Woerner, & Ross,
1983; Zitrin, 1986).

A Noradrenergic Hypothesis of Panic Disorder

The predominance of autonomic symptoms, the therapeutic effects
of tricyclic antidepressants, the increased prevalence of mitral
valve prolapse, and even the effects of Na lactate have all been
interpreted as suggestive of adrenergic dysregulation in panic disorder.
Indeed, panic disorder patients have been found to have increased
plasma levels of epinephrine both at rest (Nesse, Cameron, Curtis,
McCann, & Huber-Smith, 1984) and following lactate administration

(Appleby, Klein, Sachar, & Levitt, 1981). But an even more powerful finding has recently emerged from administration of the α-2 adrenergic antagonist, yohimbine, to patients with agoraphobia and panic disorder. This drug, which increases central noradrenergic function, induced significantly higher levels of anxiety in the patients than in a normal control group. Patients described the increase in anxiety as similar in quality to that experienced during panic attacks. The norepinephrine metabolite, 3, methoxy-4 hydroxy phenylethyleneglycol (MHPG), also increased more in the patients than the controls and this increase was correlated with the increase in anxiety. Earlier work (Hoehn-Saric, Merchant, Keyser, & Smith, 1981; Liebowitz, Fyer, McGrath, & Klein, 1981) had demonstrated anti-panic effects with the 2 adrenergic agonist, clonidine, a drug which decreases noradrenergic function. Studies with non-human primates have shown that stimulating noradrenergic neurons in the locus coeruleus by either pharmacologic or electrophysiologic means results in alarm behavior (Redmond & Huang, 1979; Redmond, 1977).

It will now be important to take a careful look at adrenergic receptor regulation in patients with panic attacks. Recent reports suggest a decreased responsiveness to the adrenergic agonist isoproterenol (Nesse et al., 1984) and a decrease in the number of platelet α-2 receptors (Cameron, Hollingsworth, Nesse, Curtis, & Smith, 1983) from patients with panic attacks. The extent to which these altered sensitivities of adrenergic receptors is a result of chronically increased peripheral autonomic function or a cause of either the psychic or somatic components of panic disorder remains to be determined.

SUMMARY

In this review two general approaches to the biology of anxiety have been pursued. The molecular approach offers a model for anxiety based on the benzodiazepine--GABA--Chlorine channel receptor complex. This structure is phylogenetically, relatively recent, is anatomically, predominantly in the telencephalon, and is studied most selectively in animal behavior paradigms utilizing conflict. Although novel compounds working at this receptor appear to produce all of the major features of generalized anxiety disorder, the case reports (Dorow et al., 1983) available with one of these agents also suggest a very intense, panic-like syndrome.

Approaching the biology of anxiety from the clinical perspective of panic disorder and agoraphobia (a syndrome which may be less responsive to benzodiazepines than is generalized anxiety disorder) leads to a model of anxiety based on the noradrenergic system. By contrast with the benzodiazepine receptor complex, the noradrenergic system is phylogenetically older; its cell bodies are located in the pons, and it is probably less involved with conflict paradigms (clonidine, for instance, has little anti-conflict potency) and more relevant to startle, alarm, or arousal. A summary of the contrasts between these two systems is shown in Table 5. One must be cautious, however, not to overinterpret this table as the two systems interact in the brain and clinical correlates for either system remain highly conjectural.

It would certainly be surprising to find that anxiety, as either an affect or a syndrome, were the product of a single neurotransmitter or a single receptor subtype. No doubt, anxiety involves both of these systems, as well as many others that have yet to be uncovered. The challenge now is to begin to bridge the islands of evidence that are evolving in both basic science and clinical areas. Will an endogenous

Table 5

NEUROPHARMACOLOGIC SYSTEMS INVOLVED IN ANXIETY

Receptor	Agonist	Antagonist	Phylogeny	Anatomic Highest Density	Animal Behavior Paradigm	Possible Clinical Correlate
BZD-GABA-Cl	Diazepam	β-CCE	Recent	Telencephalon	Conflict	Generalized Anxiety Disorder
α-2 Adrenergic	Clonidine	Yohimbine	Ancient	Brainstem	Alarm	Panic Disorder

ligand for the benzodiazepine receptor be abnormal in patients with either generalized anxiety or panic disorder? Will the genetic locus for the adrenergic receptor provide a clue to the powerful inheritance of panic disorder? How does the brain mediate the autonomic, the endocrine, and the psychic aspects of anxiety? These are a few of the exciting areas which biological approaches will seek to answer in the near future.

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THE PSYCHOPHYSIOLOGY OF ANXIETY AND HEDONIC AFFECT: MOTIVATIONAL

SPECIFICITY

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As it is widely believed that the state of anxiety involves a massive
activation of the sympathetic branch of the autonomic nervous system,
clinical researchers frequently employ psychophysiological measures
as indices of anxiety. Heart rate and electrodermal activity (EDA) are
among the most widely used measures for this purpose, largely because
of the ease with which they can be recorded. EDA refers to the
electrical changes, especially an increase in conductivity, associated
with sweat gland activity on the palmar and plantar surfaces. Since
stimulation of the sympathetic nervous system produces an increase in
both heart rate and palmar skin conductance, anxiety is assumed
to produce increases in both (e.g., Martin & Sroufe, 1970).

The purpose of the present chapter is to argue that such a view
of heart rate is simplistic and potentially misleading, but also to
suggest that electrodermal activity may be more promising as an index
of anxiety. With respect to heart rate, I will argue that increases
appear to be more closely linked to hedonic or appetitive motivational
states (Fowles, 1980, 1982) than to anxiety.

A THEORY OF MOTIVATION

The theoretical framework that suggests this alternative inter-
pretation derives from behavioral theories of appetitive versus aversive
motivational systems (e.g., Gray, 1975; Mackintosh, 1974). These are
antagonistic systems which exert an influence on the probability of a
behavioral response. The term appetitive refers to the motivation
associated with appetites, such as hunger, thirst, and sex, and it is
presumed to be accompanied by a positive hedonic state. Gray's
(1976, 1977, 1982) theory of motivation is the most suitable for
organizing the data on heart rate and electrodermal activity, since
he has tied his model explicitly to anxiety.

Gray's Model
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As seen in Table 1, the appetitive or positive hedonic motivational
system is a reward-seeking or approach system that responds to positive
incentives by activating behavior (the behavioral activation system,
                      _____
BAS).

Table 1. Gray's Motivational Theory

_____

1. Appetitive motivational system (behavioral activation)

    a. Approach: CSs for rewards
    b. Active avoidance: CSs for relieving nonpunishment
        (=safety cues)

2. Aversive motivational system (behavioral inhibition)

    a. Passive avoidance: CSs for punishment
    b. Extinction: CSs for frustrative nonreward

3. Antianxiety drugs

    a. Disinhibit behavior in extinction & passive avoidance
    b. Attributed to effect on aversive motivational system
    c. Aversive motivational system mediates anxiety

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In particular, the BAS is responsible for activating behavior both in
simple reward-approach situations and in active avoidance situations,
in which the organism must make a response in order to avoid punishment.
In the first of these, the appetitive system responds to cues or
conditioned stimuli for reward--i.e., the animal makes an approach
response to reach reward stimuli, whereas in the second the stimuli
which activiate it are safety cues for conditioned stimuli for relieving
nonpunishment--that is, the nonoccurrence of an expected punishment.
The emotional labels applied to these two appetitive states are
"hope" in the case of simple approach for rewards and "relief" in
the case of active avoidance.

    The interpretation of active avoidance responding as the functional
equivalent of reward-seeking behavior is counterintuitive. At an
intuitive level, it would seem that the cues associated with threatened
punishment would control the avoidance responding, and that has been
the traditional view in the older animal literature. In contrast,
Gray and others (e.g., Mackintosh, 1974) have argued that avoidance
responding is more controlled by the positively reinforcing properties
of safety cues--the stimuli signaling that threatened punishment is
no longer likely to occur. For example, in an avoidance paradigm in
which the animal's response takes him from the original compartment
in which shock is threatened to a safe compartment in which shock has
never been experienced, the distinguishing features of the safe
compartment are said to become positive reinforcers. Thus, the BAS
or appetitive system responds to these safety cues by initiating the
active avoidance response, the consequence of which is to bring the
animal to safety. These safety cues are also said to be cues for
relieving nonpunishment, because they signal that an expected punishment
will not occur--hence, the term "relief" as the emotional label
applied to this paradigm.

    There are certain parallels between reward-approach and active
avoidance responding that may help to make this theoretical analysis
more intuitively appealing. Both involve an aversive state and an
active response (approach-avoidance) that is made to terminate the

aversive state. The aversive state is due to endogenous factors (hunger, thirst) in reward-approach responding, whereas it is induced by external factors (threat of shock) in active avoidance responding. The emotional concomitant of the responding is positive in both cases --e.g., the hope of obtaining a reward and the relief of expecting not to be punished. With these points in mind, the characteristics of the aversive motivational system can be examined.

The aversive motivational system <u>inhibits</u> appetitively motivated behavior in the presence of cues or conditioned stimuli indicating that aversive consequences will occur if the response is made. Two important instances of this are passive avoidance in the approach-avoidance conflict paradigm and extinction in simple reward-learning paradigms. In passive avoidance, the approach behavior (motivated by some type of reward) is inhibited in response to cues or conditioned stimuli for response-contingent punishment, which produce <u>fear or anxiety.</u> In extinction, the approach behavior is inhibited by conditioned stimuli for frustrative nonreward, <u>frustration</u> being the aversive state produced by the nonoccurrence of an expected reward. The overlap in the motivational state associated with these two paradigms can be seen in the popular phase "fear of failure", in which the anticipation of frustration nonreward is said to produce fear or anxiety. Because of its role in inhibiting behavior, Gray calls the aversive motivational system the behavioral inhibition system (BIS). The BIS is presumed to be activated by both threats of punishment and threats of frustrative nonreward. The different labels--anxiety versus frustration--are applied because of differing sources of the aversive motivation, but the same neurophysiological state is presumed to be elicited by both of them.

Gray (1977) has argued that the antianxiety drugs (including alcohol, minor tranquilizers, and the barbituates) have in common a reduction of the reactivity or effectiveness of the aversive motivational system. That is, these drugs have the effect of disinhibiting behavior in passive avoidance and extinction situations. This tie to the antianxiety drugs, combined with the aversive quality of the stimuli, which activate this system, led Gray to conclude that it is the aversive motivational system whose activity is associated with anxiety.

To summarize briefly, the appetitive system or BAS activates behavior in response to cues for reward or nonpunishment. The aversive system or BIS, in turn, inhibits behavior (that would otherwise occur) in response to cues for response-contingent punishment or frustration. Anxiety is associated with the activity of the aversive system.

Implications for Psychophysiology

Before discussing the implications of this model of psychophysiology, it is necessary to call attention to a major theme in the literature on the emotional significance of heart-rate--that is concerned with cardiac-somatic coupling. In the late 1960s and early 1970s a considerable literature indicated a substantial coupling between heart rate and somatic activity (e.g., Brener, Eissenberg, & Middaugh, 1974; Elliott, 1974; Obrist et al., 1974; Obrist, Webb, Sutterer, & Howard, 1970; Roberts, 1974). These results suggested that there is a "metabolically functional linkage between cardiac and somatic events" (Obrist et al., 1970, p. 572)--that is, that increased somatic activity requires increased blood flow to the working muscles. It was further assumed that this linkage is implemented via a common control mechanism--that is, that heart rate and somatic activity both

reflect the activity of some common control mechanism in the central nervous system (Brener et al., 1974; Obrist, 1976; Obrist et al., 1970, 1974). Although cardiac-somatic coupling did not preclude psychologically interesting influences on heart rate, the pervasiveness of this finding made investigators quite cautious about inferring that psychological factors were involved (e.g., Elliott, 1974).

Returning now to the implications of Gray's model of psychophysiology, it is important to note that active avoidance, in which the organism makes a response to avoid an aversive event such as shock, is viewed as associated with an hedonic or appetitive motivational state--not with activity in the aversive motivational system that mediates anxiety (Gray, 1976). This observation can be juxtaposed with more recent findings on the motivational significance of heart rate in what amounts to an active avoidance paradigm. This literature (e.g., Obrist, 1976; Schneiderman, 1977) has indicated that cardiac acceleration in the face of threats of shock is seen only when there is a tendency to make an active response to avoid the shock. Heart rate increases are not seen in response to uncontrollable shock, such as the noncontingent presentation of shock in a classical aversive conditioning paradigm, unless there is an associated tendency to make an (ineffective) avoidance response. Since uncontrollable shock is generally assumed to induce anxiety, it has been argued that heart rate increases do not reflect anxiety. Rather, this response is associated with the "active coping" response (Obrist, 1976) or, in Gray's terminology, an active avoidance response. Since the tasks involved, such as lifting one's finger from a telegraph key, do not require much somatic activity, it has been argued that cardiac-somatic coupling does not account for the results in active coping paradigms.

It was this literature on "active coping", combined with older literature on reward incentive effects on heart rate (e.g., Elliott, 1969), that led me to argue in a 1980 theoretical paper (Fowles, 1980) that heart rate is more closely tied to the appetitive than to the aversive motivational system. Of the two aspects of this hypothesis--reward incentives vs. active avoidance--the research on active avoidance effects on heart rate was current and widely accepted. In contrast, the studies of the response to incentives had not been designed to test this particular hypothesis. Consequently, the available data were, for the most part, either empirically weak or theoretically ambiguous (e.g., did not exclude performance anxiety as a contributor to cardiac acceleration). The strongest results were to be found in older animal studies, based on the heart rate response of water-deprived rats to bar-pressing for water (Belanger & Feldman, 1962; Hahn, Stern, & Fehr, 1964). Thus, my students, Anne Fisher and Dan Tranel, and I set for ourselves the task of demonstrating the predicted cardiac acceleration to reward-incentives.

FURTHER RESEARCH ON MOTIVATION AND PSYCHOPHYSIOLOGY

In all of our research, subjects perform a motor task continuously during trials of two minutes each with a one minute rest period between trials. In this task subjects press the button adjacent to whichever of 5 lights (arranged in a semicircle) is on, turning the light off. Another light comes on randomly when the subject presses a central button, and the task continues until the experimenter tells the subject to stop.

In some studies, task difficulty was manipulated in order to give subjects different levels of success and failure feedback. Using the subject's own performance and the amount of success we

wished to produce, we established a time criterion for the rate of turning off lights. If they were faster than this criterion, they received a tone signalling success; if too slow, a tone signalling failure. Subjects average about 80 responses (i.e., lights turned off) per minute, making success and failure feedback on every response unthinkable. As a practical matter, we have given feedback (high vs low frequency tones) for blocks of five responses, and subjects are given instructions to this effect.

In other studies there was no mention of success and failure or of any time criterion and only a single tone was employed, automatically following every fifth response. This practice avoids any threat of failure feedback and is comparable to a simple 100% reward paradigm with animals. This paradigm was of particular theoretical importance, inasmuch as it permitted an evaluation of the effects of rewards in the absence of any aversive stimulation.

In all studies, subjects either received only tones, called the Feedback Only (FO) condition, or they were instructed that each tone is worth a fixed amount of money (e.g., 5 cents), called the Monetary Incentive (MI) condition. Similarly, in all studies the first trial was a practice trial without feedback. This trial yielded an estimate of the subject's motor response rate (for the time criterion) and also served as a control trial for the effects of the task per se on our dependent measures. Feedback and all experimental manipulations were introduced on Trial 2 and were constant across the remaining trials.

The major manipulations in these studies were a comparison of Monetary Incentives versus Feedback Only to determine the effect of increased reward incentive and a comparison of varying levels of % Success to determine the effects of failure feedback as a source of aversive stimulation. These are intended, then, to activate the appetitive and aversive motivational systems, respectively. A summary of the results for heart rate is presented first, since more data have been collected on this measure, followed by preliminary results for skin conductance responses.

Heart Rate

Four studies to date have employed 100% Success to compare the effect of Monetary Incentive versus Feedback Only on heart rate (Fowles, Fisher & Tranel, 1982, study 2; Tranel, 1983; Tranel, Fisher & Fowles, 1982; Fisher, 1984). In all cases there was a significant effect in which heart rate increased more with Monetary Incentive than with Feedback only.

In two of these four studies, three levels of incentive were employed in order to see whether heart rate showed a graded response to the magnitude of monetary incentive. The first study (Tranel et al., 1982), with 15 subjects per cell, contrasted 0 cents or Feedback Only with 2 and 5 cents per success. The ANCOVA, using Trial 1 heart rate as the covariate, yielded a strong main effect of Monetary Incentive ($p < .001$) with the (covariance adjusted) means averaged across Trials 2-6 showing an orderly increase as the incentive increased: 89.5, 93.3, and 99.7 beats per minute for the 0, 2 and 5 cent groups, respectively. Post hoc Duncan tests showed a significant difference between 5 and 2 cents ($p < .05$) and a trend for 2 cents to be greater than Feedback Only ($p < .10$). Comparable results were obtained in the other study (Tranel, 1983) involving three levels of incentive.

Collectively, these studies establish several important points.

First, the reliability of the heart rate increase with Monetary Incentives is established, having been found in all four studies. Second, the graded heart rate response to the magnitude of incentive seems to rule out nonspecific factors and to indicate that the results are correctly attributed to the incentive value of the money per se. Third, the 5 cents incentive in the study just presented produced a large effect: those subjects, who average $8.29 for the session, showed a 10.2 bpm increase over the Feedback Only group and an average 100.2 bpm (raw scores, not adjusted scores) during the 5 incentive trials. The strength of the motivation induced by our procedure may be inferred by noting that these five trials involved a total of 10 minutes work--an hourly rate of approximately $50/hour! Fourth, anxiety concerning failure feedback was eliminated as a possible cause of the heart rate increases, since we instructed Ss only that they would hear a tone after every fifth light and that they would receive money for each tone--i.e., the paradigm was comparable to a simple operant conditioning paradigm with 100% reward and no mention of success or failure. Thus, the results are consistent with the hypothesis stated above that cardiac acceleration is closely associated with appetitive motivational states.

As noted above, the history of psychological research on heart rate has been plagued by the problem of cardiac-somatic coupling. In order to attribute the heart rate results to an increase in appetitive motivation, it is necessary to preclude an explanation in terms of somatic activity with its associated metabolic demand. We have taken three approaches to this problem. The first approach was to introduce a predictable control task in which the lights move in a clockwise progression around the semicircle, thereby greatly speeding up the S's instrumental responding on the task. Ss performing this task with neither feedback (i.e., no tones) nor monetary incentives showed response rates in our first two studies (Fowles et al., 1982) that were 40-45% faster than those seen in our experimental groups, yet manifested heart rates equal to or lower than those of our Feedback Only groups (Fowles et al., 1982). In view of this result, heart rate does not appear to be very sensitive to differences in response rate per se in the absence of motivational differences. Secondly, the response-rate data were analyzed in a manner parallel to the analyses of HR. Neither a significant main effect of Monetary Incentive on response rate nor an interaction with other variables was seen in a majority of the studies, again indicating that response-rate data do not account for the heart rate results. In those cases in which an incentive effect on motor response rates was obtained, the heart rate results were reanalyzed with motor response rate as the covariate in an analysis of covariance. In no case was the incentive effect on heart rate eliminated. Finally, correlational analyses between heart rate and response rate yielded no indication of cardiac-somatic coupling (Tranel et al., 1982). Using each subject's heart rate and motor response rate averaged over trials for a given experimental condition, the median correlation over a total of thirteen different conditions (taken from three different studies) was +.20. Only one of the thirteen correlations was significant (+.82 for a 90% success, Monetary Incentive condition), and the correlations for the most nearly comparable groups in two other studies were not significant. Taken together, these results argue against attributing the incentive effects on heart rate to somatic activity.

The studies so far attempted to eliminate aversive motivational influences on heart rate in order to be certain that appetitive motivation produced the cardiac acceleration we found. Now it is time to consider whether anxiety adds anything to this cardiac response,

when it is presumably induced by providing subjects with failure feedback. In the context of Gray's motivational theory, failure feedback is a cue for frustrative nonreward and should activate the aversive motivational system of BIS. The absence of an effect of this failure feedback on heart rate would suggest an insensitivity of heart rate to activation of the BIS. Anne Fisher has completed three studies that indicate no effect of this type of aversive stimulation on heart rate.

In the first two, % Success was varied while the amount of money per success remained constant across conditions. For example, in the first study (Fisher, 1982) task difficulty was varied so that subjects received 10, 50 or 90% Success. Since they received the same amount of money per success (3 cents), the 10% Success group earned only 1/9 the amount of money earned by the 90% Success group and 1/5 that of the 50% Success group. Note that if aversive motivation (e.g., anxiety over slow performance even in the absence of a time criterion and failure feedback) rather than incentive is responsible for the results described above, this manipulation of %Success should show increasing heart rate as the %Success declines, since subjects receive proportionately more failure feedback. On the other hand, if Monetary Incentive is responsible for the heart rate increases, one would expect either no effect of %Success or a decline with lower %Success because of the concomitant decrease in money earned.

The significant effect of interest was a %Success x Monetary Incentive interaction (p< .05) as shown in the left side of Figure 1. When analyzed separately to examine this interaction further, the Monetary Incentive groups showed a main effect of %Success (p<.02), whereas the Feedback Only groups did not. Duncan tests showed that in the Monetary Incentive condition only the 10% and 90% Success groups differed significantly. Thus, the %Success x Monetary Incentive interaction could be attributed to a significant increase in heart rate with increasing %Success for the Monetary Incentive groups but not for the Feedback Only groups, a result entirely consistent with the hypothesis that appetitive motivation controls heart rate.

In an unpublished follow-up, Fisher repeated the 50% and 90% groups from the study just described and obtained similar results, as seen on the right side of Figure 1. That is, there was a main effect of Monetary Incentive (p<.05), but no effect of %Success. Of importance in the present context, the heart rate increase for the 50% Monetary Incentive group was slightly (though nonsignificantly) lower than for the 90% Monetary Incentive group, again tending to follow the monetary incentive rather than the aversive stimulation.

As noted above, in the studies just described the amount of money subjects earned decreased in proportion to their failure. Also, the monetary incentive of 3 cents per success was relatively small. As a result, the incentive effects were weak, as can be seen by examining the 10% and 50% Success groups in Fisher's first study. At the time that study was completed, we did wonder whether failure feedback might actually produce a decrease in heart rate in the context of the greater motivation induced by monetary incentives. There were theoretical reasons why a decrease might possibly be the case (Fowles, 1982), and the absence of an incentive effect for the 50% Success groups in Fisher's first study, combined with the very low heart rate for the 10% Success-Monetary Incentive group, raised that possibility. Given the results of other studies (Fowles et al., 1982; Perkins, 1984) and the study to be described next, it now appears that we were simply seeing the effect of lowered monetary
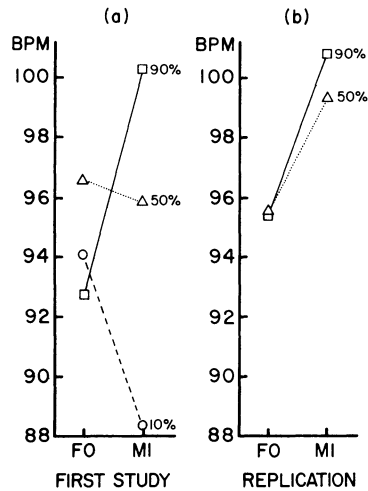
Figure 1. (a) Adjusted heart rate means (Trial 1 as the covariate) in beats per minute (BPM) as a function of Incentive (MI = Monetary Incentive, FO = Feedback Only) and Task Difficulty of %Success (10%, 50%, 90%). Each data point represents 15 subjects. Monetary incentive was the same for each success; consequently, total earnings per trial varied with %Success. (b) A replication of the study in (a) using only two levels of %Success (50%, 90%). Each data point represents 16 subjects.

incentives with decreasing success, combined with the usual variability from study to study in results with between-subjects factors and small samples. It should be noted, nevertheless, that the results were in the direction of lower heart rate with aversive stimulation and could in no way be construed as supporting the hypothesis that aversive stimulation produces cardiac acceleration.

In her dissertation, Fisher (1984) examined the effects of 10, 50 and 100% Success while holding the amount of money earned in the Monetary Incentive condition constant across %Success groups. These manipulations were too complicated to decribe fully here, but the effect was to have all Monetary Incentive groups earn approximately the same amount of money per two minute trial.

The results are shown in Figure 2, which presents means during the experimental trials adjusted on the basis of the covariance analysis. The most important results were a very strong main effect of Monetary Incentive (p<.0001) and an absence of any differences between the 10% and 100% Success groups. It is these groups which differ the most in aversive stimulation in the form of failure feedback, and yet there is no effect on heart rate. Thus, once again, it is monetary incentive and not aversive stimulation that influences heart rate. There is a trend toward an interaction of %Success and Monetary Incentive (p=.08) in which the 50% Success group in the Monetary
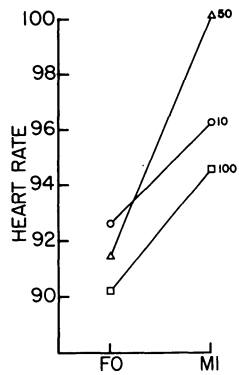
Figure 2. Adjusted heart rate means (Trial 1 as the covariate) in beats per minute as a function of Incentive (MI=Monetary Incentive, FO=Feedback Only) and Task Difficulty of %Success (10%, 50%, 100%). Each data point represents 20 subjects. Monetary incentive was adjusted so that total earnings per trial were constant across levels of %Success in the Monetary Incentive groups.

Incentive condition shows the largest heart rate increase. If reliable, this interaction may indicate some motivational effect of engaging in a moderately difficult task, but it has little bearing on the theoretical issues being addressed.

In summary, all of our studies of heart rate with this paradigm converge to demonstrate motivational specificity, in which heart rate responds to increases in appetitive or hedonic motivation but not to increases in aversive motivation. These results appear to support our hypothesis and should sound a strong note of caution for clinical investigators with respect to the use of heart rate to assess anxiety. Such an application should, at the least, require control over both somatic activity and appetitive motivation. Even in situations involving threats of punishment, where presumably the induced anxiety serves as motivation for the response, heart rate is likely to reflect the combination of anxiety and the tendency to actively cope with the threat by making an avoidance response rather than to reflect anxiety per se. To illustrate this problem, consider two categories of situations in which an investigator records heart rate as a possible index of anxiety: 1) the presentation of threatening stimuli only, and 2) situations involving both rewards and punishments or frustrative nonreward stimuli.

First, the presentation of aversive stimuli, such as the stimuli associated with specific phobias, would at first glance appear to be a purely anxiety-inducing situation. Investigators might think it is safe to use heart rate as an index of anxiety here, inasmuch as there is no obvious alternative cause for cardiac acceleration. It will be recalled, nevertheless, that cardiac acceleration is only seen in classical aversive conditioning situations when there is an associated tendency to make an active avoidance response (see page 6). A particularly interesting statement of the importance of even covert motivations for the heart rate response to anticipated shock was offered by Elliott (1969), who attributed these increases to "the incipient organization of an avoidance, escape, or defensive response, one which would surely occur were it not for the constraints imposed

by instructions" (p. 224). In contrast, the heart rate acceleration is much diminished once the subject has already experienced the shock and "is convinced that there is no way to escape or avoid shock" (p. 224). Elliott's (1969) observations suggest that the degree to which a phobic patient accepts the feared stimulus with resignation versus the degree to which the patient develops an incipient avoidance response will have a major influence on the amount of cardiac acceleration seen. Since the diagnosis of phobias includes avoidance responding as a criterion, these patients as a group may show greater incipient avoidance tendencies and thus cardiac acceleration (as compared with a hypothetical control group with equal anxiety but without the avoidance response). Individual differences in incipient avoidance tendencies within the phobic group will, presumably, still contaminate any attempt to use heart rate as an index of anxiety.

The second type of situation, involving both rewards and punishments or frustrative nonrewards, encompasses many real life situations. The potential for response-contingent reward always carried with it the threat of frustrative nonreward. For example, social inter-actions—including those occurring in the context of psychotherapy—contain elements of reward (indications of love, respect, approval, etc.), frustrative nonreward (the failure to obtain such rewards following an attempt to elicit them), and punishments (explicit rejection, disapproval, ridicule, etc.). The studies above employing mixed success and failure schedules (e.g., 10%, 50%, 90% success) suggest that appetitive motivation has a large impact on heart rate. Much more tentatively, they suggest a relative insensitivity to frustrative nonreward stimuli, at least in the motor task paradigm employed. It does seem quite reasonable to expect that punishments, insofar as they create the extrinsic motivation to perform an active avoidance response, also would have an effect on heart rate (Fowles, 1980, 1982). The point here is that the degree of anxiety is only one of several factors that may influence heart rate in these complex situations. Thus, investigators should be extremely cautious in using heart rate as an index of anxiety. The patient in therapy whose heart rate accelerates may have responded because of strong appetitive motivation, such as a desire to please the therapist, as well as from any effect that anxiety may have.

Electrodermal Activity

With these results for heart rate in mind, it is now time to examine the effects of appetitive and aversive motivation on electrodermal activity or, more specifically, the number of nonspecific skin conductance responses per minute during the two minutes of task performance. As noted above, there is much less information on this question, but the results to date are quite provocative.

The first finding is a surprisingly negative one: two attempts by Tranel and one by Fisher failed to even produce a trend for an effect of Monetary Incentive on the number of nonspecific skin conductance responses (Fisher, 1984; Tranel, 1983). This is surprising because electrodermal activity is noteworthy for its sensitivity to many experimental manipulations (Raskin, 1973). Consequently, this robust failure to find an incentive effect is of interest and seems to indicate that electrodermal activity is not responsive to differences in appetitive motivational states during task performance.

In contrast, two studies have shown what appears to be an effect of aversive motivation on nonspecific SCRs. In the first study, Tranel (1983) presented the usual 100% Success condition during

Trials 2-4 and then discontinued the feedback tones during Trials 5-6. Half the subjects were informed that this would happen (Informed) and half were not (Uninformed). The latter group were simply instructed at the very beginning that the tones might not always occur but that they should continue responding. Thus, the Uninformed subjects were viewed as being placed on extinction during Trials 5 and 6, whereas the Informed subjects were simply changed to a no feedback condition (which they fully expected from the outset). In the context of Gray's motivational theory, extinction was expected to induce the aversive motivational state of frustration.

The results are presented in Figure 3 (note that in this case raw scores and not covariance adjusted means are presented). There was a significant Time Period x Information interaction ($p < .001$), reflecting the comparison of Trials 2-4 (during the monetary incentive) with Trials 5-6 (discontinuation of the incentive). As seen in most studies of electrodermal data, there is a steady decline over trials (due either to adaptation or to peripheral changes in the skin and sweat gland effector system). Nevertheless, the effect of the frustration manipulation can be seen in the arrest of the decline in SCRs for the Uninformed group but not for the Informed group. Thus, the results were in keeping with the theoretical expectation that electrodermal activity responds to aversive stimulation. It should also be noted that the introduction of feedback and monetary incentive on Trial 2 (for all subjects) had no apparent effect on SCRs.
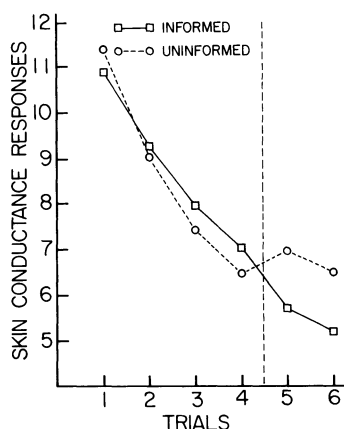
Figure 3. Number of nonspecific skin conductance responses/minute (raw scores) as a function of Information and Trials. The Informed group were told that tones signalling money would be discontinued during Trials 5 and 6; Uninformed subjects were not. Each data point represents 48 subjects. After Tranel (1983).

The second study showing an effect of aversive motivation on nonspecific SCRs was Fisher's (1984) dissertation study, already described for heart rate. In this study she examined Feedback Only versus Monetary Incentive at three levels of %Success: 10%, 50% and 100%. The results (using covariance adjusted means) are presented in Figure 4. For the electrodermal data there was a main effect of %Success ($p < .001$) and a Duncan test confirmed that the 10% groups had a significantly higher number of SCRs than did the 50% and 100% groups. This effect did not interact with the Monetary Incentive

factor, indicating that failure feedback has a similar effect on SCRs for both Feedback Only and Monetary Incentive conditions. If it is correct to assume that increasing failure feedback induces an aversive motivational state (frustration), this study again indicates that electrodermal activity responds to aversive stimulation.
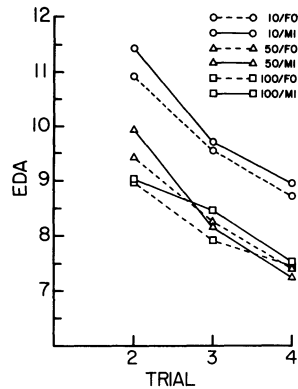
Figure 4. Number of nonspecific skin conductance responses/minute (covariance adjusted) as a function of Incentive (MI=Monetary Incentive, FO=Feedback Only) and Task Difficulty or %Success (10%, 50%, 100%) during Trials 2-4. Each data point represents 40 subjects. After Fisher (1984).

To summarize, so far our studies have found that heart rate responds to stimuli presumed to activate a positive hedonic motivational system but not to aversive stimuli. Nonspecific SCRs during the task, in contrast, appear to respond to aversive stimuli but not to appetitive stimuli, although these results are quite preliminary. Thus, we have found what seems to be a surprising degree of motivational specificity with this paradigm.

It is appropriate at this point to sound a cautionary note. First, we did not have independent evidence that the effects on electrodermal activity were, in fact, mediated by aversive motivation, nor have we had a chance to attempt to replicate either finding. Second, these results are all based on a paradigm involving ongoing motor activity with the motivational effects superimposed on this activity. We do not yet know whether the conclusions will generalize to other types of situations. Third, the task was chosen to avoid any need for motor inhibition (Fowles et al., 1982) in order to avoid a conflict between cardiac acceleration due to hedonic motivation and cardiac deceleration associated with motor inhibition (i.e., cardiac-somatic coupling). It remains to be seen whether these appetitive motivational effects can only be seen in the context of ongoing motor activity. Finally, the possible motivational specificity in this paradigm is unlikely to generalize to the SC orienting response paradigm, in which SCR amplitude to discrete stimuli is assessed. In addition to the prototypical orienting response to novel stimuli, the SC orienting response is seen to stimuli that are said to have "signal value". Signal value is a somewhat vague concept that subsumes stimuli that are given significance or meaning, such as the imperative stimulus in a reaction time paradigm, a tone the subject is told to

detect (e.g., "count to the seventh tone"), a stimulus that predicts
the occurrence of an important event, or even one's own name. More to
the point, a simple pilot study in our laboratory failed to demonstrate
motivational specificity to a series of tones signalling either the
receipt of 10 cents (appetitive) or the loss of 10 cents (aversive).
Thus, although we are much encouraged by the results summarized
above, they should not be generalized too readily to other paradigms,
and some are in need of further replication and analysis.

State and Trait Anxiety

Given the potential clinical relevance of this work, I would
like to speculate on the possible implications of Gray's behavioral
theory of anxiety for the concepts of state and trait anxiety, because
there are some interesting perspectives. The key to this discussion
is that there are two concepts of trait anxiety. The first is a
vulnerability model in which trait anxious persons react with more
anxiety to a given level of aversive stimulation. That is, when
placed in stressful situations with all other things being equal,
they will be more anxious. The second concept of trait anxiety is
that such individuals will be anxious more frequently--without
specification of the stimulus situations.

An application of Gray's motivational theory to approach-avoidance
conflict paradigms suggests a possible inverse relationship between
the vulnerability and frequency definitions, or at least a potential
uncoupling. The vulnerability definition would see trait anxiety as
due to a more reactive behavioral inhibition system--the one which
processes stimuli for threats of punishment and frustrative nonreward
with the concomitant emotions of anxiety and frustration. Given the
behavioral effects of that system, however, all other things may not
be equal with respect to exposure to aversive stimuli. Such individuals
should be strongly oriented toward a dominance of passive avoidance
with a subsequent reduction in exposure to aversive stimuli--the
classic picture of the shy, stress-avoidant personality. To the
extent that their passive avoidance is successful, they will
infrequently experience anxiety. The consequences of this BIS dominance,
then, will be failure to approach rewards in situations involving
threats of punishment or nonreward, but these individuals will not
necessarily experience frequent anxiety.

This analysis can be seen in the upper portion of Figure 5,
which compares the effect of two levels of avoidance motivation on
anxiety. The solid lines represent the avoidance gradient; the
dashed line, the level of approach motivation. As is customary in
portrayals of approach-avoidance conflict, the avoidance gradient has
a steeper slope. The two vertical arrows indicate the resulting
points of equilibrium for approach and avoidance, with the length of
the arrow reflecting BIS (and BAS) activity. That is, activity in
both the aversive and appetitive motivational systems increases as
the individual approaches the UCS (e.g., a shock grid and goal box in
animal studies) as indicated by the gradients. It can be seen that
the stronger BIS (i.e., the higher avoidance gradient) results in a
termination of the approach response at a point more distant from the
aversive UCS and that, consequently, the state anxiety will be less
(i.e., the vertical arrow is shorter). Thus, the person with the
weaker BIS will experience more anxiety, because they are more likely
to engage in risky activity.

Along the same lines, consider the impact of differences in the
strength of approach motivation, as shown in the lower portion of

Figure 5. The stronger approach (the upper dashed line) produces a point of equilibrium closer to the goal box, with the resulting increase in the strength of cues for punishment and, therefore, greater aversive motivational activity and anxiety. Thus, to the extent that strong approach motivation brings the organism closer to potential punishment, it will increase anxiety.
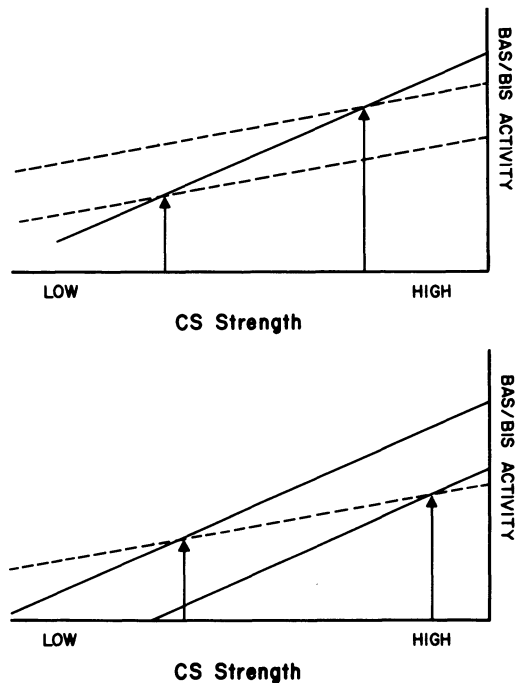
Figure 5. Approach-avoidance conflict gardients showing two levels of approach motivation (dashed lines) with one level of passive avoidance motivation (solid line) in the upper figure and the reverse (one approach, two avoidance) in the bottom figure. BAS=behavioral activation system or appetitive motivation; BIS=behavioral inhibition system or aversive motivation. Vertical arrows indicate the strength of the approach and avoidance motivations at the points of equilibrium.

From these examples it can be seen that high state anxiety may be associated with high levels of approach motivation and/or low levels of passive avoidance motivation, whereas low state anxiety may be associated with low levels of approach motivation and or high levels of avoidance motivation. This conclusion follows whether or not the levels of motivation derive from extrinsic rewards and punishments (i.e., situational factors) or from individual differences in the reactivity of the appetitive and aversive motivational systems. This analysis implies, therefore, that BIS-dominant individuals (or situations) may be characterized by relatively low levels of anxiety, not necessarily by high anxiety as might be expected without considering the effects of proximity to the UCSs.

It would be interesting to see whether the application of this model to clinical studies of anxiety might suggest ways to create more homogenous diagnostic subgroups. That is, it may be useful to

distinguish between those patients who suffer from excessive reactivity to aversive stimuli versus those who experience frequent anxiety from repeatedly engaging in behavior that increases exposure to threatening stimuli. What I have in mind here is that there may be disinhibitory syndromes in which a portion of patients show frequent anxiety because of frequent exposure to threats of punishment or frustrative nonreward. This source of frequent anxiety may be etiologically different from that due to excessive vulnerability to stress, and it may even be possible to demonstrate differences in reactivity to a standard laboratory stressor for the two groups of patients.

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The following chapter is a reflection on the ways in which
anxiety may be represented and organized in memory, how anxiety
responses modulate the retrieval of other, associated information, and
how these responses are themselves modified when accessed in vivo or
in imagination. It begins with a brief analysis of research on
emotion-state dependent, and mood-congruent, verbal learning and
memory. Current theory of these effects is assessed. Evidence is
reviewed for an alternative view, which suggests that response information
(about both somatic and visceral events) may mediate the retrieval of
associated verbal memories. An information structure for emotion is
proposed, consisting of response, stimulus, and meaning concepts,
organized into an associative network. A prototype network is described,
based on clinical phobia, and experiments exploring the utility of
this model are presented. It is shown that fear prototypes can be
accessed through imagery and that, in therapy, the processing of
response components in the image is associated with fear reduction
and clinical improvement.

DO EMOTIONS CUE MEMORIES?

The traditional, dynamic view of cognition and anxiety emphasized
two conflicting mechanisms: a protean fluidity of affective associations
and a barrier process of repression (e.g., Freud, 1933). Through the
latter mechanism thoughts evocative of an anxious state were prevented
from entering consciousness, thus permitting the patient to maintain
emotional equilibrium in the face of associative or environmental
prompts to affective expression. Despite many efforts to test this
hypothesis, its scientific status remains curiously murky (Holmes,
1974). In contrast, recent research has found intriguing evidence
for the first mechanism, that affective states have a broad mediating
effect in associative memory. In the laboratory, human beings show
an easy susceptibility to the induction of emotions, both positive
and negative, and researchers argue that even such mild mood states

can have significant impact on the content of consciousness and memory processing. It is held that an anxious mood can itself act as a cue for the recall of other thoughts and behaviors, which were acquired remotely in time and context, but acquired when the patient was in a similar affective state. Increased understanding of such emotion-state-dependent learning and memory may help us to account for the persistence across diverse settings of such anxiety related, non-productive responses as worry, obsessive thoughts, compulsive rituals, and phobic avoidance.

Much of the current interest in the problem of emotion and memory was sparked by Gordon Bower and his associates (e.g., Bower, 1981; Bower & Cohen, 1982). An experimental paradigm used by these investigators involved the induction of an emotional state through hypnotic instructions to relive a previous affective experience (either happy or sad), and the subsequent learning and recall of lists of unrelated words. Thus, in a typical study subjects learned two lists of words - List A first, then List B -- and were subsequently tested for recall of List A. Different subject groups experienced different pre-word-task emotions according to prearranged patterns (e.g., Happy, A; Sad, B; Happy, Recall A, or Happy A; Sad, B; Sad, Recall A). It was determined that subjects who were in congruent moods during learning (List A) and recall (List A) remembered the words better than if acquisition and rememberance occurred in different affective states. Furthermore, if List B was learned in a non-congruent mood (e.g., the subject was sad when learning B, but happy when learning A and at recall of A), subjects showed optimal memory for List A. Bower (1981) suggests that "their different learning moods isolated the two lists, thus reducing interference from List B when trying to recall List A" (p. 131). The poorest memory scores were obtained when mood at recall of A was congruent with the emotional experience during List B learning, and different from that experienced at List A acquisition. In this "interference condition...recall of the target List A suffers because the recall mood evokes memories of the wrong List B rather than the Target List A" (p. 131).

Bower (1981) has further shown that these apparent state dependent memory effects are obtained even when subjects recall actual, extra-laboratory experiences. For example, subjects recalled more previously rated unpleasant events from an "emotional diary" when they were later recalled in an induced unpleasant mood (with the same pattern holding for the recall of pleasant events in a pleasant mood). Subjects also showed mood congruence effects in their recall of childhood memories. Another experiment demonstrated a kind of state dependent selective learning, in which subjects acquired more information about characters in a narrative who were in a similar mood to their own (happy or sad) at the time the subjects read the material.

Key experiments by Bower and his colleagues depend on the validity of hypnotically induced moods, the hope that hypnosis does not have other confounding effects on memory, and the representativeness of a subject population which is made up exclusively of hypnotically susceptible subjects. Given our uncertain understanding of these factors, questions may be raised about the relevance of this work for natural experience. Bower himself has recently raised more serious reservations (Bower & Mayer, 1985). A careful effort at replicating his basic mood-dependency experiment (Bower, Monteiro, & Gilligan, 1978) failed to obtain the previous result, leading him to conclude that "mood dependent retrieval must be judged to be an unreliable phenomenon in the laboratory (p. 39)". In attempting to account for the new, negative result, he implicated "the hypnotic skills of the

subjects and the experimenter-hypnotist". Participants in the earlier
experiment (i.e., Bower et al., 1978) were a "special population" of
experienced hypnotic subjects, whereas the new study employed college
students selected on a group screening scale. It is possible that
these naive students did not generate the "intense mood involvement"
(p. 42) of the more experienced subjects. In point of fact, Bower
and Mayer (1985) did not check the effects of the hypnosis manipulation
by measuring either physiological (somatic or autonomic) or behavioral
phenomena which would confirm successful mood induction. We will
argue later that the efferent patterns of emotional states are indeed
critical to the achievement of state dependent effects.

While questions about hypnosis are unresolved, other investigators
have used different mood induction procedures and obtained mood
dependency effects. For example, Teasdale and Fogarty (1979) used an
induction method developed by Velten (1968), in which subjects read
and thought about a series of self-referent statements evocative of
consistent affective content (e.g., for depression, "Looking back on
my life I wonder if I have accomplished anything really worthwhile".
"I feel downhearted and miserable"). Following mood induction, they
measured the subjects' latency of retrieval for pleasant and unpleasant
memories, and obtained results analogous to Bower's: that is, reaction
times were shorter when there was congruence between the affective
valence of the memorial content and the valence of affective state at
recall.

In addition to these studies of memory and learning, researchers
have explored the effects of mood congruence on response initiation.
Isen, Shalker, Clark, and Karp (1978) gave subjects small gifts to
produce a positive mood state, and then evaluated their degree of
satisfaction with various possessions in an apparently unrelated
consumer survey. These "happy" subjects reported greater satisfaction
than controls with their automobiles, television sets, and other
purchases. More recently, Isen, Means, Patrick, and Nowicki (1982)
have been studying the effect of mood valence on risk taking behavior.
Preliminary results suggest that subjects in a positive mood tend to
take more chances than controls, but only when probability of a
negative outcome is low. Thus in this limited sense, they behave
more bravely. Rachman (1978) has commented on the independence of
courage and fear in phobic patients, some of whom, despite their
intense distress, accept exposure treatments and confront phobic
objects and situations. The Isen et al. (1982) data imply that such
procedures depend on the subject being in a positive mood just prior
to the treatment manipulation, and also on a demonstration (modeling)
that the probability of an aversive consequence is low.

While there is as yet little work on mood and memory in anxious
patients, there is an increasingly large literature evaluating memory,
response initiation and appraisal in non-patient depressed subjects
and in depressed patients (see Kovacs & Beck, 1979 for a review). In
general, depressed patients are much more likely to recall past
failures than successes, provide negative rather than positive appraisals
of stimuli, and are reluctant to initiate approach responses. It is
not surprising that the presence of depressed mood in a predominantly
phobic or obsessive symptom picture is a negative prognostic sign for
treatment (Foa, Grayson, & Steketee, 1982; Marks, Rachman, & Hodgson,
1980).

IS EMOTIONAL MEMORY A SEMANTIC NETWORK?

In a previous theoretical discussion of emotional imagery and

its memory storage, I suggested that affect might be represented propositionally and organized in network form (Lang, 1977a, 1979). Bowers' interpretation of emotion dependent learning and recall (and presumably of other related behaviors) is also based on a network theory of associative memory (Bower, 1981; Gilligan & Bower, 1984):

> An event is represented in memory by a cluster of descriptive propositions. These are recorded in memory by establishing new associative connections among instances of the concepts used in describing the event. The basic unit of thought is the proposition; the basic process of thought is activation of a proposition and its concepts. The contents of consciousness are the sensations, concepts, and propositions whose current activation level exceeds some threshold. Activation presumably spreads from one concept to another, or from one proposition to another, by associative linkages between them. A relevant analogy is an electrical network in which terminals correspond to concepts or event nodes (units), connecting wires correspond to associative relations with more or less resistance and electrical energy corresponds to activation that is injected into one or more nodes (units) in the network. Activation of a node can be accomplished either by presentation of the corresponding stimulus pattern or by prior activation of an associated thought (Bower, 1981, p. 134).

Bower holds that there are distinct emotions, e.g., joy, fear, depression. Each emotion has a specific node or unit in memory "that collects together many other aspects of the emotion that are connected to it by associative pointers, "e.g., expressive behaviors such as overt approach or avoidance, facial expressions; visceral patterns of response; verbal labels for emotions; descriptions of evocative situations; and meaningful appraisals of contexts and responses. The associative network of the emotion is in turn related to the larger domain of general associative memory. It is held that relatively high relational strength obtains between the emotion network and information from general memory pertaining to events which occurred contiguous with emotional expression. Thus, later activation of an emotion node will cause activation to spread throughout the structure of memory, raising connected memories above the threshold of conscious thought and expression. In effect, emotion represents a coincidental retrieval cue along with stimulus context, and in circumstances where the external stimulus cues are weak or not present, its effect will be palpable, priming memories of events which occurred when the organism was in a similar affective state. "In contrast, if the mood is altered between learning and recalling...recall suffers because the benefits of intersection from two search cues are absent..." (Bower, 1981, p. 136).

Bower's theory states that specific emotion nodes can be activated by "physiological or symbolic verbal means", and that "the emotion unit then transmits excitation to those nodes that produce the pattern of autonomic arousal and expressive behavior commonly assigned to that emotion" (Bower, 1981, p. 135). To date, Bower's group has not studied affect instigation techniques themselves, nor have they provided much in the way of manipulation checks on the presumed emotions that result. We do not know what specific behaviors, beyond the verbal labels, were produced by his procedure. It is reasonable to question whether there is a specific emotion node which must be activated before emotional behavior occurs, or whether it is the central representation of the relevant behaviors themselves (the

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somatic and autonomic effector patterns) which are both "the emotion"
(see Lang, 1984) and the mediators of state dependent effects. If
the latter is true, then mood congruence effects are more likely to
be expressed across a dimension of responding than to be confined by
the verbal specifications of traditional emotional states. Thus,
emotions which share similar postural, facial, or visceral response
components might be synergistically augmenting behavior associated
initially with only one state. Emotions would be reciprocally inhibiting
associated memories only if they involved mutually exclusive patterns
of response.

WHAT RESPONSES CUE PLEASANT AND UNPLEASANT MEMORIES?

While the importance of response commonalities and differences
in emotion is not stressed, Bower (1981) has provided preliminary
evidence suggesting that state dependent memory may follow a circumplex
model. That is, if the affect during recall is more nearly adjacent
to the emotional state during the original learning, on Schaefer and
Plutchik's model (1966), retention scores are better than if the two
mood states are 180 degrees from each other (e.g., opposite). The
mood and memory congruence paradigm may prove to be extremely useful
in comprehending the synergistic and inhibiting properties of emotional
states on learning and memory. Furthermore, it could be used to
tease out the specific response structures which are the mediators of
this phenomenon.

Recent research by Laird, Wagener, Halal, and Szegda (1982)
suggests that a program for facial expression could be part of such a
mediating code in memory that might account for valence modulated
state-dependent memory effects. In these experiments subjects first
read either an "anger" story (about the killing of dolphins) or a
happy story (humour by Woody Allen). They were later instructed to
assume various positions of the facial muscles, corresponding to
their configuration in emotional expressions, that is, either a frowning
or smiling visage, and recall trials were conducted. On the basis of
an independent test, subjects were divided into the groups depending
on whether, in an ambiguous situation, their self-reports of affect
were more consistent with external emotional cues (labels on abstract
pictures) or their own facial expression at the time of viewing.

The external cue group failed to show any interaction between
manipulated facial expression at recall and story content. However,
the group that had been previously shown to be more congruent in
facial expression and affective report, showed significantly better
recall of the humourous story while smiling, and better recall of the
"anger" story while frowning.

In a subsequent experiment, Laird's group explored more subtle
relationships between memory content and facial expression. The
verbal material to be recalled was all negative in valence, but was
designed to instigate three different affects: fearful incidents;
incidents descriptive of annoyance or anger inducing contexts; and
finally, sad material, descriptive of loss and isolation. The material
was recalled while subjects' faces were positioned in standard sad,
fearful, or angry expressions. Again, only subjects previously shown
to be more face congruent than external cue congruent in their affective
judgements showed differential recall. This face congruent group
showed the expected significant interaction between facial expression
and the type of affective content they recalled, e.g., recall of fear
content, was best when the subjects were posed in the matching,
fearful facial expression.

The above materials are provocative and certainly encourage the thesis that facial expression is one of the mediators of mood congruent memory, at least within a subsample of expression sensitive subjects. However, other factors have also been implicated. For example, Riskind (1983) provides evidence that overall posture, "slumped" or upright, may facilitate recall of sad or happy material, respectively. It must also be noted that, in the Laird study, no effort was made to control for sympathetic arousal, which could well have been different for both contents and expression, and could have accounted for the subtle differences in negative valence. Indeed, as will be shown below, other experiments suggest that patterns of arousal may in themselves mediate otherwise unrelated memories. Thus, mood congruence effects could be facilitated either by valence responses such as facial expressions or by visceral arousal patterns, or perhaps by an interaction of these parameters.

IS AROUSAL A CUE FOR MEMORY RETRIEVAL?

Clark and associates (Clark, Milberg, & Ross, 1983) undertook a series of experiments designed to determine whether physiological arousal is the critical mediator of mood congruent memory effects. They proposed "that information about changes in autonomic arousal that accompany moods may be part of how a mood is stored in memory and that changes in arousal that reoccur with subsequent moods may be part of what primes affectively-toned material stored earlier".

In one test of the hypothesis, subjects first learned a list of unrelated phrases while experiencing enhanced arousal and a second list, while relaxing, in a normal state. Later, they were given a recall test for both lists under ostensible conditions of visual distraction. The arousal condition which preceded the learning of one list involved stepping up and down repeatedly on a cinder block (which produced palpable heart rate and blood pressure increases). The relaxation task which preceded the other study list simply required subjects to rest in a lounge chair (with no cardiovascular pressor effect). Orders of lists and arousal tasks were counterbalanced. All subjects were asked to recall lists. According to random subgroup assignment, recall was preceded by one of two conditions: arousal -- subjects viewed a sexually explicit film; relaxation -- subjects viewed a film about a chimpanzee learning sign language. The results were as predicted. When subjects were aroused by the sex film at recall, they best remembered the list which was learned after the cinderblock step test. Furthermore, when subjects recalled the lists after viewing the sign language film, memory was better for the phrases originally learned after relaxation than it was for the list previously learned after exercise arousal. This effect is interesting particularly because of the marked difference in the arousal task from learning to recall phases (e.g., step test and sexual stimulation). This change in induction procedure would appear to greatly reduce the possibility that commonalities in stimulus information could account for these data.

The above results are reminiscent of similar phenomena in the animal conditioning literature (see the review by Mineka, 1985). For example, Fonberg (1956) reported that dogs first trained to make leg lifts to avoid a shock or to make head shaking movements to airpuffs, showed a re-emergence of these specific behaviors during the subsequent administration of an increasingly difficult appetitive discrimination procedure (this latter paradigm is Pavlov's classical method of inducing experimental neurosis in animals). As with the research of Clark and associates (Clark et al., 1983), the mediating commonality

between the two different experimental procedures appears to be the arousal state which both paradigms elicit. Thus, a response learned in the first context was re-activated in the second. Both human and animal studies suggest that information about arousal responses is represented in memory and that such action information is a key mediating element in state dependent learning.

The broad impact of the above phenomena is indicated in a subsequent experiment by Clark's group in 1983. They evaluated the proposition that arousal might act to potentiate positive judgements in an opinion survey. Subjects first listened to a story under one of two "distracting" conditions: the high arousal cinder block step test, or a low arousal task -- subjects were seated, with the task of placing cardboard disks on a string. All subjects subsequently were tested for story recall, and then given either no feedback of results or positive feedback (e.g., "You really did very well! Your score is way above the norm..."). Another experimenter then administered the opinion survey concerning student views of their university. It was found that subjects who were both aroused at story learning, and received positive feedback of results, rated the university more favorable than did the other experimental groups. The authors "believe this occurred because information about arousal is part of what is stored when people store memories of positive experience. Consequently, extra arousal at the time of a positive mood may result in a greater number of positive memories coming to mind..." Presumably, similar results might be obtained for negative memories, although this was not tested. It is noteworthy that Bartlett and Santrock (1979) found that their state dependent memory effects were dramatically reduced when subjects received relaxation instructions prior to mood induction. Clark et al., 1983 suggest that the relaxed state inhibited the arousal component of mood induction and reduced the number of mediating cues available. Differences between the mediational properties of anxious and depressive moods may depend on different intersections of the variable of valence and arousal.

DOES EMOTIONAL EXCITATION TRANSFER FROM ONE EMOTIONAL STATE TO ANOTHER?

The research previously reviewed suggested that affect information (about arousal or about valence) may mediate otherwise unrelated memories over fairly long time spans. A related line of investigation also merits consideration in the context of anxiety studies: there is the possibility that the experience and expression of different emotions are themselves modified by close sequential evocation. In the first experiment considered from the Clark group, sexual arousal appeared to be linked to (i.e., contained overlapping information with) exercise arousal, as attested to by the obtained memory effects. Another phenomenon predictable from the hypothesis of a shared response structure in memory is that emotions with such information base commonalities will be synergistic or mutually augmenting in effect.

Zillmann (1980, 1983) has reported extensive research on this theme. His work suggests, firstly, that residual excitation from physical exercise can intensify subsequently induced anger and anger behavior (Zillmann & Bryant, 1974; Zillmann, Katcher, & Milavsky, 1972) or sexual excitement (Cantor, Zillmann, & Bryant, 1975). Thus, like Clark, Zillmann and colleagues specifically implicate a general arousal factor. Furthermore, between-emotion-transfer has been shown. Both Zillmann's group (Zillmann, Bryant, Comisky, & Medoff, 1981) and Donnerstein and Hallam (1978) report that prior sexual arousal can potentiate aggression. Such excitation transfer appears to be independent of hedonic tone. Thus, Mueller and Donnerstein

(1981) have demonstrated that sexual arousal can also facilitate positive social behavior, and Zillmann (1980, 1983) reports that both positive arousal and disgust at sexual material can prime the enjoyment of music, humor, or drama.

The above studies suggest that valence factors may be completely dominated by arousal information in a transfer situation. However, when specific response structures are examined more closely, this inference must be tempered. Thus, Hoon, Wincze and Hoon (1977) examined an opposite prediction, that is, Wolpe's (1958) theory that different emotional states (specifically, sexual arousal and anxiety) are reciprocally inhibiting rather than mutually facilitating. Female subjects were alternately exposed to three video tapes depicting, (1) anxiety content -- the aftermath of tragic automobile accidents, "including occupants' death cries"; (2) erotic content -- a nude couple engaged in foreplay; (3) neutral content -- a travelogue of Nova Scotia. Heart rate and vaginal blood flow were recorded continuously during stimulus presentation. When pre-exposed to the erotic content, subjects showed a more rapidly diminishing vaginal blood flow during the subsequent anxiety stimulus than was observed when the neutral stimulus was next in sequence. This appears to be in accord with reciprocal inhibition theory. However, when preceded by the anxiety stimulus, vaginal blood flow during a subsequent erotic tape was significantly greater than when the erotic stimulus followed the neutral travelogue. In this latter circumstance, the interaction between affective states was synergistic rather than mutually inhibiting.

The Hoon et al., (1977) heart rate data were not clearly interpretable, and, in any event, heart rate is, by itself, inadequate for the assessment of a general state of arousal or energy mobilization. Thus, as in many of these experiments, a general arousal factor may be inferred, but its actual response structure goes unspecified. It is worth adding, however, that response synergy between anxiety and sexual arousal has been observed in males by Barlow, Sakheim, and Beck (1983), who reported that fear of electric shock prompted increases in tumescence when these subjects were subsequently stimulated by erotic material. Further research is clearly needed to define those properties of emotional states which result in mutual augmentation or inhibition.

THE INFORMATION TAXONOMY OF EMOTIONAL MEMORY

Response Information

In developing an information processing model of emotion and emotional imagery, I suggested (Lang, 1977b, 1979, 1984) that the information structure of an emotion could be construed to contain response information. Furthermore, while many of its propositional details might enjoy semantic representation, response information was basically part of a deeper code, that was represented fundamentally as action programs for efferent expression.

The importance of response information in the memorial representation of an emotion cannot be minimized. To paraphrase Sperry's (1952) argument in an effort to reorient the thinking of his neurophysiological colleagues, the brain did not develop to its present complexity, teleologically directed towards a perceptual, contemplative organism. If purpose can be lent to phylogenetic history, the value of the brain and its nervous elaboration is to organize action and response. Aggregations of nervous tissue function increasingly throughout evolution to extend the flexibility and variation of behavior. Thus,

much more is to be learned by an emphasis on the consequent, efferent side of the S-R equation, than by considering perception in isolation or by viewing internal information transfers as ends in themselves. In this overview sense, we are very much in sympathy with Weimer's (1977) motor theory of mental processing, that is, that an important goal of psychology is to "successfully integrate acting and perceiving, something that has never before been done by either behaviorism or cognitive psychology", or even, "the mind is intrinsically a motor system" (p. 272). We are not suggesting a return to Watsonian "muscle memory" (1930), but we are advocating a view of memory transfers or cognitive processes as fundamentally parts of programs for efferent expression.

Zajonc and Markus (1984) have recently proposed a view of emotion very similar to ours in its emphasis on response components as key units in memory. We cheerfully join with them in commending this approach to the field: "We propose that since affect contains a significant motor component and since cognition, too, contains such a motor component..., a focus on the motor system as serving represent-ational and amnestic functions provides a particularly fruitful alternative for the investigation of the interaction of affect and cognition" (Zajonc & Markus, 1984).

These arguments for a response oriented view would be of little value unaccompanied by some coherent plan of attack on the nature of response structure in emotion. The first task is clearly to determine what response features are represented in associative memory (i.e., at the level of higher cortical functioning) that can provide the mediating code in such phenomena as mood dependent memory, excitation transfer, or in the pan-behavioral effects of generalized anxiety and depression.

I orginally proposed (Lang, 1977a) that response components from the three data systems in emotion must enjoy separate memorial repre-sentation -- otherwise, how could they show both unique patterns across situations, as well as so much desynchrony over time. However, it seems likely that this was not true in phylogenetic history, nor does it appear to be a phenomenon of early ontogenetic development. Primitively, the physiology of an emotional act was probably no more than the "real time" housekeeping requirements of the act itself. However, when organisms developed in complexity, such that resources could be mobilized prior to behavior, in anticipation of action, or even tried out in imagination, there evolved separate representation of the logistic physiology and of the act itself, because of the superior survival value conferred by better preparation for response.

Two response systems became three systems with the evolutionary development of natural language. It is reasonable to presume that natural language first came into being as a second control system for behavior (Pavlov, 1941), permitting more refined differentiation of acts and providing pointers during inhibition, such that delayed responses were not lost with the advent of new, distracting stimuli from the environment. At its inception language was tied inexorably to active behaviors. This association between action and language is evident in the ontogeny of human beings. Thus, in the famous Ivanov-Smolenski paradigm (1927, 1949), described by Luria (1957), children who have only recently acquired language can readily be trained to press on a ball with their hands, and to simultaneously say the word, "Press". However, these same young children (or older, brain damaged children) have great difficulty, despite much instruction and demon-stration, saying "Press" at the same moment that they release the

ball. At this early age, language and action are one. Later in the developmental sequence langauge becomes detached from overt acts. In the adult expressive language of emotion (e.g., I hate your guts!), act and language retain their intimate association. As professional actors report, the mere mouthing of such lines sometimes causes the viscera to follow. On the other hand, the pseudo-perceptual language of feelings can be expressed in contexts which include no other emotional responses (Lang, 1978). Affective judgements are represented semantically and are subject to associative modification quite independently from the behavior and physiology of an affective response.

It is more difficult to define the separate structures of physiological mobilization and overt behavioral acts. The distinction also begins in such phenomena as inhibition and anticipation. Subjects delaying a response show a distinctive psychophysiology, as do subjects waiting for a stimulus to occur. Their visceral and somatic patterns are in some ways like those of an overt action, and in other ways unique. Thus Chase, Graham, and Graham (1968) reported that heart rate increased, after a warning tone and before a subsequent "GO" signal, when the required action was a physically demanding series of leg lifts. However, when "GO" signalled only a rapid reaction time, involving a very small motor movement of the finger, heart rate decelerated over the preceding inter-stimulus interval, with the slowest beat at the onset of the response signal. Without dwelling on the microphysiology of baroreceptor action, vagal release or sympathetic innervation (e.g., see Obrist, 1981), this difference can be construed as a consequence of the subject being assigned a dual task: attention to a stimulus signal and preparation for action at the signal's occurrence. Graham and Clifton (1966), Obrist (1981), and Lang, Ohman, & Simons (1978) are among the many investigators who have found that an attentional set is accompanied by a decrease in heart rate and/or muscle tension. On the other hand, large muscle movement itself requires a different pattern of cardiovascular activity. When only minimal response is to be required, e.g., finger reaction time, the interstimulus interval reflects mainly the attentional task; however, when a gross muscle act is to be called up, the cardiovascular mobilization process dominates the interval. We have recently observed a similar phenomenon in classical conditioning, in which conflict between attention and preparation for action appears to be implicated, and in which the task which dominates the CS-UCS interval varies between individuals.

Using cluster analysis, Hodes, Cook & Lang (1985) found that a sample of classically conditioned normal subjects were readily divided into three distinct groups, depending on CS-UCS interval heart rate change during conditioned response acquisition: accelerators, moderate decelerators, and decelerators (See Figure 1: the conditioned stimuli used in this experiment were colored slides and the UCS was an aversive noise). These different heart rate responses indicate the subjects were engaged in different cognitive processes, and that only the accelerators clearly learned to respond emotionally to the CS. This hypothesis derives from contemporary views of learning (Rescorla, 1978) which suggest that classical aversive conditioning may involve the acquisition of two basic types of responses: (1) learning an association between stimuli, i.e., that two stimuli have a temporal relationship; and (2) learning to get ready for, perhaps to avoid, a signalled aversive event. Subjects tend to emphasize in their performance one or the other of these two responses. Psychophysiological research has shown that when the attentional task is dominant (i.e., stimulus association) heart rate deceleration characterized the CS-USC interval; emphasis on the aversive quality of the signalled event will prompt

ACCELERATORS

△ HEART RATE (bpm)

DECELERATORS

CS⁺ ●—●
CS⁻ ○—○

MODERATE
DECELERATORS

SECONDS
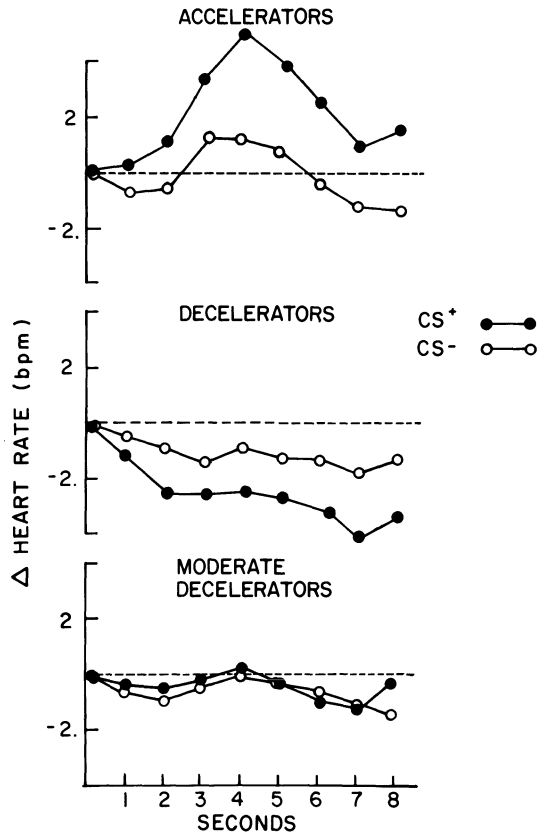
Figure 1. Results of the cluster analysis of heart rate responses
for 148 classically conditioned subjects. Data were taken during the
response acquisition phase of the experiment from the interval beginning
at conditioned stimulus onset (a slide photo) and ending at the onset
of the unconditioned stimulus (CS +, a noise). Three groups were
defined: Accelerators, Decelerators, and Moderate Decelerators (from
Hodes, Cook, & Lang, 1985).

mobilization for escape and heart rate acceleration (e.g., see Obrist,
1981). We believe that even if actual avoidance is gated out by
instructions, the preparatory physiology remains as an atavism of the
primitive "fight or flight" response.

     Some support for this general view was obtained from analysis of
the subjects' post-conditioning affective judgements of the slides
used in the Hodes et al. experiment. As can be seen in Figure 2, the
accelerators found the slides that had been followed by shock to be less
pleasant (reduced in valence), more arousing, and to generate loss of
a feeling of dominance or control (i.e., subjects showing predominant
CS-UCS acceleration were more afraid). In contrast, the pure decelerators
showed little change in their affective experience of the slides as a
function of conditioning. It is interesting to note that the accelerators
also differed significantly from the decelerators in electrodermal
extinction. That is, the accelerators were strongly orienting to the
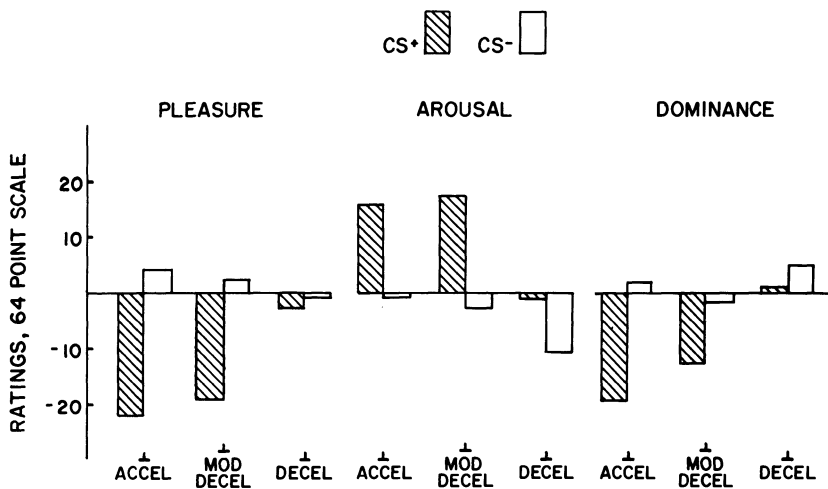
Figure 2. Change in affective ratings of colored slides from before to after classical conditioning. Some slides were followed by aversive noise (CS +) during conditioning and others (CS -) had no aversive sequelae. The rating method employed was the self-assessment manikin (SAM), in which subjects adjusted a computer display to provide scaled affective judgements. Three bipolar scales were rated: pleasure-displeasure, arousal-calm, dominance-submission (Lang, 1980). The SAM method is highly correlated with the semantic differential estimate of these dimensions, as used by Mehrabian and Russell (1974) (cited in Hodes et al., 1985).

shocked slides, long after the accelerators had ceased to make this distinction between shocked and unshocked pictures. Finally, the moderate decelerators seemed to show both a physiological middle ground, and less three-systems concordance. They are like the accelerators in their affective judgements, but their physiology, including the electrodermal data, is closer to the decelerators.

Thus, we see in the results of this conditioning study a model of the system discordance observed in many anxious patients. In this case it occurs because the same context prompts two actions (attention and avoidance) which have incompatible physiologies. Some subjects go one way, some the other, while a third group shows evidence of both types of processing, but in different response systems! One of the difficulties in the psychophysiological analysis of information processing (either at the level of classical conditioning or the imagery of fearful experiences) lies in this fact that several acts or preparations for action may be occurring simultaneously, and the researcher (or clinician) can be hard pressed to sort them out.

Stimulus and meaning information

It is clear that information about stimuli and their significance

is a fundamental part of the associative aggregate which constitutes an affective response disposition. Indeed, several theories of emotion emphasize stimulus attributes as the primitive organizing elements in understanding the varied gamut of emotional behavior. As previously suggested (Lang, 1970), these views fall into three basic categories: (1) the view that affective responses grew out of differential responding to stimulus intensity. For example, Schneirla (1959) holds that intense stimuli intrinsically prompt avoidance and states of high arousal, while weak stimuli occasion approach and low arousal. Sokolov (1963) (see also Lacey, 1967; Graham & Clifton, 1966) proposes an analogous view in the domain of attention. Based primarily on studies of auditory input, they view the attentive set as either orienting, receptivity to moderate environmental stimuli, or defense, a shutting down of stimulus analyzers in the face of high intensity. (2) Various theories of novelty have also been offered as explanations of emotion. Hebb's (1949) approach is basically a novelty theory, emphasizing, as we previously noted, the disruption of acts by incongruous or inappropriate stimuli. Kagan (1974) views the reactions of infants to abrupt, unexpected events as a precursor of adult emotional responsivity. From this perspective, the startle reflex could be taken as an ontogenetic or phylogenetic model of the emotional response. Stimuli with rapid onset (short rise time) occasion widespread somatic and visceral reactions, disrupt ongoing behaviors or cognitions, and prompt a transient loss of control (e.g., Ison & Hoffman, 1983). (3) Finally, there is the view held by ethologists, that certain complex stimuli are phylogenetically prepotent, or prepared for specific emotional response. The continuity of affective stimuli, for example within primates, is cited as support; both monkey and man appear to react with emotion to snakes, eye contact, strangers, physical touching, various facial expressions, looming stimuli, etc., with these S-R bonds appearing at consistent stages of ontogenetic development, having mimimal opportunity for previous learning. This approach to the origins of phobia has been taken by Seligman (1975), and pursued by Ohman (1979) in the conditioning laboratory. Berkowitz (1983) has similarly argued that "aversive stimulation evokes an instigation to aggression <u>independently of how the afflicted individual might interpret his or her sensations</u>" (Berkowitz, 1983, p. 1141).

It seems likely that some relationships between specific stimuli and perhaps equally specifiable response pattern are "firm wired" in the brain. It is also clear that a great variety of other stimuli find their way into an associative memory network through learning; and finally, that in human beings these S-R relationships, whatever their origin, are surrounded by a semantic penumbra of meaning. In theories which presume the substantive reality of the internal subjective life, meaning information has loomed large. Schachter (1964) held that emotions occurred when the essentially neutral input about physiological arousal was interpreted in the context of the person's appraisal of the meaning of the stimulus, e.g., "I'm aroused; there's a bear over there; bears eat people; therefore, I'm afraid and will behave fearfully". James' original view (1884, 1890) implied a similar sequence but, rather than external stimulus context, the pattern of physiological events was the focus of appraisal. Schachter's view has been cogently criticized by many theorists, some of whom still regard conscious feelings as a datum of emotion (e.g., Lang, 1970; Zajonc, 1980; Zillmann, 1983; Leventhal, 1980; and Berkowitz, 1983). The arguments against it include evidence that emotional responding often precedes evidence of appraisal, that arousal patterns are not unidimensional, and that emotional behavior may occur despite reports of conflicting appraisals (e.g., the patient "knows" that

beetles aren't dangerous, but still panics at the sight of one).

On the other hand, most students of human emotion believe meaning information to be important, and hold that is must be considered in any general theory of emotion. However, if we presume that an emotion is represented in memory as network of information, in which response, stimulus, and meaning information are all associatively related, many of the problems in appraisal theories appear to be bypassed. Conscious evaluation is simply not a necessary part of primary emotional processing in a network theory. We are no longer required to view the influence of visceral patterning only through the lens of conscious appraisal. I can do no better than quote Berkowitz (1983) on this point:

> The network analyses of emotions recently advanced by Lang (1979), Leventhal (1980) and Bower (1981) generally maintain that a particular emotional experience is a construction of expressive-motor reactions, ideas and memories (and not an inference made from one's own behavior and other situational cues). The activation of any one of these components presumably evokes the other parts of the network. Thus, where Schachter believed that thoughts affect emotions primarily by determining what label is applied to one's physical sensations, the present theorizing suggests that situationally evoked thoughts can have a priming effect. In essence, they can activate emotional expressive-motor reactions, ideas and memories that can either intensify or weaken the expressive-motor responses, ideas and recollections elicited by the aversive event. All this takes place, moreover, even if the suffering person does not label his or her sensations (Berkowitz, 1983, p. 1141).

AN INFORMATION PROCESSING VIEW OF FEAR AND ANXIETY

My own recent research on emotion has focused on the study of fear, particularly its pathological manifestation in phobia. The specificity of context and response in this disorder is great, and cognition and behavior remain relatively stable in the absence of any real nociceptive events. Thus, considering the transient character of most emotional states (the fact that affects must be, so to speak, caught on the fly, if indeed they are to be examined at all) phobia is a valuable, stable preparation for the study of pathological emotion. The goal of our work has been to define the data structure in long-term memory which forms the information base for phobic behavior, and to understand the conditions under which this information is or is not accessed and processed.

Our working theory presumes the emotion memory structure to contain three categories of information that we have just outlined: (1) information about prompting external stimuli and the context in which they occur; (2) information about responding in this context, including expressive facial or verbal behavior, overt acts of approach or avoidance, and the visceral and somatic events that support attention and action; and (3) information which elaborates or defines the meaning of the stimulus and response data.

We propose (Lang, 1977b, 1979, 1984) that emotion information is coded in memory in the form of propositions, and that these propositions are organized into associative networks of the general sort first described by Quillian (1966) for semantic knowledge and later adapted to accomodate other types of information (e.g., Anderson & Bower, 1974; Kieras, 1978). However, we view this information structure as

three dimensional: the foundation plane contains the efferent code and motor programs, which in turn project upward and define a fundamental stimulus code (the concrete, action imagery described, for example, by Paivio, 1971). The top plane is a true semantic network, which may include natural language representations of deeper level concepts, in addition to the logically derived meaning propositions. We presume that associative bonds extend between code levels as well as within planes.

The information network of an emotion is a sort of prototype or schema, which, when a critical number of propositions are accessed (through a match to environmental stimuli or internal association, or both), is processed as a unit. It is reasonable to assume as in Anderson's ACT theory (1976), that the prototype network is associated with a production system (Newell, 1973). The production system is both an information analysis program (i.e., the emotional image) and a program for response generation. Its activation is roughly equivalent to the cognitive work of emotional expression. Somato-visceral efferents and action are the output events occasioned by the production system processing of response information.

The network is the declarative knowledge of a phobia and the procedural knowledge (test programs, motor plans) is in the production system. Phobic expression is produced when a sufficient number of input concepts match those in the network. As a working hypothesis we currently presume that the probability of a phobic production is determined by the number of matching propositions, irrespective of their taxonomic category (stimulus, response, meaning) which are present in short term memory. Obviously, network activation is most likely when the phobic individual is confronted by the actual phobic object, which presumes a near perfect stimulus match. However, phobic emotions may also be elicited by degraded input -- pictures of the phobic object, verbal descriptions of context, and the like. It is important to remember that the information stored in memory is presumed to be conceptual and not iconic. A variety of media can be the vehicles of information input to the network and the production system. Furthermore, degraded stimulus matches may be as effective in prototype activation as exposure if other propositions (response or meaning), are simultaneously instigated. For example, reduced stimulus cues will still prompt a full phobic reaction in a subject who is otherwise aroused or in a context where fear stimuli are expected.

Phobic reactions are characterized by unusually coherent, stable emotion prototypes (high association value and high propositional interdependency within the network). Activation spreads with unusual rapidity through a phobic network, and total network activation can be occasioned by a limited number of concept matches. Fear production will often occur under what appear to be minimal, external instigating conditions. An example of a possible phobic network prototype is presented in Figure 3.

Imagery, Emotion and Action

Emotional imagery is widely remarked in dreams, in anticipation of affective events, as aesthetic experience, and as a vehicle of therapeutic change (e.g., Singer, 1974). From the perspective of phenomenological investigation, images are sensory events in the mind, pictures presented to the mind's eye, which may be transient and unclear or so vivid as to approach the status of hallucinations. It is a surprising fact that despite the compelling nature of this hypothesis, experimental psychology has uncovered almost no evidence

that the ability to report imagery or the vividness of individual
images relate to sensory memory (e.g., see Strosahl & Ascough, 1981).
For example, several investigators have failed to find that self-described
good imagers remember more accurately or in more detail previously
observed visual materials than do people who maintain they have few
if any images at all.

On the other hand, studies of the psychophysiological events in
imagery have shown positive relationships between responses observed
during perception and those observed while subjects image. The
probability of finding this relationship between verbal report and
physiological responses is increased when the subjects studied are
people who say they have vivid imagery. Thus, a number of researchers
have examined tasks that require highly stereotyped, cyclical eye
movements (such as visual tracking of an oscillating pendulum or
cathode ray tube display), and demonstrated that good imagers tend to
regenerate eye movements during recall of this task which have a
dominant frequency similar to that of the perceptual display (Brady &
Levitt, 1966; Brown, 1968; Deckert, 1964; Weerts, Cuthbert, Simons, &
Lang, in preparation). From the perspective presented here the above
phenomenon is attributable to the fact that subjects coded response
information into an associative memory network during the original
perception. Subsequent image processing involves the accessing of
the entire network (including both the stimulus and response informa-
tion). While the image is a cognitive production, processing of response
information initiates associated motor programs. In imagery, the
final action commands of these programs are gated out or inhibited.
However, there is always a certain amount of efferent leakage. Thus,
a sub-overt pattern of motor responses apes many of the original
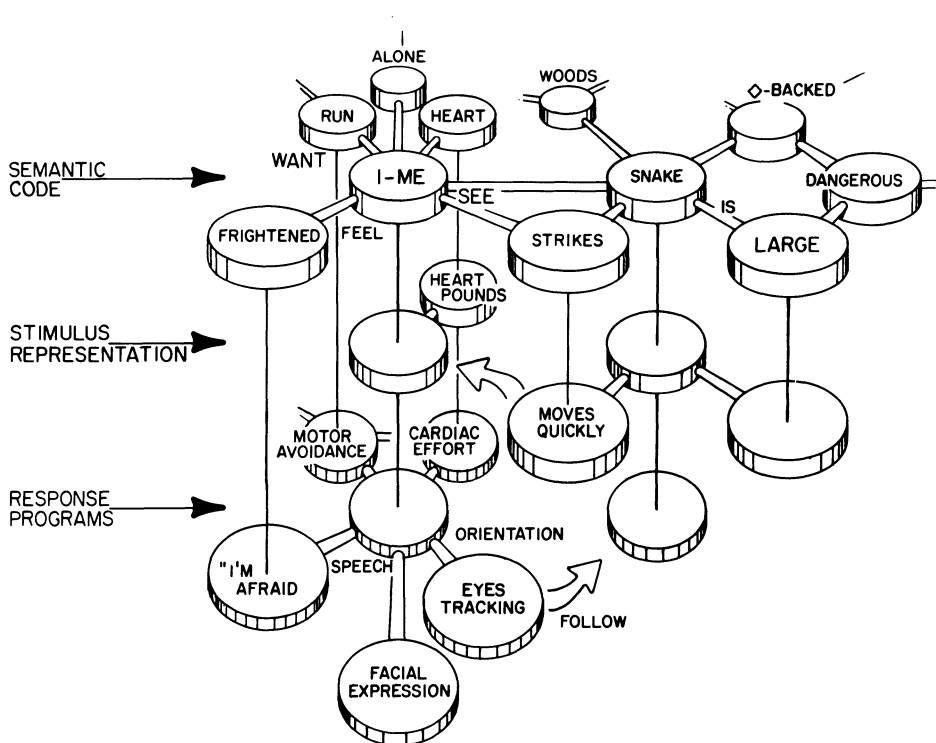
sense organ and postural adjustments of the specific stimulus orienting task. It is our view that this same motor regeneration process underlies emotional imagery. In this case, however, the efferent pattern is even more elaborate, representing the prototype of the emotion action set.

In a series of experiments we have explored the effects of inducing emotional imagery through textual descriptions of affect arousing scenes (Lang, Kozak, Miller, Levin, & McLean, 1980; Lang,

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Figure 3. The phobia prototype is a conceptual network of propositionally coded information, related by association, which has as functional output, a visceral and somato-motor program. The prototype may be activated as a unit by instructional, media, or objective sensory input, which contains information matching that in the network. The above phobia prototype could be rendered in descriptive, narrative English test as follows: "I am in a wooded area, when I see a large snake. It appears to be moving towards me. There's a diamond pattern on its back. This could be a dangerous snake. My eyes jump in my head, following a quick, striking movement. My heart starts racing. Snakes are unpredictable. 'I'm afraid!' I say it aloud, but nobody is there to hear me. I'm alone and very frightened. I want to run".

Propositions in the network are represented by the round nodes, containing the concept name, and the labeled stems that show the links between concepts. In the notation proposed by Kintsch (1974), the stems indicate predicators and the round nodes are their arguments e.g., (Is, Snake, Large). No attempt is made here to indicate all propositions or all possible connections. However, it is suggested that certain propositions are strongly bonded to others, and may thus be keys to the broad recruitment of the network, with its action subprograms. For example, as a basic stimulus representation (Moves, Snake, Quickly) may have a primitive, high-probability connection to (Pounds, I-Me, Heart), which in turn unlocks the other fear-response propositions, prompting rapid prototype activation.

The model is presented here in Tinkertoy form to illustrate three basic levels in the brain code. The semantic code is the high-level language which includes three broad classes of information -- stimulus, meaning, and response propositions. Stimulus information may also enjoy a more fundamental representation as primary, action defined, input concepts. The base representation of the entire network is the efferent code that organizes responding. Concepts may or may not be represented across levels. Network activation can theoretically begin with any set of concepts and move within or between structural levels. Similarly, mediation between different emotion networks (as in state-dependent learning) could be carried by concepts of any type -- stimulus, response, meaning -- or at any of the three levels of the structure.

The view taken here is that the deep structure of the prototype is an action set. Although the prototype can be described in a natural language, and the semantic level may be processed with some degree of independence from the rest of the memory architecture, an affective network is functionally organized to generate efferent output. Thus, the processing of conceptual emotional information (in imago or in vivo) always involves some degree of visceral and motor outflow (from Lang, 1985).

Levin, Miller, & Kozak, 1983; Miller, Levin, Kozak, Cook, McLean, &
Lang, in preparation). On the assumption that the test or image
script can be a stimulus for prototype concept matches, we have
varied the propositional content of these materials. One manipulation
involves presenting an auditory description of an encounter with the
phobic object, and including or excluding information about the
responses which occur in that context: "Your heart is pounding as
you began to speak". "Your muscles tense; you press backward".
Another procedure utilizes training programs which encourage subjects
to focus on either stimulus or response information in their imagery.
The results of these experiments have been very clear; the inclusion
of a response emphasis encourages response processing, resulting in a
psychophysiological pattern of efferent activity during imagery which
duplicates in topography (albeit at lower amplitude) the affective
responses observed with actual stimulus confrontation. Phobic subjects
imaging phobic scenes show significant increases in heart rate, skin
conductance, and respiratory rhythm, in pattern similar to what they
actually do when faced with the real phobic context. In general, we
have found that subjects are most likely to develop an affective
response to imagery instructions: (1) when response processing is
encouraged (as described above); (2) when self-reported good imagers
are used as subjects; and (3) particularly when networks of high
associative coherence are tapped (as with phobics). Contrary to the
emphasis on stimulus information prompted by subjective theory,
emotional imagery has been found to be much more of a response process,
and in this it is consistent both with the notion that affect is
basically an action set and that memory representations of
psychophysiological events figure importantly in cognition.

Matching Concepts in Memory

     As mentioned previously, we are exploring the hypothesis that
the number of input matches to network concepts determines the probability
of an affective production. This view predicts that improved stimulus
matches should be as effective as the response matches encouraged in
the above studies of emotional text processing, in evoking the
psychophysiology of affect. To test this assumption McLean (1981)
presented subjects with realistic emotional playlettes that they were
to use as a prompt to an imagery experience. The scenes included,
for example, an actor playing a clumsy laboratory attendant, who
removed a live, ostensibly poisonous snake from a cage a few feet
from the subject, and then struggled, almost unsuccessfully, to
reconfine it. Under these circumstances the conceptual match of
stimulus information to affective view prototype is nearly perfect.Even
though the subjects were clearly pre-instructed that all aspects
of the scenario were staged and not real (the snake was harmless and
the actor skilled), we nevertheless observed the same context specific
physiology of emotion that we had previously noted with response
concept matching in our studies of an emotion inducing test. We have
not yet attempted to deceive our subjects, but we presume that consonant
meaning information would have a further enhancing effect. The data
are at this point consistent with the view that any concept match
increases the probability of network activation.

     In addition to our basic research in emotional imagery, we are
also studying the imagery of anxious and phobic patients in the
context of clinical treatment. The information processing view has
prompted us to develop the concept of functional imagery. A functional
image is held to be one that can mediate a response change in the
target reality context described by the image. Our preliminary
clinical work suggests that such functional imagery occurs (regardless

of subjects' verbal reports of vividness or arousal) only if the relevant response information in the network is processed.

It is clear that subjects can respond to an image script with alternative processing modes (see Vrana, Cuthbert & Lang, in press). A subject may be instructed to simply report what events the text describes, or even just to comment on its lexical properties, and unless he is severely phobic, no affective response will be observed. Imagery implies, in our view, a different processing mode, one which includes the regeneration of response code (i.e., total network production). We already have data that the patients who profit from imagery therapies (that is, become less anxious or frightened after treatment) are those patients who can be shown to generate functional
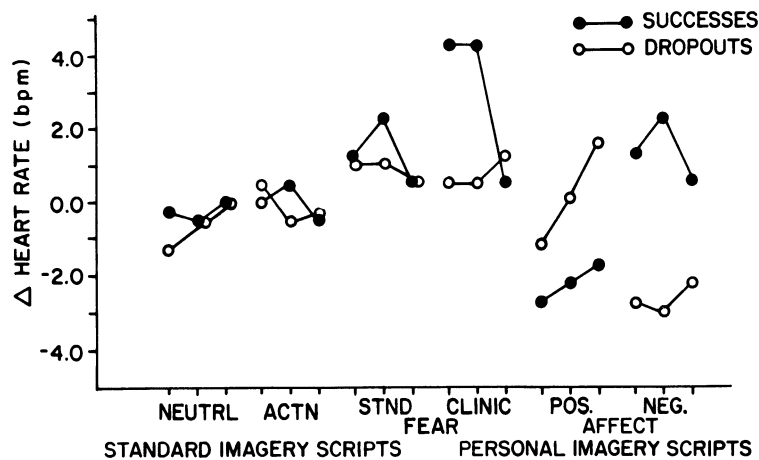
Figure 4. A comparison of pretrement heart rate change scores for patients who successfully completed therapy (N=19) and those who discontinued therapy prior to successful outcome (N=5). These clients were seen at the Psychology Department Clinic, University of Wisconsin. Patients were provided scripts and instructed to vividly imagine six scene types: Neutral situations (e.g., relaxing at home in an easy chair); action scenes that were nonaffective but included vigorous activity (e.g., bike riding); standard fear scenes (e.g., locked in a sauna); scripts prepared with the patients collaboration describing the clinical fear context; two other personal scripts, one referring to an outstanding positive life experience (pos.) and the other an unpleasant, but nonclinical fear context (neg.). The heart rate data are change scores from pre-scene rest. Three data points are shown for each scene: the 30-second period during which the scripts were orally presented; the subsequent 30 seconds of imagery; and a 30-second recovery time, which began immediately after the patient was told to stop imagining the scene. In the average patient, neutral material prompted little change in heart rate. Action and negative affects occasioned acceleration, while patients tended to decelerate during positive affect scenes. These latter effects were dramatically larger in patients who responded positively to behavior therapy intervention (e.g., flooding, desensitization, coaching and modeling) (from Levin et al., 1982).

images, that is, appropriate affective response topographies are observed during image induction in therapy (Lang, Melamed, & Hart, 1970). Furthermore, our recent results suggest that it is specifically fear patients who regenerate response code during a pre-therapy assessment who have the best prognosis for treatment (Levin, Cook, & Lang, 1982; see Figure 4). It is not yet clear how the imagery experience comes to modify emotional behavior. However, the fact that regeneration and at least partial processing of response code are critical elements, suggests that subjects could be accomplishing "off line" processes of extinction or reconditioning which normally only occur in objective settings of response evocation. In any event, these results show that imagery procedures derived from the present model may be extremely useful both in distinguishing among different pathological states of anxiety and also in providing a firmer basis for estimates of prognosis and treatment selection.

SUMMARY AND CONCLUSIONS

The view presented here differs from most previous work on fear/anxiety in three major ways; first, affective states in man are seen as having evolved from action dispositions. For example, anxiety is made up of avoidance responses, vigilance, distress calls, and the like. Its purest form may be in phobia, which is essentially a context-specific avoidance program. Secondly, emotion is not seen as independent from or in opposition to cognition. Rather, emotional behavior is viewed as the output of cognitive processes which include such operations as parsing stimuli, memory retrieval, conceptual matching, etc. Third, emotions are not held to be dependent on mental events analogous to conscious, rational thinking (e.g., appraisal). Instead, an information processing perspective is assumed. Emotional information (stimulus, response, and meaning) is conceptual. It can be considered part of the brain's associative mass, in which concepts are organized into networks of varying coherence, based on richness of interconnection and associative strength. Emotional processing is essentially automatic, based on input matching, spread of activation through the network, and the engagement of associated response productions.

The data of anxiety are verbal expressions and judgments, overt motor responses, and visceral events. The covariation among these response systems varies widely within and between subjects and among emotional states (Lang, 1968, 1985). For example, the response productions of phobics are relatively reliable in pattern and bound closely to a specific context. However, other anxious states (e.g., Generalized Anxiety Disorder, GAD) result from less cohering information networks. Furthermore, the information base for an anxiety disposition may include separate representations in memory of the component response elements. In this case, it is possible that sub-units can be activated and associated with new material, and thus emerge in new contexts, while other information in the network remains below the threshold of activation.

In considering the literature on mood-congruent and state-dependent memory, we suggested that the above mechanism might account for the inconsistent results observed in this field. When moods are induced in the laboratory, investigators seldom check their method by measuring other than verbal report on state changes. If as we suspect, visceral and sub-overt action dispositions are the significant mediators, then we have no assurance that the appropriate, common response concepts

have been activated in these experiments both at learning and recall. When experimenters (e.g., Clark and associates (1983) have more specifically attended to the psychophysiology of affect, either by directly manipulating the physiology arousal induction through exercise) or by selecting subjects who are specifically sensitive to response cues (e.g., Laird et al., 1982), more robust findings appear to be forthcoming.

The above findings suggest that physiological states can mediate language responses, such that in the anxiety disorders, reports of distress or inappropriate verbal behavior may generalize across contexts in ways not predictable from an analysis of verbal behavior alone. Furthermore, similarities in the response structure of different affective and nonaffective arousal states permits easy associative transfer. Thus, anxiety could be induced or augmented by a functionally independent response program. This phenomenon appears to be automatic and even independent of hedonic tone. Finally, the research presented here on imagery shows clearly that physiological patterns of fear and anxiety can be evoked independent of external, objective fear stimuli. Thus, a variety of mechanisms exist for broad generalization of inappropriate and potentially debilitating anxiety responses (e.g., dysfunctional arousal, verbal intrusions, repetitive thoughts, failures of attention, incompatible motor behaviors).

Viewed in a more positive light, the data also indicate that when response events are evoked through cognitive processes (as in imagery), emotional processing can occur, such that a change (reduction) in anxious behavior is readily apparent in subsequent 'real' exposure to anxiety stimuli. It is suggested here that the same conceptual network is evoked in both imagery and objective perception. Thus, modification of its structure through habituation, adding associates, or weakening links between concepts, can occur in either situation. Furthermore, this process of reorganization affects response productions as well as semantic associations. It is not farfetched to suggest that this may be a fundamental principle of psychotherapeutic change.

The proposed model is demonstrably heuristic. Our future research on anxiety will explore several predictions and questions only touched on in this paper. They include: does network coherence vary reliably with anxiety diagnosis? Are anxiety disorders (simple phobia, agoraphobia, GAD) different in their response to state-dependency/mood-congruency effects? Is imagery ability related to the etiology of phobia and anxiety? Can imagery ability be improved and would this increase therapeutic effects? In consideration of the progress so far achieved, we are optimistic that answers to these questions will significantly expand understanding of anxiety and the anxiety disorders.

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A PSYCHOLOGICAL MODEL OF PANIC

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As late as five years ago the topic of this chapter would have
been a psychological model of anxiety. However, research has now
progressed to the point where it is very difficult to talk of a
psychological model of anxiety as if anxiety were a unitary phenomenon.
Evidence is increasing that a large proportion of patients presenting
with anxiety symptoms suffer from panic attacks. These panic attacks
may represent a qualitatively different type of anxiety than the more
generalized anxiety with which we are all familiar. And yet, we know
very little about the phenomenon of panic.

WHAT IS PANIC?

Much of the increased attention to the concept of panic is due
to the description of panic in DSM-III where it is defined as "
... the sudden onset of intense apprehension, fear or terror, often
associated with feelings of impending doom", (American Psychiatric
Association, 1980, p. 230). "Sudden onset" has come to mean 10 to 15
minutes during which panic will reach a peak. Another very important
dimension of panic·to be considered in more detail below is whether
the patient reports identifiable antecedents or "cues" to the panic
attack. For example, a patient with a simple phobia of small animals
may panic when in the presence of the small animal. But another
group of patients reports unpredictable or "spontaneous" panic attacks
in which they cannot identify specific antecedents.

Recently, we recorded detailed physiological changes preceding and
accompanying "spontaneous" panic attacks in two patients who happened
to be undergoing physiological assessments at the time (Cohen, Barlow,
& Blanchard, 1985). These panic attacks were unexpected by the patients
and certainly unexpected by us. Interestingly, both attacks occurred
while the patients were engaging in relaxation, one during a psychophysio-
logical assessment, and the other during a biofeedback assisted relaxation
training session. Since these serendipitous data provide part of the
answer to the question "what is panic?" the two patients and their data
will be presented in some detail. Subject 1 was a 33 year old female
with a diagnosis of Generalized Anxiety Disorder. She presented to
the Phobia and Anxiety Disorders Clinic of the Center for Stress and
Anxiety Disorders with primary complaints of chronic tension,
irritability, palpitations, faintness, and an inability to relax.

Prior to her seeking treatment at our clinic she had been treated by her family physician for Irritable Bowel Syndrome. She reported experiencing occasional panic attacks, but not of sufficient frequency to meet the diagnostic criteria for Panic Disorder.

The panic attack presented in this report occurred while the subject was undergoing a pre-treatment psychophysiological assessment. After a ten minute period of adaptation to the laboratory, a four minute baseline was recorded. The subject was then instructed to relax her whole body, and then her face and forehead. The panic attack occurred during this relaxation period. Following the attack, after a few minutes of reassurance by the experimenter, she was able to resume the assessment. In later phases of the assessment she was required to perform a series of stressor tasks, including mental arithmetic, stressful imagery, and cold pressor test, all of which she completed with little difficulty. At the end of the session, when asked to rate her anxiety levels during each phase of the assessment, she reported having felt the most relaxed during the relaxation phase, just prior to her panic attack. She also reported, however, slight nausea associated with the relaxation.

Subject 2 was a 34 year old female who was being treated for Panic Disorder. She had reported experiencing many of her panic attacks in stressful situations. On occasion, however, they would occur at times when she felt carefree and relaxed, although usually shortly following a period of increased stress. For example, she recalled a recent panic attack which occurred in a restaurant. She had been very tense and pressured, attempting to dress her children and see to it that her family arrived at the restaurant in time for their reservation. She was fearful that her increased tension would precipitate an attack in the restaurant. But after finally settling down and ordering her meal she remembered thinking "everything is alright now, I made it." As she began to relax and enjoy her meal, she had an intense panic attack.

The panic attack presented in this report occurred during the subject's third biofeedback treatment session. Prior to beginning biofeedback training she had practised progressive relaxation for several weeks. She had made good progress, although on several occasions she experienced slight dizziness during her practice. In this particular session, a four minute baseline was recorded, after which she was instructed to begin relaxation. The psychophysiological recording procedure used in this report has been described previously by Barlow, Cohen et al. (1984).

Physiological changes for both subjects from the start of the recording session through the onset and peak of the panic attacks are presented. In both cases physiological recording ceased at the time the experimenter entered the room to comfort the subjects.

Figures 1 and 2 illustrate the changes which occurred during baseline relaxation, and panic for each subject respectively. Since the panics occurred during relaxation, and thus do not represent a separate phase of the procedure, their onset is indicated by the broken line on the figures.

The figures show remarkably similar changes for both subjects. During the relaxation phase, up to the onset of the panic attacks, decreases in heart rate and frontalis EMG were shown, indicating that the subjects did achieve some degree of relaxation. Subject 1 showed a mean heart rate decrease of 4 beats-per-minute (BPM) and mean EMG decrease of 2.4 uv. Heart rate decreases were followed by abrupt
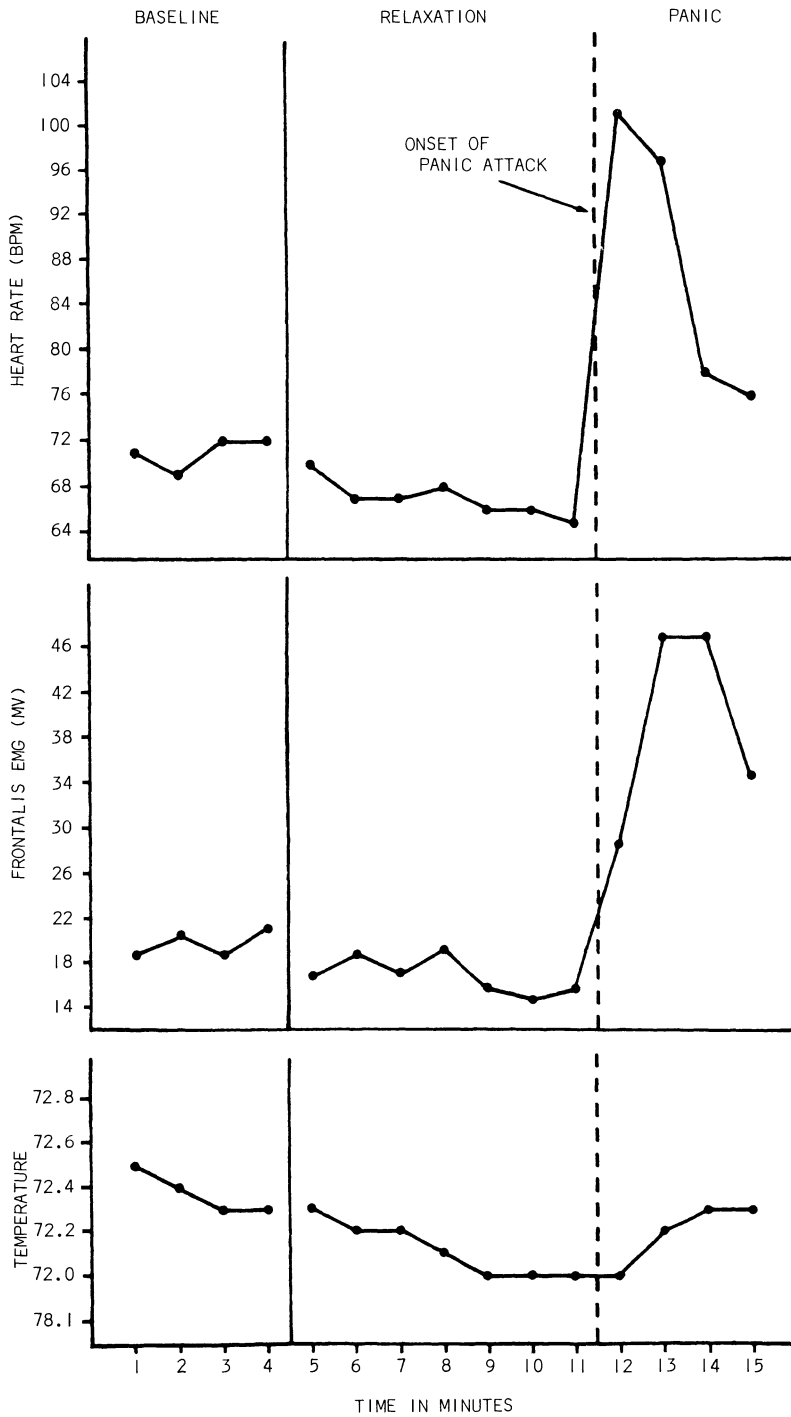
Figure 1. Heart rate, average integrated EMG, and hand surface temperature for Subject 1. From: Cohen et al., 1985. The psychophysiology of relaxation-associated panic attacks. Journal of Abnormal Psychology, 94, 96-101.

SUBJECT 2
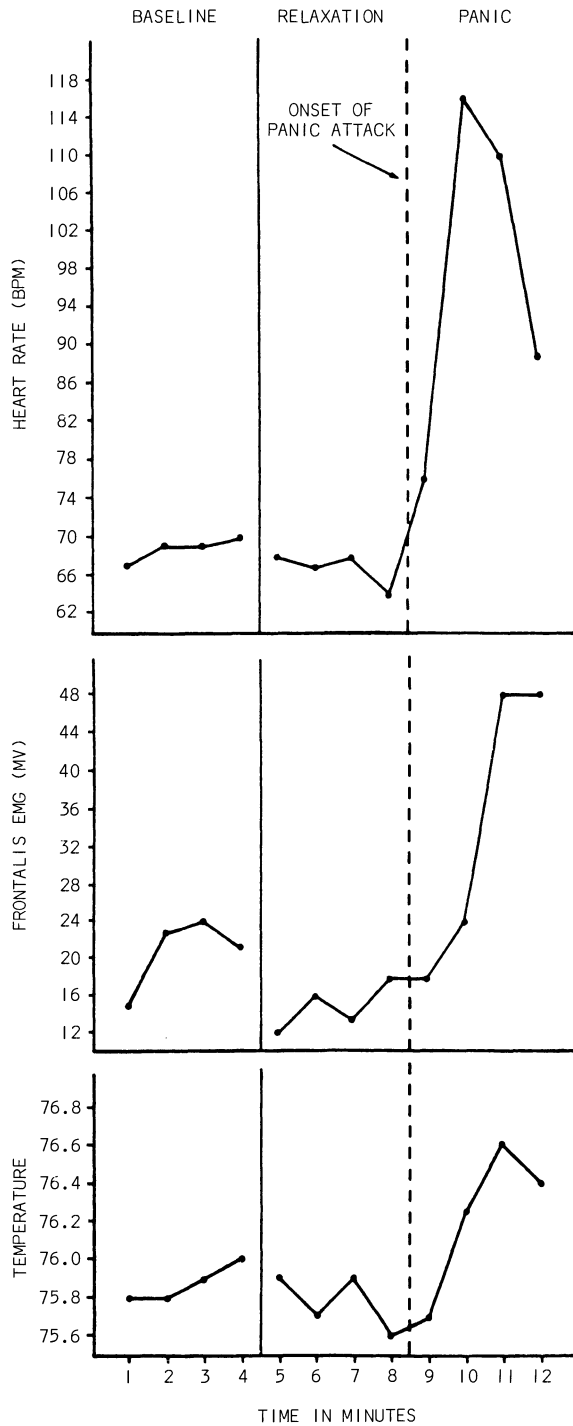
Figure 2. Heart rate, average integrated EMG, and hand surface temperature for Subject 2. From: Cohen et al., 1985. The psychophysiology of relaxation-associated attacks. Journal of Abnormal Psychology, 94, 96-101.

increases during the panic, reaching a level of tachycardia within one minute for Subject 1, and two minutes for Subject 2. EMG measures during the panics showed increases synchronous with heart rate for both subjects. Hand surface temperature showed minimal changes, but the pattern was consistent for both subjects,i.e., decreases during relaxation were followed by increases during panics.

There is growing evidence that panic on the one hand, and generalized anxiety or anticipatory anxiety on the other hand, may be qualitatively different. Initial credit for this is due to Klein (1981) and his colleagues who suggested in their early work the differential response to pharmacological treatment of panic versus anticipatory anxiety with the agoraphobia syndrome (Zitrin, 1981; Zitrin, Klein, & Woerner, 1980; Zitrin, Klein,Woerner, & Ross, 1983). In addition, the preliminary observation that lactate infusion produces panic only in those with panic disorders, and not normals, lends further support to the importance of the phenomenon of panic (Klein, 1981).

In a preliminary experiment evaluating the effects of psychosocial treatments on intense anxiety, which included but was not limited to panic episodes, we also found that a combination of relaxation and cognitive restructuring procedures affected intense anxiety but not background anxiety, lending further support to Klein's pharmacological dissection work (Waddell, Barlow, & O'Brien, 1984). In this experiment, three panic disordered patients were treated with cognitive therapy followed by a combined cognitive therapy and relaxation training phase in a multiple baseline across subjects design. These patients recorded both number and duration of episodes of "heightened or intense" anxiety, defined as "4" or higher on a 0-8 rating scale, using detailed self-monitoring forms devised for this purpose. In addition, they recorded ratings of background anxiety, not necessarily associated with periods of intense anxiety, four times a day. Data are presented in Figures 3 and 4. Despite some missing data, these preliminary results indicate that all subjects demonstrated a marked decrease in the number and duration of episodes of heightened or intense anxiety, an improvement which was maintained at a 3-month follow-up (see Figure 3). However, Subjects 1 and 3 evidenced an increase in background anxiety simultaneous with this decrease in intense anxiety during the combined treatment phase. Subject 2, on the other hand, also demonstrated decreases in background anxiety (see Figure 4). These data suggest that panic and generalized anxiety may be qualitatively different, although it is also possible that they are simply quantitatively different but respond differentially to certain treatments.

There is also preliminary evidence of different developmental antecedents of panic and generalized anxiety (Raskin, Peeke, Dickman, & Pinkster, 1982), and one cannot ignore the fact that patients report these types of anxiety to be qualitatively different. On the other hand, some investigators have found panic and generalized anxiety to appear very much alike on the whole (Hoehn-Saric, 1981), while others suppose that panic and generalized anxiety disorder are at different points on a dimension of severity (see Barlow & Maser, in press).

In any case, more recent research has strengthened the assertion only suggested by the treatment studies described above that Panic Disorder (PD) and Generalized Anxiety Disorder (GAD) are qualitatively different. For example, panic seems to aggregate differently in families than other types of anxiety (Harris, Noyes, Crowe, & Chaundhry, 1983; Crowe, Noyes, Pauls, & Slymen, 1983). Torgersen (1983), has also demonstrated in a preliminary way potentially different genetic
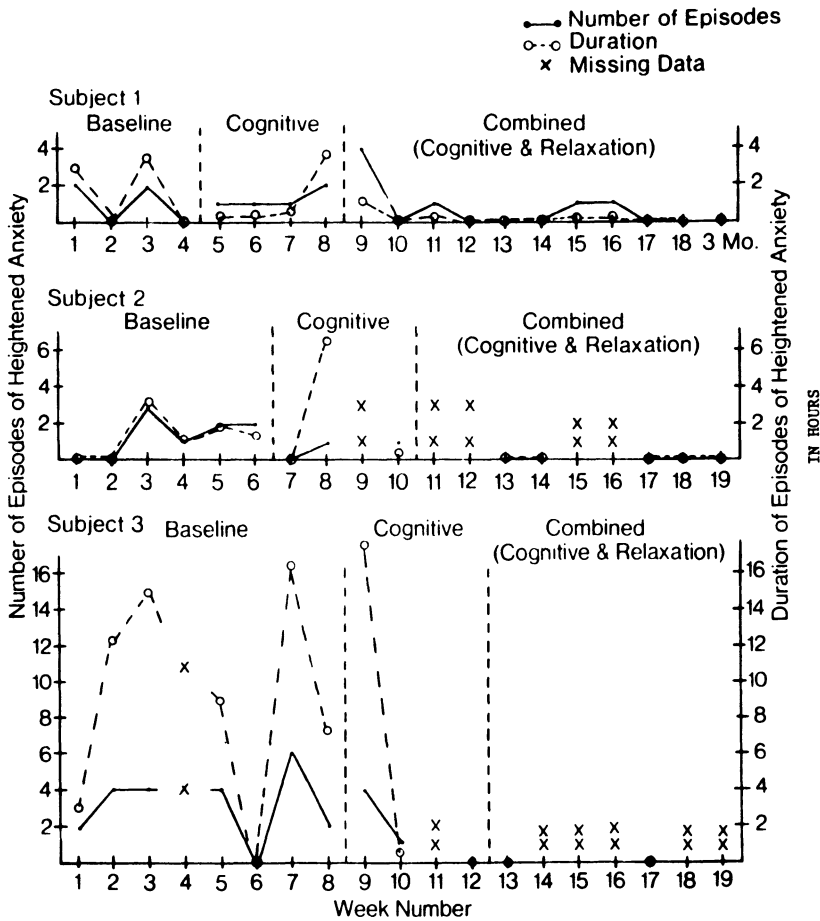
Figure 3. Total number of episodes of heightened anxiety per week and duration of episodes. From: Waddell et al.,1984. A preliminary investigation of cognitive and relaxation treatment of panic disorder: Effects on intense anxiety vs. background anxiety. Behavior Research and Therapy, 22, 393-402.
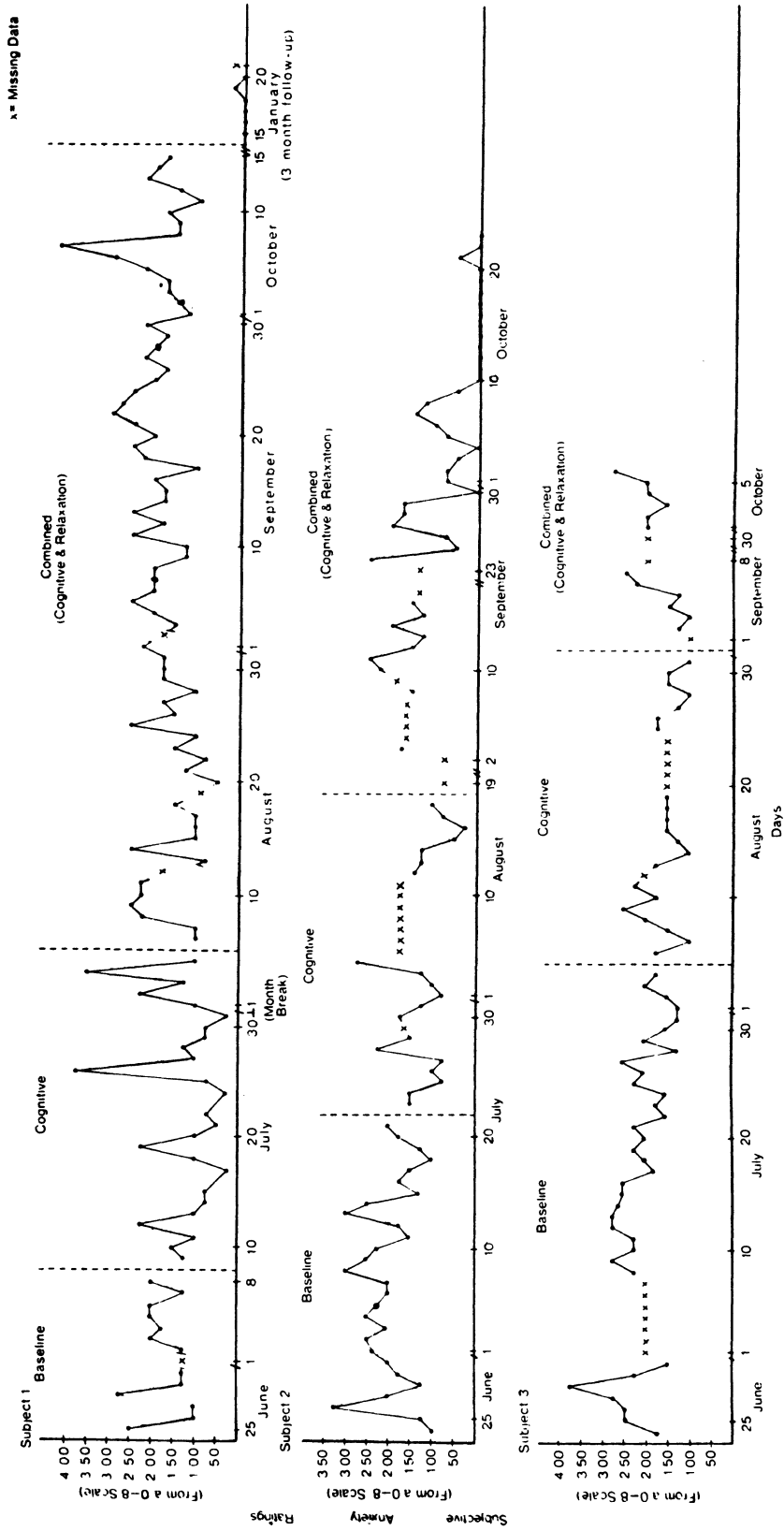
Figure 4. Average of daily time-sampled ratings of anxiety. (Based on a 0-8 anxiety scale. Ratings were recorded four times daily. X=missing data). From: Waddell, M.T. et al., 1984. A preliminary investigation of cognitive and relaxation treatment of panic disorder: Effects on intense versus anxiety vs. background anxiety. Behaviour Research and Therapy, 22, 393-402.

contributions to PD versus GAD. Recently, we have demonstrated
genetic contributions to PD versus GAD. Recently, we have demonstrated
that patients with PD evidence a stronger somatic component to their
anxiety than do patients with GAD on both detailed physiological
assessment as well as questionnaire measures of anxiety (Barlow,
Cohen et al., 1984). For example, Figure 5 presents pre-treatment
physiological assessment data for both PD and GAD patients. EMG data
were recorded on a polygraph during both relaxation as well as stressor
tasks. During relaxation tasks subjects were asked to relax their
whole body, and then to relax their face and forehead specifically.
Stressor tasks included mental arithmetic, imagery or personally
stressful scenes and a cold pressor test. This procedure has been
described in detail by Andrasik, Blanchard, Arena, Saunders, and
Barron (1982). As one can see in Figure 5, subjects with PD revealed
a significantly stronger somatic component to their anxiety than
subjects with GAD despite the fact that pre-test clinical ratings of
severity did not differ. This was reflected in a consistently higher
pattern of EMG scores during the physiological assessment. PD subjects
were also higher at every assessment point on mean heart rate, but
this did not reach statistical significance. Subjects with PD also
scored significantly higher on the somatic scale of the Cognitive and
Somatic Anxiety Questionnaire (CSAQ; Schwartz, Davidson, & Coleman,
1978) (PD mean = 23.9, GAD mean = 15.50; t = 2.91, p < .02). Scores
on the cognitive scale on the other hand, did not differ, although
the mean score was slightly higher for GAD subjects (PD mean = 17.55;
GAD mean = 18.83).

For these and other reasons the concept of panic assumes considerably
more importance in the proposed revisions to DSM-III (Spitzer & Williams,
1983; 1986). In these revisions the concept of agoraphobia recedes into
the background with panic becoming the primary focus. Avoidance behavior,
characteristic of agoraphobia, is seen as secondary to the experience
of panic.

Finally, one of the most interesting lines of evidence revolves
around research on lactate induced panics. Specifically there is evidence
that the incidence of panic attacks occurring during lactate infusion
is much higher in patients prone to panic attacks than in normal controls
(Pitts & McClure, 1967; Boon, Harrison, & Rees, 1971; Fink, Taylor, &
Volavka, 1971; Kelly, Mitchell-Heggs, & Sherman, 1971; Appleby,
Klein, Sachar, & Levitt, 1981; Rifkin, Klein, Dillon, & Levitt, 1981;
Liebowitz et al., 1984; Rainey et al., 1984; Rainey, Pohl et al.,
1984). Experimentation is also continuing with infusion of alternative
substances such as isoproterenol (Rainey et al., 1984b), as well as
the process of hyperventilation (Thyer, Papsdorf, & Wright, 1984;
Griez & Van Den Hout, 1983). Both of these procedures may also
produce panic in patients disposed to having panic attacks.

Are Panic Attacks Limited to Panic Disorder or Agoraphobia with Panic?

Recently we have examined the prevalence and phenomenology of panic
across various diagnostic categories, and we have completed a preliminary
analysis with 108 of our initial patients (Barlow et al., 1985). To
accomplish this, all individuals inquiring about treatment at the clinic
were initially screened over the telephone by one of our professional
staff. This brief interview was designed to screen out grossly
inappropriate cases such as individuals with current alcoholism, or
clear evidence of psychotic disorders.

All patients were then interviewed on two separate occasions by
two of the professional staff using a structured interview schedule,
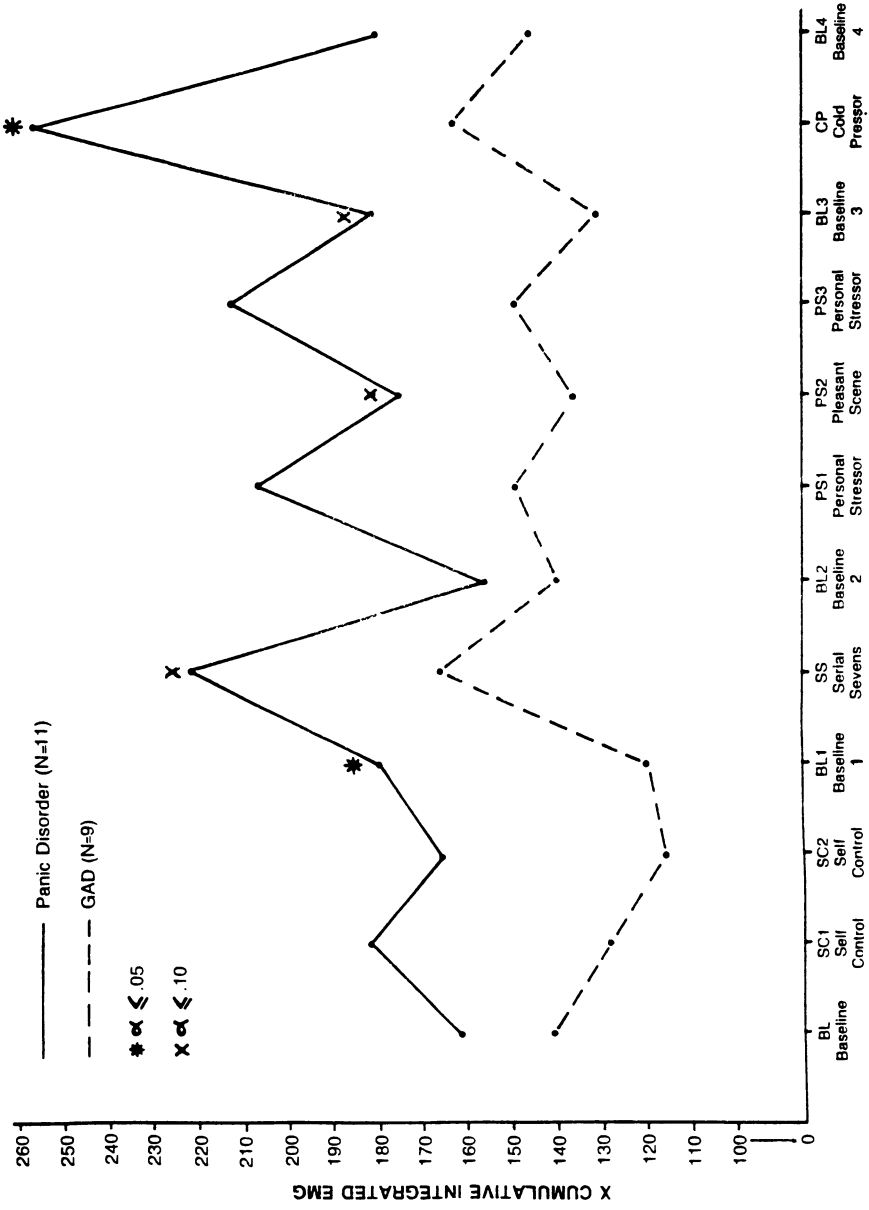
Figure 5. Pretreatment physiological assessment for Panic Disorder and Generalized Anxiety Disorder: EMG values. From: Barlow, Cohen et al., 1984. Panic and generalized anxiety disorders: Nature and treatment. Behavior Therapy, 15, 431-449.

the Anxiety Disorders Interview Schedule (ADIS). We have previously
reported on the reliability of differential diagnoses within the
anxiety disorders obtained with this instrument for the first 60
patients (DiNardo, O'Brien, Barlow, Waddell, & Blanchard, 1983) as
well as the 108 patients reported here (Barlow, 1983; 1985). The two
interviews were conducted within three weeks for 60% of the patients,
but up to 4 to 9 weeks intervened in a few cases (see Di Nardo et
al., 1983 for procedural details). All patients gave written informed
consent for these assessments.

During each interview, patients were asked about the occurrence
of any panic attacks and about their onset and frequency. Specifically,
each patient was asked, "Have you had times when you felt a sudden
rush of intense fear or anxiety or feelings of impending doom?". If
the patient admitted to having had a panic attack, he or she was then
asked about each of the 12 symptoms of panic attacks listed in DSM-III
(p. 231-231), including presence or absence and degree of intensity
of each symptom using their typical or most recent attack as a point
of reference. Each symptom was rated by the interviewer on a five-point
scale of severity (from 0 - absent to 4 - very severe). "Spontaneity"
of the panic attack was ascertained by careful questionning regarding
the circumstances surrounding the panic or whether they occurred
unpredictably. Following the two interviews staff arrived at a
consensus diagnosis.

Table 1 lists the frequencies of primary diagnoses represented
by the sample along with the mean age and sex distribution for each
diagnostic category. Also included in this table are the percentages
of each subgroup who reported having had a panic attack and the
percentage who met the DSM-III criteria for Panic Disorder. Specifically,
reporting that they had a panic attack means that the patient answered
yes to the question "Have you ever had times when you felt a sudden
rush of intense fear or anxiety or feelings of impending doom?".
"Diagnosis met except for panic frequency" means that the patient
reported panic and also reported at least four of the twelve symptoms
listed as associated with panic in DSM-III (see Table 2). "Diagnosis
on DSM-III panic criteria" means that patients reported panic, met
the four symptom criteria, and reported at least 3 panic attacks in a
3 week period.

It should be noted that six patients eventually received a consensus
diagnosis of Major Depressive Disorder. We recognize that these patients
are not in any way a random sample of major depression since they were
referred to our clinic for anxiety symptoms specifically.
Nevertheless, their data are included for comparison purposes.

PHENOMENOLOGY OF PANIC ATTACKS

If panics do not differ in frequency across diagnostic categories,
perhaps there are some differences in severity. In Table 2 are listed,
for those individuals who admitted to having had a panic attack, the
severity ratings of the 12 DSM-III symptoms of panic.

These ratings were each subjected to a one-way analysis of variance.
The F values are also listed in Table 2. On four symptoms, there were
significant differences in the severity ratings: chest pain, dizziness,
faintness, and fear of going crazy or losing control. For complaints
of chest pain, patients with PD, agoraphobia with panic, and obsessi-
ve-compulsive disorder have more severe symptoms than those with
social phobia while the other patient groups did not differ from any
of these.

TABLE 1

SAMPLE DESCRIPTORS AND INCIDENCE OF PANIC ACROSS DIAGNOSTIC CATEGORIES

	AGORAPHOBIA WITH PANIC	SOCIAL PHOBIA	SIMPLE PHOBIA	PANIC DISORDER	GAD	OBSESSIVE COMPULSIVE	MAJOR DEPRESSIVE EPISODE	STATISTICAL COMPARISON
MALES (N)	2	10	2	6	8	2	1	
FEMALES (N)	39	9	5	11	4	4	5	
MEAN AGE (YEARS)	36.2^{AB}	28.8^{A}	44.6^{BC}	34.8^{A}	36.1^{AB}	28.5^{A}	46.3^{C}	$F(6,101)=4.64, p < .001$
REPORTS OF PANIC (%)	98	89	100	100	83	83	83	$X^2(6)=7.27$, NS
DIAGNOSIS IS MET EXCEPT FOR PANIC FREQUENCY (%)	98	84	85	100	75	83	83	$X^2(6)=9.50$, NS
DIAGNOSIS ON DSM-III PANIC CRITERIA (%)	74	50	33	82	29	*	*	$X^2(6)=14.67, p < .03$

Categories sharing superscripts are not significantly different by Duncan's Multiple Range Test.

*N's were too low to analyze, due to missing data on panic frequency. However, for the 3 obsessive compulsives and 3 depressed patients for whom we had complete data, 100% met the criteria.

TABLE 2: AVERAGE SEVERITY RATINGS OF SPECIFIC PANIC SYMPTOMS ACROSS DIAGNOSTIC CATEGORIES

SYMPTOM	AGORAPHOBIA WITH PANIC	SOCIAL PHOBIA	SIMPLE PHOBIA	PANIC DISORDER	GAD	OBSESSIVE COMPULSIVE	MAJOR DEPRESSIVE EPISODE	STATISTICAL COMPARISON
DYSPNEA (0-4)	1.71	1.33	1.33	1.29	1.67	1.80	1.10	$F_{(6,90)} = .661$, NS
PALPITATIONS (0-4)	2.35	2.03	1.67	2.21	1.67	2.10	.96	$F_{(6,91)} = 2.05$, NS
CHEST PAIN (0-4)	1.31^B	$.31^A$	$.92^{AB}$	1.29^B	1.00^{AB}	1.00^B	$.90^{AB}$	$F_{(6,91)} = 2.39$, $p < .05$
CHOKING (0-4)	1.35	.90	1.17	1.06	.83	1.50	.70	$F_{(6,91)} = .737$, NS
DIZZINESS (0-4)	2.04^B	$.91^A$	$.58^A$	1.76^B	1.39^{AB}	1.70^{AB}	$.70^A$	$F_{(6,91)} = 5.04$, $p < .001$
UNREALITY (0-4)	1.28	.88	.83	1.83	.78	1.80	.90	$F_{(6,91)} = 1.86$, NS
PARASTHESIAS (0-4)	.76	.22	.92	1.00	.78	1.10	.80	$F_{(6,91)} = 1.72$, NS
HOT OR COLD FLUSHES (0-4)	1.71	.94	1.50	1.41	1.11	2.10	1.70	$F_{(6,91)} = 2.12$, NS
SWEATING (0-4)	1.51	1.38	1.33	1.44	.78	1.60	1.60	$F_{(6,91)} = .76$, NS
FAINTNESS (0-4)	1.61^B	$.66^A$	$.67^{AB}$	1.15^{AB}	$.94^{AB}$	1.10^{AB}	.10	$F_{(6,91)} = 3.02$, $p < .01$
SHAKING (0-4)	1.74	1.19	1.42	1.71	1.11	2.00	1.10	$F_{(6,91)} = 1.33$, NS
FEAR OF GOING CRAZY LOSING CONTROL (0-4)	2.11^{BC}	$.97^A$	1.58^{ABC}	2.50^C	$.89^A$	1.50^{ABC}	1.10^{AB}	$F_{(6,90)} = 5.53$, $p < .001$
AVERAGE PERCENT OF SYMPTOMS ENDORSED	85.6^B	61.3^A	68.0^{AB}	83.3^B	58.3^A	90.2^B	61.6^A	$F_{(6,91)} = 6.21$, $p < .001$

Categories sharing superscripts are not significantly different by Duncan's Multiple Range Test.

Patients with PD and agoraphobia with panic also report more severe dizziness than patients with social phobia, simple phobia or major depressive episodes. Those with GAD or Obsessive-Compulsive Disorder do not differ from either of these two groups. On a related symptom, faintness, the agoraphobics with panic are more severe than the social phobics or patients with Major Depressive Disorder. For this symptom, patients with PD do not differ from any other patient group. For the symptom of fear of going crazy or of losing control, patients with PD have the highest average severity rating, midway between moderate to severe. This rating is significantly higher than that given patients with Social Phobia, GAD or Major Depressive Disorder. The average rating for those patients with Agoraphobia with Panic also exceeds the scores of those with Social Phobia and GAD. The overall severity scores are somewhat low due to the fact that many patients who reported panic and at least four of the twelve symptoms, nevertheless did not have all of the symptoms. Therefore, a number of zeros on each particular symptom lowered the average severity rating.

The difference in percentage of symptoms endorsed in those patients reporting panic in each diagnostic group are found in the last line of Table 2. Patients with Agoraphobia with Panic, PD and Obsessive-Compulsive Disorder all report a very high percentage of the twelve symptoms (85.%, 83.3%, and 90.2%, respectively). This is a significantly higher percentage than all other diagnostic groups except simple phobics.

In general, few differences in panic phenomenology emerge between diagnostic categories. On only 4 out of 12 symptoms, as well as the average percent of symptoms endorsed, are there any differences. When differences exist, agoraphobics with panic, Panic Disorder patients, and obsessive-compulsives trend slightly higher in symptom severity and percent of symptoms reported, while social phobics are clearly lower.

IS THERE A DIFFERENCE BETWEEN PREDICTABLE AND UNPREDICTABLE PANIC?

DSM-III implicitly recognizes the ubiquity of panic by noting that panic attacks may accompany withdrawal from substances such as barbituates, intoxication due to caffeine or amphetamines, etc. More importantly, it is noted that panic attacks may occur in the context of simple or social phobias, but only in the specific phobic situation. That is, there are clear "cues" for the panic attacks. This is in contrast to "spontaneous" or "unpredictable" panics such as those that occur in PD or agoraphobia with panic and occasionally other anxiety disorders and affective disorders, where clear cues or triggers are not readily identifiable.

Yet the impression has grown that unpredictable panics differ in ways other than lack of "cues" from predictable panics. Apart from various speculations, this is due largely to one study (Zitrin, Klein, & Woerner, 1980; Zitrin et al., 1983). In this study, a differential response to treatment with imipramine was reported in agoraphobics with panic and mixed phobias (phobics with unpredictable panic but lacking a broad pattern of avoidance) versus simple phobics. That is, agoraphobics and mixed phobics with (unpredictable) panic who were treated with a variety of structured and unstructured, exposure-based procedures improved somewhat more if they also received imipramine instead of placebo. This was not true for the simple phobics. Thus, the differential drug response suggests qualitative differences between predictable and unpredictable panic. While this study has been criticized elsewhere on methodological grounds (Emmelkamp, 1982; Marks, 1981; Mathews, Gelder, & Johnston, 1981; Wilson, 1984),

the voluminous amount of data collected, including direct estimates of spontaneous panic by both patients as well as therapists and independent evaluators, and the large number of patients included, makes this a landmark contribution. Nevertheless, a close look at the results indicates no drug-diagnosis interactions for "spontaneous" panic across these three groups. That is, based on the major statistical analytic technique, an analysis of covariance, there was no differential improvement from imipramine among patients with predictable versus unpredictable panic although, as the authors point out, the error variance was large. More fine grained analyses of drug effects within the diagnostic categories (despite the lack of an interaction) reveals that some measures of panic within the agoraphobia and mixed phobia categories show a drug effect (most often at the .10 level of significance) and others do not. Similar analyses of drug effects in simple phobics either do not show this effect or more often are not reported. One other study also reported differences in drug effects among agoraphobics and simple phobics (Sheehan, Ballenger, & Jacobsen, 1980), but panic was not directly measured and only nine specific phobics were treated. Overall, these results provide only modest support for a differential drug response on predictable versus unpredictable panic.

Inferring the nature of psychopathological states by observing treatment effects is, of course, a very weak experimental approach, subject to a logical fallacy (post-hoc ergo propter hoc). A more straightforward approach is to directly examine the phenomenon of both predictable and unpredictable panic across various diagnostic categories.

The preceeding analyses (see Table 2) obscure a direct comparison between predictable and unpredictable panic. While agoraphobics with panic and PDs suffer from unpredictable panic by diagnostic definition, other patients, who do not meet DSM-III criteria for those two diagnostic categories, also experience unpredictable panic occasionally (Zitrin et al., 1980; Barlow, Di Nardo, Vermilyea, Vermilyea, & Blanchard, 1984). Typically, these may be simple or social phobics who, if they experience panic, report that it occurs in the presence of their feared situations but also report recurring "spontaneous" or unpredictable panic. Some patients with obsessive-compulsive disorder, GAD, or major depressive disorder also report unpredictable panics. In the case of major depressive disorders, these unpredictable panics were considered part of the depressive syndrome until recently (e.g., Leckman, Weissmann, Merikangas, Pauls, & Prusoff, 1983; Leckman, Merikangas, Pauls, Prusoff, & Weissman, 1983).

To contrast predictable and unpredictable panics more directly, patients were divided into those who had never reported "spontaneous" panic and compared to three groups who did report "spontaneous" panic (Barlow et al., 1985). Patients with a diagnosis of depression were not included in order to restrict the analyses to the anxiety disorders. Group One consisted of patients who reported never experiencing an unpredictable panic. Group Two consisted of simple and social phobics as well as patients with GAD who reported experiencing at least one unpredictable panic during their lifetime. This group has been referred to as "mixed" by previous investigators (e.g., Zitrin et al., 1983). Group Three consisted of agoraphobics with panic and Group Four consists of PDs. These data are presented in Table 3 which lists the severity ratings of the 12 DSM-III symptoms of panic for those individuals who admitted having had a panic attack in the four groups. As in Table 2, these ratings were subjected to a one-way analysis of variance. The F values are also listed in Table 3.

TABLE 3: AVERAGE PERCENT OF SYMPTOMS ENDORSED AND AVERAGE SEVERITY RATINGS OF FOUR GROUPS OF PATIENTS REPORTING EITHER PREDICTABLE OR UNPREDICTABLE PANICS

SYMPTOM	GROUP 1 CUED PANIC N=27	GROUP 2 MIXED N=11	GROUP 3 AGORAPHOBIA WITH PANIC N=41	GROUP 4 PANIC DISORDER N=17	STATISTICAL COMPARISON
AVERAGE PERCENT ENDORSED	58.23^A	66.50^A	85.60^B	83.29^B	11.632 (3,85) p<.001
DYSPNEA	1.04	1.29	1.67	1.75	Not significant
PALPITATIONS	1.46^A	1.77^{AB}	2.29^B	2.21^B	3.77 (3,92) p<.01
CHEST PAIN	$.37^A$	$.86^{AB}$	1.28^B	1.29^B	5.31 (3,92) p<.002
CHOKING	.74	.95	1.32	1.06	Not significant
DIZZINESS	$.722^A$	1.00^A	1.99^B	1.76^B	10.82 (3,92) p<.001
UNREALITY	$.65^A$	$.77^{AB}$	1.24^{BC}	1.82^C	4.76 (3,92) p<.004
PARASTHESIAS	$.296^A$	$.73^{AB}$	$.74^B$	1.00^B	3.47 (3,92) p<.02
HOT OR COLD FLUSHES	$.70^A$	1.36^B	1.67^B	1.41^B	6.23 (3,92) p<.001
SWEATING	.98	.95	1.48	1.44	Not significant
FAINTNESS	$.56^A$	$.73^A$	1.57^B	1.15^{AB}	5.64 (3,92) p<.001
SHAKING	$.93^A$	1.14^{AB}	1.695^B	1.71^B	4.02 (3,92) p<.01
FEAR OF GOING CRAZY, LOSING CONTROL	$.63^A$	1.41^A	2.06^{BC}	2.50^C	15.19 (3,91) p<.001

TABLE 4: AVERAGE SEVERITY RATINGS FOR ONLY THOSE PATIENTS REPORTING EACH SYMPTOM IN FOUR GROUPS REPORTING PREDICTABLE OR UNPREDICTABLE PANIC (THE N REPORTING EACH SYMPTOM IN EACH GROUP ACCOMPANIES THE SEVERITY RATING)

SYMPTOM	CUED PANIC N=27	N	MIXED N=11	N	AGORAPHOBIA WITH PANIC N=41	N	PANIC DISORDER N=17	N	STATISTICAL COMPARISON
DYSPNEA	1.65	17	2.19	8	1.85	37	1.57	14	Not significant
PALPITATIONS	1.88	21	2.44	8	2.35	40	2.50	15	Not significant
CHEST PAIN	1.11	9	1.58	6	1.69	31	1.83	12	Not significant
CHOKING	1.67	12	1.50	7	1.80	30	1.80	10	Not significant
DIZZINESS	1.63	12	1.57	7	2.09	39	1.77	17	Not significant
UNREALITY	1.46	12	1.7	5	1.82	28	1.94	16	Not significant
PARASTHESIAS	1.33	6	1.6	5	1.17	26	1.42	12	Not significant
HOT OR COLD FLUSHES	1.27^A	15	1.67^{AB}	9	1.96^B	35	1.71^{AB}	14	3.429 (3,69) p < .02
SWEATING	1.66	16	1.75	9	1.73	35	1.75	14	Not significant
FAINTNESS	1.36^A	11	1.14^A	7	2.07^B	31	1.77^{AB}	11	3.42 (3,56) p < .02
SHAKING	1.67	15	1.56	8	1.93	36	1.81	16	Not significant
FEAR OF GOING CRAZY LOSING CONTROL	1.83^{AB}	9	1.55^A	10	2.28^B	37	2.50^B	17	3.16 (3,69) p < .03

As one can see, agoraphobics with panic and PDs endorsed significantly more of the 12 symptoms than the mixed group or the cued panic group. Both PDs and agoraphobics with panic endorsed over 80% of the twelve symptoms. In this analysis, unpredictable panics also achieved significantly higher severity ratings on most of the symptoms. This is particularly true for the agoraphobics with panic and the PDs with the mixed groups occupying a somewhat intermediate position.

However, if one recalculates average severity ratings based on only those patients who actually reported having each symptom, a different picture emerges. These data are presented in Table 4 along with the number of people in each group who reported having a particular symptom. In this analysis, very few differences among symptoms emerged and in no case do symptoms among the group of PD patients exceed severities of the cued panic group (although agoraphobics with panic exceed the cued group on severity of 2 symptoms). This indicates that almost all of the differences found in Table 3 are due to the tendency for those experiencing unpredictable panics to endorse a larger number (a greater percentage) of the 12 symptoms thereby inflating some of the severity scores.

Since differences emerged in the number of symptoms endorsed, Table 5 examined the patterning of symptoms across predictable and unpredictable panic with X^2 analyses. In every case except dyspnea, choking, and sweating, significant differences emerged among groups. A significantly larger number of patients with agoraphobia with panic and PD endorsed almost every symptom compared to patients with unpredictable panic. The "mixed" group usually occupied an intermediate position. The sharpest differences occurred for fear of going crazy or losing control, dizziness, parasthesias, shaking, pain in chest, and unreality.

It is possible, of course, that these data support a qualitative difference among these types of panic due, perhaps, to differential underlying biological processes (e.g., Klein, 1981). Another possibility is that the difference lies in the cues which serve as the major defining characteristic of predictable versus unpredictable panic. That is, the cues for panic in simple and social phobia are obvious and readily reported by the patient. Cues in obsessive-compulsive disorder are also usually obvious and are tied to identifiable, aversive, intrusive thoughts or dangerous or contaminating external situations that are not readily escapable. But cues in PD and Agoraphobia with Panic are not always so obvious, although panic attacks within agoraphobia often become associated with leaving a safe place or a safe person.

It is possible that the inability to identify consistent cues is due to inadequate measurements of panic. As noted above, most clinicians and researchers to date have simply asked the patient to recall panic attacks occurring during the past week or perhaps a longer period of time. At the same time, these patients are asked to recall antecedents. From the point of view of psychological measurement, a more satisfactory procedure would involve prospective self-monitoring of panic so that antecedents or cues can be recorded at the time of the panic over a period of days or weeks. For example, a depressed patient presented as an agoraphobic at our clinic with reports of panic associated with leaving the house, going shopping, etc. A closer prospective analysis revealed that these panic attacks were triggered by having to make a decision, however small, concerning making out a grocery list, whether to go to a friend's house or not, and so on. The cues for these

TABLE 5: NUMBER OF PATIENTS (AND PERCENTAGE OF GROUP) ENDORSING EACH SYMPTOM ACROSS GROUPS HAVING PREDICTABLE OR UNPREDICTABLE PANIC[1]

SYMPTOM	CUED N=27	MIXED N=11	AGORAPHOBIA WITH PANIC N=41	PANIC DISORDER N=17	STATISTICAL COMPARISON
DYSPNEA	17 (63)	8 (80)	37 (90)	14 (82)	Not significant
PALPITATIONS	21 (78)A	8 (80)A	40 (98)B	15 (88)B	$x^2(3) = 8.33$ p<.05
CHEST PAIN	9 (33)A	6 (55)AB	31 (76)B	12 (71)B	$x^2(3) = 13.13$ p<.01
CHOKING	12 (44)	7 (64)	30 (73)	10 (54)	Not significant
DIZZINESS	12 (44)A	7 (64)A	39 (95)B	17 (100)B	$x^2(3) = 30.96$ p<.001
UNREALITY	12 (44)A	5 (45)AB	28 (68)B	16 (94)B	$x^2(3) = 13.06$ p<.01
PARASTHESIAS	6 (22)	5 (45)AB	26 (63)B	12 (71)B	$x^2(3) = 14.22$ p<.01
HOT OR COLD FLUSHES	15 (56)	9 (82)AB	35 (85)B	14 (82)B	$x^2(3) = 8.75$ p<.05
SWEATING	16 (63)	9 (82)	35 (93)	14 (94)	Not significant
FAINTNESS	11 (41)	7 (64)AB	31 (76)B	11 (65)B	$x^2(3) = 8.50$ p<.05
SHAKING	15 (56)	8 (73)AB	36 (88)B	16 (94)B	$x^2(3) = 13.03$ p<.01
FEAR OF GOING CRAZY, LOSING CONTROL	9 (35)	10 (91)BC	37 (90)C	17 (100)C	$x^2(3) = 38.26$ p<.001

[1] Categories sharing superscripts are not significantly different based on orthogonal planned comparisons. Only x^2 comparisons at or below p= .05 are presented, and only where significant overall x^2 exist.

panics, then, were consistent with a diagnosis of Major Depressive Disorder. Our own impression is that cues for panic in both agoraphobics with panic and PDs are usually associated with mild exercise, sexual relations, sudden temperature changes, stress, or other cues which alter physiological functioning in some discernable way, albeit out of the patient's awareness.

The fact that cues associated with altered physiological functioning may trigger "unpredictable" panics through a process of interoceptive conditioning has long been considered a possibility (Evans, 1972; Mineka, 1985; Razran, 1961; Ackerman & Sachar, 1974). While this hypothesis awaits confirming empirical evidence, it would account for the well-known marked sensitivity to physiological changes and bodily sensations on the part of patients with unpredictable panics (e.g., Chambless & Goldstein, 1981). Since symptoms of panic in their most severe form are also cues for panic in milder form, an ever spiraling repetitive cycle of panic attacks occurs that can be cued by changes in humidity, temperature, mild exercise, stress or even relaxation as indicated in the data presented above (Cohen et al., 1985, in press; Heide & Borkovec, 1983). Of course, the marked physiological alterations involved by lactate infusion, isoproterenol infusion and induced hyperventilation would all be likely to elicit panic in those patients who have become interoceptively conditioned. The fact that these cues are often subtle accounts for the unpredictability of the panic by the patient and the endorsement of feelings of going crazy or losing control. A successful search for antecedents to "unpredictable panics" as well as a careful analysis of the effects of both pharmacological and behavioral treatments of panic will require sophisticated prospective monitoring of panic attacks and their potential antecedents.

TREATMENT IMPLICATIONS

This psychological model of panic, if verified, has marked treatment implications for psychotherapeutic or behavioral intervention. The standard behavioral treatment for Agoraphobia with Panic is prolonged in vivo exposure to situations typically avoided, such as shopping malls, crowds, etc. (Barlow & Beck, 1984). Panic attacks are considered only secondarily, if at all, with the primary emphasis on overcoming avoidance behavior. Within this conception of panic, the treatment emphasis should be on exposure to interoceptive cues which are responsible for panic attacks in the first place. Once these interoceptive cues lose their fear value, then panic attacks are much less likely to occur and one can work on any residual avoidance behavior or anticipatory anxiety that remains.

Our own data indicate that this general approach is successful with people presenting with panic disorder without the avoidance behavior that accompanies agoraphobia (Barlow et al., 1985). Other case reports also indicate that experiencing physical sensations associated with hyperventilation in the therapist's office is also successful when dealing with panic attacks (Clark, Salkovskis, & Chalkley, in press). Future research will determine the ultimate success of these therapeutic strategies.

CONCLUSIONS

Of course, this analysis does not address the question of the origins of the panic attacks, and the data cited above indicating that susceptibility to panic runs in families (Harris et al. 1983; Crowe et al., 1983). But a common observation is that initial episodes of

panic arise during stressful situations such as illness, marital disruption, financial difficulties, and the like (Mathews et al., 1981; Last, Barlow, & O'Brien, 1984). Furthermore, other recent data indicates that panic attacks may be a relatively frequent occurrence at some time in one's life in the population at large (Norton, Harrison, Hauch, & Rhodes, 1985). It may be, then, that only a few of those people who are susceptible to panics during stress and who do panic also undergo the interoceptive conditioning necessary to develop a full-blown panic disorder or agoraphobia with panic.

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FOOTNOTE

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COGNITIVE APPROACHES TO ANXIETY DISORDERS

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The phenomena of anxiety are well illustrated by the following
scenario presented by a patient:

> I am standing in front of a group and I suddenly begin to feel faint,
> my mind goes blank, my tongue cleaves to the roof of my mouth,
> I suddenly develop lockjaw, and my entire body begins to convulse
> gently until it becomes firmly fixed into a full body cast. My
> heart is beating so hard it feels as though it will burst, and
> the perspiration cascades out of my pores.

We find it difficult to understand these specific phenomena.
Although technical constructs (such as conditioned reflex or inverted
hostility) have been advanced to clarify these phenomena, they fall
short of adequately explaining why a person chokes so hard that his
eyes bulge or why he becomes so faint that he can barely keep his
balance. A salient characteristic is that what he wants most not to
happen, namely appearing petrified and behaving incompetently, occur
almost as a perverse twist of his wish.

LEGACIES FROM THE PAST

We have inherited a host of behavior patterns designed to protect
us from harm in a primitive environment but which have since themselves
become the source of considerable distress and even harm in our
present environment. Among the legacies is a hyperactive system that
alerts us to danger and which, like the others acts as a double-edged
sword. To a certain extent, this system served our ancestors in the
wild by providing an emergency response that prevented them from
falling, suffocating, drowning, or otherwise being injured or killed.

Many of these modern fears and phobias can be traced to the dangers
faced by prehistoric humans while roaming the plains. For example, the
fear of heights may be traced back to the danger of falling from trees
or cliffs; of water, to drowning; of crowded places, to suffocating;
of small animals, to being injured.

The first legacy is the ability to identify dangerous situations rapidly and without any prior experience of falling from a high place, drowning, or suffocating. While this built-in emergency response is often life-saving, it may also lead to the tendency to misidentify or to fear situations that are relatively innocuous or easily handled. Thus the "alarm" goes off not only when we are in danger but also when we mistakenly think we are in danger - a phenomenon labelled "false positives".

This overactive alarm system leads us to perceive dangers where they do not exist or to exaggerate those that do exist. The individual selectively responds to the unsafe features of a situation while remaining oblivious to the safe features, and, consequently, becomes overprepared, overvigilant, and overreactive. Many are afraid to walk on high balconies though there is a protective railing to ensure their safety. Others experience a feeling of constriction in close places like tunnels even though there is no objective danger of being suffocated.

Still, this overactive system is a key to survival. If a person should fail to react to a dangerous situation in time, that is, a single false negative - he/she risks death and, thus, the elimination of his/her genes from the gene pool. We therefore remain overly nervous a good part of the time for the sake of the few occasions when our lives are in actual peril. The cost of survival and the preservation of our lineage is a lifetime of anxiety.

Over-reactions to psychosocial "dangers" may also have their roots in life-preserving patterns established in primitive times. Thus, exaggerated fears of inept performance in public (as in public speaking) may be a contemporary derivative of fears of being branded a failure by other members of the tribe and consequently being relegated to a less favorable position in the communal organization. The loss of status could mean reduced access to food supplies as well as diminished protection against predators.

Flight-Freeze-Faint Axis

The second legacy is an automatic device that prevents the individual from proceeding into a dangerous situation or that propels him out of the situation - a process that I term the "flight-freeze-faint reaction". Simply stated, certain reactions (for example, freezing or fainting) may reduce vulnerability in perilous situations and specific actions (such as flight) may propel the individual out of these situations. As pointed out previously, however, these reactions may be adaptive only in an evolutionary sense - that is, at one time the automatic responses could have been life saving.

It is important to view these behavioral reactions as part of a more comprehensive pattern or program. These patterns, consisting of an orchestration of all systems (thinking, feeling, and behaving) and designed for highly specific purposes, are designated by the term "strategies". The strategies for dealing with danger, including flight, freeze, and faint, are activated automatically, like a reflex which occurs though the individual may consciously attempt to prevent or terminate it. Patients do not realize that these reactions are life-preserving strategies but, rather, look upon them as symptoms derived from some "weak" part of their personality that is unable to withstand threats or stress. Yet what may be regarded as weakness actually represents a repertoire of basic mechanisms that evolved to protect against the dangers of the wild; primitive strategies were developed to ward off primitive dangers.

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The purpose of the flight strategy is to escape; freezing is designed to "buy time" in order to assess the nature of the danger and prepare a defense against attack. Further, the forced inhibition of motor activity might make an individual less conspicuous to a predator. The faint response serves to take the individual out of action until the danger has passed. This immobility reaction occurs notably when an individual is bleeding or perceives that he is overwhelmed by a dangerous force. The value of forced immobility when wounded is the prevention of further blood loss or injury. Thus, it is clear that what may be perceived by some as a sign of a fragile or weak constitution could have important survival value. (This pattern is seen most clearly in the propensity of blood phobics to faint at the sight of bleeding or mutilation).

Prolongation of Juvenile Patterns

It is important to note that the individual at greatest risk in the wild was not the adult, who presumably had developed a number of skills for handling the perils of fire, earth, and water, and for evading predators. Rather, the automatic strategies were designed for the benefit of their smaller, more defenseless children (Montague, 1981). As long as the children were protected by their caretakers, they were essentially kept out of danger. However, should a child wander into the line of sight of a predator or crawl towards the edge of a cliff, he would be in danger of sustaining injury or being killed. Thus, providential nature implanted an automatic reflex (freezing or fainting) that would deter the child's further advance into the dangerous zone. Should the child perceive an approaching danger (e.g., a predator), an automatic signal would trigger the flight response, whereupon the child would propel himself to a place of safety. This safety system, consiting of "brakes" against rash action and an "automatic ejection" from unsafe situations persists into adulthood.

This final legacy explains in part our tendency to react to perceived social "threat" with the same armament of physical defences mobilized in response to physical dangers. For example, a young man having an interview with a potential employer whom he wants to impress finds that his body suddenly stiffens, and his hands shake. The uncontrolled symptoms represent a derivative of the freezing strategy developed to protect the person against physical assault. The inhibition may involve not only the muscles of the trunk and extremities, but even the vocal chords in perhaps what is the vestige of a primitive quieting response. Although these physical defenses might prepare us to deal with a physical danger, they disable us when we are faced with a social threat.

The operation of the primitive defense response is particularly evident in the evaluation anxieties (Beck & Emery, 1985) – social anxiety, test anxiety, and public speaking anxiety. Though our lives at home or on the job are protected from the usual primitive hazards, we are inclined to react as though we are continually exposed to advers- aries. All those who are in a position to judge us can arouse a sense of apprehension: supervisors, shopkeepers, cab drivers, employers, potential dates. Here, the act of being observed triggers a fear of being devalued, which in turn leads to primitive inhibitions and consequently, awkwardness and ineptitude.

The primitive physical responses (e.g., sweaty palms, stuttering) that are activated in these confrontational situations stem from the perception of these "observers" as, at best, judges and, at worst, predators. The program that elicits these defensive responses does

not make adequate distinctions between close kinfolk, indifferent strangers, mildly negative strangers, and enemies. Rather, the primitive principle of survival remains; if you are not my friend, you are a potential enemy.

The "Internal Saboteur"

The defensive mechanisms of freezing, fainting and fleeing, we have seen, are presumably designed to prepare an individual against attack; yet, once exposed as weak or helpless he or she tends to be attacked, or at least becomes vulnerable to, attack. Paradoxically, the very mechanism of freezing or fainting designed for the individual's protection effectively broadcasts to others that he or she is weak and inept, thereby prompting rivals or superiors to demean, ridicule or taunt him or her and, further, makes him or her less capable of warding off an attack. In this way, even while the "mature" adult may function smoothly in the presence of friends and kin, he or she becomes susceptible, as soon as he or she moves out of this safe environment, to the operation of an "internal saboteur", which subjects him or her to the activation of the primitive strategies.

Although these reflexes may serve a protective function for a child - particularly if the child is exposed to a dangerous environment - it seems strange that they should still be present in an adult who is in a relatively safe environment. The explanation seems to lie with a phenomenon known as "neoteny" or juvenilization. Unlike our cousins, the gorillas, whose anatomical and behavioral characteristics show a sharp transition from childhood to adulthood (Gould, 1977), we retain behavioral patterns as well as specific physical characteristics of the young child. Although we walk around with our panoply of social competencies, manual proficiencies, and verbal efficiencies, we are still prone to react to certain threatening situations, such as being evaluated, with the same responses we had as children.

Exactly what are people afraid of as they enter into evaluative situations such as public appearances, social interactions, or test taking? It would seem unlikely that they fear actual physical harm. Rather, they are afraid of displaying incompetence and consequently being downgraded; indeed, many are hypersensitive to the prospects of "making a fool of myself".

The internal factor that trips up many people seems to be the "internal saboteur", the automatic juvenile mechanism designed to deal with attacks. So long as we judge that we are vulnerable in a situation, this internal mechanism acts to prepare us for defense by inhibiting the very systems that we ordinarily use to cope with problems. The effect of the freezing strategy is to interfere with our rational thinking, smooth articulation, and confident actions. Since we learn from experience that the internal saboteur can force us into all kinds of dysfunctions, we become more fearful of the workings of this mechanism than of an actual attack or a peer's unfavorable judgment. We are aware, for instance, that if we do not receive a friendly smile, we may automatically tighten and brace ourselves just as for an attack; consequently, the _fear_ that we may tighten and thus, appear incompetent may be sufficient to activate the freezing pattern - and bring on exactly what we fear the most.

We have seen then, that the fear of appearing incompetent and being downgraded may have archaic roots in the patterns that were designed to prevent the juvenile from getting into a dangerous situation or

enabling him to minimize the effects of an attack. Our culture,
however, has nurtured the fear of incompetence to such an extent that
it dictates the very structure of our social hierarchy. The individual's
position on the social ladder can be established on the basis of very
fine discriminations; we are graded according to our apparent self-
confidence, ease, smoothness, and general appearance. Attaining a
high enough "score" gives us the justification to look down on an
array of our peers. With even this success, however, we continue to
be vulnerable to the sabotage of internal factor and the subsequent
fall to a lower position in the hierarchy. In this way, many social
interactions are directed towards finding some weakness or failing in
another person's make-up that would warrant his/her fall in social rank.

THE MECHANISMS OF ANXIETY

Subjective Anxiety as a "Danger Signal"

     Anxiety may be thought of as a kind of "attention getter". It
forces us to shift our attention away from our present preoccupations
in order that we may focus instead on whatever situation or circumstances
may be leading to the anxiety. In this sense, anxiety acts as a prod
to direct our attention toward a particular danger: we may rid
ourselves of the anxiety only by reducing the danger that is producing
it. At times, for example, an individual may be engaging in an
activity that is potentially dangerous. Any increase in the perceived
danger may activate the experience of anxiety and, deter him from
progressing further into the dangerous circumstances. Anxiety thus,
induces him to either curb his reckless actions or to initiate protective
behavior.

     Anxiety is useful when there is a true danger present and when the
person's ongoing behavior may serve to increase the danger. However,
it is obviously not adaptive if the danger is more fantasized than real,
and if it is in the individual's best interest to go through with the
"dangerous" activity (for example, giving a speech in public). The
aspect of public speaking anxiety that is most disabling is the
withdrawal of attention away from the presentation of the oral material
and the fixation on the various symptoms. This interfering function
of anxiety and the shifting of attention constitutes the central
problems of individuals with performance anxiety. As they perceive
themselves in an evaluative situation, the alarm signals go off
and the anxiety and inhibitions originally designed to protect against
danger interfere with the individual's performance and, thus, increase
the danger of negative evaluation.

     We can perhaps better understand anxiety if we compare it to the
function of pain. The overall function of pain is to draw our attention
to the fact that something is wrong; there is either actual or potential
danger of damage to our tissues. We are inclined to focus our attention
on the pain until it is relieved, either spontaneously or as a result
of our actions. Pain serves to stimulate the person to do something
to alleviate the suffering, whether it be protecting the particular area
from further injury, terminating whatever activity may be contributing
to the pain, or eliminating the object or substance that may be
producing it. Similarly, we should regard anxiety as one of the many
mechanisms in the threat response that has become activated, not as
the "cause" of the anxiety disorders. In chronic anxiety, the unremitting
generation of this affect represents a perseverative but ineffective
mechanism for impelling the organism to reduce the danger.

The Appraisal of Vulnerability

When an individual is exposed to a potential danger, the first step in his information processing is the identification of a particular set of stimuli as indicative of a potentially dangerous situation. The individual makes a rapid appraisal of the degree of danger in the situation (primary appraisal) and of his ability to cope with the danger (secondary appraisal). These appraisals, which occur practically simultaneously, represent an overview of the situation, and give a sense as to whether the individual is vulnerable in a substantial way (that is, whether there is a reasonable likelihood of his being harmed). Although these appraisals occur rapidly, they generally involve high-level evaluative processes which remain in operation until it has been determined whether a real risk of harm is present.

If the rapid computation establishes the presence of a danger and doubts about one's ability to neutralize it, there is an immediate triggering of the "vulnerability set" and an emergency organization is activated; appropriate emotional, physiological and behavioral patterns are triggered to deal with the danger. The individual's perceptions of the presumably dangerous situation are enhanced and the other cognitive and motor systems are primed for defensive action.

To illustrate the operation of the vulnerability set, or program, let us take the example of a male soldier who is lost in enemy territory. Since he knows that he is in danger and that his resources for coping with an enemy patrol are practically nil, he will be locked into the following "vulnerability set":

1. He will be hypervigilant: i.e., he will have a heightened focus on possible danger cues almost to the exclusion of other cues.

2. He is likely to magnify the degree of threat from a particular configuration.

3. He is likely to overgeneralize so that relatively innocuous cues will be seen as dangerous (e.g., the rustling of the leaves by the wind will sound like footsteps, or the movement of the branches may resemble an enemy soldier).

With this cognitive processing, the individual is primed to react with one of the aforementioned strategies (freeze, flight or faint). It is important to note that the cognitive set (or program) in itself is sufficient to produce a preparatory mobilization. Thus, irrespective of the strategy that is utilized, the soldier in enemy territory is continuously poised for action.

When danger is perceived as immediate, the individual may experience a rapid mobilization of various systems which prepare him for emergency action. For example, he hyperventilates to prepare for vigorous activity; sweats profusely in order to dissipate an anticipated increase in body heat; has an increase in blood pressure and pulse rate which facilitates the necessary supplies to his peripheral muscles; and shows additional evidence of hypervigilance (increased startle reflex, increased eye blink reflex).

Under certain circumstances, instead of the hyperactivation and mobilization strategy already outlined, the soldier experiences the faint reaction, produced by activation of the parasympathetic nervous system, and generalized weakness of the muscles (atonic immobility).

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The Vicious Cycles

The response to a potentially "dangerous" situation consists of a number of mechanisms which in themselves may seem to increase the danger or at least the perception of danger. For example, a student about to take an oral exam initially perceives the situation as threatening. He believes that he may function poorly and thus receive a negative evaluation. As he starts to speak, his mind becomes blank and he starts to stutter. This reaction increases the perceived danger in the situation which, in turn, increases his feelings of anxiety and his difficulties in expression.

A somewhat similar cycle occurs in a person with a fear of physical disorders such as heart attack. As the individual begins to exercise, she feels a slight pain in her chest. She interprets this sensation as a heart attack and starts to breath more rapidly, thereby blowing off carbon dioxide. The physiological result is a feeling of faintness and tingling in her extremities, which reinforces her fear that she is experiencing a heart attack and may be dying.

The Anxiety Disorders and Vulnerabilities

The anxious individual, especially one with socially-related anxiety, is like the soldier in enemy territory, for here, too, the vulnerability set is continuously activated; he/she is continuously poised with all systems mobilized for defensive action. Yet, in contrast to the solider in enemy territory, the person with the anxiety disorder encounters risks that are relatively minor. Consequently, the patient's mobilization for defense does not fit the environmental situation, and instead of adaptation to the immediate situation he/she has what is termed "maladaptation". His/her vulnerability set is characterized not only by oversensitivity to danger signals, but also by overgeneralization, selective abstraction, and magnification. As a result, he/she remains chronically tense and experiences a variety of physiological symptoms representative of an overmobilized state. The preponderance of danger-related thoughts and images in such cases have been documented in clinical studies of generalized anxiety disorder (Beck, Laude, & Bohnert, 1974), panic attacks (Hibbert, 1984), and agoraphobia (Last, Barlow, & O'Brien, 1984).

There is a crucial difference between the reactions of a person with generalized anxiety disorder and those of a normal person exposed to the same noxious stimulus. In contrast to the non-anxious person, the anxious individual does not go through the series of appraisals and reappraisals each time he enters a problematic situation. Once the vulnerability program is in place, the processing of a potentially threatening stimulus bypasses much of the primary and almost all of the secondary appraisal and immediately re-energizes the emergency mechanism. This bypassing of the higher-level evaluative processes elicits a faster response than that of a normal person; however, we find that in the usual non-dangerous situations of everyday life there are a large number of false positives for every correctly assessed danger.

Further, because the response strategies are so stereotyped, there is often a misfit between the strategy chosen and the actual environmental threat. The rigidity of these patterns produces a combination of inhibition and action which culminates in relatively clumsy performance. The type of physical strategy that is triggered, for example freezing, interferes with a more adaptive response. Thus, the potentially skillful responses are impeded by the generalized inhibitory "strategy".

In contrast, individuals such as surgeons or firemen, who are well prepared for dealing with danger, can react swiftly and competently to the sudden danger of the tear of a blood vessel or a falling firebrand. Their belief in their own competence prevents the automatic primitive strategies from being mobilized and they are able to respond to the danger in a skillful manner. If, however, this confidence in their ability has been shaken, the vulnerability set along with the primitive inhibitions may be activated and serve to undermine their skillful performance.

In a certain sense, the automatic strategies that "take over" in anxiety reactions as well as in phobias may be analogized to the rigidity of a computer program. Once the system is locked into place, it determines the kind of information that will be introduced, the way it will be analyzed and synthesized, and the kinds of instructions that will be issued.

PANIC DISORDERS

The patient with panic attacks perceives some abrupt, unanticipated physiological change or other sensations (for example, drop in blood pressure when getting up quickly, quick temperature change going out-of-doors, shortness of breath or rapid heartbeat from climbing stairs). He reads this normal physiological reaction as a sign of something seriously wrong with his mind or body. When he cannot terminate this physiological reaction voluntarily, he "catastrophizes" and attributes it to a serious internal disorder (heart attack, interference with breathing mechanism, stroke, loss of control, some non-specific internal disintegration). The type of sensation he experiences will dictate the kind of misinterpretation he will make; thus, numbness and tingling produced by hyperventilation may be "read" as a sign of a stroke, rapid heart beat produced by exercise or excitement will be attributed to a heart attack.

For the episode to proceed to a full-blown panic attack, there is generally a reduction or inhibition of "higher evaluative functions", i.e., the ability to recognize that his symptoms are not serious. He then anticipates a progression of the symptomatology; the symptoms will go all the way until the point of Ultimate Disaster. (This phenomenon is the basis for the therapeutic technique of "flooding", namely having a patient go through an entire episode without any "props" so that he will see for himself that the Ultimate Disaster does not occur). Also he believes that he will be incapable of "turning off" this reaction by himself but conceivably could be helped by another person (e.g., a physician) who could help to evaluate whether the symptoms were indeed serious and, if necessary, could facilitate access to medical help.

When the primitive mechanism becomes activated it is experienced in various spheres: sharp, subjective feelings of anxiety; physiological symptoms relevant to the operation of the sympathetic and parasympathetic branches of the autonomic nervous system; motor response; increased muscular tension, swaying, trembling, or loss of postural control (parasympathetic nervous systems); mental inhibition which interferes with his focusing on the real problem and increases his sense of uncontrollability and vulnerability.

The mental inhibition is a crucial factor in allowing a panic attack to develop. If the patient is able to bring his reasoning to

bear, he can frequently arrest the panic attack before it develops. Thus, a critical factor in the progression of anxiety is the relative lack of availability of the higher evaluative processes. If the individual has been subjected to cognitive strain as a result of recent psychological upset or mental fatigue, he is less capable of applying reason to his automatic catastrophic cogitions. The vulnerable individual will show a similar type of reaction if the threat is internal (as described above) or if the threat is predominantly external as in evaluative situations (social anxiety, public speaking fear, test anxiety).

AGORAPHOBIA

The central problem in agoraphobia is more complex than that of the simple phobias (see the next section). There is a constellation of factors involved, the summation of which may result in an agoraphobic reaction. It is likely that it is not necessary for a given patient to meet each one of these conditions in order to have agoraphobia:

1. Distance from home or other sanctuary.
2. Confrontation with the types of situations that would be threatening, unfamiliar or strange to a small child.
3. The absence of a caretaker to provide reassurance.
4. The appearance of "symptoms" as a result of hyperventilation, bodily rigidity, increased pulse rate, etc.
5. Interpretation of these symptoms as indicative of internal disaster.

The initial phases of the agoraphobic's panic attack are similar to those seen during the panic attacks produced by phobic situations. In agoraphobia, however, the patient may not be conscious of a specific fear of being in the supermarket or auditorium. His fears are more likely to center around the concern of being away from home, not having access to a caretaker, having a panic attack in a place in which he had previously had such an attack, and not having a clear exit. In this respect he is unlike the height phobic, for example, who clearly knows that he is afraid of falling. Since the agoraphobic is highly sensitized to any unusual internal sensation, he is prone to attribute these various symptoms of anxiety to some more serious disorder, such as a heart attack. Further, he experiences an automatic inhibition of rational thinking during the attack so that it is difficult for him to reason that he is not in mortal danger.

SIMPLE PHOBIAS

A person with an animal phobia reacts to an innocuous situation, such as a "confrontation" with a harmless puppy, in the same way in which other people might react to the real danger of, for example, an encounter with a ferocious tiger. In phobias, an exaggerated fear is chained to a particular stimulus configuration; if the individual avoids this type of situation, he does not experience anxiety. The program, or cognitive set, is activated with a minimum of primary and secondary appraisals. Thus, the cognitive and behavioral responses, are, in effect, reflexive.

As soon as the phobic individual is exposed to a particular stimulus situation (here, a small animal), he reacts to it immediately, in the same way that he would if he were in actual danger. He does not go through the systematic process of testing the probability of injury, or evaluating his resources for warding off the danger. His belief that he is in danger arises rapidly and independently of the actual nature of the circumstance. Furthermore, unlike a non-phobic individual,

he does not automatically test the validity of his fearful belief while he is frightened; if he does attempt to question his immediate belief at all, the fear seems to be quite plausible.

The phobic person responds <u>automatically</u> to the phobic stimulus much as we might react when we smell noxious fumes. For example, the blood phobic automatically feels faint and weak at the sight of blood even though he knows that he is not in danger. Here, the usual systematic sorting of the risks of injury and appropriate coping mechanisms are circumvented. This circumventing process is not only automatic but it is also removed from voluntary control and appraisal. The individual is unable to bring his knowledge and rational thinking to bear on this reflexive reaction.

An example of the reflexive process at work is illustrated by the reactions of a person with public speaking anxiety. As soon as he gets on the platform he feels weak and stiff, as though he is being signalled that he cannot perform adequately. In these perform-ance-based phobias, there is an immediate bypass of the individual's appraisal of his own capabilities and competencies (secondary appraisal), as though it is assumed that he is deficient in performance skills.

Since the individual with a specific phobia does not make a proper assessment of his coping skills, he tends to be especially susceptible to the phobic stimulus (e.g., a barking dog or public speaking). After treatment with, for example, exposure therapy, however, his phobia improves and there is correspondingly a notable increase in his sense of efficacy. It is as though once the grip of the phobia has been loosened or possibly broken altogether, that the patient may think in a logical way when in the threatening situation, and he is thus, no longer prevented from making more positive and realistic appraisals of himself. He shifts from reflexive to reflective thinking. Similarly, he is enabled to appraise the actual noxious features of the situation more accurately and realistically; he is able to see the puppy as a puppy, and the audience as merely a group of people who pose no actual threat.

There is some suggestion from clinical descriptions that not only does the phobic patient bypass the more realistic appraisals but, in addition, he exhibits a powerful resistance to attempts to apply objectivity and reasoning upon activation of the phobic response. An individual who has had numerous experiences of interpreting pain in the abdomen as a sign of a heart attack, for example, may "know" from past experience that he is not in danger, yet remains unable to utilize this knowledge on subsequent occasions when he is faced with the phobic stimuli. Once he becomes anxious, in fact, he finds it difficult to think objectively or, indeed, to reason at all. At least two factors seem to be operating in producing this phenomenon. First, the phobic fear is encapsulated and, thus, is impermeable to rational intervention. Second, since attention is fixated on the symptoms, the higher evaluative and reflective processes cannot be activated to balance off the fears. The only effective way of penetrating the hard core of the phobia is through exposure to the stimulus situation in such a way that the fears are exposed and can be system-atically disconfirmed.

SUSCEPTIBILITY TO ANXIETY DISORDERS

Some people have a hyperreactive primitive mechanism so that situations which they see only as mildly threatening become extremely threatening because they realize that it does not take much of a

stimulus to activate the primitive mechanisms. Thus, situations that
they rationally regard as not dangerous in themselves become dangerous
because of the possibility of the primitive mechanism becoming activated.
Thus, these individuals are more afraid of the activation of the
primitive mechanism than they are of the intrinsic dangers in the
particular threat situation. Another possibility is that these
individuals are sensitizers: that is, the primitive mechanism may
not be any more labile in these individuals than in others, but they
are more aware of the physiological changes. Along the same lines,
they must have not only increased awareness but a tendency to read
normal physiological changes as a sign of a serious threat to their
health, their ability to control their behavior, or their ability to
function or perform adequately. Another possibility is that these
individuals are supreme "catastrophizers" in that they not only
misread the internal symptoms, but that they anticipate that these will
progress until the point of Ultimate Disaster.

     Another basic problem lies in the individuals' tendency to
magnify the intrinsic threat in any situation. Because of their
propensity to catastrophize they, therefore, are prone to threat and
alarm even when the danger is minimal. Thus, the individual would
see a social encounter, a public speaking assignment, or an examination
as a life-or-death matter. The basic assumption, which is activated
as they approach the threat, is that a failure or a threat to health
can produce irreversible (even fatal) effects.

     It is conceivable that, if the problem lies in an overly sensitive
set of primitive responses or a generalized hyper-reactivity, these
individuals are mislabeled when the public at large, and particularly
psychiatrists and psychologists, regard them as neurotic. A more
reasonable view is that these individuals either have a particularly
hyper-reactive pattern of primitive responses or they have an ingrained
pattern of misreading symptoms. The misreading and fixation on the
symptoms then lead to the panic in those who are disposed to the
fear of a threat to their body (or mind) or to other dysfunctions in
those people with evaluative anxieties. In other words, the neurotic
features that have been described in the literature may be secondary
to the type of mechanism just described; the avoidance, dependency,
low self esteem, and multiple fears may come from the individual's
recognition of having this particularly disabling mechanism. In
addition, much of his energy is taken up by a "need" to cover up
and preserve a "non-neurotic" front.

                    TREATMENT OF ANXIETY DISORDERS

     The main thrust behind the treatment of anxiety disorders is the
reduction of the inappropriate sense of vulnerability, for any symptomatic
relief would be ineffective unless this controlling perception is
diminished. Accordingly, most of the symptomatic relief measures
designed to aid the anxious patient in some way interrupt the "vicious
cycles" of anxiety in order to decrease the perceived vulnerability.

     People with social anxiety, phobias, and the like learn to
reduce their vulnerability by utilizing a variety of maneuvers or
"props". For example, the socially anxious person might have a
friend accompany him on a date both to reduce the amount of attention
focused on him as well as to facilitate his performance in front of
his date by engaging his friend in a more spontaneous interchange.
Similarly, agoraphobics effectively reduce the perceived danger
by going to public places accompanied by a caretaker; or, when venturing
out alone, they may take precautions to ensure that they are never

far from an exit at any given location within the public area. So, too, individuals with public speaking anxiety overlearn the material so that they can rely on established subroutines in order to withstand the intrusion of distracting factors such as inhibitions and subjective anxiety. Thus, they can proceed to deliver a speech automatically, as it were, even though their attention is fixated on their feelings.

Frequently, the individual may learn to cope with the "danger" by consciously changing the cognitive set of vulnerability to one of invincibility or invulnerability. A large-scale application of this method is illustrated by the guiding philosophy the military utilizes to inspire its soldiers with a unified vision of success as they enter into combat. The esprit de corps and inspirational martial music, for example, prompt the individual to identify with the Juggernaut and its invincibility. Ultimately, the sense of invulnerability pervades the entire regiment so that the individual can go into battle secure in the knowledge that his strength far outweighs his opponents' weakness. In the realm of therapy, Arnold Lazarus (1971) has used analogous methods to treat children who have phobias. For example, he had one phobic child imagine himself as Superman whenever he had to enter a frightening situation.

A number of techniques serve to change the individual's sense of vulnerability by increasing the patient's appreciation of his "resources", specifically, his evaluation of personal skills, competency, and efficacy. Goldfried and Goldfried's (1975) cognitive self-control method, based on relaxation prior to and during encounters with a threatening situation, gives the patient the belief that he can voluntarily regulate symptoms such as subjective anxiety. Since much of the disturbance in anxiety disorders is produced by the feeling that the symptoms are uncontrollable, the patient who learns to "put a ceiling on" or reduce the symptoms receives a strong boost to his sense of control and, thus, a reduction in his sense of vulnerability.

The various methods of graded exposure (Mathews, Gelder & Johnston, 1981) serve to reduce the sense of danger in several ways. Experiencing the fear and anxiety through systematic exposure provides an opportunity for the "encapsulated" phobic belief to be subjected to correction. Each successive step taken by the patient increases the sense of mastery. Further, the fact that he or she can go into the "danger zone" without any detrimental consequences also tends to reduce the sense of danger.

Several of the methods used to neutralize panic disorders incorporate the same philosophy. For example, Clark, Salkovskis, and Chalkley (1985) describe the overbreathing technique which effectively induces an episode that is quite similar to the panic disorder. The individual who experiences the symptoms of panic as a result of overbreathing is then able to gain perspective and to conclude, ultimately, that the cause is not a mysterious disintegrating force but simply a physiological response to hyperventilation. Furthermore, by giving the patient breathing exercises that eliminate the excessive loss of carbon dioxide, the therapist demonstrates to the patient that he can, in fact, control the intensity of his symptoms. Remarkably, this type of intervention results in the elimination of the patient's panic attacks, as the shift in the sense of vulnerability is sufficient enough to inactivate the panic mechanism.

The aforementioned techniques are used to increase the individual's confidence in coping with changes. Another set of techniques is

designed to minimize the degree of harm attached to a situation. One
of the cognitive techniques, labelled "decatastrophizing", serves to
prod the patient into matching his fears of the consequences of a
particular action or situation against the more realistic expectations
of the outcomes of specific events. Asking, "what is the worst thing
that could happen?", helps the individual to view a particular situation
more objectively. Further, the decatastrophizing technique prompts
him to question the notion that a particularly undesirable event or
consequence would be so unpleasant that it would be completely intol-
erable.

Another technique, titled "collaborative empiricism", consists of
the therapist and the patient examining the validity of the patient's
fears (Beck & Emery, 1985). This technique is built around the
notion that by empirically testing the beliefs, looking for contradictory
evidence, and providing alternative explanations, the patient will
modify his exaggerated fears and bring them into a closer approximation
of reality.

COGNITIVE ANALYSIS AND THERAPY

In the cognitive analysis of a patient's problems, it is important
to determine the various parameters of the onset or increase of
anxiety. Does it appear in the context of a particular situation?
Does it precede entry into a situation that could be expected to
produce anxiety in a "susceptible individual"? What automatic thoughts
does the person have in the situation? What images does he experience?

It is important initially to try to ascertain the individual's
"spontaneous" cognitive responses to a situation. After the therapist
has proceeded as far as he can with this line of inquiry, he then can
ask somewhat more leading questions, such as, "What are you afraid
might happen? What is the meaning of this situation to you?"

The next step is to delineate the specific dangers perceived by
the individual. A typical sequence of dangers would be the following:
a. An individual enters a situation in which other people are present;
b. He perceives that they will be observing his demeanor and behavior;
c. He is concerned about the possibility of a negative evaluation;
d. He anticipates that the negative evaluation will cause him substantial
    pain.

Hypothesis Testing

From this sequence, the therapist (working with the patient) can
establish the specific fear (namely of negative evaluation and
consequently, of being hurt). From this material they can then
extract what seems to be the underlying rule that shapes the individual's
interpretation or conclusion. In the above example for instance, the
rule would seem to run something like this; if I enter into a situation
I expose myself to the possibility of negative evaluation and consequently
of being hurt. Therefore, situations like this are dangerous (and
worthy of arousing anxiety and avoidance).

Rules such as the above apply to "external dangers". However,
there are also rules that apply to "internal dangers". For instance,
an individual who reads a pain in his chest as a sign of a heart
attack; a feeling of faintness as a sign of losing consciousness; and
an internal turbulence as an indicator of loss of control, is operating
under a rule such as "any unexpected or unexplainable sensation may
be a sign of serious pathology".

Another type of rule is of a more general nature. One whole cluster of such rules revolves around interpersonal relations. For example:

a. "I have to do a perfect job in pleasing my guests or my reputation will be ruined".

b. "If my readers don't like this particular story, I may lose my job".

c. "If my clients are dissatisfied with me, they will talk about it and will ruin my reputation".

d. "If I don't make a concerted effort to get my fellow workers to like me, then they will shun me and I won't have any friends".

Another more general rule relevant to physical sensations is "I can't afford to experience any anxiety at all because once it starts, the anxiety can escalate into a full-blown panic attack". Similar assumptions are, "If I start to experience anxiety or other dysfunctions, it will be apparent to other people and they will reject me - consider me weak and neurotic...if I experience anxiety and other dysfunctions, I will be unable to perform the task (complete the examination or continue with a speech)".

Cognitive Restructuring

The essence of cognitive therapy is to produce cognitive restructuring. Whereas we believe that any psychotherapy that is effective produces cognitive restructuring, we include under the rubric of cognitive therapy those techniques that fit the following conditions: they can be logically derived from the cognitive model of anxiety; their mechanism of action can be readily understood in terms of essential cognitive changes; the methods are reasonably straight-forward and are relatively easy to teach and demonstrate although not necessarily easy to learn; finally, the methods are economical and reasonably efficient.

Automatic Thoughts

Reality Testing: After an individual has been able to isolate a significant automatic thought, it can then be reviewed with some degree of plausibiity or validity attached to it. For example, after a patient left a session, the therapist had the thought, "I probably messed up this session and my client will probably sue me". The therapist then experienced continuing waves of anxiety.

A number of questions were raised with the therapist: are the basic facts accurate? Is it a reasonable conclusion that the therapist messed up the session? Even if the therapist did mess up the session, does it follow that the client is likely to sue him? Is there any evidence from past experience that the patient is litigious? Even if the patient does sue, is the therapist indeed vulnerable? Did the therapist perform in a substandard way during the interview? That is, did he do anything or fail to do anything that other qualified therapists would not do or might do? Is there any evidence that the patient was dissatisfied with the session? If the patient seemed unhappy at the end of the session, are there any other explanations besides the therapist's presumed ineptitude that could account for the patient's unhappiness?

Hypothesis testing: The patient and therapist set up experiments to test the hypothesis. For example, a patient is afraid to ask the boss for a raise because he might get angry and reject him. Several hypotheses can then be set up. First, if you ask for a raise, the boss will reject you. Second, this rejection will be absolute in the sense that it will permanently impair your relationship. Third, his manner of refusal will be very traumatic to you. Each of these hypotheses can be tested logically in the office before the patient approaches the boss. First, is there any evidence that the boss will get angry if you ask for a raise? Even if he does get angry, is it likely to permanently affect your relationship? Assuming that you will feel pain upon being rejected, would it be worth going through the possibility of the pain in the hope that you may achieve the gain, namely getting the raise?

In addition to hypothesis testing, in this case the therapist and patient would want to look at the patient's basic assumptions, namely that it is wrong to put the boss in an awkward position or one should not take risks such as the possibility of incurring the boss' wrath. Once the hypotheses have been set up in the therapeutic situation then the patient may decided to test them out by actually approaching the boss. The results of the experiment could be written down and then brought in to the therapist next time.

Another approach to the types of anxiety problems may be subsumed under the title of "de-catastrophizing" techniques. The therapist for example may use the "what if" technique. This consists in part of pushing negative consequences to the extreme. For example, the following interchange could occur: What if you ask the boss for a raise, what is the worst thing that could happen? "I could get fired." If you get fired, what is the worst thing that could happen after that? "He could blackball me so I could never get another job". Assuming you get blackballed and could never get another job, what would happen then? "I would have to go on unemployment compensation until my benefits ran out". Once your benefits ran out, what's the worst thing that could happen? "I would end up on skid row and die".

The therapist then examines with the patient the likelihood of these events occurring. At some point in the questionning it would become apparent to the patient that he does consider the worst outcomes and also that the worst outcomes are unlikely. For example, it may be unlikely that being blackballed by his employer would prevent him from getting another job. It is also unlikely that he would be fired for asking; even if fired, it is unlikely that he would not be able to find another job, etc.

The actual "exposure" to a traumatic situation may be so threatening that the individual will avoid it. Furthermore, he may not have had enough experience in dealing with such situations to be able to present himself positively and skillfully without being undermined by an insidious fear reaction. For this reason, social skills training is often used in the above case. For instance, a patient and therapist might roleplay asking for the raise. They also might add "reverse roleplay" in which the patient plays the role of the boss and the therapist the role of the patient requesting a raise. During these roleplaying procedures, the individual can catch his automatic thoughts and identify his basic assumptions. It is often important to pinpoint and evaluate the basic assumptions prior to the actual confrontation or experience.

In many cases an individual's anxiety may be seen to be directly related to dysfunctional attitudes. An office worker, for example, would become anxious in anticipation of having direct contact with other office workers. The general assumption appeared to be "I have to be nice to other people or they won't like me". This attitude also pervaded the patient's relationships outside of the office. The attitude with friends or family seemed to encapsulate the notion, "I have to be cheerful and entertaining or my friends won't like me".

The patient also placed a great deal of emphasis on not showing weakness. Her attitude seemed to be "If my friends knew anything about my physical or emotional problems they would scoff at me". A derivative of her attitude of this was, "If I show any weaknesses my friends no longer will be interested in me".

The patient worked in an advertising office with a number of other men and women. Although she had problems with both sexes, they took a somewhat different form. She found that the men would try to "kid me along" and at times make seductive comments. She was afraid that if she did not go along with them and respond in a humourous vein, they would consider her "square" and dislike her. Her problem with the other women in the office was embodied in the notion "If I am not nice to them, then they won't like me," or "I have to be nice to them or they will dislike me".

In the therapy sessions the problem with the women in the office was addressed first. The therapist pointed out how "dichotomous" her attitudes were. She felt that she was either liked or disliked, with nothing in between. The therapist suggested that liking or disliking was like a spectrum with an infinite number of gradations from one end to the other. Thus, at one end which could be signified by the color red on the rainbow, the relationship could be very warm or hot. The other end was typified by dark blue (or violet) which could symbolize a cool relationship. The therapist then tried to get the patient to grade her present relationships with the other workers according to where they stood on the hot-cold spectrum. As it turned out, only a few fell into the warm category and the majority fell into a midpoint on the spectrum. (A somewhat similar approach was used by David Clark in an interview with one of his patients.)

The patient was then asked to devise some formula by which she could determine which of the workers she would really like to have a friendly relationship with. She specified a number of criteria. Most of which centered around a kind of spontaneous rapport and also having a "meeting of the minds" on a number of issues. Basically, she was looking for individuals with whom she could "let her hair down," "be herself, not have to put up a front", "feel comfortable with just chit-chatting". In essence, then, the immediate objective was for her to revise the imperative "I should be nice to everybody or they won't like me" to "It would be desirable to foster relationships with people I think I like and to maintain a polite or even neutral relationship with others". She felt quite comfortable with this newer rule since it fitted in more closely with what she felt she wanted.

In the time between this and the next session the patient had a chance to test out the old and new rule. She found that when she approached a group of the other women she did have a sudden upsurge of the thought, "I should go over and be extra nice to them". When she passed them by, she felt a twinge of anxiety and had the thought,

"Now they won't like me". She then took a few moments off to review
this incident and concluded that the automatic thoughts actually were
contrary to her best interests and in any event did not hold much
water. In subsequent practice sessions the patient recognized that
each time she would approach a group the old formula would be activated
and would be accompanied by a fearful thought and also anxiety. The
thought usually took the form of "They may not be responsive to me".
After several weeks the patient's level of anxiety decreased substantially
and she had only minimal twinges when approaching women who were on
the "cool" end of her friendship spectrum.

Her problem with men was a bit more complicated. There were several
men with whom she thought she might be able to have a more than
superficial relationship. However, in any kind of group situation
these men tended to be frivolous and flirtatious. Her rule here
seemed to be "If I am not flirtatious in response, then they won't
like me". We then set up an experiment of structuring the patient's
responses in the form of making some kind of neutral comment or
simply asking questions not related to a flirtatious overture.
The purpose of this experiment was to determine whether she would alienate
the men by not responding in their own currency. She found after several
encounters that her relatively neutral response to the provocative
comments did not alienate them. In fact, after a few more tries most
of the men were willing to drop the flirtatious style and started to
discuss work-related topics with her more seriously.

Her difficulties with her friends outside of the office were of
a somewhat different nature. She had for a long time operated under
the assumption "If I show any of my weaknesses or discuss my feelings
with them, they will think less of me". The therapist made a dent
into this particular assumption by asking a series of questions:

Therapist: Do you listen to the other women discuss their problems?

Patient: Yes.

Therapist: Do you think any less of them for showing their weaknesses?

Patient: No.

Therapist: Are any of these women hypercritical so that it is likely
that they would depreciate you for showing weakness?

Patient: None of them are really hypercritical or I wouldn't have
them as friends.

Therapist: Since there is no reason for them to be more critical of
you than you are of them for weaknesses, is there any
reason why you cannot begin to expose the "real you".

The patient felt a twinge of anxiety over the prospect of "exposing
her weaknesses". Therapist and patient then decided to set up a
series of exercises in which this hypothesis could be tested out,
namely that her friends would think less of her for letting her hair
down. Initially the therapist conducted a roleplay with the patient
in which the therapist played the role of the patient and the patient
played the role of other friends. The therapist then went through a
kind of rehearsal of acknowledging certain faults and problems and
the patient then was asked to respond the way one of her friends would.
As it turned out she found it difficult to respond in a critical manner.

The patient then was asked to test this assumption by gradually exposing more and more of her problems to her friends. She was very pleased to find that her friends were not only not critical but seemed to appreciate the fact that she was willing to share her problems with them.

Exposure Therapy

It is important to note that cognitive and behavioral techniques should not be regarded as separate components of entirely different domains. Rather, we enter into specific situations with all our systems activated in a synchronized manner, with each system operating as a subordinate of a master system or strategy. Therefore, if we attempt to alter the cognitive structuring of a situation substantially we would inevitably alter both the behavior as well as the affective response. In other words, any intervention directed at a particular system will necessarily affect the coordinated systems simultaneously.

Thus, when a patient is engaged in exposure therapy, cognitive changes will almost certainly take place, as demonstrated by Williams and Rappaport (1983). What additional advantages, then, does cognitive therapy offer if exposure therapy is adequate for producing cognitive, behavioral, and affective change? It is helpful to keep in mind that, as mentioned above, the individual involved in exposure therapy is at the same time engaged in thinking and feeling. Consequently, if we can help to alter his thinking through a direct procedure (as opposed to the indirect exposure therapy), we may be able to add to the short-term and long-term effectiveness of the behavior therapy.

One of our therapists, for example, utilizes this direct procedure by accompanying a patient who has driving phobia associated with agoraphobia. While driving, the patient will report her cognitions as soon as she begins to feel anxious. A typical exchange would be as follows:

Patient: There's a truck up ahead. I'm afraid I'm going to ram into it. I'm feeling very anxious.

Therapist: What is the likelihood that you will ram into it?

Patient: I guess not very high. Not as high as I thought a second ago.

Therapist: What can you do to prevent piling into him?

Patient: I'll just relax and slow down until I can pass him.

One of the notable features in the above exchange is the inhibition of rational thinking that the patient experiences as soon as she begins to feel threatened. The cognitive therapist can be very helpful in such cases by encouraging the patient to adopt a more rational approach, or by supplying some reasonable notions that the patient many incorporate.

Patients who have driving phobias seem to harbor a variety of fears which, additionally, trigger or even exacerbate the anxiety they experience while driving. For example, as a patient negotiated a blind curve she had the thought: "I might get stuck in the traffic and not be able to get out". By encouraging the patient to articulate these fears and thus, to test them, the therapist prompted her to gain more objectivity and thereby diminish the sense of threat. Furthermore, the sense of control attained by these techniques seems

to increase the patient's feelings of self-efficacy and lessen the sense of vulnerability.

CONTROLLED STUDIES OF ANXIETY

We have recently conducted a research project for the purpose of determining whether there are certain cognitive variables that are characteristic of anxiety but not depression. Thus, we had to translate into measurable constructs the notion that anxiety was characterized by danger-related cognitions (as opposed to the loss-related cognitions in depression). Since both groups tended to have negative views, we needed to assess what was clearly the difference: Depressed patients believed that bad things will happen whereas anxious patients predict that bad things may happen. Depressed patients thus, would attach a higher probability of negative events occurring than would the anxious patients, even though the content of these negative events might be the same.

Similarly, we needed to test the notion that whereas depressed patients attached high probabilities to negative events and low to positive events, the anxious patient were equally likely to attach high probabilities to positive outcomes as to negative outcomes. We developed a test called the Fantasied Outcome Test (Beck, Riskind, Brown, & Steer, 1986) designed to measure the anticipated outcome of each patient's most distressing problem and the probabilities of the positive as well as negative outcomes. Each patient was asked to imagine the negative and positive outcomes of his most distressing problem and then was asked to assess the probabilities of each. The anxious patients attached approximately equal probabilities of positive outcomes, whereas the depressed attached relatively high probabilities to negative outcomes and low probabilities to positive outcomes (Beck et al., 1986).

Similarly, on a test designed to assess the frequency of anxious versus depressive automatic thoughts (the Cognition Checklist; Beck et al., 1986) the anxious patients endorsed significantly more items relevant to danger and significantly less items relevant to depression (hopelessness, self-devaluation, pessimism) than did the depressed patients.

SUMMARY

The anxiety disorders may be understood within a framework that views the various symptoms as representing the overactivity of various systems utilized for coping with danger. These systems are component parts of primitive (probably evolutionary) strategies such as flight, freeze and faint.

The behavioral symptoms such as muscular rigidity, trembling, and difficulty in speech represent a generalized inhibition of action from the primitive "freezing" strategy. The strategy serves to prevent activity that might expose the individual to increased dangers.

The affective symptoms exemplified by intense subjective anxiety serve to enhance the awareness of danger and produce discomfort until the danger is terminated.

The autonomic symptoms by and large may be viewed as the mobilization of the physiological systems (especially the sympathetic nervous system) for action, generally to facilitate the flight reaction. The faint reaction, on the other hand, represents a generalized deactivation,

especially of the cognitive and motor systems, and is mediated, in part, by the parasympathetic nervous system.

The cognitive symptoms, namely fixation on danger, loss of objectivity, and inhibition of reflective thinking accentuate the physiological symptoms (e.g., tachycardia and sweating) and the affective symptoms (anxiety and fright). The relative replacement of reflective, reality - oriented thinking by reflexive, danger-oriented thinking prevents the individual from utilizing adaptive coping mechanisms.

In panic attacks, the patient experiences the activation of a primitive mechanism designed to protect the individual in emergency situations. The exclusive focus on the stimuli symbolizing external danger (such as bridges, closed spaces, or heights) or somatic sensations symbolizing some dangerous internal process (such as heart attack or loss of control) interferes with reflective thinking and triggers unpleasant affective and physiological symptoms. In panic disorders, the attention is fixed on the presumed "cause" of the symptoms, namely, a catastrophic internal process, and the anticipated consequences such as death, disgrace, or commitment to a mental hospital.

The treatment of panic disorders consists of coaching the patient in a number of techniques designed to abort or alleviate a panic attack: practice in slow breathing, using a rebreathing-bag, distraction, and re-attribution of symptoms. Although these techniques provide control over incipient attacks, they do not, by themselves, substantially alter the durable panic mechanism. Systematic exposure to stimuli provoking panic and the experience of the panic attacks followed by their cognitive evaluation are necessary to facilitate the penetration of realistic cognitive processes into the encapsulated beliefs that form the core of the panic mechanisms.

Generalized Anxiety Disorders revolve around the theme of vulnerability to psychosocial or physical threats. Because of a prevailing sense of being continuously vulnerable to rejection, domination, or devaluation or to serious physical or mental disorders, the individual is overly vigilant to any signs of danger. The over-vigilance leads to excessive activation of the behavioral and affective systems, which is experienced as symptoms of tension and anxiety.

The therapy of Generalized Anxiety Disorder consists first of training the patient to recognize and to re-evaluate the automatic thought expressing the exaggerated sense of danger. Secondly, the patient develops or improves interpersonal skills through role-playing and actual practice. Finally, the therapist and patient explore the formulae, rules and premises that produce the sense of vulnerability, for example, demands for perfection and intolerance of anxiety. With a greater objectivity towards catastrophic thoughts, increased inter-personal skills, and reduced domination by dysfunctional rules, the balance is shifted from a predominance of danger signals to safety signals and the constant sense of vulnerability is eliminated.

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EXPOSURE-BASED TREATMENTS FOR ANXIETY DISORDERS

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     Behavioral treatments based on the exposure principle play
a major role in the management of anxiety disorders, notably those in
which recurrent avoidance is a feature, as in phobic and obsessive-
compulsive disorders. The therapeutic principles have been around
for millenia and are rooted in common sense. In the past two decades
they have been welded together into a potent therapeutic technology
that can relieve many formerly untreatable conditions and hold promise
for further advance.

     ·Much behavioral treatment is a framework for applying common
sense to behavioral problems. Anxiety can be overcome more effectively
within such a framework than by a simple command to "pull yourself
together" or "use your willpower", which is heard all too often. In
some ways behavioral treatment is the scientific approach to willpower.

SELECTION OF ANXIETY DISORDERS FOR EXPOSURE TREATMENT

     Exposure treatment tends to be most effective under the following
conditions (see Marks, 1978). First, the patient has to be persis-
tently avoiding situations which trigger discomfort. Second, the
patient needs to be able to specify, after discussion with the therapist,
clearly attainable goals. Statements such as, "I want to get better",
are not sufficiently precise, and do not allow specification of
behavioral goals, which are crucial if treatment is to succeed.
Third, the patient must be willing to invest the hours of therapeutic
time and effort needed to overcome the problem, so that he or she
believes that his or her life will change in worthwhile ways if the
problems are overcome. The behavioral approach consists largely of
training patients to self-manage their own behavior. For this, their
co-operation is essential. No patient can be treated against his or
her wishes. In addition, treatment is easier if relatives or friends
are involved as exposure cotherapists helping the patient's management.
Fourth, the patient should not have serious depressive mood, which
makes it unlikely that behavioral treatment will work (see below).
Fifth, the patient should not be on high doses of sedative drugs
(e.g., benzodiazepines) or of regular alcohol to the point of being
drunk. In patients who are heavily sedated with drugs or alcohol,
the effects of behavioral treatment tend to wear off when the drug or
alcohol are metabolized or excreted. Patients therefore need to come

off sedative drugs or alcohol, except in minimal quantities, if they are to benefit from behavioral treatment. This withdrawal of sedation may take several weeks to avoid untoward medical complications. Antidepressant drugs, unlike benzodiazepines or beta-blockers, can apparently be continued without mishap during behavioral treatments. Sixth, and last, the complicating presence of serious physical disease such as angina, asthma, peptic ulcer or colitis all make high anxiety undesirable; in such patients exposure treatment needs to be carried out more slowly than usual to avoid extreme anxiety.

METHOD AND OUTCOME OF BEHAVIORAL TREATMENT: EXPOSURE

The behavioral approach to anxiety disorders does not assume that phobias are symbolic transformations of hidden difficulties. It does not dig and delve for unconscious dirt. Instead it regards the phobia or ritual as the main handicap, and tries to eliminate it directly by teaching the sufferer how to face those situations which trigger his discomfort so that he or she can eventually learn to tolerate them (exposure therapy). A wealth of research has shown that this approach works well in most cases, including agoraphobics with panic attacks (reviewed by Marks, 1981). Even phobias which have been present for 20 years can be overcome in a few hours of treatment. A typical treatment might total 3-15 hours of exposure, applied in 1 1/2 hour sessions. Not only the phobias but also spontaneous panics have been shown to improve after exposure treatment. Figure 1, taken from a study by Marks et al. (1983) in which imipramine was found to be ineffective in potentiating the effects of exposure, illustrates how spontaneous panic attacks improved following exposure therapy.
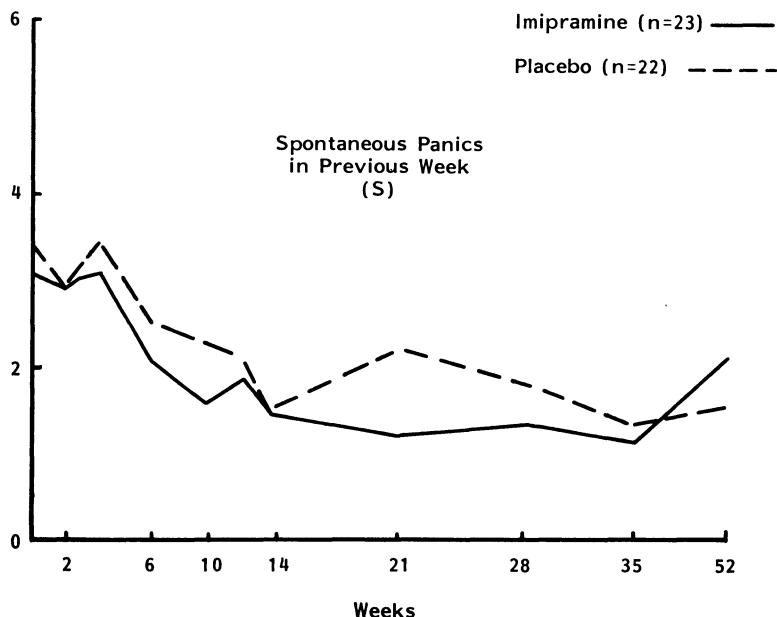
Fig. 1. Improvement of spontaneous panic and of phobias during self exposure with placebo and with imipramine (Marks et al., 1983).

It is important to note that not all behavioral methods are equally effective. Relaxation is often called a behavioral treatment but generally does not reduce phobic responding. Exposure to the frightening situation until the anxiety subsides, is an effective behavioral technique in the great majority of patients, provided exposure continues for long enough. In a lucky minority of sufferers, just a few minutes of exposure to their fear-evoking stimuli is sufficient to reduce panic. More commonly, the panic starts to reduce within half an hour of the start of the exposure, even in phobias which have been there for decades. Rarely, several hours may be needed for the fear to start abating. The important point is to continue exposure until this happens. In general, the more rapidly that exposure is undertaken the briefer the total time needed to complete exposure therapy.

In its simplest form, exposure treatment consists merely of advice to patients to expose themselves everyday to a phobic situation they find slightly difficult, and to record their daily actions in a diary which the therapist reviews at the next visit. As they gain confidence they can set themselves fresh targets to achieve from one week to the next. Patients define weekly targets that are useful for them to attain. Relatives can aid greatly by helping the patient work out the details of the exposure homework program, monitoring it, and reinforcing him or her for any progress that is made.

The following is a typical explanation given to a patient before treatment begins. In this case it is directed to an agoraphobic

We find from past experience that a good way of getting over your fear is to allow yourself to confront the very situations you have tended to avoid, but the confrontation should be for quite long periods of time - several hours is better than a few minutes. If necessary we will help you go into these situations in the beginning and then gradually fade ourselves out of the exposure tasks. Eventually, we will expect you to do them yourself. For example, you had somebody escort you here because you couldn't make the trip alone. We will ask you within two or three sessions to come to the clinic alone.

Of course, you will experience quite a bit of anxiety, especially in the beginning. You may even panic and feel that you must rush out of the situation; but the one thing you mustn't do is escape, because that will only make your phobia worse. You will learn that if you just stay there, in that frightening situation, the panic will go away - usually in less than 20 minutes, sometimes a little longer. But if you can persuade yourself to stay in the situation, and the great majority of patients like you can, the next time you try, it will be much easier.

In between sessions with us, we will ask you to engage in exposure-homework tasks. We will ask you to lay out a series of goals that you know you have to achieve in order to overcome your phobia. You might choose to go into a crowded part of town every day and stay there in the crowds for at least an hour. At the same time you can go into the supermarket and perhaps for a walk in the park. We will ask you to record your goals and achievements in a diary and record what your panic rating was, so we both can see it go down from a maximum of 8 to maybe 6 or 5 in the course of a couple of tries. You will bring your diary to each session, and we will use it to help plan the next phase of therapy. Members of your family can help you with your homework, if you wish. They can act as your co-therapists.

We won't cure you absolutely. There will be a tendency
for some recurrence of the fear from time to time, but we will
teach you the coping strategies that will enable you to stop avoiding
fearsome situations.

After all this has been discussed and the patient has agreed
to participate in the program, understanding the commitment it requires,
the first step is to work with him or her to establish concrete goals
and to rank them in order of importance. The definition of goals
must be as specific as possible, e.g. for an agoraphobic, "I want to
spend two hours a week shopping alone at the nearest mall", rather
than, "I want to be able to get out and go about by yourself", and for
a compulsive washer, "I want to be able to touch the garbage can every
day without washing my hands afterwards", rather than,"I want to get
rid of my hang-up about dirt".

When possible, as it usually is in the families of cooperative
patients, a family member is recruited as co-therapist. The husband
or wife, for example, is asked to initial each day's diary entries,
witnessing that the tasks were completed.

An essential part of the homework is that the family not reward
phobic or ritualistic behavior. It is counterproductive to reassure
those who ritualistically ask for reassurance. The illness phobic
who constantly asks for reassurance, hoping to be told he is not
sick, has his anxiety reduced only briefly by such reassurance, but
the anxiety flares up again shortly afterwards. What he must do is
learn to tolerate the idea of illness just as most other people do.
Withholding the reassurance deprives him of his fix, so to speak.
Addiction to reassurance can be broken only by withdrawal of the latter.

Learning not to reply to repeated requests for reassurance
can be surprisingly difficult for family members. Relatives may have
had years of training to answer, "Yes, you're all right, you're doing
fine." Repeated role-rehearsal of appropriate responses in the
presence of the therapist and patient can help them to unlearn the
response - and help the patient learn that the denial of reassurance
is part of the treatment. An example of an appropriate response to
the patient's question "Have I got cancer?" is for the relative to
reply "hospital instructions are that I don't answer such questions".

For illness phobics the primary care physician must be brought
into the picture. He needs to learn to withhold examinations and
tests unless they are necessary for genuine medical reasons. Like
family members, the physician should withhold reassurance until the
patient is able to tolerate the discomfort of not being certain
whether he is ill.

Compulsive slowness presents special problems. The lives of
such patients and their families can be crippled because the patients
may take several hours to get dressed or undressed, have a bath, or
cross the road. The problem can at times be helped by "time and
motion" treatment. This involves prompting and pacing the patient in
progressively more rapid sequences of behavior, with modeling of
these when necessary until eventually he is able to complete his action
in normal times. The results however do not always justify the
effort needed from the therapist.

Obsessive thoughts without rituals (obsessive ruminations)
respond much less predictably to behavioral methods than do rituals.

Two procedures that have been used are thought stopping and prolonged exposure. Both have had limited success, but at the moment there is no clear guide to effective treatments of obsessive ruminations.

Most patients can be treated on an outpatient basis. In the author's unit perhaps 5% require inpatient treatment – those who need to be gotten off excessive alcohol or sedative drugs, or who live too far away to come regularly during the early stages of treatment. Others may have relatives who need to be admitted with them to facilitate co-therapy after discharge.

Occasionally, dramatic cures are effected in one or two sessions; explaining the principle of exposure treatment sometimes leads the patient to apply treatment to him or herself without further help from the therapist. More commonly, however, the therapist will need to see the patient from 4-20 times, perhaps with monitoring telephone calls in between, reviewing the homework tasks amd making suggestions as to the next phase.

During exposure treatment phobics experience more anxiety in the course of exposure to the real life feared situation than during slow approach to an imagined phobic situation, but this price is well worth paying for the time it saves in improving the patient more quickly. Phobics treated by rapid exposure to their real frightening situations later said this was no worse an experience than going to the dentist.

There is considerable recent evidence that many phobics can treat themselves adequately by self-exposure without a therapist, using carefully devised self-help manuals (reviewed by Marks, 1981 and Mathews, Gelder, & Johnston, 1982). The self-treatment package for phobias has worked in several controlled studies. One experiment (Ghosh, Marks, & Carr, 1984) assigned phobic patients (more than half being agoraphobic) to one of three groups. The first treated themselves by following the self-exposure homework instructions from the manual Living with Fear (Marks, 1978). The second group interacted with a computer which delivered those same instructions on a video screen and modified them according to progress that was assessed by the information which patients typed into the terminal from week to week. The third group was given their exposure-homework instructions from a therapist who briefly escorted them first into a phobic situation and left them to continue the exposure alone. The results, presented in Figure 2 showed that all 3 groups of phobics improved substantially and highly significantly, with no significant differences among the 3 groups up to 6 months follow-up.

Side effects of exposure requiring treatment

Anxiety during exposure is common and does not require special measures. Nightmares and mild depression on nights following exposure sessions sometimes occur and usually clear up with continuing treatment. If they become more troublesome, then exposure could concentrate on less stressful cues until the patient is used to them, after which more difficult items can be confronted.

The criterion for adequate response is sufficient reduction of discomfort or rituals in the presence of the evoking stimuli. Reduction of anxiety from the start to the end of each session is ususaly a good indicator of progress. A decrement rather than a disappearance
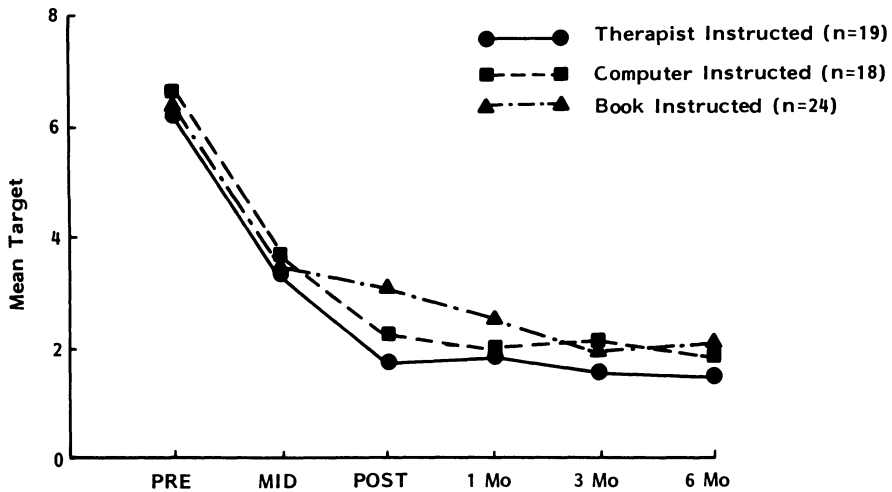
Fig. 2. Phobics: Controlled Study: Outcome of exposure instructions
given by book, by computer and by a therapist. Up to
6 months follow-up improvement was substantial and
comparable in all 3 groups (Ghosh et al., 1984).

of anxiety is the goal; few patients lose all traces of anxiety, even
after considerable gains.

If relapse occurs, its potential cause needs to be determined.
This could be an intercurrent depressive episode which may require
antidepressant drug treatment, or noncompliance, reasons for which
would need to be reviewed and dealt with, or new life stress which
has to be managed. Brief booster treatments of exposure may be
needed on occasion. Generally, however, patient improvement has been
maintained in the two to four years of follow-up after exposure
treatment (recorded now with hundreds of patients, Marks 1981, 1982).
Maintenance of treatment gains is addressed in the next section.

Durability of outcome after exposure

Evidence is mounting for durable improvement from treatment
centers in several countries. There have been at least 5 studies
showing that phobics retain their gains up to 2-7 years after exposure
therapy (Marks, 1971 - London; Munby & Johnston, 1980 - Oxford; McPherson,
Brougham, & McLaren, 1980 - Scotland; Emmelkamp & Kuipers, 1979 -
Holland; Cohen, Monteiro, & Marks, 1984 - London). Four other studies
also demonstrated enduring gains in obsessive-compulsive ritualizers
for 2-4 years after exposure treatment (Boulougouris, 1981 - Greece;
Emmelkamp & Rabbie, 1981 - Holland; Marks, 1975 and Mawson, Marks, &
Ramm, 1982 - London).

Many more studies have demonstrated that improvement lasts up to
6-12 months following treatment. Only one study of phobic patients
so far has employed a routine treatment control (Marks, 1985). In

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that study phobics presenting in primary care were assigned at random
either to a routine treatment control condition for one year or to
exposure therapy from a nurse-therapist. Treated patients improved
highly significantly, while routinely treated controls did not. This
effect is demonstrated in Figure 3.
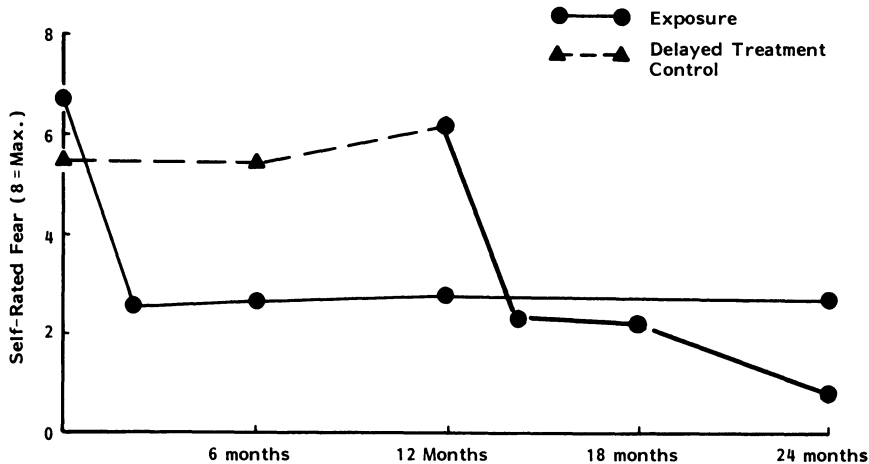
Fig. 3. Phobics in Primary Care: Controlled Study. Patients
on a waitlist did not improve over a year, but improved
quickly after that point when they had exposure therapy.
Patients who had exposure therapy from the start
improved rapidly, in a mean of 7 sessions (Marks, 1985).

At the end of a year control patients were offered exposure
therapy. The majority accepted, and improved significantly by treatment.
That chronic patients did not improve with a non-exposure routine
treatment is consonant with the results of Agras, Chapin and Oliveau
(1972) that an untreated cohort of adult phobics did not improve over
5 years follow-up.

All the experiments above dealt with chronic phobics and obsessive-
compulsives, the mean problem duration typically being about 10 years
or longer. In the phobic samples the proportions of agoraphobics
with non-situational panic attacks vary from 100% to about 50%; 100%
had situational panics.

Despite the abundant evidence that exposure treatment produces
lasting and substantial improvement in agoraphobics with panic attacks
and also in other phobics and in compulsive ritualizers, adoption of
the treatment method by psychiatrists has been remarkably slow.
Perhaps this is because exposure is often seen as being the province
of psychologists and as being time-consuming. In fact, no knowledge
of learning theory is required for successful therapy, and with the
advent of self-help methods the amount of time the therapist actually
needs to spend with the patient has decreased greatly. Exposure
therapy has several advantages over drug treatments. There are very
few side-effects and there is no need to continue with the treatment
for years as the results tend to be lasting, though occasional booster
sessions may be needed in a few cases. This is in marked contrast to
the effects of drugs in such patients, of which more will be said
presently.

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Prevention of phobias by pre-exposure

After sudden trauma there is often a lag phase before a phobia develops. If during this incubatory phase the subject is immediately re-exposed to the original situation, this protects him from becoming phobic of it. There is much folk wisdom suggesting that after falling from a horse it is best to mount it again right away, and that car drivers should resume driving as soon as they can after a car crash. In children fewer dental fears have developed where, before serious dentistry begins, the children have been allowed to play with the dentist, his chair and his dental equipment.

How do exposure and drug treatment relate in phobic and obsessive-compulsive disorders?

Neither anxiolytics nor beta-blockers have yet been shown to be of more than temporary value for phobic or obsessive-compulsive disorders. More impressive results have been found with tricyclic and with MAOI drugs, though there is a high relapse rate on drug withdrawal, even after a year's treatment, so that the drugs do not seem to be altering the underlying pathology (reviewed by Marks, 1983). There have been two negative outcomes of antidepressant drugs in agoraphobics, one with imipramine (Marks et al., 1983) and another with phenelzine (Solyom, Solyom, LaPierre, Pecknold, & Morton, 1981). In both of these studies the agoraphobics had normal mood scores on scales like the Hamilton and the Zung, whereas in most of the studies where antidepressants reduced phobias, patients had at least moderately depressed mood to start with, and with drugs they improved not only in their phobias but also in their mood and on other measures.

Similar findings were noted for obsessive-compulsives. This suggests that antidepressants may be less reliable for phobic and obsessive-compulsive patients who are euthymic, and act mainly where there is complicating dysphoria. More careful attention is needed in future studies to the level of initial dysphoria and its relationship to outcome with drugs. Correlational analyses may not demonstrate a relationship which depends upon a particular threshold, and sufficient numbers of euthymic patients are needed in the sample to test out this idea, which has not always been the case in past studies.

The issue is reviewed in detail by Marks (1983). It can be summarized by stating that these patients' behavioral treatments are more focused and lasting in their effects than are antidepressants, which are more broad-spectrum with a higher tendency to relapse on drug withdrawal. The received wisdom is that antidepressants are specifically antipanic in agoraphobia, but it has never been shown that spontaneous panics are the first symptoms to remit on these drugs. Rather – when there is a drug effect – panic plus many other symptoms remit together. It is unclear what the relationship is between the frequent affective episodes commonly found in these patients and their phobias and rituals. These episodes are not obviously reduced after either behavioral or antidepressant drug treatments.

If this analysis is correct then the interesting possibility arises that antidepressants are not syndrome-specific in their action, but rather act in the presence of dysphoria whatever its cause, rather like aspirin is antipyretic and anti-inflammatory in a variety of inflammatory conditions. Perhaps dysphoria is a kind of 'psychic inflammation', and antidepressants may have a broader application than has been thought hitherto.

Anxiety disorders without situational anxiety (non-phobic, non-obsessive-compulsive)

These are probably the most numerous of all forms of anxiety disorders, but have been much less systematically studied, both diagnostically and therapeutically. Some reports have claimed results with relaxation treatment, with or without biofeedback, but in the absence of reasonable follow-up these claims cannot be properly evaluated. The same applies to exposure approaches in which the patient is asked to imagine anxiety cues for long periods of time; a controlled study of this approach is long overdue in such patients.

Behavioral claims for other methods of anxiety management training also remain to be substantiated, and the same applies to cognitive methods.

Anxiety management training (stress immunization, stress inoculation, cognitive behavior therapy) is currently fashionable for these conditions and follows similar lines to those described above under coping tactics during exposure for phobic-obsessive problems. So far, these methods have not been tested adequately in controlled studies of clinical populations. Just as there is a lack of evidence for the value of behavioral psychotherapy for such conditions, so it is with other psychotherapies, including dynamic modalities. Counselling probably has more of a role to play than intensive psychotherapy, because of its lower cost.

The controlled study of Sloane, Staples, Cristol, Yorkston, and Whipple (1975) found no difference in outcome between behavioral and psychodynamic methods for a patient population suffering largely from anxiety states and personality disorders, and neither treatment was substantially better than being on a waiting list for 4 weeks, even though the last group had far less therapist contact.

There is a large literature on Post Traumatic Stress Disorder concerning the role of abreacting traumatic events. Abreaction has been induced by a variety of drugs given by inhalation, injection, or orally; by hypnosis; and by more straightforward suggestion. It is sometimes said that for the results of abreaction to be worthwhile the abreacted material should be integrated into the patient's awareness and linked with other material he has discussed. It is clear that abreaction is often followed by relief of distress, but that in many cases the problem remains unaltered, and a few patients seem to be sensitized by abreaction (Bond, 1952). Controlled studies to sort out these issues remain to be done.

For the anxiety and stress which patients often have during medical and surgical procedures, brief psychological interventions may be of value. Havik (1979) summarized 25 US studies of the effects of information and education in such patients. On average patients who had 'psychological treatment' were better off than 76% of control hospital patients, and spent significantly less time in hospital. Interventions of less than 30 minutes were as good as longer interventions. Information and education from nurses was as effective as that given by doctors or psychologists. This result will surprise nobody familiar with the large literature showing the value of paraprofessionals and less trained people in health care as a whole, and in psychiatry in particular (Marks, 1981). Of relevance here, Cooper, Harwin, Depla, and Shepherd (1975) found that chronic neurotics in primary care who received brief help from a social worker were

better adjusted after a year than a similar control group that did
not receive such assistance, though the assisted group's total consul-
tation rate with the GP's did not go down.

The anxiolytic drugs have not been shown to be more than palliative
in anxiety disorders, and carry the risk of addiction. Beta-blockers
too have not been studied over long-term follow-up. There are studies
indicating the short-term value of MAOI's (Paykel, Rowan, Parker, &
Bhat, 1982) and tricyclics (Johnstone et al., 1980), but long-term
follow-up remains to be carried out. Most drug studies have been too
short-term to gauge the long-term efficacy of drugs, and this is
surely critical in conditions as chronic as many of the anxiety
disorders. Given a) the overlap between anxiety and dysthymic disorders,
b) the results of antidepressants in non-psychotic depression and c)
the effects of antidepressants in minor depression complicating
phobic and compulsive disorders, it would be surprising if antidepressants
had any long-term effect in anxiety disorders after drug withdrawal.

In summary, exposure treatments are the approach of choice
for phobic-compulsive disorders, antidepressants are indicated for
affective complications, and brief counselling for certain
anxiety states, with or without antidepressants, but far more research
is needed into the treatment of non-situational anxiety.

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PSYCHOSOCIAL TREATMENT OF ANXIETY DISORDERS

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The purpose of this chapter is not to attempt a comprehensive analysis of the cognitive-behavioral treatment of anxiety disorders. There are simply too many different strategies and techniques to incorporate into the present chapter. Nor is an attempt made to cover the full range of anxiety disorders. Rather, the chapter focuses on some current treatment issues, which, it can be argued, are of particular conceptual and clinical importance. The chapter draws mainly on the treatment of agoraphobia and panic. One reason for this choice is the clinical significance of agoraphobia and panic disorders, as well as the fact that a good deal is already known about the treatment of agoraphobia from a cognitive-behavioral perspective so that it provides a useful framework for examining relevant conceptual issues. Much of what is said here is directly applicable to other complex anxiety-based problems.

The conceptualization of any anxiety disorder obviously has profound implications for the manner in which it is assessed and treated. If, for example, agoraphobia is a product of some specific biological abnormality, it follows logically that the appropriate therapy might be some form of pharmacological treatment. Alternatively, if agoraphobia is rooted in the dynamics of family interactions, then a family systems approach of some kind would appear to be indicated. Currently, there is no uniform cognitive-behavioral conceptualization of agoraphobia. At one extreme there is Goldstein and Chambless'(1978) view that agoraphobics are unassertive, dependent people, who are unable to relate emotions to the events that cause them. In this scheme, the anxiety of interpersonal conflict is erroneously attributed to external events. At the other extreme, agoraphobia is seen as conditioned fear and active avoidance learning (Eysenck & Rachman 1965). Not surprisingly, Chambless and Goldstein (1982) recommend a more extensive and eclectic treatment approach than behavior therapists who do not share their view about the causal properties of interpersonal conflicts and their assumptions about agoraphobics' premorbid personality (e.g., Emmelkamp, 1982; Mathews, Gelder, & Johnston, 1981; Wilson, 1984).

To summarize, one's conceptualization of a disorder such as agoraphobia - a conceptualization which might only be implicit - is likely to critically affect one's choice of treatment strategy.

There are other ways in which conceptual issues enter the clinical
picture and help to determine how patients will be treated. As the
famous social psychologist Kurt Lewin said, there is nothing quite as
practical as a good theory.

THE IMPORTANCE OF BEING THEORETICAL

Different views of why therapeutic procedures work may have any
or all of the following consequences. First, they bear on what is
the target of therapeutic intervention. Is the goal to extinguish a
classical conditioned fear reaction or an avoidance response? Is it
to boost the patient's sense of personal efficacy? Or is it to
modify an anxiety self-schema? Second, different views about theoretical
mechanisms responsible for therapeutic success will influence choice
of treatment methods. If, for example, Bandura (1977) is correct and
all fear reducing methods are effective because they increase patients'
self-efficacy in coping with anxiety-related situations, then it
follows that techniques other than in vivo exposure may be both
indicated and effective. Indeed, DeSilva and Rachman (1981) have
argued persuasively that although exposure is the most powerful means
of treating phobic fear and avoidance, and is often sufficient, it
cannot be said to be necessary. Finally, one's theory about why a
particular treatment procedure is effective will critically influence
how that technique is actually used in clinical practice, as indicated
below.

THEORETICAL MECHANISMS IN EXPOSURE TREATMENT

To demonstrate how different conceptualizations of a treatment
procedure's mechanisms affect basic clinical practice, consider the
example of in vivo exposure. It is now well established that in vivo
exposure is an effective treatment for phobic and obsessive-compulsive
disorders, but the active mechanisms in exposure are still a matter
of debate (Barlow & Wolfe, 1981; Marks, 1981). According to the customary
conditioning formulation of exposure treatment (often referred to as
habituation theory), the goal of treatment is the extinction of
conditioned fear responses. To this end the necessary and sufficient
therapeutic ingredients are systematic and repeated extinction trials
in which the patient is exposed to the conditioned fear-eliciting
stimuli without any untoward (unconditioned) negative experience. In
graduated, desensitization-like exposure treatments it would be
necessary to limit any anxiety the patient experienced to relatively
low levels (Wolpe, 1958; Eysenck, 1982) since high levels would undermine
(or even preclude) extinction. High levels of anxiety in response to
fearful stimuli would be appropriate in exposure methods akin to
flooding, in which the essential procedural parameter would be suffi-
ciently prolonged exposure to ensure that the patient's anxiety
reactions are clearly waning before exposure is terminated (Levis &
Hare, 1977; Marks, 1981). Clinical accounts of these types of exposure
treatment, informed by conditioning theory, focus almost exclusively
on the technical niceties of the conditioning technique (e.g., the
intensity and duration of exposure, typifying the time-honored variables
of animal conditioning research) with little attention devoted to
what have been called the "nonspecifics" of therapy (Wilson, 1980).
The point at issue here is not the validity or utility of the conditioning
formulation.[1] The question is whether the actual clinical practice
of exposure treatment is consistent with the conditioning or habituation
theory.

"Exposure treatment" is usually discussed in the literature as though it were a uniform and standardized procedure that was directly comparable from one study to the next. This assumption seems unwarranted. Although exposure treatment is a straightforward method, its effective use frequently depends on success in dealing with clinical issues such as increasing motivation, facilitating compliance, coping with anticipated anxiety attacks during exposure sessions, and overcoming cognitive distortions (Wilson, 1984). These often critically important clinical strategies tend to be ignored or relegated to the status of "non-specific factors" in necessarily abbreviated journal accounts of behavioral studies. In this connection Mathews et al. (1981) did the field a great service in spelling out the details of their exposure treatment, which is widely regarded as typical of standard behavioral fare.

Even a cursory analysis of the Mathews et al. treatment program reveals that it cannot be encompassed by simply describing it as an extinction technique aimed at producing an habituation of the fear. In addition to prescribing the basic behavioral tasks of gradually approaching phobic situations, Mathews et al. (1981) offer suggestions for coping with thoughts and feelings that would otherwise undermine therapeutic progress. Detailed considerations of these treatment manuals is beyond the scope of the present chapter, but the point at issue here can be illustrated with reference to their suggestions for coping with what they call "set-backs."

Consider the following advice:

Hardly anyone recovers from agoraphobia without having at least one "setback." Feelings vary, sometime from day to day, and what you did successfully yesterday may seem impossible today. Even then you could make real progress. What counts is how you cope with whatever feelings you experience. So, a little done on a bad day can be worth more than a lot done on a good day. (Mathews et al.,1981, p. 184).

Here and elsewhere in their program Mathews et al. (1981) help clients to interpret (others might say "reframe") critical events in constructive rather than negative, self-defeating ways. By anticipating the possibility of a "setback" at some point in the future, they explicitly attempt to defuse the otherwise detrimental effects of an unexpected anxiety attack just when clients feel they are improved. Little or no mention is made of such specific interventions in the literature on agoraphobics, but it is plain to see that Mathews et al. are engaging in what Marlatt and Gordon (1985), in the field of addictive disorders, have described as the cognitive-behavioral technique of relapse-prevention training. Mathews et al. even provide clients with a short set of summary rules about what to do if a panic strikes. These include the following: "1. The feelings are normal bodily reactions; 2. They are not harmful; 3. Do not add frightening thoughts; ...9. Plan what to do next..." (p. 183). The parallel to relapse-prevention training, in which clients are provided very similar "rules" that bear on attributional processes, and coping strategies, is striking. Specifying treatment interventions (including cognitive

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1 There is now a substantial body of animal and human studies showing the conditioning (two-factor) theory of fear reduction to be untenable (see Bandura, 1977, 1978; O'Leary & Wilson, in press; Williams, Dooseman, & Kleifield, 1984).

and behavioral components) and relating progress in one area to developments in another, as now seems possible, constitutes a major therapeutic advance.

In pointing out that the clinical implementation of exposure treatment in behavior therapy goes well beyond the confines of conditioning theory, it is appropriate to mention Gelder's (1982) observation in his discussion of whether or not exposure is necessary and sufficient for the successful treatment of agoraphobia. He notes that "when behaviour therapy was first introduced into Europe in the 1950s, the standard method for agoraphobia was a form of exposure treatment known as graded retraining. This gave very limited results ..." (p. 87). Gelder attributes the increased efficacy of current exposure-based techniques to subsequent research developments. Referring to the successful clinical research of his group of investigators at Oxford University, Gelder states that

> exposure is sufficient, but in this treatment it is not used alone but combined both with anxiety management techniques and with considerable efforts to replace attitudes of helplessness with those of self-efficacy. If we remember the limited results which were obtained years ago with graded retraining, in which exposure treatment was used without these two additional measures, then we would be unwise to conclude that exposure is a sufficient condition. One way of interpreting this is to suppose that the behavioural procedure of exposure to avoided situations does not, by itself, produce the cognitive changes which are required for complete recovery; and that these additional measures are necessary to induce these cognitive changes (p. 92).

A social learning analysis helps to spell out the "cognitive changes" and "additional measures" for which Gelder calls.

A SOCIAL LEARNING ANALYSIS

Unlike the conditioning model, social learning theory (Bandura, 1977; O'Leary & Wilson, in press) explictly dictates the broader cognitive-behavioral strategies I have pointed to in the Mathews et al. (1981) program.

One of the problems in treating some complex anxiety disorders, such as agoraphobia, is that patients often do not respond in a straightforward manner to the evidence of behavioral success or improvement. Cognitive processes may distort or neutralize behavioral accomplishments. For example, patients may engage in cognitive avoidance, in which case they appear not to come into contact with the phobic cues that are necessary if fear reduction is to occur. With regard to the occurrence of cognitive avoidance of this kind, Borkovec (1982) refers to the importance of "functional exposure" to the phobic stimuli. The term functional acknowledges that simply exposing patients to external phobic stimuli does not guarantee that they actively engage - that is, attend to and encode - those stimuli.

Most therapists who have used exposure treatments will undoubtedly be familiar with instances of apparent exposure to phobic stimuli not producing reductions in fear. Guidano and Liotti (1983) recently reported the following not atypical illustration. A thanatophobic patient avoided the sight of a coffin or corpse, fearing that she would die is she were to see one. Guidano and Liotti decided to try to disprove this idea to the patient, using

the imaginal systematic desensitization technique.
The patient was able to imagine vividly the various
items in the hierarchy of anxiety-causing stimuli,
starting from the fleeting sight of an empty hearse
down to watching a corpse being dressed and laid in
the coffin; although at first she showed great anxiety,
later on she calmed down and was able to remain in a
state of deep muscular relaxation (pp. 148-149).

Despite the procedural success of desensitization, the results
did not generalize to real life, and the phobia continued unabated.
Careful questioning of the patient then revealed the reason for the
therapeutic impasse. While imagining the scene, the patient "silently
said to herself, °I shall never be able to do this.' That is, she
imagined the scene, but not herself in the scene" (p. 149). The
reasons for this personal distancing from the scene would then have
to be addressed. Guidano and Liotti suggest that a subsequent clinical
analysis of this kind uncovers therapeutically significant "deeper
cognitive structures."

The cognitive processing of the patient in the foregoing example,
what I have labelled distancing, is only one of many forms of cognitive
avoidance or distortion that may undermine the efficacy of exposure
treatment. Patients with complex disorders, including some agoraphobics,
typically show distortions in the way in which they appraise personal
and situational information. They attend selectively to cues, mislabel
internal sensations, misinterpret events, recall selected information
in a cognitively biased manner that emphasizes negative features, and
may minimize or ignore evidence of accomplishment. Fisher and Wilson
(1985) for example, showed that agoraphobics mislabeled their internal
sensations and attributed the causes of these feelings to internal,
abnormal causes significantly more than nonagoraphobic subjects. The
agoraphobics did not show greater sensitivity to internal cues than
the nonagoraphobics. This pattern of findings is consistent with
Chambless and Goldstein's (1982) concept of an "hysterical" cognitive
or attributional style in agoraphobic patients. Fisher and Wilson
(1985) suggest that
     In recognizing the causes of their fears as internal and
     abnormal, the agoraphobics were in effect saying that they
     were afraid of their own arousal sensations. If their
     sensations are really no different from those of other
     people ... then there seems to be more of a cognitive-
     attributional problem than a physiological one. The
     agoraphobic may then very well be afraid of fear, but
     this 'fear of fear' appears to be taking place on a
     cognitive level (p. 106).
To overcome these obstacles the therapist needs to address the patient's
cognitive and emotional processing of information. Attempts to
conceptualize functional exposure in the more traditional, peripheral
terms of conditioning theory (Borkovec, 1982), are unlikely to succeed.

Nunn, Stevenson, and Whalan (1984) have demonstrated a selective
memory for phobic stimuli in agoraphobic patients, while Burgess,
Jones, Robertson, Radcliffe, and Emerson (1981) found that agoraphobics
were more sensitive to their specific phobic words than other anxious
subjects. Interpreting findings of this sort as evidence for cognitive
structures mediating phobic behavior, Nunn et al. (1984) speculate,
consistent with the implications of the present analysis, that "the
maintenance of anxiety responses, even following frequent exposure,
can be best understood in terms of the existence of this cognitive
organization. If it is not modified during therapy, the future

activation of such thoughts presumably means that the patient's interpretation of future events remains 'at risk'" (p. 200).

In contrast to conditioning theory, a social learning analysis explicitly recognizes the absence of any fixed isomorphic relationship between behavior and mediating cognitive processes. According to self-efficacy theory, an important mini-theory within the larger social learning framework (Bandura, 1977), behavioral performance is only one, albeit the most powerful, source of information which determines one's sense of personal efficacy. There might exist discrepancies between a person's self-efficacy and his or her overt behavior. These discrepancies are a function of the person's cognitive processing, an inferential process in which the relative contributions of personal and situational (e.g., behavioral performance) factors are centrally integrated.

Social learning theory has only begun to address the biasing of cognitive processing that accounts for the discrepancies between personal concepts such as self-efficacy and actual behavior. A clinical conceptualization of the cognitive processing of efficacy information, based on Beck's (1976) cognitive-behavioral treatment, provides useful therapeutic leads (Wilson, 1984). The cognitive distortions or errors that Beck and other cognitive therapists have identified describe the difficulties that may occur at any or all of the different subprocesses of cognitive processing, such as attention, perception, encoding, storage and retrieval. Particularly important in this regard is the influential role that affect plays in biasing cognitive processing. A well-documented illustration of affect's role in influencing cognitive processing is Bower's (1981) research on the effects of mood on memory, demonstrating a mood-congruity effect which means that people attend to and learn more about events that match their emotional state. He proposes that emotion "serves as a memory unit that can enter into associations with coincident events." People tend to recall more experiences that are congruent affectively with their feeling state during recall. An agoraphobic's vivid recall of a previous panic attack, when anxious, is an example of this latter process, as noted below. Affect may change cognitive accessibility, making mood-relevant material more available. Kihlstrom and Nasby (1981) note that

> While moods are themselves created cognitively ... moods
> affect cognitive processes - thus leaving open the
> possibility for a vicious cycle that can be highly
> maladaptive. Consider the case of a clinician who attempts
> to alter the 'depressive triad' of negative cognitions - about
> one's self, one's past, and one's future - by leading the
> client to focus on positive rather than negative features of
> percepts and memories. This will be difficult to do if
> the client's mood is having just the opposite effect. The
> clinician must find some way to break the vicious cycle of
> affect and cognition before treatment can hope to be
> successful - either by means of drugs ... or better, by
> teaching the client a self-regulatory strategy by which he or
> she can learn to modulate the effect of mood (p. 298).

Another means of breaking the cycle to which Kihlstrom and Nasby (1981) refer would be to prod the person into a series of graded mastery experiences, as in exposure treatment, which modify both the associated affect and cognition.

Much of the research on the interaction between mood and cognition has centered on the impact of depression. Yet Butler and Mathews (1983) have shown that anxious patients differ from non-anxious

patients in interpreting ambiguous material as threatening and rating
the subjective cost of threatening events as higher than controls.
In particular, anxious patients, unlike their depressed counterparts,
see these threats as self-relevant rather than applying to other
people. Johnson and Tversky (1983) have shown that even a brief
description of a tragic event can have a pervasive influence on
estimates of the frequency of risks and other threatening events. In
this latter study, Johnson and Tversky found a pervasive global
impact of affect without any effect of similarity or association. As
these authors state, "Evidently people dissociate the affective
impact of the account away from its content. These observations are
consistent with the view that the influence of affect is at least
partially independent of semantic association (Zajonc, 1980). The
results give rise to the hypothesis that we tend to make judgments
that are compatible with our current mood, even when the subject
matter is unrelated to the cause of that mood" (p. 30).

Another example of affect's impact on cognitive processes is
Wright and Mischel's (1982) findings that affect predictably influences
how people evaluate their performance, and specifically how they
react to feedback, set future expectations and goals, and selectively
recall their past successes. The significance of these data for the
self-regulation and modification of anxiety is clear.

SOME TREATMENT GUIDELINES

The following are some examples from my own social learning-based
treatment approach to agoraphobia which, in addition to the above-men-
tioned illustrations from the Mathews et al. (1981) program, show how
exposure treatment is used within a broader psychosocial context.

Patients are carefully prepared in advance for guided in vivo
exposure experiences. Briefly, the goal is made to increase commitment
to the treatment and reduce any resistance or non-compliance. They
are told that one of three outcomes is likely when they enter a
previously avoided situation: they will experience no anxiety, which
will happen infrequently; they will suffer a panic attack, which is
not likely but possible; or they will experience some anxiety with
which the therapist will help them to cope. It is emphasized that we
want them to experience a tolerable level of anxiety which can then
be "worked through" with a lasting increase in self-efficacy for
coping with threatening situations. In stressing the importance of
experiencing and coping constructively with inevitable anxiety, we
address a particularly common dysfunctional cognition, namely all-or-
nothing thinking. Patients often believe that they should feel no
anxiety whatsoever. Any anxiety is interpreted as a sign of failure,
or as an unbearable burden. Patients are helped to challenge this
dysfunctional thought or assumption in the manner described by Beck
(1976) and to accept a more realistic goal of coping with varying
levels of anxiety.

Beyond clinical exigencies, there are sound theoretical reasons
for exposing patients to anxiety-eliciting experiences during treatment.
In their analysis of cognitive processes in anxiety disorders, Butler
and Mathews (1983) have speculated the role of "danger schemata", as
noted above. Modification of these schemata (cognitive structures)
would require that they be accessed during treatment. To do this,
Butler and Mathews suggest that coping strategies must be taught in a
way that "links them with the cognitions concerning danger and anxiety.
One solution would thus be to deliberately invoke anxiety during

treatment and then teach cognitive coping methods under these conditions" (pp. 61-62).[2]

The overall purpose of the preparation for the exposure phase of treatment is to have patients develop a cognitive set which will allow them to anticipate and organize their exposure experience in ways that will facilitate learning. This strategy was originally derived from non-clinical research in experimental social and cognitive psychology by Goldstein, Heller, and Sechrest (1966). They recommended it for overcoming resistance and acquiring new patterns of behavior. This theory-based proposal squares neatly with the following clinical observation by Hand, Lamontagne, and Marks (1974): "With the 'right' cognitive set a situation can be therapeutic, which with a different attitude could be disastrous. Exposure to a certain event can be 'traumatic' ... or it may lead a person to gird his loins and emerge strengthened."

Patients are provided with several cognitive and behavioral coping strategies for use during actual in vivo exposure experiences – strategies which may be rehearsed in imagination prior to in vivo exposure. Relatively rare occurrences of panic attacks are treated as described by Mathews et al. (1981), Weekes (1976), and others. Patients are urged to accept and not to fight the panic; to label their sensations realistically; and to try not to exacerbate the panic by what Ellis (1962) calls "catastrophizing".

The cognitive coping strategies for anxiety reactions during exposure may be illustrated with reference to the emphasis on the importance of concentrating on the present. Thinking about past and/or future is discouraged, although this is far from easy. On the one hand, it is common for agoraphobics to recall, vividly, the painful details of a previous panic attack in a particular setting while "ignoring" (being less able to access memories discrepant with the danger schema) other occasions on which no panic occurred. This is an example of the dysfunctional cognition of negative selective recall. On the other hand, patients have a tendency to project ahead and to assume that their moderate degree of anxiety will inexorably increase and end in a panic attack. This potential self-fulfilling prophecy must be corrected, and focused self-instructions are used in this regard. The obvious cognitive restructuring that is involved in this advice requires little underscoring.

Finally, patients' planned and unplanned exposure experiences are carefully reviewed in therapy. A major goal here is to foster appropriate attributions on the part of the patient. Basically, in the jargon of attribution theory, the attempt is made to have patients attribute performance of previously avoided activities to internal factors (i.e., their own successes), and failures or setbacks to external, unstable, and usually specific determinants (Wilson, in press). Therapists will be familiar with patients who, in Beck's (1976) terms, disqualify the positive, i.e., they discount successful instances of nonphobic behavior, explaining them away as "luck" or as one of those rare but real "good days" that agoraphobics experience.

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2   The social learning view that behavioral procedures are the most effective means of producing changes in relevant cognitive/affective mediating processes leads inevitably to the more general consideration of the relationship between research on social cognition and behavior therapy – see Wilson, in press.

Two strategies are especially useful in this regard. Patients' own self-monitoring of specific daily progress can often be used effectively to challenge global discounting of improvement. Continued resistance to the therapist's interpretation of behavioral improvement can be countered by asking patients themselves to specify what accomplishment would convince them that progress is being made. Having patients set their own goals - which, of course, must be realistic - often has the effect of undercutting resistance of the sort indicated above.

To conclude, it must be stated that not all patients will require the extensive cognitive context or strategies summarized above for exposure treatment to work. Some will respond dramatically to simple, cognitively unadorned instructions to cease avoiding and confront phobic situations. It is, however, the more difficult patients who will require the more sophisticated use of exposure treatment informed by a social learning perspective.

COGNITIVE PROCESSES VERSUS PROCEDURES

The confusion of cognitive treatment procedures with processes has obfuscated the evaluation of therapeutic outcome and hindered the identification of therapeutic mechanisms, as Rachman and I have shown (Rachman & Wilson 1980). To set matters straight, it is clear that verbal (cognitive) methods, lacking any performance-based component, are ineffective in treating simple phobias (Biran & Wilson, 1981), social phobias (Biran, Augusto, & Wilson, 1981), agoraphobia (Emmelkamp, Kuipers, & Eggeraat, 1978; Emmelkamp & Mersch, 1983; Williams & Rappoport 1983), and obsessive compulsive disorders (Emmelkamp, van der Helm, van Zanten, & Plochg, 1980). Cognitive processes, however, play a vital role in effective treatment of anxiety disorders.

It can be argued that behavioral treatment procedures, such as exposure, work because of the cognitive changes they induce (Bandura, 1982). Their successful clinical use is enhanced when informed by a cognitive social learning framework rather than conditioning theory. This use of behavioral procedures entails treatment strategies designed to ensure compliance by patients in a way which facilitates learning and emotional processing of phobic stimuli. Cognitive processes such as attention, attribution, encoding, and retrieval from memory loom large in this conceptual scheme. These processes have little or no place in conditioning formulations of behavioral procedures such as exposure treatment.

The cognitive strategies that are an integral part of the social learning-based use of behavioral procedures cannot be equated with simple verbal methods such as self-instructional training, the most prominent of the cognitive (verbal) methods. So-called cognitive restructuring or cognitive therapy methods often differ widely from each other in both theory and practice (Rachman & Wilson, 1980), and care must be taken to identify precisely what is meant by these terms in the evaluation of treatment outcome.

Take, for example, the Williams and Rappoport (1983) study. In a well-controlled experiment, these authors showed that the addition of a cognitive treatment component did nothing to enhance the efficacy of in vivo exposure in the treatment of agoraphobics. The cognitive strategies that were used consisted of instructions to use distraction, relabelling of fearful sensations, and more adaptive self-talk during exposure. Of the 11 hours of treatment, 90 minutes were devoted to cognitive therapy. The latter comprised 1 - 2 minute discussions

between the frequent in vivo tasks of the behavioral method.

Williams and Rappoport decisively showed the failure of simple self-talk or distraction to augment the value of in vivo exposure. In a rare but welcome methodological advance, Williams and Rappoport actually assessed their subjects' use of these cognitive strategies by recording their verbalizations and showed that their subjects complied with the treatment protocol. But this method is a far cry from the cognitive therapy described by Beck (1976), for instance, and from the cognitive strategies which are integral to the social learning approach as noted above.[3] In Beck's therapy, which overlaps heavily with a social learning approach since it is really an amalgam of cognitive and behavioral methods, there is a concerted focus not only on changing what he calls automatic thoughts (surface structures? peripheral concepts?), but also on altering more basic dysfunctional assumptions (deep structures? core concepts?).

CONDITIONING VERSUS A SOCIAL LEARNING FORMULATION OF IN VIVO EXPOSURE

Thus far I have argued that whether one adopts a conditioning or social learning perspective has major consequences for the clinical practice of exposure treatment. Certainly the case has been made that a social learning (self-efficacy) analysis fits the existing clinical and experimental data on the behavioral treatment of phobic disorders more adequately than conditioning theory (see Bandura, 1982; Wilson, 1982, 1984, 1985). Yet to justify the approach I have advocated here it has to be shown empirically that exposure treatment informed by a social learning conceptualization is more effective than one based quite literally on conditioning theory. Although there have been few direct tests of this comparison, the findings consistently show the greater efficacy of the social learning approach.

In the first of two closely related studies, Williams, Turner and Peer (1984) compared the conditioning view of exposure treatment, which emphasizes the extinction of conditioned anxiety responses to phobic stimuli, to the social learning model, which emphasizes the development of coping and personal mastery (Bandura, 1977). Degree of overall exposure was equated between the two treatment conditions. The critical procedural difference between the two studies was the extent to which the therapist provided subjects with driving and height phobias with "mastery induction aids". The latter included active guidance by the therapist during exposure tasks, setting proximal goals to overcome lack of progress, and varied performance.[4] Both treatments were more effective than a no treatment control condition, and the guided mastery treatment significantly superior to the exposure model procedure measures of behavior, self-efficacy, and self-report of fear.

In the second study, with acrophobics, Williams et al., (1984) compared the exposure model of phobia treatment with that of the guided mastery approach used in the previous study. Again, the chief difference hinged on the use of "mastery induction aids", which in this case often involved the therapist giving the subjects physical support. Subjects treated with the procedure based on the conditioning (desensitization) model received a significantly greater amount of in

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3   Williams and Rappoport themselves do not make this erroneous claim. But other reviewers have lumped together different methods in blanket evaluations of "cognitive therapy".

vivo exposure than their counterparts who were treated with the guided mastery procedure. Nonetheless, the guided mastery treatment was significantly superior in producing greater change in phobic behavior, self-efficacy, and self-reported anxiety.

In a study at Rutgers University, we compared three procedures in the treatment of agoraphobia. One procedure was derived, literally, from the conditioning model of exposure in vivo. The therapist accompanied patients during systematic and graduated in vivo exposure treatment sessions, providing encouragement to engage in previously feared activities and emphasizing the importance of breaking the avoidance cycle. The therapist refrained, however, from any relabelling or interpretation of the patient's success or failure, did not address dysfunctional cognitions surrounding exposure or its consequences, and did not suggest or rehearse any cognitive coping strategies. The second procedure (social learning model) was modeled after the cognitive-behavioral approach and the derivative treatment guidelines I summarized earlier in this chapter. We used the same graduated in vivo exposure component as in the first (conditioning model) procedure, however, we made the theoretical assumption that the behavioral procedure was effective because it modified central mediating cognitive processes, such as a sense of self-efficacy. The third procedure (cognitive restructuring), adapted from that described by Biran and Wilson (1981), was a verbal treatment which identified and sought to correct dysfunctional thoughts and assumptions without any formal performance based component. Treatment consisted of 12 weekly sessions which were approximately 90 minutes in duration.

As expected, the social learning model treatment was more effective than the conditioning model version in terms of self-reported behavioural change and scores on the Marks and Mathews (1979) fear questionnaire. The cognitive restructuring treatment produced little change, consistent with previous studies of simple phobics (Biran & Wilson, 1981) and agoraphobics (Emmelkamp et al., 1978; Emmelkamp & Mersch, 1982). Although the absence of a follow-up limits the value of this study, its findings are consistent with those of Williams and his colleagues.

Parenthetically, the therapists in this study found it difficult to adhere to the treatment protocol in the conditioning model procedure. The problem we experienced was in resisting interpreting or explaining patients' reactions, challenging dysfunctional thoughts and expectations, and addressing issues related to relapse and its prevention. This experience is consistent with the view that most behavior therapists have always used in vivo exposure within a broader cognitive-behavioral context than is reported in the behavior therapy literature - as the Mathews et al. (1981) treatment shows.

CONCLUDING COMMENTS

To recap, I have made the case that one's theory of behavior change and therapeutic mechanisms can critically affect the choice of treatment methods and how they are actually implemented. These consequences of different theoretical views are illustrated with reference to the use of in vivo exposure. As Mathews et al.'s probably

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4   It can be objected that the use of proximal goals and varied performance would be dictated by the exposure (conditioning) model. The processes are shaping and stimulus and response generalization, beyond the active contribution of the therapist during exposure, the two procedures represent less than an optimal differentiation of the two theoretical models in question.

not atypical treatment manual indicates, behavior therapists have used exposure treatment within a broader cognitive-behavioral context than journal article descriptions of a simple habituation or extinction technique have suggested. And it seems that the broader treatment context affects the efficacy of in vivo exposure procedures.

Specification of the cognitive and behavioral treatment strategies that are part of the sophisticated use of in vivo exposure, and which comprise other behavior therapy methods for anxiety disorders in general, is vital to refining our procedures and increasing our treatment effectiveness. These cognitive-behavioral components need to be related to an integrative theoretical framework, such as social learning theory, in understanding the mechanisms of therapeutic change.

My call here for differentiation of treatment procedures, an analysis of their separate and interactive effects, and the identification of specific psychological mechanisms runs counter to the commonly held view that virtually all psychological therapies are equally effective (e.g., Smith, Glass, & Miller, 1980). Klein, Zitrin, Woerner, and Ross (1983) have recently reached a similar conclusion in the treatment of phobic disorders. All methods, they suggest, achieve their effects by instigating "corrective activity" between therapy sessions in the form of in vivo exposure. If there are differences among treatments, they reduce to the theoretically uninteresting matter of rapidity of change. Undoubtedly, Klein et al. are right in observing that many forms of non-behavioral therapies serve the instigating function they describe. But if, as I have argued in this chapter, different cognitive-behavioral views of the same basic technique - in vivo exposure - can differentially affect how it is used in clinical practice, then widely discrepant theories of equally diverse techniques are surely likely to have practical consequences for outcome.

Once it is agreed that some form of corrective activity (in vivo exposure) is central to overcoming phobic disorders, it then makes sense to use the most efficient (behavioral) methods for accomplishing this task. Moreover, these methods would ideally be those that follow logically from a theoretically sound conceptualization of the effective ingredients in exposure treatment. Klein et al. correctly reject an explanation of exposure in terms of reciprocal inhibition. But they fail to acknowledge that current conceptualizations of fear reduction and exposure differ, as I have shown here. They err in dismissing behavioral treatments as mere "persuasive devices" that are fundamentally no different from the persuasive devices of other forms of therapies. A social learning or cognitive-behavioral conceptualization provides guidelines for how exposure treatment might be optimally implemented. These guidelines differ not only for conflicting cognitive-behavioral conceptualizations, but also, in more significant ways, from non-behavioral approaches.

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SELF-CONTROL SKILLS FOR THE TREATMENT OF ANXIETY DISORDERS

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The concept of "self-control" initially appeared in the psychological
literature in the early 1950s, when Skinner (1953) devoted an entire
chapter to the topic in Science and Human Behavior. To a very large
extent, Skinner's conceptualization of self-control provided a general
backdrop against which much of the work in the 1970s and the more
contemporary work in the 1980s that has been carried out. In particular,
Skinner made a very helpful distinction between the "controlling
response" and the "controlled response". The essential difference
between the two is that individuals are able to emit a behavior or a
pattern of behavior over which they have control -- the controlling
response -- in order to change the probability of another, typically
problematic behavior pattern over which they lack direct control --
the controlled response.

Behavior therapists embraced the concept of self-control during
the late 1960s, perhaps in large part as a response to many of the
accusations made against their intervention methods as a way for
"modifying" or "manipulating" the behavior of their presumably passive
and helpless clients. The emphasis on self-control highlighted
techniques that might be used by clients in order to learn to cope
more effectively with their own lives. Behavioral self-control
started to develop into a separate area in the 1970s, but then quickly
dissipated and became less of an area and more of an emphasis
that was given to a variety of intervention procedures -- including
methods for dealing with anxiety reduction, eating disorders, alcoholism,
study problems, as well as a host of other problems. Hence, one
became less likely to read about self-control in the abstract without
getting into specific problem behaviors.

A concept that has come to replace self-control in the 1980s is
that of "coping skills". In many respects, coping skills is a better
description, in that it more accurately connotes what takes place during
the change process, namely clients' acquisition of certain skills or
abilities that will help them to deal more effectively with their
lives. Within this conceptualization, the role of the therapist is
that of a supervisor, educator, coach, and consultant, with the goal
being to impart coping skills to clients so that they can function as
their own therapists.

In considering self-control or coping skills for the management of anxiety, we are dealing with a generic category, under which there are a wide variety of controlling responses that may be used by individuals to deal with their heretofore uncontrollable anxiety reactions. Physical exercise is often employed successfully by individuals as a stress management technique; study and organizational skills may be used to deal with anxiety, confusion, and the feeling of being overwhelmed; assertiveness may help to minimize potentially anxiety-inducing aversive responses of others; and problem solving skills can enable one to avoid possible anxiety-arousing negative consequences associated with an ineffective course of action. Other coping skills -- which we more typically think of as being most relevant to the treatment of anxiety disorders -- include relaxation, desensitization, and cognitive restructuring. The most appropriate intervention to use in any given case would clearly depend upon a behavioral assessment of the determinants that appear to be maintaining the particular anxiety reaction. Bandura (1969) made this point quite vividly by cautioning that if one used desensitization to treat a socially incompetent individual who was experiencing anxiety in social situations, one would end up with a "relaxed incompetent".

The purpose of this chapter is to deal with several different issues, all of which are closely interrelated, and some of which are touched upon by Marks (1987) and by Wilson (1987). The chapter begins with a consideration of the notion of perceived control, moves on to the concept of self-efficacy, and then presents an overview of such coping skills as desensitization, relaxation, and cognitive restructuring. Following this, the issue of control is dealt with once again, particularly with regard to its impact on anxiety. The chapter concludes with a discussion of cognitive processes and their relationship to coping with anxiety.

PERCEIVED CONTROL

Richard Lazarus (1966) has dealt with the topic of perceived control in his conceptualization of stress reactions by pointing out that an external stressor only makes an aversive impact on individuals when they do not believe that they have the resources to cope with the event. According to this viewpoint, psychological stress is the result of an interaction between the parameters associated with both the external event and one's own perceived coping abilities.

Consistent with this thesis, there is an extensive body of research attesting to the positive effects that can occur in a wide variety of situations when individuals perceive that they have some control over the events in their lives (Lefcourt, 1982). Sometimes referred to as an internal locus of control, perceived control involves a personal belief or prediction that one can act in ways that will result in favorable consequences. Research findings have indicated that both physiological and subjective indicators of anxiety can be mitigated if individuals have -- or at least believe they have -- control over the aversive events that are the source of the anxiety (Geer, Davison, & Gatchel, 1970; Glass, Singer, & Friedman, 1969).

Within a clinical context, greater anxiety reduction has been obtained with treatment interventions that emphasize the training of self-control skills as opposed to those involving a more passive lessening of anxiety (Goldfried, 1979). For example, Goldfried and Trier (1974) found that training individuals in relaxation as a coping skill resulted in the reduction of public speaking anxiety,

whereas relaxation training that was presented as an automatic inhibitor
of anxiety did not. Moreover, maintenance of change has been found
to be enhanced if individuals believe that they had an active role in
bringing about that change (e.g., Davison, Tsujimoto, & Glaros,
1973). Perhaps one of the most dramatic demonstrations of the power
of perceived control comes from the research by Langer and Rodin
(1976) with the institutionalized aged. Langer and Rodin report that
nursing home residents who were given the responsibility for making
their own decisions rather than having them made by the staff -- such
as being able to choose and care for a house plant -- were happier
and more alert. In a follow up, Rodin and Langer (1977) not only
found these differences to be maintained over time, but also enhanced
in a most unexpected way; the group allowed to take personal respon-
sibility actually had a lower mortality rate.

SELF-EFFICACY

Closely linked to perceived control is Bandura's (1977, 1982)
notion of self-efficacy, which refers to the individual's expectation
that he or she is capable of implementing a course of action that
will result in positive consequences. This efficacy expectation is
typically obtained by means of self-report methods by asking about:
a) the likelihood of making a particular response in a specific situation;
b) the number of situations one expects to be able to handle successfully
within a hierarchically arranged set of situations varying according
to difficulty level; and, c) the extent to which positive expectancies
are held for one's ability to respond effectively in other situational
contexts.

The concept of self-efficacy has been shown to be useful in
studying a wide variety of problems, including phobias, test anxiety,
social anxiety, and unassertiveness. One of the very interesting
research findings is that self-efficacy expectations can predict
future behavior more accurately than can past behavior (Bandura, 1982).

There has been a debate in the literature regarding the utility
of the self-efficacy construct. For example, a special issue of
Advances in Behaviour Research and Therapy (Rachman, 1978) was devoted
to the pros and cons associated with self-efficacy. Some behavior
therapists eschew such an expectancy construct, preferring instead to
make use of past experiences -- such as exposure and other forms of
conditioning -- as the more important determinant of future behavior.
Their contention is that one's efficacy expectation is really an
epiphenomenon, and consequently is of relatively little importance in
understanding the change process. However, the fact of the matter is
that self-efficacy expectancies are better predictors of future
behavior than is past behavior (Bandura, 1982), a finding that cannot
be ignored.

A useful way to view self-efficacy expectations is as an index
of the change process (Goldfried & Robins, 1983). It provides us with
an indication that certain learning experiences have not only occurred,
but that they have occurred in such a way that individuals are able
to "use" them in order to accurately predict how they will react in
future situations. The implications for therapy are far-reaching;
indeed, they are crucial for any complete understanding of the change
process. To the extent that efficacy expectations accurately predict
future behavior, they are thereby an indication that the changes
resulting from therapy are likely to be maintained over time.

We shall return to this very important issue later in the chapter in conjunction with our discussion of cognition and coping with anxiety. At this point, we turn to a description of some coping skills that have been found to be effective in the self-management of anxiety, such as desensitization, relaxation, and cognitive restructuring.

SYSTEMATIC DESENSITIZATION AS A COPING SKILL

As originally presented by Wolpe (1958), systematic desensitization was construed as a passive deconditioning that occurred by imaginally exposing clients to increasingly more aversive stimuli while they were in a state of relaxation. The assumption here was that relaxation, induced by the procedures outlined by Jacobson (1929), would reciprocally inhibit the anxiety response so that "the bond between these [aversive] stimuli and the anxiety responses will be weakened" (Wolpe, 1958, p. 71).

As a result of using systematic desensitization clinically, and also because of anecdotal findings from the early research on desensitization, it became fairly evident that even though the intervention was being presented as a passive deconditioning procedure, many clients and subjects were not construing it this way. Instead, they were viewing desensitization as providing them with an active coping skill -- a method for dealing with various anxiety-producing life situations. For example, in a study of the effectiveness of group desensitization, Paul and Shannon (1966) observed that:

> "subjects in the group seemed to perceive the desensitization method as an active mastery technique which they could acquire and use themselves, more than in the individual application. Clients' descriptions of utilizing desensitization training to master anticipated areas of stress themselves suggest the development of a confidence-building "how to cope" orientation" (pp. 133-134).

In considering the cognitive variables associated with desensitization, Lang (1969) similarly suggested:

> "desensitization is an operant training schedule, designed to shape the response "I am not afraid" (or a potentially competing response such as "I am relaxed" or "I am angry") in the presence of a graded set of discriminative stimuli. When well learned, the response could have the status of a "set" or self-instruction, which can then determine other related behaviors".... (p. 187).

Viewing systematic desensitization as providing training in an active coping skill, Goldfried (1971) suggested a number of procedural changes consistent with this conceptualization. Rather than viewing desensitization as a deconditioning, it was construed more as a cognitive rehearsal, providing clients with practice in coping with various aversive situations. Thus, the following variations of systematic desensitization were outlined:

1. Presentation of rationale. In providing a coping orientation for desensitization, clients are told that they will be learning a method for reducing their anxiety in various life situations. The cognitive rehearsal they will be engaging in during the consultation sessions will not only help to prepare them for specific anxiety-arousing events that they may be able to anticipate, but it will also give them practice in coping with anxiety in general. Much like biofeedback, the relaxation training is presented in a way to help clients to become more sensitive to the sensations of tension and to respond to

such cues with their newly acquired relaxation skills.

2.   Construction of the hierarchy. In Wolpe's description of
systematic desensitization, it is usual practice to make use of
carefully selected hierarchies, each of which reflects a single
theme. If a client is being treated for more than one fear, a separate
hierarchy would be drawn up for each. Inasmuch as clients are being
taught to respond to their own internal cues for anxiety, rather than
the external situations that may have elicited them, multithematic
hierarchies may be used in the training process.

3.   Desensitization proper. Instead of instructing clients to
stop imagining a given scene when they signal that they are experiencing
anxiety -- as is recommended in the procedure outlined by Wolpe --
the coping skill variation encourages them to continue to imagine
themselves in the situation as they actively relax away the anxiety.
Thus, if clients signal being anxious while imagining themselves
sitting at a desk preparing for a talk they are scheduled to present
the following day, they are instructed to continue to imagine themselves
sitting at the desk, but relaxing away their experienced anxiety.

4.   Application of relaxation skills. Inasmuch as the relaxation
response practiced during the consultation sessions function as a
rehearsal for coping with anxiety in real life, a very strong emphasis
is placed on having clients apply their relaxation skills in vivo.
With increased practice in relaxation training -- typically with the
aid of between-session taped recorded instructions (Goldfried &
Davison 1976) -- clients typically become able to relax away anxiety
by simply taking a few deep breaths and letting go.

The research on the effectiveness of this self-control or coping
skills variation of desensitization, which has focused primarily on
public speaking and test-taking anxiety, has been reviewed in detail
by Deffenbacher and Suinn (1982) and Goldfried (1977). In general,
controlled studies have found that the coping skills variation was
either comparable to or more effective than standard desensitization.
In research where the two methods were found to be equally effective
in reducing the anxiety in targeted situations, self-control desensi-
tization was more effective with regard to generalization to non-targeted
areas, or was shown to be superior at follow up.

Research has also been conducted on self-control desensitization
that compared a totally irrelevant hierarchy with a target-relevant
hierarchy. In a study by Goldfried and Goldfried (1977), speech
anxious individuals were either presented with a hierarchy dealing
with public speaking situations, or were given a hierarchy involving
anxiety-arousing situations associated with flying (e.g., experiencing
problems with one of the engines while in flight). A third treatment
condition entailed imaginal presentation of speech-relevant items
without relaxation, as a control for the imaginal exposure associated
with the target-relevant desensitization condition. The findings
indicated that there was a significant reduction in speech anxiety
for all three procedures, although fewer within-group changes occurred
for the imaginal exposure condition. No differences were found
between the two desensitization procedures. At follow up, participants
in both desensitization conditions reported that the treatment had
been significantly more successful in helping them to overcome their
fear of public speaking than did those in the exposure treatment.
Goldfried and Goldfried's (1977) findings indicate that the procedure
of using carefully delineated hierarchies may not be an important
component of desensitization, at least as presented within a self-control

framework. An implication of this finding is not only that the nature of the hierarchy may be unimportant, but that one might not even be needed. In point of fact, this has been found to be the case, as research with the use of relaxation as a coping skill has found it to be equally effective as self-control desensitization (Deffenbacher & Suinn, 1982).

RELAXATION AS A COPING SKILL

When Jacobson first outlined his method of progressive relaxation training in 1929, he presented it as a viable clinical procedure for anxiety management. Because of practical considerations (e.g., Jacobson recommended 50 to 200 training sessions at a time before the widespread availability of tape recorders), and perhaps also because of an unreceptive zeitgeist, relaxation training was not used very much clinically until Wolpe (1958) incorporated it into his desensitization procedure.

On the basis of the research carried out in the 1960s that attempted to study the effectiveness of the individual components of desensitization (e.g., Davison, 1968; Lang, Lazovik, & Reynolds, 1965; Rachman, 1965), relaxation alone was not found to be particularly effective. Indeed, there were instances where relaxation training was construed as an attention-placebo control (e.g., Trexler & Karst, 1972). Despite these early reports on the ineffectiveness of relaxation training, clinical observations and the subsequent research that confirmed these observations (Deffenbacher & Suinn, 1982; Goldfried, 1977; Grimm, 1980) eventually led to the conclusion that relaxation may indeed function as an effective method for the self-management of anxiety.

There have been several descriptions in the literature of how relaxation training may be used as a coping skill, either alone (e.g., Cautela, 1966; Deffenbacher & Suinn, 1982; Goldfried & Davison, 1976; Jacobson, 1929; Suinn & Richardson, 1971; Zeisset, 1968) or in combination with cognitive restructuring (Meichenbaum, 1972). The variations across methods are slight, and none has been shown to be any more effective than another.

In training clients in the use of relaxation to cope with anxiety, it is important to emphasize that they will be learning a skill -- requiring time, patience, and practice. The training task may be presented by drawing an analogy to what is involved in learning to drive a car. Before one can expect to make use of a car for functional purposes (e.g., running errands), a fair amount of practice is required. These practice sessions are initially carried out on deserted roads or in empty parking lots, and are designed solely for learning the skill. Only at a later point in time, as one becomes better skilled, is it possible to use one's driving abilities to actually get from one place to another.

In the clinical use of relaxation training, the initial induction typically takes place live during the consultation session. A tape recording can be made of the relaxation instructions, which the client then uses on his or her own between sessions. Portions of subsequent consultation sessions are used to monitor progress and discuss any difficulties encountered. As the client progresses, the taped instructions are gradually faded out (see Goldfried, 1976 and Goldfried & Davison, 1976 for guidelines). Although there are wide individual differences, most clients are able to learn to make use of

relaxation for actual coping purposes after about one to two months of training.

Research has demonstrated that relaxation training can be effectively used to cope with a wide variety of anxiety-related problems, including generalized anxiety, public speaking anxiety, test anxiety, interview anxiety, insomnia, hypertension, and tension headaches. Comparative outcome studies on speech and test anxiety have shown coping relaxation to be as effective as self-control desensitization, equal to or better than standard desensitization in reducing target anxiety, and more effective than standard desensitization in producing generalized anxiety reduction and maintenance over time (Deffenbacher & Suinn, 1982; Goldfried, 1977; Grimm, 1980).

COGNITIVE RESTRUCTURING AS A COPING SKILL

As pointed out by Meichenbaum (1977) and Wilson (1986), it is misleading to think about cognitive restructuring as a uniform clinical procedure; variations can be expected, depending on whether one follows the guidelines described by Beck, Rush, Shaw, and Emery (1979), Ellis (1962), Goldfried and Davison (1976), Lazarus (1971), Mahoney (1974) or Meichenbaum (1977). For example, Ellis typically uses logic and verbal persuasion to try to get clients to change their view of things, whereas Beck and his colleagues engage clients in a collaborative search for evidence that can contradict certain problematic misconceptions. Further, Goldfried and Davison encourage clients to reappraise their unrealistic view of various life situations, which contrasts to Meichenbaum's greater focus on the use of adaptive self-statements (e.g., "Don't think about the fear; just think about what you have to do. Stay relevant.") and the integration of such cognitive skills with coping relaxation. To date, there exists no evidence that any one of these variations of cognitive restructuring is more effective than another.

In my own clinical and research work in this area (e.g., Goldfried, & Davison, 1976; Goldfried, Decenteceo, & Weinberg, 1974; Linehan, Goldfried, & Goldfried, 1979), an attempt was made to structure Ellis' rational-emotive therapy -- both in methodology and style of presentation -- so as to construe the reevaluation process as a self-regulatory skill. Thus, the clinical procedure of systematic rational restructuring is much like self-control desensitization, where the individual is using reevaluation instead of relaxation to cope with anxiety. This reevaluation process is designed to help clients to differentiate between a real threat in the environment from one that is erroneously perceived as being dangerous. Specifically, the clinical implementation of rational restructuring involves the following:

1. Presenting the assumption that thoughts mediate emotions. The initial therapeutic goal is to help clients recognize that their thoughts, assumptions, expectations, and labels -- however fleeting or automatic -- can affect their emotional reaction to situations. General examples as well as specific instances in the client's own life can serve to illustrate and document this very basic point.

2. Eliciting a realistic perspective from the client. Rather than having the therapist attempt to convince clients that their anxiety-arousing assumptions are unrealistic, the goal here is to assist clients in gaining this perspective on their own. One way in which this may be accomplished is by having the therapist play devil's advocate, so that the clients' task is to convince the seemingly unrealistic therapist why his or her ways of thinking do not make

sense. The arguments generated by clients through this procedure
(e.g., "Just because other people disagree with you doesn't mean they
dislike you") may later be used by them as coping self-statements.

   3.   Identifying the unrealistic assumptions mediating the
clients' anxiety. As a result of the previous step, clients often
spontaneously recognize that certain implicit beliefs are relevant to
their own anxiety reactions. If this is not the case, then a more
detailed exploration can be carried out so that clients become better
aware of the specific assumptions that cause them to be anxious in
various life situations.

   4.   Providing practice in reevaluating unrealistic beliefs. At
this final and most essential phase, the goal is to apply the coping
process in the context of actual anxiety-arousing situations. This
is initially accomplished in the consultation sessions, using an
imaginally-presented hierarchy in which clients learn to identify and
then reevaluate the unrealistic assumptions that serve as the basis
of their anxiety reaction. Following this cognitive rehearsal in the
consultation session, clients apply this procedure in real life
situations.

   One of the most relevant clinical problems for which rational
restructuring may be applied consists of interpersonal anxiety.
Basic research findings have repeatedly demonstrated that anxiety in
social situations involves concerns over the reactions of others,
particularly the potential for being evaluated negatively (e.g.,
Goldfried, Padawer, & Robins, 1984; Smith, 1972; Smith & Sarason, 1975).
Clinical work with interpersonally anxious clients similarly reveals
that their complaints of anxiety in social situations are typically
accompanied by excessive concerns about how they will be evaluated by
others.

   Research on rational restructuring has shown it to be a more
effective intervention in the reduction of interpersonal anxiety than
desensitization (e.g., Kanter & Goldfried, 1979). Studies on the
comparative effectiveness of this form of cognitive restructuring
versus skill training for social anxiety and/or unassertiveness have
produced mixed results. Some findings have shown cognitive restructuring
to be equivalent to skills training (e.g., Carmody, 1978), whereas
others have shown it to be superior (e.g., Glass, Gottman, & Shmurak,
1976). In a collaborative study carried out at Stony Brook and
Catholic University on assertiveness in women (Linehan, Goldfried, &
Goldfried, 1979), the combination of rational restructuring and skills
training was found to be slightly better on some measures than either
of the two alone. A more detailed consideration of these and other
research findings can be found in Goldfried (1979).

CONTROL AND ITS IMPACT ON ANXIETY

   Most of the work that has been done on the self-regulation of
anxiety is based on the assumption that individuals are deficient in
certain aspects of their behavior, and that this leads to their being
anxious. Consequently, the intervention method used is typically
designed to teach clients how to overcome this deficiency so that
they can better cope with anxiety. Certainly, this has been the theme
that has run through this chapter up until this point.

   However, there is a class of individuals whose anxiety is not so
much due to a deficiency in coping skills, but, in contrast, to an
excess of coping skills. Instead of having unrealistically low

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self-efficacy expectations, they may be said to have unrealistically
high expectations regarding their ability to respond to various life
situations. I am referring here to the Type A individual, whose
stress reaction is more the function of either an overextended behavior
pattern or an attempt to control the uncontrollable. The overcommitted
behavior pattern is accompanied by a sense of urgency, a competitiveness,
and an overinclusiveness, in which the Type A individual finds himself
-- Type A individuals are typically male -- overwhelmed with too many
tasks with which he must cope (Glass, 1977). In attempting to control
the uncontrollable, the Type A individual is not facing up to the
reality that there are certain tasks or aversive events in one's life
over which one can have no control.

Control is perhaps best construed as a dimension, the extremes
of which can create clinical problems. On the one end, when there is
an individual who believes she or he -- in actuality, it is typically
she -- has little control, we see a depressed state. On the other
end, with the person who believes he or she -- usually he -- can or
should control everything, we have a Type A behavior pattern that is
accompanied by anxiety.

In working with clients whose anxiety is the result of excessive
attempts to control their world, it is doubtful that relaxation
training alone is likely to produce any lasting change. On the other
hand, I believe that cognitive-behavioral methods have great promise
in altering these anxiety-inducing misconceptions and behavior patterns.
There is some preliminary research on the use of cognitive-behavioral
methods with Type A individuals that looks promising (e.g., Jenni &
Wollersheim, 1979; Roskies, 1983), but more work clearly needs to be
done to demonstrate their effectiveness.

RECONSIDERATION OF COGNITION AND COPING IN ANXIETY

At this point, it would be helpful to reconsider the issue of
cognitive processes in the self-regulation of anxiety, as it represents
a theme that runs through much of this chapter. The use of cognition
to cope with anxiety may be seen as being important in at least two
ways: the reevaluation of consequences and the identification and
retrieval of past success.

To begin with, cognition can play a significant role in that it
enables individuals to reevaluate the anticipatory consequences of
their behavior, especially those outcomes that are perceived -- at
times only vaguely -- as being negative. The reference here is to
Bandura's (1977) concept of outcome expectancies, which he maintains
are not as important as efficacy expectancies -- a conclusion with
which I would take issue. The importance of having clients learn to
more accurately estimate the anticipated consequences of their actions,
as indicated earlier, is especially relevant in coping with interpersonal
anxiety.

The issue of anticipated consequences also brings us back to
Marks' (1987) discussion of the therapeutic role of exposure. As is
well documented by Marks, the most effective method of reducing
clients' unrealistic fears of certain objects or situations is to
expose them to that which is feared. As an old Chinese proverb has
put it: "Go to the heart of danger, for there you will find safety."
However, for certain types of anxiety-related problems, this cannot
be readily accomplished, as the consequences of one's actions are not
directly observable. In most social situations, where people are
unlikely to tell others what they think about them -- even if it is

positive -- mere exposure will not provide socially anxious individuals
with feedback on the feared consequences of their behavior (i.e., the
negative evaluation of others). Although behavioral exposure alone
may not be the most appropriate intervention, the therapeutic principle
underlying exposure -- namely reality testing -- can be implemented
by means of cognitive restructuring procedures. Thus, even if it is
not possible for the socially anxious person to test reality directly
as a way of overcoming their unwarranted fears of negative evaluation,
cognitive procedures can help them to more realistically estimate the
likely interpersonal consequences of their actions, to assess the
importance and feasibility of always being evaluated positively by
others, and to focus their attention more on the interpersonal process
than on excessive concerns about outcome.

Another way that cognitive processes play an important role in
coping with anxiety is through the retrieval of past successes. This
relates to Bandura's concept of self-efficacy, particularly if one
views it as an index that past therapeutic experiences have been
processed and are now being used to predict future behavior. And
here too we may draw on insights from the East, which tell us:
"Believe in yourself and you will be successful." With regard to
anxiety-management, we can modify this timeless truth slightly to
read: "Believe in yourself and you will be less anxious."

During the change process, even though clients may be engaging
in actions that reflect therapeutic progress, they often have difficulty
in drawing on these successes at a later point in time. Thus, clients
will persist in predicting failure and continue to experience anxiety
even though there are clear indications -- at least to the therapist
-- that they are changing. Despite clients' long history of incompe-
tencies and failure experiences, behavioral technology has provided
us with the means for enhancing the effectiveness of their actual
performance. Behavioral competencies are being emitted that heretofore
had been absent. Yet, clients' predictions regarding how they are
going to respond in the future are inaccurately being made on the
basis of their more distant past, causing them to become anxious
because they (inaccurately) conclude that they do not have the resources
to cope with the situation (cf. Lazarus, 1966).

The tendency for clients to make erroneous predictions about
their ability to respond in certain ways may be better understood in
light of work that has been done in experimental cognitive psychology
(see Goldfried & Robins, 1983; Turk & Speers, 1983; Winfrey & Goldfried,
1986). For example, Tversky and Kahneman (1974) have suggested
that individuals employ a "representativeness" heuristic when making
judgments, including judgments about themselves. Because clients'
success experiences are likely to be more the exception than the
rule, such unrepresentative but nonetheless objectively effective
interactions with the world may fail to be accurately classified as a
"success". This is particularly the case when an individual's action
is composed of a number of attributes that vary in effectiveness,
leading the client to attend to those that are more typical of his or
her past. Thus, a client may report "Yes, it is true that I entered
into the conversation at the party, but I was very nervous at the
time," and then categorize this as a failure, rather than a success
experience.

Kahneman and Tversky (1973) also describe the tendency of people
to make use of an "availability" heuristic when they retrieve past
events from memory, such that their estimated probability of an event
occurring is dependent on the ease with which past instances come to

mind. Based on the fact that clients have experienced more failures
than successes in a particular area of their lives -- even though
this ratio may be in the process of change -- their incompetencies
are likely to be more salient and hence serve as a source of memory bias.

In general, one may construe clients' continued pessimism about
their ability to handle situations effectively as being schema-driven
rather than data-driven. Their erroneous view of themselves -- which
presumably was based on evidence accumulated in the more distant past
-- is now preventing them from attending to and retrieving more
recent evidence attesting to their enhanced ability to cope. The
role of the therapist, therefore, becomes that of assisting clients
in identifying and retrieving their therapeutic successes as evidence
that they can bring to bear in predicting how they are going to
respond in particular life situations.

A dilemma associated with a client's use of recent successes to
predict his or her ability to cope with a situation is that these
successes are not as immediate as other "evidence" that tends to
bolster self-efficacy. The information that is most immediate is the
feeling of anxiety (e.g., "If my hands are sweating and my heart is
pounding, I am going to have difficulty in handling this situation.").
When clients are in the process of changing, there is an asynchrony
in their functioning, in that they may feel anxious and anticipate
difficulty in responding even though their observable response to the
situation may be objectively positive. This is a particularly crucial
phase in the change process, requiring research efforts on those
parameters that enable clients to reach the point where they can tell
themselves -- and actually believe: "Yes, I think I can handle this
situation".

The challenge that we face is not whether cognitive therapy is
better than behavior therapy; as Wilson (1987) has pointed out,
this is an artificial distinction, both conceptually and practically.
Instead, the challenge is (1) How can we help our clients to achieve
a critical mass of positive experiences; (2) How can we teach them to
encode, classify, and store these experiences; and (3) How can we
help them to retrieve these success experiences so that they can more
accurately be used to predict efficacious behavior and thereby reduce
anxiety.

SUMMARY

In our consideration of a coping skills approach to anxiety
management, we have dealt with the general issues of perceived control
and self-efficacy as important determinants of anxiety. The clinical
application of desensitization, relaxation, and cognitive restructuring
as coping skills were outlined, together with some of the research
findings attesting to their effectiveness. The concept of control
was reconsidered within a broader context, where it was suggested
that not only low but also unrealistically high self-efficacy expectations
can lead to anxiety. The chapter concluded with a discussion of
cognitive processes in the self-regulation of anxiety, particularly
as a way of reevaluating anticipatory consequences, and a means of
identifying and retrieving past successes.

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NEW PERSPECTIVES ON THE TREATMENT OF PANIC AND PHOBIC DISORDERS

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The treatment of panic and phobic disorders continues to be a challenging and sometimes difficult task. The recent National Institute of Mental Health collaborative epidemiological study found these disorders to be far more common than was previously believed. Indeed, phobias appear to be the most prevalent of all mental disorders in women. In men, the most prevalent is alcohol abuse or dependence. (Robins et al., 1984; Myers et al., 1984).

Three sites were used for the study: New Haven, Baltimore and St. Louis. Table 1 gives the lifetime prevalence of phobic disorders at the three sites. This ranges from 7.8% in New Haven to 23.3% in Baltimore. The St. Louis rate is 9.4%. Panic disorders are almost identical at the three sites, 1.4%, 1.4%, 1.5%.

Table 1: Lifetime Prevalence Rates of DIS/DSM-III Disorders, Three ECA Sites*

Disorders	New Haven,Conn, % (N=3,058)	Baltimore, % (N=3,481)	St. Louis,% (N=3,004)
Phobia	7.8 (0.4)	23.3 (0.8)	9.4 (0.6)
Panic	1.4 (0.2)	1.4 (0.2)	1.5 (0.3)
Obsessive- Compulsive	2.6 (0.3)	3.0 (0.3)	1.9 (0.3)

*DIS indicates Diagnostic Interview Schedule; ECA refers to the Epidemiologic Catchment Area; numbers in parentheses are Standard Errors.

Table 2: Sex Distribution of Disorders Across Sites
Numbers Given as Percentages of the Total.

| | New Haven, % | | Baltimore, % | | St. Louis, % | |
	Male (N=1,292)	Female (N=1,766)	Male (N=1,322)	Female (N=2,159)	Male (N=1,202)	Female (N=1,802)
Agoraphobia	1.5	5.3*	5.2	12.5*	1.5	6.4*
Simple Phobia	3.8	8.5*	14.5	25.9*	4.0	9.4*
Panic Disorder	0.6	2.1*	1.2	1.6	0.9	2.0
Obsessive-Compulsive	2.0	3.1	2.6	3.3	1.1	2.6+

*p < .001   +p < .01

The sex distributions of phobias, panic disorder and obsessive compulsive disorder are described in Table 2. For both agoraphobia and simple phobia, there is a preponderance of female patients. In agoraphobics, this ranges between 70% and 81% of the total number of afflicted people depending upon the site. In simple phobics, the range is between 64% and 70% of the total. In panic disorder, female patients represent 69% to 78% of the total. All of these sex differences are statistically significant.

In addition to their wide prevalence, phobias tend to be chronic and often interfere significantly with the individual's functioning and interpersonal relationships. Further, they impinge upon other members of the family. Family studies have demonstrated that often the children of phobics become phobic themselves, and there are studies in progress that show the involvement of three generations of a family. Harris, Noyes, Rowe and Chaundhry (1983), in a study of agoraphobia, state: "A family study of agoraphobia, panic disorder and nonanxious controls showed the morbidity risk for all anxiety disorders to be 32% among first degree relatives of agoraphobia, 33% among relatives of patients with panic disorder, and 15% among relatives of controls".

This group (Crowe, Noyes, Pauls, & Slymen, 1983) also found that 17.3% of first degree relatives of panic disorder patients showed a morbidity risk for this disorder and 7.4% were categorized as having probable panic disorder. Both rates were significantly higher than the rates of risk in relatives of controls. They also found the risk of panic disorder to be twice as great in women as in men. No other psychiatric disorders were increased in the families of patients with panic disorder.

Thus, the treatment of these disorders is an important public health problem, often affecting generations within a family and causing severe disruption of the family unit.

RELATIONSHIP BETWEEN PANIC DISORDER AND PHOBIAS

In order to clarify the relationship of phobic disorders to panic disorder, I have drawn upon the experience of our clinic.

```
                        INEXPLICABLE
                        PANIC ATTACKS


         PANIC DISORDER                    NO MENTAL ILLNESS


  CIRCUMSCRIBED   AGORAPHOBIA   GENERALIZED
    PHOBIAS                      ANXIETY
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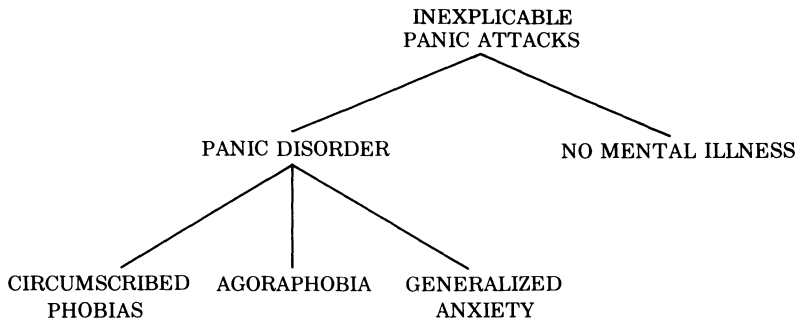
Figure 1: Possible consequences of inexplicable panic attacks.

Figure 1 conceptualizes the development of panic disorder and its
sequelae. The first symptom is an inexplicable panic attack that
comes "out of the blue". In some individuals, one severe attack will
precipitate panic disorder or panic disorder with phobias. In others,
a series of such attacks is required before the panic disorder or
phobic syndrome develops. In still others, these panic attacks are
dismissed by the patient and no psychiatric disorder develops. After
these inexplicable panic attacks occur, the person may develop
anticipatory anxiety, specifically, the expectation that these terrifying
experiences will occur again. The combination of panic attacks and
anticipatory anxiety leads to panic disorder. If patients start to
avoid situations because of the fear of recurrent panic attacks, they
develop either circumscribed phobias or agoraphobia. If the individual
does not develop avoidance but remains chronically anxious, he or she
has developed generalized anxiety disorder.

     DSM-III did not clarify this issue, but the proposed revision of
DSM-III reclassifies certain phobias under Panic Disorder. Spitzer
and Williams (1986) discussed the proposed revision in their chapter
in this volume. Under panic disorder, there are three sub-
headings: 1) uncomplicated panic disorder; 2) panic disorder with
limited (circumscribed) phobic avoidance; 3) panic disorder with extensive
phobic avoidance (now called agoraphobia with panic attacks). Individuals
who do not have panic disorder, but are phobic, are classified as:
1) agoraphobia without panic attacks; 2) social phobia; 3) simple phobia.

Table 3: Typical Symptoms of Panic Attacks

Dyspnea or Hyperventilation	Paresthesias
Palpitations	Hot and Cold Flashes
Chest Pain or Discomfort	Trembling or Shaking
Choking or Smothering Sensations	Sweating
Dizziness, Vertigo, or Unsteady Feelings	Faintness
Feelings of Unreality, Depersonalization	Fear of Dying or Going Crazy or Doing Something Uncontrolled During An Attack

Table 3 lists the typical symptoms of panic attacks. In addition
to those listed, some people experience nausea, vomiting, diarrhea, or urgency
of urination. Not all patients experience all symptons. In any given patient,
there tends to be a symptom cluster, typical for that individual, which
recurs with each full-blown panic attack. For example, one subgroup of
patients will typically experience palpitations and chest discomfort, while
another will always experience dizziness and never have palpitations and
chest discomfort. The most important symptoms are the last, fear of dying or
impending doom, going crazy or doing something uncontrolled during an attack.
These fears terrify the patients.

Who gets panic disorder and/or phobias? In a study of 186 phobic patients,
we found a high incidence of separation anxiety in childhood and adolescence;
these symptoms were greater in agoraphobics and mixed phobics (called panic
disorder with limited phobic avoidance in DSM III-revised) than simple phobics.
A history of childhood separation anxiety was given by 20% to 48% of the
patients, depending upon the diagnostic group. A positive history was more
prevalent in female than male patients. In the female group, agoraphobics and
mixed phobics had significantly more childhood separation anxiety than simple
phobics, while for the male group, there were no significant differences
between diagnostic groups. All phobics had significantly more separation
anxiety than non-phobic controls.

At this time, we don't know if predisposing factors, such as separation
anxiety, are the result of nature or nurture. Their presence in families
could be due to genetic factors, environmental factors or a combination of
both. However, our findings suggest that childhood separation anxiety makes
the individual psychologically vulnerable to the development of panic and
phobic disorders.

Table 4: Possible Precipitants of Panic Attacks

PHYSIOLOGICAL	PSYCHOLOGICAL
MITRAL VALVE PROLAPSE	LOSS OF LOVED ONE
ENDOCRINE DISORDERS	INCREASED RESPONSIBILITIES
Thyroid	
Hyperthyroid	Marriage
Hypothyroid	Birth of child
Hypoglycemia	
Estrogen level	CHANGE IN LIFE SITUATION
TOXIC EFFECTS	Moving to new area
	Business reverses
Caffeine	Loss of Job
Amphetamines	
Marijuana	HYPERVENTILATION
Hallucinogens	Due to perceived threat
MEDICALLY USED DRUGS	
Liodocaine HCl	
Procainamide HCl	
HYPERVENTILATION	
Due to respiratory difficulties	

In clinical practice, we frequently find factors occurring shortly before the onset of panic disorder and/or symptoms that appear to be related to the onset. We have called these possible precipitants. They are listed in Table 4. Findings on some of these have already been published or are in press. To give examples: 1) several investigators have reported that the incidence of mitral valve prolapse in panic disorder or agoraphobia is significantly higher than in the normal population (Pariser, Pinta, & Jones, 1978; Venkatesh et al., 1978; Kantor, Zitrin & Zeldis, 1980); 2) An increased evidence of thyroid disorder developing shortly before or at about the same time as the onset of phobic disorders has been reported by Lindemann, Zitrin and Klein, 1984. Seventy-eight percent of the phobic patients with thyroid dysfunction were patients whose phobias were secondary to panic disorder.

These findings on predisposing and precipitating factors are based upon retrospective data, so one must take into account the possibility of distortion. However, the findings are suggestive and indicate that we need good prospective studies, starting in early childhood, in order to obtain more accurate information.

TREATMENT STUDIES

First Treatment Study

In planning a treatment outcome study of phobias, we recognized that it was necessary to divide phobic patients into two separate groups. The first group comprised of those whose phobic avoidance consisted of patients whose phobias were primary while the second group included patients whose phobias were secondary to panic disorder.

We hypothesized that 1) individuals whose phobias were secondary to panic disorder - that is, agoraphobics and mixed phobics (now to be called panic disorder with limited phobic avoidance), would benefit from medication that would stop the panic attacks, and 2) patients with phobias that were unrelated to panic disorder, principally simple phobias (which also included social phobics in our sample), would not.
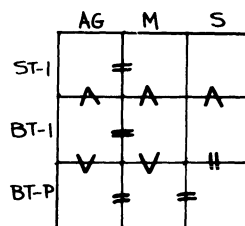

Figure 2: Research design of comparative outcome trial with three patient groups: agoraphobic (AG); mixed phobic (M) and simple phobic (S) and three treatments; supportive therapy with imipramine (ST-I), behavior therapy with imipramine (BT-I) and behavior therapy with placebo (BT-P).

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Figure 2 shows the design of the first study from our clinic (Zitrin, Klein, Woerner, & Ross, 1983). It is somewhat complicated. There were three different diagnostic groups: agoraphobics, mixed phobics (panic disorder with limited phobic avoidance), and simple phobics. These patient groups were treated with one of three treatment conditions: 1) supportive psychotherapy with imipramine; 2) behavior therapy (imaginal systematic desensitization and assertiveness training according to the techniques of Wolpe, 1969) with imipramine; and 3) behavior therapy with placebo. The supportive psychotherapy group was included as a control for the behavior therapy groups. Patients were randomly assigned to the three treatment conditions. The behavior therapy groups were double blind for medication, while the supportive therapy group was single blind (i.e., only blind to the patient for medication).

The purpose of using medication was to stop the panic attacks. This plan was based upon earlier studies with small numbers of patients in which imipramine appeared to be effective (Klein, 1964, 1967). Since agoraphobics and mixed phobics have panic disorder and simple phobics do not, we hypothesized that agoraphobics and mixed phobics would do better on drug than placebo, but that simple phobics would not benefit from the drug. We further hypothesized that behavior therapy would be superior to supportive psychotherapy, since it was focused on the phobias and highly structured, with homework assignments designed to follow-up desensitization in imagination with desensitization in vivo.

Table 5 details the demographic findings on these patients. There were no significant differences between groups with regard to age or marital status. With the exception of the mixed phobic group, about 70 % of the patient were female. Simple phobics had significantly more education and significantly higher status occupations than agoraphobics or mixed phobics. They also had a significantly longer duration of symptoms, often going back to childhood. The other two groups, although their symptoms were not as long-standing still were chronically ill, with a history of symptoms for a mean of 10 or 11 years. The vast majority of agoraphobics and mixed phobics had had prior treatment and 40% of the simple phobics had been treated by the time they came to the clinic.

Of 265 patients evaluated for the study, 47 were rejected as unsuitable. Seventeen of these were found to be schizophrenic, eleven were severely depressed, eight were not phobic, eight had been treated previously with a tricyclic drug, and three had chronic cardiac disease. Note that only four percent of the applicants had clinically significant depression.

Table 6 shows the dropout rate. This rate was somewhat higher in the imipramine than in the placebo group, but these differences were not significant. The most important reason given for dropping out was refusal to take medication (60%). It is also interesting to note, however, that five of the eighteen early dropouts who refused to continue medication were actually taking a placebo. Two patients dropped out because they became seriously depressed, six failed to keep appointments, three had new jobs which prevented them from coming to the clinic, three moved away, two stopped treatment early becasue they felt they had already obtained satisfactory improvement, one stopped because of lack of improvement, one had no transportation, and one dropped out because of marital problems.

TABLE 5

	Agoraphobic (n=77)	Mixed Phobic (n=60)	Simple Phobic (n=81)	Significance*
Patient Characteristics				
Sex, No. (%)				
Men	23(30)	25(42)	23(28)	NS
Women	54(70)	35(58)	58(72)	
Age at screening				
mean/SD	35.5/6.3	35.6/6.5	33.8/7.0	NS
Marital status				
No.(%)				
Never Married	8(10)	10(17)	12(15)	NS
Married	62(80)	46(76)	64(79)	
Divorced,widowed	7(9)	4(7)	5(6)	
Years of education				
mean/SD	13.2/2.3	13.4/2.7	14.8/2.4	$p < .001$;AG v S,$p < .01$;M v S,$p < .01$
Occupation, No. (%)				
Professional, minor professional	21(27)	23(38)	36(945)	$p < .02$
Clerical, skilled or unskilled labor	20(26)	18(30)	9(11)	AG v S,$p < .02$ M v S,$p < .10$
Housewife	36(47)	18(30)	30(37)	NS
Student	0(0)	1(2)	6(7)	NS
Duration of phobias (yr), mean/SD	10.2/7.2	10.9/7.6	16.7/9.4	$p < .0001$;AG v S,$p < .01$;M v S,$p < .01$
Age at onset of phobias (yr), mean/SD	25.4/7.4	24.6/8.3	17.1/10.7	$p < .0001$;AG v S,$p < .01$;M v S,$p < .01$
Prior treatment for phobia,No.(%)				$p < .001$; AG v S,$p < .001$;AG
Yes	54(70)	32(53)	34(42)	
No	23(30)	28(47)	47(58)	
Duration of prior treatment (yr), mean/SD	2.8/2.7	3.4/4.0	1.3/1.5	$p < .02$; M v S,$p < .01$

*Based on one-way analysis of variance followed by Tukey's Honestly Significant Difference for pairwise comparisons, or 2x3 x^2 followed by 2x2 x^2 tests for dichotomous data. AG indicates agoraphobic; S, simple phobic; and M, mixed phobic.
Housewives and students not included in analysis.

From Zitrin, C.M., Klein, D.F., Woerner, M.G., & Ross, D. (1983). Treatment of phobias. I. Comparison of imipramine hydrochloride and placebo. Archives of General Psychiatry, 40, 125-138.

TABLE 6: DROPOUTS BY TREATMENT AND DIAGNOSIS

	SUPPORTIVE THERAPY PLUS IMIPRAMINE HYDROCHLORIDE	BEHAVIOR THERAPY PLUS IMIPRAMINE	ALL IMIPRAMINE	BEHAVIOR THERAPY PLUS PLACEBO
AGORAPHOBIA				
NO.	30	23	53	24
DROPPED 1-9 WEEK	4	4	8	1
DROPPED 10-17 WEEK	2	1	3	2
COMPLETED	24	18	42	21
MIXED PHOBIA				
NO.	23	20	43	17
DROPPED 1-9 WEEK	3	2	5	1
DROPPED 10-17 WEEK	3	2	5	3
COMPLETED	17	16	33	13
SIMPLE PHOBIA				
NO.	26	29	55	26
DROPPED 1-9 WEEK	8	6	14*	1
DROPPED 10-17 WEEK	1	1	2	2
COMPLETED	17	22	39	23

*$x^2 = 5.463$, P $.02$ (simple phobic early dropouts versus late dropouts plus completers, all imipramine versus placebo). There are no other significant differences between treatment or diagnostic groups.

From Zitrin,C.M., Klein,D.F., Woerner,M.G., & Ross,D. (1983). Treatment of phobias. I. Comparison of imipramine, hydrochloride and placebo. Archives of General Psychiatry, 40, 125-138.
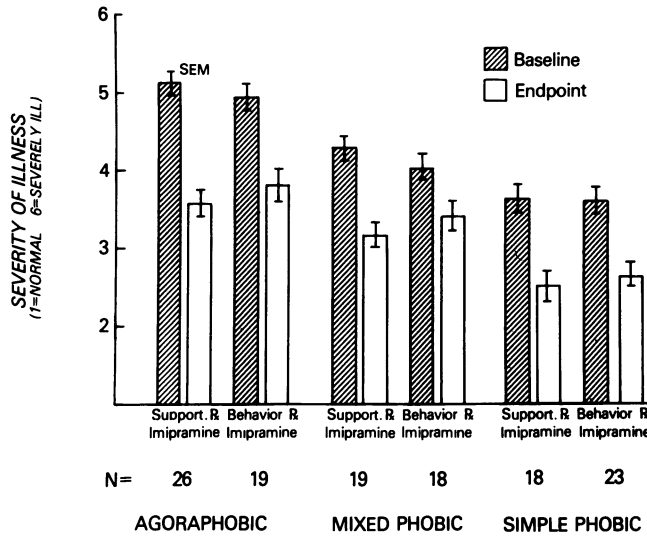
Figure 3: Therapist ratings of the overall severity of illness at baseline and endpoint.

Figure 3 compares therapy ratings of severity of illness at baseline and endpoint. Agoraphobic patients were found to be the most severe at baseline and simple phobics the least severe, with mixed phobics in an intermediate position. At endpoint, this was still true. Agoraphobics and mixed phobics did considerably better on drug than placebo, whereas there were no significant differences between drug and placebo in the simple phobics. This finding confirmed our hypothesis that those patients who did not suffer from panic disorder would not respond to medication. However, all of the patients, including those on placebo, showed good improvement. There were no significant differences between behavior therapy and supportive therapy in any group. Both psychological therapies resulted in good improvement.

In this study, there were three evaluators: patient, therapist, and independent evaluator. The last was blind to treatment condition. We found that patient evaluations were the most optimistic, independent evaluator ratings the least optimistic with the therapist evaluations in between. Table 7 details the improvement in primary phobia, according to the most conservative of the three raters, the independent evaluator at the completion of treatment. In agoraphobics and mixed phobics, patients on imipramine improved significantly more than those on placebo, whereas in simple phobics, there was no difference between imipramine and placebo treatment.

A behavioral measure was used both at baseline and endpoint of treatment. This measure consisted of an in vivo test of avoidance by the independent evaluator. We found this procedure to be an inaccurate measure because, at baseline, patients would force themselves to enter phobic situations they had previously avoided for prolonged periods, apparently in an attempt to show the evaluator that they could do the task. This action was an aberration, since the patients subsequently resumed their old phobic behavior pattern.
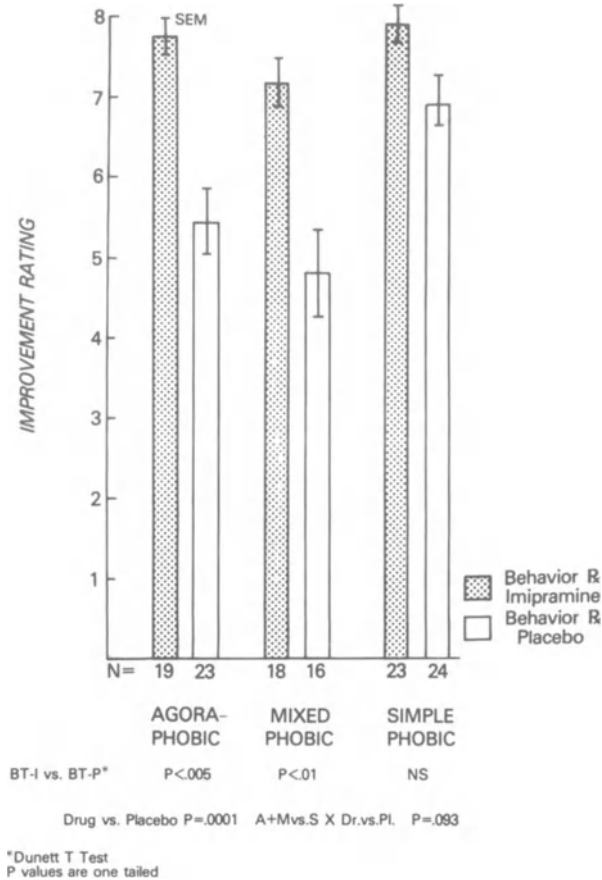
Figure 4: Patient ratings of overall improvement at endpoint for
agoraphobic, mixed phobic and simple phobic groups.

Figure 4 shows patient overall improvement ratings for each
diagnostic group. Agoraphobics and mixed phobics show significantly
greater improvement on imipramine than placebo, whereas simple phobics
show no difference. Patients in all diagnostic groups did equally
well with either behavior therapy or supportive therapy. Seventy-
five to 85% were significantly improved, depending upon the rater.

As shown on Table 8, the majority of patients receiving placebo
showed marked or moderate overall improvement, even though this
improvement was significantly less than for those patients on imipramine.
The results for primary phobia and panic were similar. Note the
similarity of results, uniformly high, between behavior therapy and
supportive psychotherapy. There was no correlation between depression
and imipramine's effect on panic and phobic behavior.

We have recently completed a five year follow-up study on these
patients. To our surprise, there are no significant differences in
relapse rate between diagnostic groups or treatment groups. The vast
majority of relapses occurred in the first and second years after
completion of treatment. The relapse rate was 17.5 - 22.7%, depending
upon the group.

TABLE 7:   INDEPENDENT EVALUATOR IMPROVEMENT RATINGS OF PRIMARY PHOBIA

RATING	SUPPORTIVE R-IMIPRAMINE	BEHAVIOR R-IMIPRAMINE	BEHAVIOR R-PLACEBO	ALL IMIPRAMINE
AGORAPHOBIC				
N	13	13	19	26
% MARKED IMPROVEMENT	54	31	21	42
% MODERATE IMPROVEMENT	31	62	37	46
% MINIMAL IMPROVEMENT	8	8	32	8
% NO CHANGE	0	0	11	0
% MINIMALLY WORSE	8	0	0	4
MEAN RATING*	6.23	6.23	5.68	6.23
STANDARD DEVIATION	1.12	0.58	0.92	0.89
t	0.00	1.84	1.96	
p	NS	$p < .05+$	$p < .05+$	
MIXED PHOBIC				
N	7	9	8	16
% MARKED IMPROVEMENT	57	22	0	38
% MODERATE IMPROVEMENT	14	67	12	44
% MINIMAL IMPROVEMENT	29	11	50	19
% NO CHANGE	0	0	38	0
MEAN RATING*	6.29	6.11	4.75	6.19
STANDARD DEVIATION	0.95	0.60	0.71	0.75
t	0.42	4.25	4.60	
p	NS	$p < .005+$	$p < .0001+$	
SIMPLE PHOBIC				
N	7	15	18	22
% MARKED IMPROVEMENT	43	40	44	41
% MODERATE IMPROVEMENT	29	40	28	36
% MINIMAL IMPROVEMENT	14	13	17	14
% NO CHANGE	14	6	6	9
% MINIMALLY WORSE	0	6	6	0
MEAN RATING*	6.00	6.13	6.00	6.09
STANDARD DEVIATION	1.15	0.92	1.19	0.97
t	0.27	0.36	0.26	
p	NS	NS	NS	

*Numerical values for scale are as in Table 3; +One-tailed test.

From Zitrin,C.M., Klein,D.F., Woerner,M.G. (1978). Behavior therapy, supportive psychotherapy, imipramine, and phobias. Archives of General Psychiatry, 35, 307-316.

TABLE 8: COMPARISON OF TREATMENT RESULTS IN DIFFERENT GROUPS

Percent Showing Marked or Moderate Overall Improvement at Completion of Treatment

	AGORAPHOBIC			MIXED PHOBIC				SIMPLE PHOBIC	
	SUPPORTIVE Rx IMIPRAMINE	BEHAVIOR Rx IMIPRAMINE	BEHAVIOR Rx PLACEBO	SUPPORTIVE Rx IMIPRAMINE	BEHAVIOR Rx IMIPRAMINE	BEHAVIOR Rx PLACEBO	SUPPORTIVE Rx IMIPRAMINE	BEHAVIOR Rx IMIPRAMINE	BEHAVIOR Rx PLACEBO
N	13	14	19	7	9	9	7	15	18
THERAPIST RATING	93%	93%	79%	100%	100%	56%	86%	93%	72%
INDEPENDENT EVALUATOR	85%	76%	63%	71%	89%	37%	72%	87%	72%
PATIENT SELF-RATING	100%	100%	74%	100%	88%	55%	86%	93%	77%

From Zitrin,C.M., Klein,D.F., Woerner,M.G. (1978) Behavior therapy, supportive psychotherapy, imipramine, and phobias. Archives of General Psychiatry, 35, 307-316.

Drug Sensitivity

An important finding in this study was that 18 to 25% of these patients (depending on the diagnostic group) were exquisitely sensitive to tricyclics. This sensitivity was characterized by an immediate amphetamine-like reaction which occurred after the first or second dose of 25 mg. The patients complained of insomnia, jitteriness, overstimulation and increased energy. Some patients compared it to taking dexedrine or "speed". When this occurred we decreased the dose to 10 mg. Sometimes, it was necessary to cut back even further, then increase very gradually. Several patients were never able to tolerate more than 10 mg. a day, yet their panic attacks ceased.

Second Treatment Study

The second study involved only agoraphobic women. This plan was followed because of the preponderance of female patients with this disorder and to attain greater homogeneity in the patient sample.

The study was double-blind for medication, with patients randomly assigned to imipramine or placebo. All patients were treated with group in vivo exposure. (We now prefer the term desensitization in vivo, because it implies the gradual approach that was used). Medication was begun four weeks before the desensitization sessions, in order to control panic attacks before the in vivo treatment started. In vivo desensitization was begun in the fifth week and continued for a total of 10 weekly sessions. Each session started with a group meeting for about one hour. Following that, patients went out into the field with the therapist and aides. After the completion of the in vivo desensitization sessions, medication was continued for an additional three months, then stopped.

There were no significant differences in demographic factors between the 2 groups. Seventy six patients entered the study. Forty-one were assigned to imipramine treatment plus in vivo desensitization and 35 to placebo plus in vivo desensitization. Of these, 12 (29%) dropped out of the imipramine group and 10 (29%) dropped out of the placebo group. In the imipramine group, dropout was largely due to medication refusal, whereas in the placebo group, both medication refusal (30%) and inability to keep up with the group (50%) were common factors.

Table 9 shows therapist improvement ratings (global, primary phobia, spontaneous panic, and functioning), at the end of in vivo therapy. On all scales, there was significantly more improvement in those patients who received imipramine than those who received placebo. However, even placebo-treated patients showed significant improvement. Sixty-eight percent or more, depending upon the scale, were moderately or markedly improved.

Due to our previous experience with behavioral measures, none was used in this study.

Table 10 shows independent evaluator improvement ratings. According to this rater, the most conservative of the three raters, there were significant drug effects on all scales except functioning. Nevertheless, placebo treated patients also showed good improvement (e.g., 68% significantly improved overall; 52% improved in primary phobia).

Table 9: Therapist Improvement Ratings at End of In Vivo
Therapy (14 weeks) Combined with Either
Imipramine or Placebo.

	Imipramine Group (N=29)	Placebo Group (N=25)	t Test*
Clinical Global Impressions Scale			
Marked improvement	6(21)+	2(8)	
Moderate improvement	21(72)	16(64)	
Minimal improvement	2(7)	5(20)	
No improvement	0(0)	2(8)	
Mean	1.86	2.28	t=2.44,
SD	0.52	0.74	p < .01
Primary Phobia Scale			
Marked improvement	18(62)	9(36)	
Moderate improvement	10(35)	8(32)	
Minimal improvement	1(3)	5(20)	
No improvement	0(0)	3(12)	
Mean	6.59	5.92	t=2.98,
SD	0.57	1.04	p < .002
Spontaneous Panic Scale			
Marked improvement	22(76)	10(40)	
Moderate improvement	5(17)	8(32)	
Minimal improvement	2(7)	1(4)	
No improvement	0(0)	6(24)	
Mean	6.69	5.9	t=3.19,
SD	0.60	1.2	p < .001
Functioning Scale			
Marked improvement	22(76)	10(40)	
Moderate improvement	5(17)	10(40)	
Minimal improvement	2(7)	4(16)	
No improvement	0(0)	1(4)	
Mean	6.69	6.16	t=2.67,
SD	0.60	0.85	p < .005

*Indicates that the P values are one-tailed.
+The numbers in parentheses are percentages.

From Zitrin,C.M. et al. (1980). Treatment of agoraphobia with group
exposure in vivo and imipramine. Archives of General Psychiatry, 37,
63-72.

TABLE 10

INDEPENDENT EVALUATOR IMPROVEMENT RATINGS*

IMPROVEMENT RATING	14 WEEK		26 WEEK	
	IMIPRAMINE	PLACEBO	IMIPRAMINE	PLACEBO
Clinical Global Impressions Scale, No. of patients	29	25	29	24
Marked improvement, No. (%)	7(24)	4(16)	18(62)	7(29)
Moderate improvement, No. (%)	18(62)	12(48)	8(28)	10(42)
Minimal improvement, No. (%)	4(14)	5(20)	3(10)	6(25)
No improvement, No. (%)	0(0)	4(16)	0(0)	1(4)
Treatment-group comparisons	t= 2.15, p< .02		t= 2.64, p< .01	
Primary phobia scale, No. of patients	29	25	27	22
Marked improvement, No. (%)	11(38)	6(24)	17(63)	6(27)
Moderate improvement, No. (%)	12(41)	7(28)	9(33)	10(45)
Minimal improvement, No. (%)	6(21)	8(32)	1(4)	3(14)
No improvement, No. (%)	0(0)	4(16)	0(0)	3(14)
Treatment-group comparisons	t= 2.33, p< .02		t= 3.22, p< .001	
Spontaneous panic scale, No. of patients	29	25	27	22
Marked improvement, No. (%)	16(55)	7(28)	21(78)	5(23)
Moderate improvement, No. (%)	4(14)	3(12)	1(4)	4(18)
Minimal improvement, No. (%)	3(10)	4(16)	0(0)	5(23)
No improvement, No. (%)	6(21)	11(44)	5(18)	8(36)
Treatment-group comparisons	t= 2.30, p< .02		t= 3.31, p< .001	
Functioning scale, No. of patients	29	25	27	22
Marked improvement, No. (%)	8(28)	6(24)	12(44.4)	8(36)
Moderate improvement, No. (%)	11(38)	8(32)	12(44.4)	10(45)
Minimal improvement, No. (%)	10(34)	6(24)	3(11.1)	1(5)
No improvement, No. (%)	0(0)	5(20)	0(0)	3(14)
Treatment-group comparisons	t= 1.29, p< .10		t= 1.2, NS	

*Indicates that only patients who completed eight or more in vivo exposure sessions are included
Indicates that the P values are one tailed.

Table 11: Correlations of Independent Evaluator Baseline
Depression Ratings* With 14 and 26 Week Outcome Measures.

Improvement Ratings	Imipramine Group			Placebo Group		
	n	r+	P++	n	r+	P++
14 week						
Independent evaluator						
CGI	27	.37	.06	23	.44	.034
Phobia I	27	.28	NS	23	.23	NS
Spontaneous panic	27	.28	NS	23	−.26	NS
Functioning	27	.39	.046	23	.10	NS
Therapist*						
CGI	27	.35	.07	23	.55	.008
Phobia I	27	.44	.02	23	.425	.044
Spontaneous panic	27	.43	.026	23	.01	NS
Functioning	27	.25	NS	23	.12	NS
Patient self-rating	27	.58	.002	23	.27	NS
26 week						
Independent evaluator						
CGI	5	.40	.04	22	.58	.006
Phobia I	25	.25	NS	20	.22	NS
Spontaneous panic	25	−.22	NS	20	.44	.054
Functioning	25	.32	.12	20	.44	.054
Patient self-rating	27	.47	.014	21	.44	.048

*The distribution of baseline depression scores was as follows: in
the imipramine group, 12 were rated 2 (normal), 7 were rated 3 (very
slight), 11 were rated 4 (slight), 7 were rated 5 (moderate), and 0
were rated 6 (marked); in the placebo group, 12 were rated 2, 4 were
rated 3, 11 were rated 4, 7 were rated 5, and 2 were rated 6. The
last 2 patients were rated moderately depressed at the time of screening.
+Positive correlations indicate that greater depression is associated
with worse outcome. ++Indicates that the P values were two-tailed.
CGI indicates Clinical Global Impressions Scales. * Indicates
that the last contact with patients was at 14 weeks.

The purpose of Table 11 is to show that improvement was not due to improvement in depression. Initially, we had eliminated all patients from both of these studies who showed significant clinical depression. This table indicates that according to the independent evaluator baseline depression rating, there was an inverse correlation between initial depression and eventual treatment outcome. Clinically, many agoraphobic patients give a history of depressive episodes but the relationship between depression and agoraphobia is not clear and and requires further investigation.

GROUP IN VIVO - IMIPRAMINE ●————————●
                  - PLACEBO   ○ - - - - - - ○
INDIV. DESENS. - IMIPRAMINE ■————————■
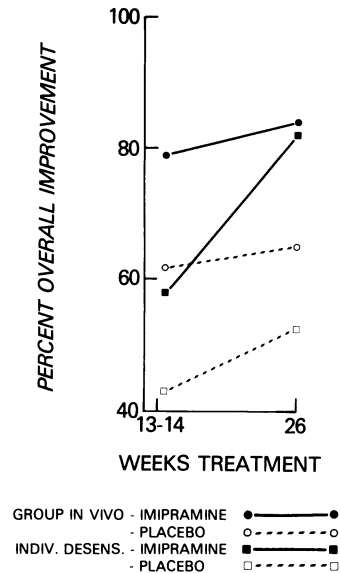   - PLACEBO   □ - - - - - - □

Figure 5: Patient ratings of overall improvement (expressed as a percentage) after 13-14 weeks and 26 weeks for all groups.

We compared the agoraphobic patients in the first and second studies. Figure 5 shows that, at the mid-point of treatment (13-14 weeks), patients who were treated with desensitization in vivo showed much greater overall improvement than those who received desensitization in imagination. However, at the end of treatment (26 weeks), results of treatment with desensitization in vivo and desensitization in imagination were equally effective, given the same drug condition.

Since the placebo treated patients in these two studies showed such good improvement, it has been the policy of the clinic since then to start treatment of all patients with desensitization in vivo or, for those who are unwilling to go into frightening situations initially, desensitization in imagination. We do not use medication routinely. It is not considered until there has been a reasonable trial of therapy (for 4 to 6 weeks, in most cases) without medication.

While studies showing the efficacy of imipramine and other tricyclics were being conducted, several investigators reported that MAO inhibitors were valuable in treating anxiety states, including phobias. (Kelly, Guirguis, Frommer, Mitchell-Heggs, & Sargent, 1970; Lipsedge et al., 1973; Tyrer, Candy, & Kelly, 1973; Capstick & Rooke, 1974). These controlled studies found that MAO inhibitors were signif-icantly superior to placebo.

Table 12: Significant differences in dependent measures
based on various comparisons of phenelyine,
imipramine and placebo.

| | At 12 weeks | | |
	Placebo vs Phenelzine	Placebo vs Imipramine	Phenelzine vs Imipramine
Zung Depression Scale	$p < .001$	$p < .01$	NS
Wolpe Lang Fear Survey Schedule	$p < .01$	NS	NS
Rubin Fear Survey Schedule	$p < .01$	NS	NS
Symptom Check List-90 Items			
Somatisation	$p < .05$	$p < .05$	NS
Obsessive-Compulsive	$p = .08$ (NS)	$p < .05$	NS
Interpersonal Sensitivity	$p < .005$	$p < .001$	NS
Depressive	$p < .005$	$p < .005$	NS
Anxiety	$p < .005$	$p < .001$	NS
Hostility	$p < .05$	NS	NS
Phobic Anxiety	$p < .001$	$p < .05$	NS
Psychoticism	$p < .005$	NS	NS
Symptom Severity and Avoidance Behavior Scale	$p < .001$	$p < .05$	$p < .05$(NS)+
Work and Social Disability Scale	$p < .001$	NS	$p < .05$+

From: Sheehan,D., Ballenger,J., & Jacobsen,G. (1980), The treatment
of endogenous anxiety with phobic, hysterical and hypochondriacal
symptoms. Archives of General Psychiatry, 37, 51-59.

Third Treatment Study

Sheehan, Ballenger and Jacobsen (1980) reported a study in which 57 agoraphobic patients who had had their illness for a mean period of 13 years, were randomly assigned in a double-blind design to imipramine, phenelzine, or placebo and treated for twelve weeks. All received group psychotherapy every two weeks during this period. At the end of treatment, patients in the phenelzine and imipramine groups showed significant improvement over patients in the placebo group and over baseline on all outcome measures. However, on follow-up during the first year after ending treatment, there was a high relapse rate of panic attacks and phobic avoidance. This finding may signify that a longer course of therapy, as in the first treatment study, is indicated.

Table 12 shows the significance tests between groups at the end of treatment (12 weeks). There was a persistent trend for phenelzine to be superior to imipramine but this difference achieved significance only on 1) the work and social disability scale and 2) the symptom severity and phobic avoidance scale.

These investigators reported that medication effects were not due to their effect on depression. They found that these drugs achieve good control of the spontaneous panic attacks, disability, somatic symptoms, and anxiety, even where there is neither depressed mood nor any vegetative signs of depression. We believe that in these patients, the spontaneous panic attacks are primary and depressed mood secondary.

A dissenting view comes from Marks et al. (1983), who attribute the value of imipramine in phobic patients to its action on depression. They report that there was a drug effect when depression was absent at the onset of treatment.

Mavissakalian and Perel (1985) reported on 62 agoraphobic patients, treated for 12 weeks with behavioral techniques and either imipramine or placebo under double-blind conditions. The imipramine-treated patients improved significantly more than those on placebo. Furthermore, patients receiving between 150 mg. and 200 mg. per day improved significantly more than those receiving less than 150 mg. per day. This study suggests that the therapeutic effect of the drug is dose dependent.

Use of Benzodiazepines

Although the benzodiazepines are very good anxiolytics, two studies found that they were not particularly effective in phobics.

Rickels (1978) observed that benzodiazepines are effective in nonpsychotic patients with high levels of emotional and somatic symptoms of anxiety, but low levels of depression and interpersonal problems. He found that these drugs were not very effective in phobic disorders.

McNair and Kahn (1981) compared imipramine, chlordiazepoxide (a benzodiazepine), and placebo in the treatment of agoraphobics. Patients were treated for ten weeks with drug and supportive psychotherapy (weekly for four weeks, biweekly thereafter). In this study, imipramine was reported to be significantly better than chlordiazepoxide. Both drugs were superior to placebo. These investigators corroborated previous findings that the imipramine effect was not due to its antidepressant action. "There was no suggestion of an interaction

with depression. The imipramine effect on panic attacks was thus
independent of degree of depression in this sample" (p. 75).

These two studies used older members of the benzodiazepine
family. However, there is a relatively new drug, alprazolam, which
belongs to a new class of the benzodiazepines, the triazolo-
benzodiazepines. This class is the most potent of the benzodiazepines
currently available, as they appear to cause less sedation, and have
been reported to be strikingly effective in blocking panic attacks.

Table 13: Benzodiazepines Marked as Anxolytics

DRUG	DOSAGE (mg)	HALF LIFE (hours)	ACTIVE METABOLITES
Long-acting			
Clorazepate	7.5-60	30-100	N-desmethyldiazepam
Prazepam	10-60	30-100	N-desmethyldiazepam
Halazepam	20-160	30-100	N-desmethyldiazepam
Moderately long-acting			
Diazepam	4-40	26-53	N-desmethyldiazepam
Chlordiazepoxide	15-100	8-28	Several
Short-intermediate acting			
Oxazepam	30-120	5-15	None
Lorazepam	1-8	10-20	None
Alprazolam	0.5-4.0	12-15	Not clinically important

In a controlled study of more than 100 agoraphobic patients,
Sheehan (Sheehan et al., 1984) compared alprazolam, phenelzine and
imipramine with placebo. Medication was given for 10 weeks, then
tapered off. Figure 6 compares overall improvement in these patients.
Although alprazolam and phenelzine were slightly superior to imipramine,
this difference was not statistically significant. All three drugs
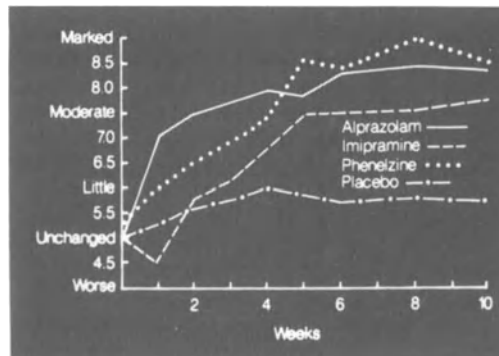were significantly superior to placebo.

Figure 6: Physician's global rating of improvement in agoraphobic
patients treated with alprazolam, imipramine, phenelzine
or placebo. From Sheehan et al., (1984).

TABLE 14

CHARACTERISTICS OF TEN PATIENTS WITH PANIC DISORDER TREATED WITH IMIPRAMINE ALONE

PATIENT	AGE (YEARS)	DURATION OF ILLNESS (YEARS)	DURATION OF IMIPRAMINE THERAPY	DURATION OF FOLLOW-UP (MONTHS)	SELF-RATED IMPROVEMENT		SIDE EFFECTS
					END OF THERAPY	FOLLOW-UP	
1	25	3.0	10 days	12	0	0	Dizziness
2	32	6.0	2 weeks				Dizziness
3	40	11.0	2 months twice, with 3 month interval between	12	+10.0	0	Low-grade fever
4	37	19.0	1 month	7	+10.0	0	None
5	44	4.0	5 weeks	8	+6.0	+5.0	Tachycardia
6	25	11.0	1 month		+6.0		Increased motor tension
7	24	1.5	11 months	11	+9.5	+9.5	None
8	43	13.0	11 months	11	+8.0	+8.0	None
9	24	4.0	8 months	8	+10.0	+10.0	None
10	44	1.0	5 months	5	+9.0	+9.0	None

From: Garankai, H., Zitrin, C.M., & Klein, D.F. (1984). Treatment of panic disorder with imipramine alone. American Journal of Psychiatry, 141, 446-448.

On the disability scale for the same patients, phenelzine showed the most improvement, with alprazolam and imipramine giving equivalent degrees of improvement. Again, all three were significantly superior to placebo.

The advantages of alprazolam are: a) it acts very quickly on panic attacks, b) it does not have the unpleasant anticholinergic side effects of tricyclics, c) it does not require the strict diet necessary with MAO inhibitors, and d) it does not lead to the weight gain that is troublesome to many patients on tricyclics and MAO inhibitors. The usual dose has been between 1.5 and 6 mg. per day. In our clinic, the most common side effect has been drowsiness. A few patients have experienced nightmares. One showed transient hostility and agitation. Caution is necessary when tapering off the drug, since rapid decrease in the dose can lead to convulsions. It is recommended that patients should not decrease by more than 1 mg. every four days. A more gradual decrement than this is recommended when possible. Alprazolam, like the other benzodiazepines, but unlike tricyclics and MAO inhibitors, may be addicting (Rickels, 1983).

Imipramine as Sole Treatment

In all of the above studies, there was some form of psychological therapy with the drug treatment. To my knowledge, there is only one published study in which medication alone was used. This study was an open pilot trial of 10 patients with panic disorder who had no phobic avoidance (Garakani, Zitrin, & Klein, 1984). All patients were given imipramine. Minimal time was spent with the patient, never more than 15 minutes per session, in order to minimize any psychotherapeutic effect.

The results, presented in Table 14, show that all patients reported a cessation of panic attacks and consistent overall improvement Patients who took medication for five months or more reported marked overall improvement, which was sustained at follow-up one year after termination of treatment. These data provide presumptive evidence that drugs can affect panic attacks directly, with secondary improvement in other symptoms, such as anticipatory anxiety. In order to confirm these results, a randomized, double-blind study is necessary.

SUMMARY

To summarize, in patients who have panic disorder, with or without avoidance behavior, there are three classes of medication that effectively stop the panic attacks: tricyclics, MAO inhibitors and the new benzodiazepine, alprazolam. However, in one study, when medication was stopped after 12 weeks, there was a very high relapse rate, not only for panic attacks, but also for avoidance behavior. In another follow-up study, after 26 weeks of imipramine, the relapse rates were much lower. The vast majority of patients who relapsed did so within the first and second years.

In all but one study, the use of drugs was coupled with a psychological therapy. The exception, a small, open, pilot study, used medication alone for patients with panic disorder without phobic avoidance. The medication used, imipramine, was very effective in eliminating panic attacks in this small group.

Since a majority of patients who have panic disorder with phobic avoidance make significant gains solely with psychological therapy (behavioral or supportive psychotherapy), in clinical practice a

trial of psychological therapy alone is indicated, before one considers medication to block panic attacks.

Simple phobics respond well to psychological therapies and do not derive any benefit from the drugs discussed in this chapter.

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THE USE OF BENZODIAZEPINES IN ANXIETY DISORDERS

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For the past three decades the benzodiazepines have been among the most widely used prescription medications (Blackwell, 1975; Mellinger, Balter, Uhlenhuth, 1984). These drugs have been viewed both as a panacea for the treatment of anxiety and as drugs which have similarities, in addictive potential, to the opiates and barbiturates (Gordon, 1979). Clinical trials have demonstrated (Greenblatt & Shader, 1974) or questionned (Bowden & Fisher, 1980) their efficacy, addictive potential and propensity for misuse (Marks et al., 1981). Soon after the introduction of these drugs authors warned against chronic use (Hollister, Motzenbecker, & Degan, 1961) and stressed the potential for addiction. Some investigators continue to see these drugs as dangerous and cite cases of serious addiction (Cooperstock & Jill, 1982; Petursson & Lader, 1984) while others feel that the benzodiazepines are safe and, while not advocating their indiscriminate use, suggest that abuse is minimal (Rickels, 1983; Marks, 1978). The benzodiazepines are therefore a group of drugs that are popular with some physicians and their patients while decidedly unpopular with others (Gordon, 1979).

The purpose of this chapter is to review some of the evidence which support both the advocate and the deterrant positions. I will also describe a group of patients who have experienced long-term benzodiazepine use and discuss the effects of this prolonged use. In this way the reader may determine his/her own attitude to the use of these medications.

THE BENZODIAZEPINES

The earliest non-barbiturate anxiolytics were meprobamate and chlordiazepoxide. The latter was the first benzodiazepine. In the early 1960s diazepam (Valium) was found to have anxiolytic, anticonvulsant, hypnotic, sedative and muscle relaxant effects. Since the actions of the benzodiazepines affect most of the common symptoms that patients experience they became extraordinarily popular. In fact, soon after the introduction of diazepam it became the most popular proprietary drug of this century (Usdin, Skolnick, Tallman, Greenblatt, & Paul, 1982).

Marks (1978) showed that the use of benzodiazepines was widespread and estimated the general use of sedative-hypnotic drugs in the United States, the United Kingdom, and other European countries as occurring in 10% to 16% of the adult population. It should also be noted here that the benzodiazepines have been found to be most commonly prescribed for women, the elderly, and those with high levels of emotional distress and somatic problems (Mellinger et al., 1984).

There are currently 13 benzodiazepines available in Canada and 12 in the United States (see Table 1). A number of texts have been devoted to reviewing the pharmacology and the clinical uses for this group of drugs (Usdin et al., 1982; Costa, 1983). These authors agree that the benzodiazepines differ in potency, absorption, onset and duration of action, pharmacokinetics, elimination half-life, and active metabolites. There is consensus regarding the significance of onset of effect as it is related to absorption, and elimination half-life. Unfortunately there is no agreement about what these differences mean in terms of other clinical effects (e.g., anxiolytic, sedative) of the benzodiazepines.

Recently, neuroreceptors have been identified that specifically bind the benzodiazepine molecule (Insel, 1986; Squires, 1977; Snyder, Enna, & Young, 1977). The presence of these receptors suggest a specific mechanism by which benzodiazepines may be effective. Such information may allow the production of more specific and efficient anxiolytics in the future.

The toxicity and addictive potential of these drugs has been of some concern to clinicians, especially if combined with alcohol and neuroleptics. The toxicity of the benzodiazpines is low (Greenblatt & Shader, 1975).

Lethal effects are rarely seen with ingestion of benzodiazepines alone, but have been documented when they are combined with other drugs or alcohol (Marks, 1978).

CLINICAL USES

As noted above the usual indications for the use of benzodiazepines are as anxiolytics, muscle relaxants, hypnotics, and, as anticonvulsants. Although certain benzodiazepines are singled out as specific for each of these uses, it is clear that they all are equally effective in the short term management of anxiety (Lader & Peturrson, 1983). A modification in dose can turn an anxiolytic into a hypnotic or anticonvulsant (e.g., while 5 mg. of diazepam can be anxiolytic, 10 to 20 mg. can be hypnotic, and larger doses can be anticonvulsant).

Elimination half-life has been suggested as an important factor in benzodiazepine use as some of the drugs have short half-lives. In addition, a short half-life has been seen as beneficial since the drugs might accumulate less and thus, be less likely to result in prolonged sedations. Short half-life benzodiazepines are claimed to facilitate sleep of insomniacs without morning hangover.

Unfortunately, the same short half-life drugs which makes these newer high potency benzodiazepines so attractive may create new problems. When this type of benzodiazepine is discontinued there is a rapid drop in the serum level, leading to a higher incidence of withdrawal reactions (De la Fuente, Rosenbaum, Martin, & Niven, 1980; Einarson, 1980; Howe, 1980) or rebound insomnia. In contrast to this rapid drop in serum levels with the shorter half-life benzodiazepines, the longer half-life ones, such as diazepam and chlordiazepoxide, may

produce fewer problems. Diazepam is highly protein bound and although
the pharmaco-kinetics suggest accumulation, the reality is that the
active drug available to the brain is both small and constant (i.e.,
it does not accumulate). Because this longer acting benzodiazepine
is highly protein bound it may be safer in terms of withdrawal. When
diazepam is withdrawn suddenly, the protein bound drug is released
slowly and a constant but decreasing serum level ensues.

ARGUMENTS AGAINST BENZODIAZEPINE USE

The majority of the research into the effectiveness of the
benzodiazepines has been directed at their anxiolytic and sedative-
hypnotic activity. Most of the early investigations of the benzodia-
zepines treat anxiety as a symptom measured by standard rating scales
for anxiety such as the Hamilton Anxiety Rating Scale (Hamilton,
1959). There has been some research done on the usefulness of the
benzodiazepines in the treatment of specific anxiety syndromes (Shader,
Greenblatt, & Ciraulo, 1981). Concerns have been raised that, at
best, benzodiazepines are only a symptomatic treatment and, at worse,
they are addictive and dangerous (Petursson & Lader, 1984). In addition
there have been concerns about whether they might impair people when
driving, or when doing jobs that require the use of complicated and
dangerous machinery (Linnoila, 1983). Finally, the issue of their
interaction with outcome provided by various psychotherapies has been
raised (Uhlenhuth, 1983). For example, do the benzodiazepines have a
synergistic or antagonistic effect on psychotherapy? These issues
will be discussed later in the chapter.

Both professional and lay authors have discussed the danger of misuse
and/or abuse with the benzodiazepines (Cooperstock & Jill, 1982;
Gordon, 1979). Addiction symptoms, with both tolerance & withdrawal,
have been proposed as possible in patients who use these drugs
chronically.

The first report of benzodiazepine withdrawal symptoms came
early after the introduction of the drugs, as their use became widespread
(Hollister et al., 1961). Since these early reports evidence has
accumulated that these drugs may result in either psychological or
physical dependence, or both (Petursson and Lader, 1984). On the
other hand, these effects are not invariable and most patients who
take benzodiazepines, intermittently or on a regular basis, manifest
with few adverse effects (Rickels et al., 1982).

Marks (1978) documented a low incidence of addiction or abuse
with benzodiazepine treatment. His calculations suggested that the
incidence of addiction was two or three cases per five million patient
months. Unfortunately, Marks (1978) used an unusual method of measuring
abuse, relying on cases per million patient months, with the result
that there are no other studies with which to compare his work. The
main point is that the evidence from these studies indicates that the
incidence of problems with benzodiazepines is minimal.

Rickels, Case, Downing, and Winokur (1983) examined groups of
patients being treated by general practitioners and found withdrawal
symptoms in up to 43% of the patients who had been taking their drugs
for longer than eight months. They also reported that these withdrawal
symptoms were mild and easily dealt with by gradual withdrawal.

In contrast, Ashton (1984) has documented physical dependence
and withdrawal symptoms in a small group of carefully evaluated
patients. This observation and other evidence (Owen & Tyrer, 1983)

suggests that the benzodiazepines can be a dangerous group of drugs. There is special concern regarding the propensity of the short acting, high potency benzodiazepines to produce severe withdrawal symptoms if stopped abruptly.

Interestingly, however, there are reports of sudden withdrawal from benzodiazepines with few or no side effects. Bowden and Fisher (1980) reported a lack of adverse effects from abrupt withdrawal. Cohn and Noble (1983) reviewed 200 patients with chronic anxiety who took alprazolam or lorazepam for 6 months followed by a 1 month placebo period. Withdrawal effects were minimal but occurred in 43% of the alprazolam group and 55% of the lorazepam group. Laughren, Battey, Greenblatt and Harrop (1982) examined 24 middle-aged male chronically anxious outpatients who were taking diazepam at a mean dose of 17 mg/day for a mean duration of 5 years. The patients were assigned to three groups: maintenance, gradual withdrawal, or abrupt withdrawal. No differences were seen on two self-report anxiety measures or in withdrawal symptoms between groups. The authors concluded that withdrawal from chronic diazepam use (10-30 mg/day) did not produce prominent withdrawal syndrome.

Studies of physician prescribing habits, patient use and indications for use suggest that the amount and way in which these drugs are used is quite appropriate. Lasagna (1977) assessed non-psychiatric patients who received benzodiazepines and suggested that these are mainly people with chronic medical conditions who require the drug and use it judiciously. Hasday and Karch (1981) have shown that most physicians do not dispense benzodiazepines excessively. Also they concluded that physicians tend not to use a benzodiazepine to replace other therapies, such as psychotherapy. In fact, most physicians seem to be conservative in their use of these medications.

There are groups of patients, especially those who abuse alcohol and other drugs, who are also at high risk for benzodiazepines abuse. The primary risk factor in benzodiazepine abuse appears to be other drug misuse, especially alcohol. On the other hand, there are patients who can use a benzodiazepine over long periods of time and at high doses with little evidence of adverse effect. The majority of patients would appear to use the drug judiciously.

The question has been raised as to what is the effect of benzodiazepines on other psychological therapies such as behavioral or traditional psychotherapy. A number of authors have suggested that the benzodiazepines are of help during behavior therapy procedures, especially graduated exposure (Hafner & Marks, 1976; Johnston & Gath, 1973; Marks, Viswanathan, Lipsedge, & Gardner, 1972). More recently Marshall and Segal (1986) have stated that the benzodiazepines may impede behavioral psychotherapy. The understanding of this adverse effect is that through reducing anxiety, the benzodiazepines prevent the extinction that occurs with prolonged and constant exposure therapy.

Psychotherapists are concerned that the combination of a benzodiazepine with psychotherapy might in some cases be countertherapeutic and as a result prolong the disorder despite immediate relief of symptoms. Uhlenhuth (1983) reviewed a number of publications and suggested this concern is not based in fact. Uhlenhuth (1983) notes that only the behavior therapy studies meet the criterion for controlled, double-blind evaluations. In his selective review of studies on psychotherapy benzodiazepine interaction, which come close to his standard for scientific proof, there was no evidence of an antagonistic

effect. Indeed, the benzodiazepines in some cases actually helped to produce a positive outcome.

There has been serious concern voiced about the effects that benzodiazepines might have on everyday activities. Driving is the most common activity that might be affected by these drugs. There is concern for persons who operate dangerous machinery or perform jobs that require a high level of concentration. Common sense would suggest caution for anyone taking benzodiazepines. However, the actual effect of these drugs on performance is uncertain. Kleinknecht and Donaldson (1975) obtained measures of cognitive and motor performance such as reflex speed, critical flicker-fusion threshold, attention and vigilance, decision making, learning, memory, and psychomotor performance. They documented impaired performance in all of these functions. Despite this, and after a review of the literature, they concluded that "most of the studies used normal, healthy, male volunteer subjects and may not be comparable to the clinical population for whom the drug is typically prescribed." Linnoila (1983), also using measures of performance in non-clinical populations, demonstrated a negative effect of the benzodiazepines on human psychomotor performance with the potential for increased accident risk. There is, therefore, evidence of impairment with benzodiazepines in normal volunteers. The question arises as to whether highly anxious individuals on benzodiazepines would show a similar impairment on tests of psychomotor functioning.

Bo et al. (1975) and Honkanen et al. (1980) showed in a study of traffic accidents that there was an over-representation of diazepam users (usually in combination with ethanol ingestion) involved in these incidents. The question arises however whether highly anxious individuals would be affected by chronic or acute benzodiazepine ingestion. Also, is the over-representation of diazepam users in traffic accidents correlated with other drug ingestion? Unfortunately as yet there is no specific answer to the dangers from benzodiazepines in the above situations. It is reasonable to assume that these drugs affect performance and the therapist should caution patients accordingly.

BENZODIAZEPINES IN ANXIETY DISORDERS

With the introduction of DSM-III we now have a diagnostic category, Anxiety Disorder, within which have been defined several syndromes (Spitzer & Williams, 1986). In all of these syndromes, anxiety is a cardinal symptom and thus, the benzodiazepines may play a major role. Clinical experience, however, shows that many physicians and their patients are reluctant to consider these drugs for fear of addiction and withdrawal, particularly the former. Patients express concern that they are using a "crutch" to deal with their symptoms and not getting to the "root" of the problem. Some patients fear the long-term effects of the benzodiazepines, especially teratogenicity in women of child-bearing age. Others worry that they will not be themselves while using these drugs, or that the drugs will make them groggy. Finally, the adverse publicity attached to benzodiazepines (Gordon, 1979) has increased anxiety in patients who might otherwise benefit from the use of the drugs.

Benzodiazepines are seen as useful in the short-term treatment of anxiety (Cohen, 1981). What is the role of these drugs in anxiety syndromes such as Agoraphobia or Panic Disorder? There has been little work in this area. There has been little research into the relative efficacy of the benzodiazepines in comparison with other treatments for Anxiety Disorders. McNair and Kahn's (1981) study compared chlordiazepoxide and imipramine in the treatment of agoraphobia and showed that imipramine was more effective.

Alprazolam (a new benzodiazepine of the triazolobenzodiazepine
type) has been reported as both anti-panic and anti-depressive (Feighner,
1983; Dawson, Jue, & Brogden, 1984; Rickels et al., 1983; Sheehan et
al., 1984). Although structurally dissimilar to the earlier benzo-
diazepines, alprazolam still falls within their chemical group. The
question must be raised as to whether this anti-panic and anti-depressive
effect is common to all benzodiazepines, or specific to alprazolam.

LONG-TERM USE OF BENZODIAZEPINES IN ANXIETY DISORDERS

As noted previously, the effects of long-term use of benzodiazepines
suggests that withdrawal does occur in a large percentage of patients.
At the same time, there is contradictory evidence as to the severity
of such withdrawal reactions. Ashton (1984) reports severe withdrawal
syndromes in a group of patients. The symptoms of withdrawal can
include such severe experiences as seizures, psychosis, and hallucinatory
phenomena. Rickels (1983) sees mild withdrawal symptoms in his patients.
He also reports that withdrawal symptoms are easily dealt with by
gradual withdrawal. There is as yet no easy resolution to these
contradictory findings. Perhaps, these studies involve different
diagnostic groups of patients with differing tolerances or sensitivities
to drug withdrawal.

Can chronic benzodiazepine ingestion exist with little disability,
no evidence of withdrawal, and/or evidence of improved functioning?
In the course of my clinical practice I decided to review a group of
12 patients with chronic anxiety and chronic benzodiazepine use.
These patients were not randomly selected. They had been placed on
benzodiazepines before coming to see me. The following is therefore
a description of their experiences with long-term benzodiazepine use
and not a rigorous evaluation of long term treatment with a benzodia-
zepine.

All 12 patients had taken benzodiazepines for greater than four
months (though there is no exact definition of "chronic use" available
at this time, there is general agreement that after 4 months the
percentage of patients experiencing withdrawal symptoms begins to
rise dramatically). Their diagnoses, clinical profiles, level of
benzodiazepine use, and level of functioning will be reviewed followed
by a discussion of these results.

Twelve patients were followed over two years. Their average age
was 33 (range from 21 to 49). The patients experienced a variety of
symptoms and problem behaviors including anticipatory anxiety, avoidance
and panic. They met DSM-III criteria for either Agoraphobia with
Panic (5 subjects) or Generalized Anxiety Disorder (7 subjects).
None met DSM-III criteria for Major Affective Disorder, Schizophrenia,
or Organic Brain Syndrome. Five of the subjects had depressive symptoms
as reflected by scores over 16 on the Beck Depression Inventory (Beck
Ward, Mendelson, Mock, & Erbaugh, 1961).

Ten of the subjects were employed and all of these ten said that
their use of benzodiazepines permitted them to continue functioning
in their jobs. One subject was unemployed and one was a housewife. Six
subjects were single, five married and one divorced.

The twelve subjects used an average of 22 mg of diazepam
or its equivalent per day (equivalency was measured in the manner
suggested by Shader, Greenblatt, Salzman, Kochansky & Harmatz, 1975).
They regularly used the drug for a minimum of four months to a maximum

of ten years. No subject described tolerance (i.e., requiring an
increasing dose to produce the same effect). One subject experienced
withdrawal symptoms when she lowered the dose. The other 11 subjects
experienced no withdrawal symptoms even when they lowered the dose
as a function of fluctuating levels of anxiety. All but two of the
patients seemed eager to maintain themselves at the minimum dose
possible.

One subject had used cocaine in the past. She showed a dramatic
variation in dose, both in terms of amount and abruptness with which
she changed her dose. She would typically be taking 40 mg. of diazepam
per day, for a week, and then stop it for weeks with seemingly no ill
effect. She would then begin it again, usually at 40 mg. per day
for what appeared to be increasing anxiety but may have been withdrawal
symptoms. It was difficult to be certain. Her symptoms included
of sweating, palpitations and feelings of anxiety. They would commence
2 to 4 weeks after she stopped her drug. It is likely that this
constituted delayed withdrawal. One alcoholic patient maintained a
constant dose with no recurrence of his alcoholism, as measured by
his self-report and my observations of his behavior and functioning.

The agoraphobic patients under study were treated with graduated
exposure (Marks, 1978). When not taking benzodiazepines they were
unable to obtain any benefit from graduated exposure. They reported
continued avoidance behavior and continued anticipatory anxiety.
Patients with generalized anxiety received either supportive psychotherapy
or Anxiety Management Training (Suinn, 1972). Patients were asked to
and did continue in the above treatments for at least six months. No
patient reported an ability to function without a benzodiazepine. They
reported that both their avoidance and their anticipatory anxiety
continued at the same level as before these treatments.

TABLE 1

BENZODIAZEPINES AVAILABLE FOR USE IN CANADA

Short Acting Agents	Long Acting Agents
Alprazolam	Chlordiazepoxide
Bromazepam	Clonazepam
Lorazepam	Clorazepate
Oxazepam	Diazepam
Temazepam	Flurazepam
Triazolam	Ketazolam
	Nitrazepam

The four agoraphobic patients met criteria for agoraphobia with
panic attacks; they were offered a course of imipramine. Two of
these patients refused the imipramine treatment when side-effects
were discussed. The other two patients began imipramine but would
not continue the drug, even in doses as low as 10 mg. per day.
These patients seemed unusually sensitive to the side effects of
imipramine. Zitrin, Klein and Woerner (1980) have commented on this
unusual sensitivity that some patients with panic attacks experience
when placed on imipramine. This sensitivity occurred even though
small doses were used and attempts were made to carefully titrate the
dosage.

Many of these patients stated that they were seen by their family physicians as addicted to benzodiazepines. Some reported that their physicians asked them to change from their benzodiazepines to neuroleptics or to withdraw from their benzodiazedpine completely. Some patients were advised to attend addiction facilities for specialized care, even though they did not abuse alcohol, cocaine or other drugs. These patients saw this suggestion as an indication from their physicians that they had serious drug abuse problems. They reported resenting this attitude and feeling out of place in facilities which specialized in the treatment of drug abuse.

What I have described is a group of patients with Anxiety Disorders who show no response to Graduated Exposure, Anxiety Management Training, or imipramine. It would seem that except for one patient, who had previously shown problems with drug misuse, these patients were able to maintain their benzodiazepine ingestion for long periods with no evidence of misuse, abuse, or tolerance. These patients could be seen as treatment resistant.

As a condition of continued treatment all patients were asked to monitor their daily intake. Medication was dispensed monthly with the number of pills geared to the patient's previous month's average intake. There was no evidence that the patients gradually increased their dose, because of a waxing anxiolytic effect. There were peaks of ingestion, as there were valleys. The patients appeared to keep their dose within the prescribed range. For example, one patient took 8 mg per day of lorazepam for several months and then suddenly dropped to 2 mg per day. She continued this pattern for a few months and then, as her anxiety increased, she increased her dose once more to 8 mg per day. Other patients showed a similar pattern.

The patients frequently asked questions about the long-term effects of the drugs they were taking. The women were concerned about what might happen if they became pregnant. They were advised that as yet there were no serious long term effects identified except that withdrawal might occur if the drugs were discontinued abruptly. It was suggested that if a female patient thought she was pregnant she should stop her benzodiazepine although it was stressed that there was no clear evidence of teratogencity.

Withdrawal effects (as summarized in Table 2) were not observed in this group of patients. As mild withdrawal and anxiety are difficult to distinguish, these patients may have been experiencing withdrawal and using larger doses to deal with withdrawal. No severe withdrawal effects such as hallucinations, delusions, or psychosis were observed.

CONCLUSIONS

The benzodiazepines are widely used drugs, important in the management of anxiety symptoms. They have not been carefully evaluated for their usefulness in specific anxiety syndromes, such as Agoraphobia or Obsessive Compulsive Neurosis. While they appear to be safe drugs when properly used there have been reports of severe withdrawal effects. It may be that these severe withdrawal symptoms are rare and associated with the misuse of other agents, especially alcohol. The contradictory evidence about the incidence and severity of withdrawal symptoms suggests that each physician monitor patients closely and be certain about the target symptoms he/she wants to alter. Generally, the benzodiazepines would seem to be prescribed appropriately and taken for appropriate reasons by patients.

There may be a group of patients suffering from chronic anxiety, in whom the long term use of benzodiazepines is necessary. Although there is no way to pick out this group prospectively, given our present knowledge, it may be that their lack of response to non-pharmacologic treatments (e.g., Graduated Exposure, Anxiety Management Training or Supportive Psychotherapy), the absence of multiple drug use, their ability to function with benzodiazepines and the difficulty they have without them, indicates that chronic or long term use is appropriate in this carefully selected group of patients.

TABLE 2

Diazepam Withdrawal Symptoms

       Extreme Distress
       GI symptoms (Nausea, diarrhea, or constipation)
       Diaphoresis (profuse perspiration)
       Tremor
       Lethargy
       Dizziness
       Increased Acuity for Sound and Smell
       Restlessness
       Insomnia
       Tinnitus
       Feelings of Depersonalization
       Difficulties Expressing Thoughts Coherently
       Headaches
       Irritability
       Anxiety
       Convulsions
       Psychotic Reactions

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NEW APPROACHES TO THE PHARMACOLOGICAL TREATMENT OF ANXIETY AND DEPRESSION

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INTRODUCTION

    Psychopharmacological advances in the last decade have contributed
to the treatment of anxiety and depression in a number of ways.
These developments have modified the conceptual framework of the
biological understanding of these conditions and have led to a differ-
entiation of subgroups of patients within the broad diagnostic categories
of anxiety and depression. These more specific sub-categories are
based for the most part on differences in treatment response. Psycho-
pharmacology has also led to changes in nosology, the development of
laboratory diagnostic tools, methods of response prediction and to
the use of more neurochemically specific therapeutic agents. In
addition to these advances, drug developments have resulted in the
use of chemicals which, while maintaining initial therapeutic objectives,
have fewer of the adverse effects which limited the use of the earlier
compounds. In this chapter, an attempt will be made to review these
developments of the last few years.

ANXIETY

    Traditionally, anxiety reduction and sedation were conceptualized
as having a common mechanism. Inevitably a drug proposed for the
treatment of anxiety had sedation as its side effect. However,
clinical observation indicates that even though they may be sedated,
some patients may remain anxious disproportionately to their level of
arousal. This strongly suggests that qualitative as well as quantitative
differences exist to differentiate anxiolysis from sedation. This
change in conceptualization derives from findings that non-sedating
drugs may be anxiolytic and that sedatives may not be so. In support
of these clinical observations, basic neuropharmacological mechanisms
of drug action and psychophysiological profiles of anxiety levels
indicate that such a distinction does indeed exist (Lader, 1979).

    The developing concept of endogenous anxiety is partly based on
psychopharmacological differentiation of treatment response. Although
there is not yet a clear distinction of these subgroups of endogenous

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anxiety syndromes, panic disorder and most probably generalized
anxiety disorder will be included (Sheehan, Ballenger, & Jacobsen,
1980; Sheehan & Sheehan, 1982; Claycomb, 1978). Research into anxiety
disorders is extremely complex and for further progress to occur,
there is a requirement of greater precision on the definitions of
anxiety, the clinical models of various anxiety disorders and a
better definition of the phenomenology and mechanisms of drug action
(Janke & Netter, 1983).

The benzodiazepines have been the mainstay of treatment of
anxiety disorders since their introduction some 25 years ago. The
original group of benzodiazepines offered very few differences other
than those related to pharmacokinetic and possibly pharmacodynamic
characteristics. More recently, however, controlled clinical evaluations
of some of the derivatives of these initial benzodiazepines suggest
that differences in potency and in clinical profile of effectiveness
do exist. For example, bromazepam, a halogenated derivative of
diazepam, may have increased potency over the latter and may be more
effective in controlling symptoms of an obsessional nature (Fontaine,
Annable, Chouinard, & Ogilvie, 1983). Clonazepam, a highly potent benzo-
diazepine, has an added neuropharmacological effect of potentiating
serotonin mechanisms and because of this, has been suggested as
useful in controlling mania (Chouinard, Young, & Annable, 1983).
Benzodiazepines, up to a few years ago, were the most widely prescribed
medications with an estimated 12-16% of the adult population in
developed countries using them at least once a year (Lader & Petursson,
1983).

The major innovation in therapy with benzodiazepines has been
the introduction of the triazolo-benzodiazepines. This group of
drugs represented by triazolam and alprazolam have, it appears,
certain characteristics in addition to the features they share with
other benzodiazepines. These qualitative differences have therapeutic
implications in the management of the milder forms of depression and
of panic disorders (Itoh, Takahashi, & Miura, 1980; Sheehan et al.,
1984). In spite of this, triazolo-benzodiazepine compounds share the
problems of sedation, idiosyncratic responses and the possibility of
withdrawal syndromes after sudden cessation or following drastic
reduction in dosage. These effects are in common with the other
benzodiazepines (Lader & Petursson, 1981).

The widespread use of benzodiazepines and their universally
accepted anxiolytic properties provided a useful tool in the investigation
of the biological substrates of anxiety. The discovery of the benzo-
diazepine receptor in the central nervous system (Mohler & Okada,
1977) opened the way to further clarification of some of the neurochemical
mechanisms involved in at least one form of anxiolytic therapy. The
benzodiazepine receptor is present throughout the central nervous
system with its greatest density in cortical areas. Its distribution
is similar to that of gamma aminobutyric acid (GABA) receptors and
there is now evidence suggesting that benzodiazepines act at a site
associated with the GABA receptor (Costa & Guidotti, 1979).

The demonstration of the benzodiazepines receptor was followed
by a search for endogenous ligands to the receptor. A number of
compounds have been suggested as possibly fulfilling this role.
These have included inositine or hypoxanthine (Colello, Hockenbery,
Bosmann, Fuchs, & Folkers, 1978), nicotinamide (Mohler, Polc, Sumin,
Pieri, & Kettler, 1979), and others such as the beta-carbolines
(Braestrup, Nielsen, & Olsen, 1980). This area of investigation
continues in the hope that effective anxiolysis may eventually be
possible through the use of naturally occurring endogenous compounds.

This line of investigation follows that which developed after the discovery of the opioid receptors. If the brain possesses a receptor to a drug, this same receptor should logically be existent for a naturally occurring substance or endogenous ligand which would serve as its natural activator. It could then be postulated that in the anxiety state there would exist a relative or functional deficiency of this ligand and that in certain types of anxiety especially in patients with heavy genetic loading for the disorder, there would be a genetic or biochemical deficiency predisposing to one form of anxiety or another.

More recent findings suggest that the benzodiazepine receptors are not homogenous (Haefely, Polc, Pieri, Schaffner, & Laurent, 1983). Although the intrinsic structural differentiation of the different benzodiazepine receptors has not been elucidated, certain functional subtypes have been suggested. The type I benzodiazepine receptor would be the one responsible for the anxiolytic effect of these drugs. The type II receptor would be the receptor responsible for the phenomenon of tolerance. The evidence for this is the down-regulating of responsiveness in this group of receptors after administration of benzodiazepines. This differentiation has clinical relevance in partially explaining the separation of anxiolytic effect of benzodiazepines from tolerance which may occur to certain of their other effects such as to sedation and muscle relaxation. The phenomena of habituation and dependence may also be related to the type II receptors.

With the recognition of the benzodiazepine receptors and of these possible receptor ligands, a new approach to drug development becomes possible. Suriclone and other drugs of this same chemical group such as zopiclone, have been developed on the basis of their affinity to the benzodiazepine receptor. Suriclone is being actively investigated as an anxiolytic. Although its anxiolytic properties have not yet been well established, there are clinical indications that its main modes of action rest with neuropharmacological mechanisms related to the gamma-aminobutyric acid (GABA) neuro-transmitter at different brain sites. This GABA transmission may be stimulated by activation of the benzodiazepine receptor.

Since the original benzodiazepine, chlordiazepoxide, a number of compounds have been developed which are analogues or metabolites of the benzodiazepine molecule. Their clinical differences arise mainly from pharmacokinetic characteristics. The blood distribution and levels of different benzodiazepines are not all the same (Greenblatt, Shader, Harmatz, Franke, & Koch-Weser,1977; Shader & Greenblatt, 1977). Following the administration of this group of drugs, the absorption through the gastrointestinal tract, distribution in the different body compartments then takes place and finally the drug is eliminated. This last step may be mediated by metabolism of the drug which is generally accomplished by the liver. These metabolic processes result in a gradual degradation of the administered drug into simpler breakdown products to the point of inactivation of the drug. It may be excreted directly via the kidney or other excretory mechanism. It is this time of elimination from the blood stream that is referred to in establishing the postulated duration of a drug's action. The conventional measurement is the elimination half-life. This is the time required for the blood level of a drug to drop from its peak or maximum to half of that maximum level. These half-life differences derive from their metabolism and the production of active metabolites. The short half-life compounds go through a process of glucuronidation and can then be excreted as inactive products whereas the longer half-life benzodiazepines produce a number of active metabolites through a number of metabolic steps such as oxidation, demethylation,

and finally glucuronidation. There is now growing evidence that in addition to half-life differences, there may be more specific clinical differentiation of these compounds (Chouinard et al., 1983; Sheehan et al., 1984).

PANIC DISORDER AND ANXIETY

The segregation of panic disorder and anticipatory anxiety from the group of anxieties arose from a differential pharmacological response. Panic attacks are generally not prevented by conventional doses of the traditional benzodiazepines (Klein, 1964). On the other hand, they may be prevented from occurring by the administration of a tricyclic antidepressant such as imipramine. Although this is the only tricyclic which was systematically studied in panic disorder, one would expect that blocking the panic attack may be achieved by most of the other tricyclics with a similar mode of action. The prevention of panic attacks does not necessarily control the anticipatory anxiety which may require pharmacological management with a benzodiazepine. Should the panic attacks not respond to a tricyclic, MAO inhibitors may bring the condition under control (Sheehan, 1984). Another new indication for MAO inhibitors in anxiety is in a condition referred to by Klein as hysteroid dysphoria (Klein & Davis, 1969). This condition resembles closely the atypical depression studied more exhaustively by Nies, Robinson, Bartlett, and Lambourn (1977).

Although the epidemiology of the syndrome described by these authors has not been validated, they do provide evidence in favor of a subgroup of depressives who are not responsive to tricyclic antidepressants but do respond to phenelzine, an MAO inhibitor, once the dosage has been demonstrated to have reached an adequate level (Spitzer & Williams, 1982).

Beta blockers such as propranolol are anxiolytic for a number of chronically anxious patients (Kathol et al., 1980). In one study, propranolol brought both somatic and psychic symptoms of anxiety under control. Other studies (Tyrer & Lader, 1974) suggested that propranolol was superior in the control of the somatic symptoms of anxiety. The mechanism by which beta-blocking agents are thought to relieve the anxiety syndrome is through their direct pharmacological action on the peripheral autonomic symptoms of anxiety such as palpitations and tachycardia. By breaking this chain of events and reducing the autonomic cues of anxiety, the feedback loop to the psychic component would be less, thus allowing for control of the latter.

Acebutolol, another beta-blocker, was found to potentiate diazepam and thus may exert its anxiolytic effects. This remains to be clearly demonstrated (Emerson, Pare, Turner, & Hathaway, 1981).

Clonidine, an alpha-2 presynaptic agonist evaluated in a double-blind cross-over comparison with placebo, reduced the psychic symptoms of anxiety rather selectively with very little effect on the somatic symptomatology (Jimerson, Post, Stoddard, Gillin, & Bunney, 1980).

NEW ANTI-ANXIETY DRUGS

Buspirone, a non-benzodiazepine, has demonstrated anxiolytic effects (Feighner, Merideth, & Hendrickson, 1982; Goldberg & Finnerty, 1982; Taylor, et al., 1982). This compound shows no evidence of interacting with GABA nor with the benzodiazepine receptor. Its main neuropharmacological mechanism inasmuch as can be recognized at this time, is its interactions with the dopaminergic system (Meltzer,

1983). These are not yet clearly elucidated as it is not clearly a complete agonist nor a complete antagonist to the dopamine system having some characteristics of both mechanisms. A theoretical rationale explaining its anti-anxiety effect is not yet elaborated. It is possible that its anxiolytic effect derives from its dopamine and its cholinergic mechanisms (Kolasa, Fusi, Garattini, Consolo, & Ladinsky, 1982). Its anxiolytic properties seem to be equal to those of diazepam with less sedation and less cognitive impairment arising from its use (Taylor et al., 1982; Bond & Lader, 1981). One study on normal volunteers suggests that buspirone does not potentiate alcohol (Seppala, Aranko, Mattila, & Shrotriya, 1982) in psychomotor performance.

Melperone has undergone preliminary studies and there are suggestions that it may be an effective anxiolytic. This drug is a butyrophenone with weak and short-lasting dopamine blocking activity. Whether it will be a valid anxiolytic remains to be demonstrated (Fabre & Napoliello, 1981).

Fenobam, another non-benzodiazepine, has been assessed in anxiety disorder (Lapierre & Oyewumi, 1982; Pecknold, McClure, & Appeltauer, 1980). There are preliminary indications that it may exert anxiolytic properties, however, more double-blind comparative studies remain to be completed (Friedmann, Davis, Ciccone, & Rubin, 1980).

DEPRESSION

The cornerstone hypotheses of biochemical understanding of depressive disorders have been those enunciated by Schildkraut (1965) and Coppen (1967). Schildkraut postulated that depression may be the result of a deficiency of catecholamines, mainly norepinephrine (NE) at critical sites in the central nervous system. Coppen's hypothesis was analogous but implicated serotonin (5-HT) as the critically deficient neurotransmitter. The observation that the tricyclic antidepressants produced a blockade of NE and/or 5-HT uptake in animals gave support to both of these hypotheses. A number of questions remained unanswered and more have developed with the discovery of the newer antidepressants. Reuptake blockade is an acute drug effect whereas, clinically, a lag phase of 1-3 weeks is required for the amelioration of depression. Another deficiency of this initial hypothesis is that certain drugs such as iprindole and mianserin had no effect on the uptake of these amines but are nevertheless effective antidepressants. Finally, other compounds such as cocaine and amphetamine have reuptake blocking capabilities but are not antidepressant. The postulated deficiencies of 5-HT and/or NE as etiological factors in the development of depression remain unclear. The defect in the function of these neurotransmitters could well be a phenomenon secondary to other neurochemical mechanisms. Nevertheless, the subclassification of depressive disorders based on these biochemical parameters remained a heuristic approach. This issue was pursued by Asberg, Bertilsson and Tuck (1972) who observed that patients with lower cerebrospinal metabolite levels of 5-HT showed a poor antidepressant response to nortriptyline, a tricyclic with mainly NE reuptake inhibition, while those patients with lower urinary levels of MHPG, a CSF metabolite of NE, had a better response to this type of antidepressant (Maas, 1975). The role of dopamine remains unclear as an essential component of depression although it does appear to be related with certain features of the depressive syndrome such as motor activity (Van Praag, 1980).

It becomes apparent that classification of depression based on biochemical constructs as they relate to clinical phenomenology is

still not resolved. Nevertheless, this approach may be utilized to classify depressive disorders pragmatically, inasmuch as they may serve as predictive indicators of drug response. MHPG studies suggest the existence of a variety of subtypes of unipolar depressions (Schatzberg et al., 1982). For example, subtype I would be of low NE output and subtype II with normal or high NE output. The latter would possibly also have abnormalities in other neurochemical systems. This group of depressed patients could also be those individuals with high free cortisol levels. Subtype I may be more responsive to maprotiline or imipramine treatment whereas the other two groups would be less so.

Maas et al. (1984) took a multi-neurotransmitter and multi-metabolite approach. These studies suggest that those bipolar patients with normal levels of urinary NE and low levels of urinary MHPG were generally associated with a better drug responsiveness. In unipolar depressives, those with low CSF 5-HIAA and high urinary metanephrine had a greater incidence of drug response. The clarification of amine metabolism in depression and of the two monoamine hypotheses contributed to the pursuit of more refined investigations. There are still a number of deficiencies with these studies such as small numbers of patients, difficulties in relating nosology and symptom profiles, criteria for drug choice and mechanism of drugs (Kelwala, Jones, & Sitaram, 1983).

NEUROENDOCRINE APPROACHES

Since the late 1960s, the techniques of endocrinology have made inroads in psychiatry. This advance is particularly true in affective disorders because of the hypothesized relationship between the limbic system, hypothalamus and the pituitary gland. A number of neurotransmitter systems may be involved and the findings may thus shed more light on the abnormalities of biological function in these disorders. The observations of Sachar and his colleagues in 1970 that depressed patients had disturbed circadian excretion of serum cortisol (Sachar, Hellman & Fukushima, 1970) lead to further exploration of the hypothalamic-pituitary-adrenal axis. A clinical application of these observations has been the dexamethasone suppression test (DST), the implications of which have been extensively investigated and were recently summarized (Carroll, 1983). The standardized technique consists of the administration of dexamethasone 1 mg. at 11:00 p.m. with collections of serum cortisol at 1600 and 2300 hours the following day. The generally accepted level to delineate non-suppression is 155 mmol per liter of cortisol. In cases of depression with melancholia, the expected suppression of cortisol production does not occur in approximately 60% of depressed patients. The test is considered specific for melancholia in up to 96% of cases so diagnosed. The test thus would have a clinical application in the support of a clinical diagnosis of these depressions rather than in the making of a diagnosis.

These findings led to the search for other neuroendocrinological abnormalities in depression. Another endocrine system which sparked interest was the TRH-TSH axis (Langer, Aschauer, Koinig, Resch, & Schonbeck, 1983). A blunted TSH response to TRH can be observed in up to 40% of biologically depressed patients. The specificity of the TRH-TSH test is however not as great as that of the DST making it less useful clinically.

The value of these tests as predictors of response to antidepressants remains unknown. On the other hand, serial testing during the

period of recovery may serve as a predictor of relapse in patients where the neuroendocrine challenge becomes abnormal in the presence of a euthymic mood (Targum, 1983). The DST can become non-suppressive even before the depressive syndrome sets in thus serving as an additional guide to the maintenance of antidepressant therapy.

THERAPEUTIC ADVANCES

The effectiveness of the tricyclic antidepressants in the treatment of depression have been well demonstrated in a number of studies over a number of years (Shopsin & Waters, 1980).

The monoamine oxidase inhibitors (MAOI) are now recognized as effective antidepressants in endogenous as well as in atypical depression (Ravaris, Robinson, Ives, Nies, & Barlett, 1980). The main finding in pharmacotherapy with MAOI's over the last few years relates primarily to adequate doses as can be demonstrated by biological parameters such as suppression of REM sleep (Akindele, Evans, & Oswald, 1970) or by monitoring the inhibition of platelet MAO activity (Nies, et al., 1977). The combination of a tricyclic antidepressant and a MAOI under proper supervision, is now recognized as quite safe (Pare, 1979). Prior to discontinuation of an antidepressant, it is essential that for a trial of treatment to be considered as adequate, it should extend from 5 to 6 weeks at full dosage before considering the patient non-responsive to the treatment (Quitkin, Rabkin, Ross, & McGrath, 1984).

MECHANISMS OF ACTION OF ANTIDEPRESSANTS

The initial observations of inhibition of reuptake of norepinephrine and/or serotonin after an acute dose of tricyclic antidepressant did not fully explain the clinical profile of response. Subsequent investigations at the receptor level indicate that, during antidepressant treatment, there is a decrease in alpha-2 adrenergic receptors of blood platelet membranes. The platelet is generally considered as reflecting events occurring in the neuron (Smith, Hollingsworth, Garcia-Sevilla, & Zis, 1983). This finding is complicated by the observations that in depression, it is not the sensitivity of the alpha-2 adrenergic receptor which is abnormal but rather the sensitivity of the post-synaptic adrenergic (alpha 1) receptors may be decreased in the hypothalamus (Charney et al., 1982). These conclusions are based on the blunted Growth Hormone response to clonidine in depression and the lack of difference in the blood pressure response. These findings were questioned by Garcia-Sevilla, Zis, Hollingsworth, Greden, and Smith, (1981) who found that alpha-2 adrenergic receptor sensitivity may be increased in depression and that TCA treatment is associated with a decrease in the number of these receptors.

Therapy with most of the clinically effective antidepressants has an effect at the post-synaptic receptor sites. The beta-adrenergic receptor activity is down regulated by antidepressant therapy and by ECT (Sulser, 1983). This is particularly limited to the beta-adrenergic receptors which are linked to adenylate cyclase which suggests that there may be a role for the cyclic AMP system in the treatment of depressions. An application of this concept is the role of lithium in the treatment of depression (Belmaker, 1981).

The serotonin hypothesis suggests that brain serotonin (5HT) levels are lowered during depression. This hypothesis was supported by the findings of Lloyd et al., (1974) who observed decreased levels of serotonin and 5-hydroxyindoleacetic acid (5HIAA) in discrete areas of the brain stem of suicide victims compared to controls. Asberg, Thoren, Traskman (1976) also found evidence that certain subgroups of depressives had lower levels of cerebrospinal fluid 5-HIAA. Although levels of tryptophan in peripheral circulation were not consistently demonstrated as being lower in depressed patients, the ratio of tryptophan to other essential amino acids such as phenylalanine, tyrosine, leucine, isoleucine, and valine was found to be lower in depressed patients. This ratio increased to control levels as depression improved. Based on these observations, attempts have been made to treat depression with L-5-hydroxytryptophan, a serotonin precursor. Van Hiele (1980) obtained beneficial results in a number of previously unresponsive depressives with a combination of L-5-hydroxytryptophan and carbidopa, a peripheral decarboxylase inhibitor. A study using L-tryptophan in elderly depressives did not result in a similar improvement for this population (Cooper & Datta, 1980). On the other hand, Kaneko, Kumashiro, Takahashi, & Hoshino, (1979) found some improvement in patients with low 5-HT serum levels using L-5-hydroxy-tryptophan.

The norepinephrine hypothesis of depression led to the investigation of D-phenylalanine and tyrosine in the treatment of depression. D-phenylalanine, a precursor to tyrosine and to norepinephrine did not produce any changes in blood levels of norepinephrine nor did it improve the depression (Mann, Peselow, Snyderman, & Gershon, 1980). On the other hand, isolated case reports have suggested that tyrosine may occasionally be helpful in certain cases of depression (Gelenberg, Wojcik, Growdon, Sved, & Wurtman, 1980; Goldberg, 1980; Gelenberg, Wojcik, Gibson, & Wurtman, 1983). There is still not sufficient evidence to support the recommendation for the use of tyrosine as an effective antidepressant agent although studies are presently underway to clarify this observation.

POTENTIATORS OF ANTIDEPRESSANT THERAPY

The majority of patients respond to a single antidepressant when it is administered in an adequate dosage over a sufficient period of time. However, there are still substantial numbers of patients who do not respond to this first drug nor do they respond to a second antidepressant even if this second drug is also well administered. These cases fall into a category referred to as the treatment resistant depressions. For these patients, pharmacotherapy becomes more complex and pharmacological mechanisms of potentiating the antidepressants must be found. The following illustrate some of the pharmacological manoeuvres which have been employed.

Lithium

The use of lithium alone in the treatment of an acute depression has not been proven as consistently effective as the tricyclic anti-depressant drugs (Mendels, 1976). The recent reports of de Montigny, Grunberg, Mayer, & Deschenes (1981) suggest that lithium may serve as a helpful adjunct in the treatment of the more resistant depressive once the patient has had a period of antidepressant therapy. On the other hand, prophylaxis of unipolar depression with lithium is of similar efficacy to that of tricyclic antidepressants (Peet & Coppen,

1980). The choice of one drug over the over then becomes a clinical decision weighing the advantages of one or of the other in view of the primary and side effects of each.

Thyroid Extracts

The addition of L-triiodothyronine (T$_3$) has been demonstrated as helpful in potentiating the antidepressant effects of tricyclics in some non-responding patients (Prange, Wilson, Robon, & Lipton, 1969). This potentiation is found to occur within a few days of the addition of 25-50 micrograms of T$_3$ daily. Its postulated mechanism of action is either through postsynaptic mechanisms as well as through its role in increasing tyrosine hydroxylase activity (Goodwin, Prange, Post, Muscettola, & Lipton, 1982).

Methylphenidate

A few case reports suggest that methylphenidate through either enzymatic inhibition of the metabolism of tricyclics (Wharton, Perel, Dayton, & Malitz, 1971) or by direct agonist effect on dopaminergic mechanisms may potentiate the antidepressant effect of tricyclics in more resistant patients (Drimmer, Gitlin, & Gwirtsman, 1983).

Estrogen

Klaiber, Broverman, Vogel, and Kobayashi (1979) reported some therapeutic benefits of high doses of estrogens in severely resistant depressions in females. This observation has yet to be further substantiated although rational mechanisms may be hypothesized through changes brought about by these hormones at neurotransmitter receptor levels (Oppenheim, 1983).

SECOND GENERATION ANTIDEPRESSANTS

The impetus stimulating the search for new antidepressant drugs was based on the biology of depression as it came to be understood from available biochemical findings. In addition, the specificity in the inhibition of the reuptake of some neurotransmitters suggested that a similar specificity of therapeutic effect may exist. Thus treatment could become more efficient from the outset. The slowness of therapeutic onset of the tricyclics and of the MAO inhibitors plus the lack of predictor variables of outcome made obvious the need for more effective drugs with fewer of the unwanted side effects such as sedation, cholinergic blockade, cardiovascular toxicity and low therapeutic index of most antidepressants. The new antidepressants have been extensively reviewed elsewhere (Leonard, 1980; Feighner, 1980; Lapierre, 1983).

The system of subclassifying these new drugs can be based on their structure or on their inhibition of a specific neurotransmitter when such is the case. The first of these new compounds was maprotiline. It is a pseudotetracyclic compound, quite specifically an inhibitor of reuptake of norepinephrine. This drug was followed by a series of compounds having a variety of chemical structures. They are generally referred to as the heterocyclics to distinguish them from the original tricyclic antidepressants. Referring to these compounds can be simplified by alluding to their prime action on a specific neurotrans-mitter system. In general, most of these compounds have fewer antic-holinergic effects, hopefully less cardiovascular toxicity and often less sedation than the tricyclic antidepressants. It is expected that in the future newer compounds will be synthesized with a lower degree of toxicity as well as greater efficacy.

CONCLUSION

Psychopharmacological developments of the last decade have had a two-pronged influence on the understanding and treatment of anxiety. The discovery of the benzodiazepine receptor has led to a further understanding of the neuropharmacological substrate of anxiety and served as an incentive in the search for more specific anxiolytic substances as well as for endogenous ligands. The definition of panic disorder as an entity seperate from generalized anxiety disorder came from detailed clinical observations and therapeutic outcome with the presently available drugs.

The psychopharmacology of depression has resulted in a refining of the biogenic amine hypotheses of depression as well as an improved understanding of its biological substrate and thus to improved management of what was previously considered refractory depression.

The second generation antidepressants have provided us with drugs of equal efficacy to the tricyclic series but with fewer of the unwanted side effects such as those produced by anticholinergic blockade as well as cardiotoxicity.

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GLOSSARY

Table 1: New Generation Antidepressants

Generic Name	Trade Name (if determined)
Maprotiline	Ludiomil
Trazodone	Desyrel
Zimelidine	Zelmid
Fluoxetine	Prozac
Viloxazine	Vivalan
Fluvoxamine	
Bupropion	Wellbutrin
Nomifensine	Meritol
Amoxapine	Asendin
Alprazolam	Xanax

ANXIETY DISORDERS: FUTURE DIRECTIONS AND CLOSING COMMENTS

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Given that our knowledge of the nature and treatment of the
anxiety disorders has grown exponentially over the past few years,
the purpose of this text has been to present a comprehensive picture
of the current state of the field. At the level of classification/
assessment, Spitzer has outlined the proposed revisions to the DSM-III
anxiety disorders category. The revised classification system is some-
what controversial in that panic disorder is elevated to a much more
central role than it has had in the past.

Consequently, the differentiation of unexpected panic from
anticipatory anxiety is an oft addressed issue in the book. Barlow,
in his chapter outlines a psychological model of panic which is
appropriately accompanied by the contribution of Insel, who suggests
that there may be separate neurobiological systems underlying panic
and general anxiety (the noradrenergic model and the benzodiazepine
receptor). Zitrin, reviews psychopharmacological intervention studies
that differentiate panic from nonpanic states in response to anti-
depressant medication. Collectively, these papers present an integrative
perspective on the panic model of anxiety, a model that is receiving
increased attention in the literature.

Intervention has also been a major focus of the text. Cashman
has outlined the clinical use of benzodiazepines, and Lapierre
systematically reviews some of the alternative anxiety medications and
their use. From a behavioral perspective, Marks reviews the efficacy
of exposure for anxiety disorders in which avoidance behavior is a
primary feature. Goldfried's presentation demonstrates how the self
control model of anxiety provides a useful conceptual perspective on
the mechanism of action of behaviorally-based treatments. Wilson
presents a model of treatment which uses exposure as a base but
extends beyond to encompass the social learning and cognitive elements.
It is our hope that those reading this text will come away with a
fuller understanding of how anxiety disorders are conceptualized, the
theoretical mechanisms which underlie the disorders and their role
in the methods of intervention. In this chapter we consider the
implications of selected material presented. We will organize our
comments around the issues of assessment and treatment with our
purpose being to highlight important issues overlooked in other
chapters and to suggest future directions for the field.

Reclassification of Diagnostic Criteria

In response to dissatisfaction with the anxiety neurosis category of DSM-II anxiety neurosis was separated into Panic Disorder and Generalized Anxiety Disorder in DSM-III. Establishing panic disorder as a separate category has facilitated a great deal of research into panic attacks. This research has, by and large, validated Panic Disorder as a nosological category (Brier, Charney, & Heninger, 1985; Barlow et al., in press). In the revised (DSM-III-R) Panic Disorder is elevated to a more central position, with respect to both theory and treatment. In fact, the category of Agoraphobia is subsumed by Panic Disorder in the revised scheme. Panic Disorder will be divided into the following subcategories: uncomplicated Panic Disorder (formerly Panic Disorder), Panic Disorder with limited phobic avoidance (nonexistent in DSM-III) and Panic Disorder with extensive phobic avoidance (formerly Agoraphobia with panic). Agoraphobia without panic remains as a separate, albeit infrequently diagnosed category (DiNardo, O'Brien, Barlow, Waddell, & Blanchard, 1983).   While the importance of panic has been demonstrated in family/genetic studies, (e.g., Crowe, Noyes, Pauls, & Slymen, 1983) in psychobiological models of etiology and treatment, and in patients' phenomenology (e.g., Riskind & Beck, 1983) the implications of reconceptualizing Agoraphobia as Panic Disorder need to be considered.

The major reason for revising the diagnostic criteria along these lines stems from the observation that the majority of agoraphobics commonly report unpredictable panic attacks as precipitants of their avoidance behavior (Spitzer & Williams, this volume). Fear of having a panic attack [variously labelled as fear of fear (Chambless & Goldstein, 1982) or anticipatory anxiety (Klein,1964)] has been proposed to be the most important mediator of the development of agoraphobia in many of the theoretical models of the disorder. This raises a question as to which process is more important, the panic itself, or the fear of fear and related avoidance behavior which subsequently develops. Avoidance behavior clearly differentiates agoraphobic and panic disorder patients.

While the etiological significance of panic is recognized in virtually all models of agoraphobia, once the agoraphobia has developed it is arguable whether the panic or the anticipatory anxiety (fear of fear) is more central to understanding the nature and treatment aspect of the disorder.

Klein's theoretical model of anxiety (e.g., Klein, 1981) is often credited with being responsible for the re-emergence of the importance of the spontaneous panic attack. The theoretical differentiation of panic and anticipatory anxiety as independent constructs, with separate pathophysiological processes and requiring different interventions, was developed largely from observation of the effects of medication. Accordingly, the benzodiazepines are said to alleviate generalized (anticipatory?) anxiety but not spontaneous panic, where tricyclic antidepressants (eg., imipramine) are said to influence spontaneous panic, but not generalized anxiety. While the value of Klein's model cannot be disputed, there is an inherent error in logic in Klein's paradigm. Rather than developing a theoretical position and then testing out the predictions of the theory, Klein uses drug effects to establish theory. Barlow (this volume) as well as Mathews, Gelder and Johnston (1981), have also criticized the model on this basis. Given the influence that the revised criteria have on the

psychological/psychiatric community, caution must be exercised in attributing a central role to panic.

Caution about Klein's model is warranted on the basis of several recent empirical studies on drug effects. Zitrin, Klein, Woerner, & Ross (1983) compared imipramine and behavior therapy in phobics experiencing spontaneous panics and those experiencing predictable panic (simple phobia). The major analysis examining the efficacy of imipramine, a drug by sample analysis of covariance, was nonsignificant. While several posthoc comparisons showed differences at the 0.10 level, these findings are not strong. One can question the validity of posthoc comparisons in the first place, given the fact that the initial analysis was nonsignificant. A second study by Telch, Agras, Taylor, Roth and Gallen (1985) compared imipramine and exposure in the treatment of agoraphobics. Participants were randomly assigned to one of the following groups: imipramine plus anti-exposure instruction, imipramine plus exposure, or exposure plus placebo. Participants in the imipramine plus anti-exposure group were told not to expose themselves between sessions so as not to counter the effects of the drug. Interestingly, only the imipramine plus exposure group improved on the measure of panic attacks. Imipramine alone, even after anti-exposure instructions were removed and participants were encouraged to travel, failed to reduce panic attacks. General anxiety was reduced in the imipramine alone group, however. These data call into question the assumption that tricyclics influence spontaneous panic but not general anxiety.

Another corollary of Klein's model is that psychologically based interventions would affect anticipatory anxiety, but not panic. Data presented by Marks in his chapter on exposure based interventions contradict this position by showing exposure effectively reduced spontaneous panic. The recent work by Clark and his colleagues (e.g., Clark, Salkovskis, & Chalkley, 1985; Rappee, 1985), which demonstrates the efficacy of behavioral interventions to combat the hyperventilation induced panic, also goes against Klein's model. Collectively, these findings question the separation of panic and anticipatory anxiety as separate constructs requiring different treatments.

It is not uncommon for agoraphobics to present for treatment having not had a full blown panic attack for some time. Apparently, extensive and successful avoidance behavior can stave off panic attacks. We must be cautious that the role of avoidance and anticipatory anxiety not be overlooked as interest in panic increases. There may be phases of the disorder in which one or the other issue is central. For instance, early in the development of agoraphobia, panic attacks might play a central role. Over time, however, anticipatory anxiety and avoidance may take on a more central role. If so, then a high proportion of panic disorder patients should develop agoraphobia. Conceptualizing Agoraphobia/Panic Disorder also as a phasic disorder has interesting implications for the category panic disorder with limited avoidance. These individuals might go on to develop more extensive avoidance.

One of the essential features of Panic Disorder is that panic attacks are spontaneous. They might occur at home, unpredictably in a variety of situations, or not immediately upon exposure to a given situation. Often, however, agoraphobics may experience only one or two full blown panic attacks, none at home, before developing extensive avoidance behavior. This raises the question as to whether these patients would meet diagnosis for panic disorder. There is no question about their experience of panic attacks. The issue is whether panic

disorder, as defined in DSM-III, is present. Barlow (this volume) reported that only 74% of agoraphobics with panic meet criteria for Panic Disorder. What will happen to the remaining 26% if the proposed revisions are accepted?

Further, there may be important differences between panic disorder patients and agoraphobics that would be obscured by combining them under one category. These differences might have important implications, both for etiology and treatment. Stampler (1982) for instance, suggests that panic disorder patients are better copers than agoraphobics. Coping style might therefore be an important etiological factor differentiating those who develop agoraphobia from those who don't. It might also be the case that fewer psychological issues are involved in panic disorder than in agoraphobia. Panic disorder might be more of a pure 'biological' disorder. If so, then this disorder might be more responsive to biological than psychological treatments. Such a claim must be supported by data, however, and cannot be accepted at face value.

Barlow (this volume) compared subjects who experienced predictable and unpredictable panic attacks. Other than the symptoms of dizziness and loss of control there were few differences in the nature of panic between predictable and unpredictable groups. The major difference was that the unpredictable group experienced a greater number of symptoms. Thus, there appears to be little that is unique to unpredictable panic, the cardinal symptom of panic disorder. Clearly, there are more similarities than differences in the experience of unpredictable and predictable panic.

Barlow (this volume) goes on to question the extent to which unpredictable panic attacks are unpredictable at all. Specifically, methodological inadequacy might have prevented the identification of introceptive cues that are antecedent to panic attacks. If this hypothesis is confirmed the spontaneous/cued distinction can be further questioned.

Data from the hyperventilation model of panic support Barlow's hypothesis. Ley (1985) proposes that panic attacks involve an interaction between hyperventilation and fear. According to this model hyperventilation precedes panic. Fear occurs in response to the physiological effects of hyperventilation. This fear reaction increases hyperventilation, setting up a spiraling feedback loop. The fact that breathing retraining is a feasible intervention for panic attacks (Clark et al., 1985; Rappee, 1985) is suggestive of the importance of hyperventilation in panic.

Barlow and his colleagues (Barlow et al., in press; DiNardo et al., 1983) present extensive data on the experience of panic in anxiety disorders. These data clearly indicate that the experience of panic is very similar among patients with panic disorder, agoraphobia with panic, and obsessive-compulsive disorder. In none of the comparisons involving the diagnostic groups were there differences between obsessive-compulsive patients and agoraphobia with panic or panic disorder patients. Why then is obsessive compulsive disorder not incorporated into the panic disorder category? Clearly there are important features that differentiate obsessive compulsives from agoraphobics and panic disorder patients (e.g., obsessions and compulsions). There are also important features that differentiate agoraphobics from panic disorder patients (anticipatory anxiety and avoidance).

It is not our intent to suggest that the proposed revisions

to panic disorder and agoraphobia should be rescinded. We do, however, think that these revisions should not be accepted uncritically. Research data should be relied upon to help guide the process of reconceptualization. Further comparisons between panic disorder patients and agoraphobics with panic attacks will be particularly helpful in this regard.

Spitzer's chapter illustrates the dynamic nature of diagnoses. As information accumulates conceptualizations are revised and changed. It is important, in this light, not to allow diagnostic categories to become reified. Categories are heuristics that are employed to facilitate conceptualization, communication and hopefully, intervention.

Outstanding Assessment Issues

Focus on the diagnostic assessment of anxiety disorders is likely to increase as research continues. At the same time assessment of issues other than diagnosis should continue. This section highlights several important areas of assessment aside from diagnosis.

Functional Assessment. In response to concerns that diagnosis yields limited predictive information, behaviorally oriented psychologists adopted a more idiographic, functional approach to assessment. In a functional assessment a myraid of specific factors are assessed, all of which are relevant to the target problem. Consider the following girding principles as an example (c.f. Hersen & Bellack, 1981).

First, target problems or behaviors are identified. The problem is assessed with respect to frequency, intensity, duration and discreteness, and is further defined in terms of relevant treatment factors (including behavior, affect, cognition, physiology), interpersonal factors, and social/cultural factors. Once the problem is specified the following are identified: functional relationships (e.g., factors associated with the worsening or improvement of the problem, secondary gain, etc.), eliciting conditions, relevant covert operations, biological factors, and social relationships.

Functional assessment, while time consuming, offers several advantages over diagnostic assessment. First, it produces highly differentiated information on the characteristics of specific individuals. Diagnostic assessment tends to artificially create homogeneity by giving individuals, who can be very different with respect to etiology, phenomenology, and important treatment issues, identical diagnoses. Second, the information generated by a functional analysis can be directly used in the selection of specific interventions tailored to the needs of a given individual. For example, a functional analysis can identify interpersonal, cognitive or physiological characteristics that deserve particular attention by virtue of their role for a given individual. Third, functional assessment provides a framework for measurement of important issues. Such assessments involve detailed documentation and quantification that provide the very information most appropriate in evaluating the effects of a given intervention.

Functional assessment has been primarily advocated by behaviorally oriented therapists. As a result, functional assessments have been heavily weighted toward a behavioral perspective (e.g., reinforcement contingencies, eliciting stimuli, etc.). There is no reason not to expand the model, however, to incorporate assessment of whatever factors have been demonstrated to be important. For example, Kendall (1984a; 1984b) illustrates how cognitive behavioral assessment has

been incorporated into behavioral assessment. Biologically relevant variables, such as family history, response to lactate infusion, etc. can also be incorporated into a functional assessment.
One of the most appealing features of a functional assessment is its adaptability. It is a general approach to assessment and not a specific procedure.

Assessment of Response Modes. Anxiety is not a unitary experience, but involves subjective experience as well as behavioral and physiological manifestations. Three response modes (behavioral, cognitive, and physiological) have been repeatedly demonstrated to be, to some degree at least, independent. (Lang, this volume; Rachman & Hodgson, 1974). In response to these observations investigators have become interested in examining concordance among the modes, or synchronous changes over time. If discordance and desynchrony are common occurrences, then this may have implications for how we conceptualize and measure anxiety. Should all these response modes be assessed, or can assessment of a single mode suffice? If only a single mode is assessed, which is most appropriate?

The majority of research studies have not assessed all three response modes (Himaldi, Boice, & Barlow, 1985). Further it is generally the case that behaviorally oriented research focuses primarily on behavioral measures and pharmacological researchers focus on self report measures. This limits the comparability of their studies.

Not all researchers are in favour of multiple response mode assessment. Mathews et al. (1981) for instance, recommend a focus on self report data, in conjunction with ratings made by an independent assessor. Direct behavioral assessment is seen as "difficult and expensive to organize, and because we have found that it correlates highly with other measures, we do not think it necessary for routine clinical practice and are of the opinion that it may also be unnecessary for most outcome evaluation". They also dismiss physiological measures as having low validity, a conclusion they reach on the basis of low correlations between physiological and other response modes.

Hugdahl (1981) has also criticized the use of multiple response mode assessment and identifies several major problems; the first difficulty is definitional. If the three response modes are independent then the response dimension cannot be used to define fear since individuals who differ on the response mode cannot be compared. Second, there are problems with how the different modes are assessed. For instance, different investigators define the self report component in different ways (e.g., self report of fear, worry, catastrophizing). While granting that, in principle at least, multiple response mode assessment could yield useful treatment information, Hugdahl maintains that the definitional and measurement problems prevent this potential from being fulfilled.

In contrast to these negative views (see also Cone, 1979; Schwartz, 1978). Himaldi et al. (1985) argue that triple response measurement (their phrase) should be included. They suggest that the noted dissatisfaction stems in part from conceptual confusion and expectations that synchrony and concordance should exist. If anxiety is a single system then different measures of the same construct should cohere together. Since they often do not cohere some investigators see the measures as independent (e.g., Hugdahl, 1981). But, as Himaldi et. al. (1985) and Lang (this volume) argue, the different modes are neither dependent or independent, but partially independent. Thus concordance exists in some contexts and not in others.

Himaldi et al. argue that triple response assessment can yield important information predicting treatment outcome. They cite work suggesting that subjects with high initial heart rates demonstrate greater treatment gains on other response modes. They believe subgroups can be identified on the basis of the pattern of relationships among the response modes, such that different subgroups will respond to different treatments. This latter suggestion is particularly intriguing.

Barlow and Mavissakalian (1981) illustrate the value of these recommendations in a case of a 31 year old female agoraphobic treated with 12 sessions of cognitive restructuring, covert modeling, and structured homework (the patient's spouse was involved in the group sessions). This woman demonstrated striking treatment gains on behavioral and self report fear measures. Despite remarkable improvement on these measures heart rate increased rather than decreased over treatment. This woman relapsed within 4 weeks of termination of treatment. While it goes without saying that this finding needs to be replicated, these data suggest that multiple response mode assessment can be used to predict treatment response.

Additional support for multiple response mode assessment is provided by the work of Ost and his colleagues. Ost, Jerremalm, and Johansson (1981) assessed social phobics through a role played interaction with a stranger. Based on this assessment they identified subjects who demonstrated either a primarily physiological or a primarily behavioral responsiveness (overt expression of anxiety). Behavioral and physiological responders received either applied relaxation or social skills training. Results indicated that applied relaxation was more effective than social skills training for physiological responders, but the reverse was true for behavioral responders. These findings were replicated on claustrophobics (Ost, Johansson, & Jerremalm, 1982) and blood phobics (Ost, Lindahl, Slerner, & Jerremalm, 1984). In both latter studies exposure was compared to applied relaxation. The implications of these data are clear. Different treatments may be more effective for individuals whose primary experience of anxiety involves different response modes.

Self report measures are easy to collect and are standard among clinicians and researchers alike. Behavioral measures are more commonly used by behavioral researchers than pharmacological researchers, and physiological indices are infrequently used. Ignoring the physiological component can deny access to important information, however. Lang (this volume) illustrates most clearly how the physiological component of anxiety is an integral part of the experience of this emotion and how it can be employed to facilitate treatment.

When considering physiological indices it is important to keep in mind the problems with heart rate. Fowles (this volume) presents data that clearly calls into question the assumption that there is a linear relationship between heart rate and anxiety. Instead, heart rate might reflect appetitive motivation rather than aversive motivation. Clinical investigators must recognize that increases in heart rate might reflect cardio-somatic coupling, active coping, or appetitive motivation. In contrast, electrodermal activity might be preferable, as it may reflect aversive motivation more directly. It is interesting, along this line, to note that heart rate has been the most common physiological index employed in studies that assess multiple response modes. Perhaps the focus on heart rate has inflated the degree of disconcordance and desynchrony. Regardless, it appears premature to disregard the potential value of multiple response modes in anxiety. As Himaldi notes, a relatively small number of studies have had an

inordinate amount of influence on the field with respect to multiple
response modes.

ISSUES IN THE TREATMENT OF ANXIETY DISORDERS

The various contributions in this text have adequately addressed
the current interventions for anxiety disorders. In this section we
address several neglected issues and make suggestions for future research.

Process vs. Outcome Research

By far the dominant paradigm for evaluating interventions for
anxiety related problems has been the outcome study. This approach
is characterized by a group design, in which one treatment is compared
to another (or to a control group). The value of these studies
cannot be questioned, yet the information provided often supplies
only global types of evaluations concerning the efficacy of one
treatment over another. It is therefore important to consider alternative
paradigms and their potential contributions. In this regard, Barlow
and Wolfe (1981) have recommended an increased focus on process studies.
This strikes us as a laudable recommendation, however, most process
research studies have consistently failed to yield variables predictive
of treatment outcome (Rice & Greenberg, 1984). How then can process
studies be best conducted to yield the type of information we are
seeking? Rice and Greenberg present an innovative model for conducting
process research that is specifically designed to overcome problems
with existing process research paradigms. They criticize existing
approaches for assuming that specific replicable processes can be
identified by aggregating observations over sessions and clients (the
homogeneity of process assumption). Different processes are likely
to operate at different points in time, and must be studied in a
highly context specific manner. As well, it is the patterns of
behaviors or processes that occur in specific contexts, and not their
rate, that are important to examine (Rice & Greenberg, 1984).

In contrast to existing approaches Rice and Greenberg recommend
a detailed focus on the mechanisms of change within very specific
contexts. Their focus is on the client and not on the therapist,
with the aim being the identification of a recurrent issue (e.g.,
a replicable change event or problematic issue) which is then studied
in detail, using a rational-empirical method. Detailed descriptions
of the event are made and theoretical models of how change occurs
are developed and validated against future observations. Once a
change process is identified issues such as generalizability can
be addressed.

This paradigm is a major departure from that typically employed
by anxiety researchers, who focus primarily on therapist interventions
and implicitly assume client homogeneity. However, there are several
features of this paradigm which may be of use to anxiety researchers.
First, a focus on client operations should improve our understanding
of how treatments work. A good example of this is Bandura's work on
self-efficacy (Bandura, 1982). By examining changes that take place
at the level of the individual client Bandura was able to demonstrate
that self efficacy changes can be more predictive of outcome than
past behavior itself. Rather than focus exclusively on therapist
operations such as timing, length, and content of exposure, there has
been a move to include clients' evaluation of his/her ability to cope
throughout treatment. It is not so much how long one spends in a
previously avoided situation, but how one appraises one's ability to

cope, that seems most important (Williams, 1985; Wilson, this volume).
Second, the highly specific context dependent focus is consistent
with the behavioral models of anxiety. This should make it easy for
researchers to adapt their focus to process issues. Third, the model
can be used to examine issues not addressed by existing models, with
one potential application being the examination of treatment failures.
Failures are not uncommon, either with behavioral or pharmacological
treatments. For instance, it has been estimated that approximately
25% of agoraphobics drop out of behavioral treatments. Therefore,
even though behavioral treatment of agoraphobia is considered efficacious,
approximately 40% of those entering treatment studies do not benefit
from treatment. These cases could be examined and recurrent events
associated with failure identified. A search for replicable client
process associated with failure represents a valuable endeavour
(Foa & Emmelkamp, 1983).

One recurrent event might be the patient's report of being
unable to perform behavioral exposure exercises. Processes associated
with failure to perform exposure exercises can be identified and
compared to markers associated with successful performance of exposure
exercises. By identifying specific processes by which treatment
fails we can focus on ways of overcoming these blocks. One might
hypothesize that cognitive (e.g., catastrophizing cognitions), affective
(e.g., concomitant depression), behavioral (e.g., reinforcement for
avoidant behavior) and physiological (e.g., mitral valve prolapse)
variables serve as treatment blocks in different circumstances.
Developing a comprehensive model that facilitates the identification
of these factors, and provides a mechanism for overcoming blocks,
will go a long way toward increasing the effectiveness of our interv-
entions.

Increased attention to the patient does not mean that therapist
intervention is unimportant. Instead, it is through the integration
of our knowledge as to which interventions are most impactful and
under what conditions patients benefit from the different inter-
ventions, that we stand to learn the most.

A second paradigm that deserves more attention is single subject
methodology (Barlow & Hersen, 1984). Aggregate group studies have
clearly been of value. However, as our questions become more and
more complex the methodological requirement becomes more and more
difficult to fulfill. The number of subjects required can become
prohibitively high very quickly, given that populations are not
unlimited so can the cost to the investigator in terms of time allocated
towards recruitment. An alternative is to employ single subject
methodology with specific individuals or groups. Multiple baseline
across variables within a single case, or multiple baseline across
cases, within a homogenous group, can be quite useful. Replication
of single case designs is feasible and recommended. As an example,
Last, Barlow and O'Brien (1985) present 4 case studies examining the
stability and agreement between several cognitive assessment measures.
They were able to demonstrate that the different measures (in vivo
assessment, thought listing, and imaginal cognitive assessment)
showed little agreement with each other, although there did appear
(with all measures) to be a relationship between degree of anxiety and
negative cognitions. There was sufficient consistency across the
four cases to allow conclusions to be drawn. While this study is
not without flaw, it does demonstrate how intensive case studies
can be used productively.

As has been illustrated in this text the behavioral and pharmac-
ological treatments have received the greatest support in the literature.
Given the difficulties associated with intervention in the anxiety
disorders outlined in the previous section, the development of more
effective treatments should not be discouraged. In this section we
highlight several promising developments which may bear productive
fruit at a later date.

The cognitive model of anxiety has been articulated by a number
of theorists including Beck (1976), Meichenbaum (1977) and Ellis
and Greiger (1977). This model has led to the development of numerous
cognitive behavioral interventions. The most frequently examined
cognitive interventions are self instructional training and cognitive
restructuring. These interventions, particularly the former, have
been evaluated relative to behavioral, exposure treatment.

Emmelkamp and Mersch (1982) compared self-instructional training
to in vivo exposure, and a combination of the two, in the treatment
of agoraphobia. Treatments consisted of eight two-hour group sessions.
At posttreatment the exposure and combined groups were superior to
the self-instructional training alone condition. At one month follow-up
however, all treatments were equally effective. The effects of
exposure dissipated somewhat between posttreatment and follow-up
while the self-instructional group continued to improve. In a previous
study, Emmelkamp, Kuipers and Eggeraat (1978) also found the immediate
effects of in vivo exposure to be superior to self-instructional
training. It is noteworthy that the treatments in this study were
very brief, and delayed effects of treatments were not examined.
Williams and Rappoport (1983) evaluated the contribution of cognitive
coping skills to exposure treatment in agoraphobia. One half of the
participants received exposure only, the other half received both
treatments. Treatments were relatively brief, involving 6 sessions in
2 weeks. A total of 1 1/2 hours of treatment time was devoted to
training subjects in distraction, relabelling, and the use of self-
instructions. By sampling participants' actual cognitions during the
behavioral avoidance task Williams and Rappoport were able to verify
that the cognitive treatment was being implemented. Results indicated
that both treatment groups were equally effective at posttreatment and
follow-up assessments. Williams and Rappoport use these data to
argue that cognitive treatment adds nothing to exposure.

In contrast to these studies, Marshall (in press) compared
(among other things) exposure alone to exposure plus self-instruc-
tional training in the treatment of agoraphobia. The addition of
mastery self-instructions did not produce greater treatment gains at
posttreatment. The efficacy of self-instructional training increased
during follow-up however, and this condition was superior to exposure
alone at 4 weeks follow-up. Mavissakalian, Michelson, Greenwald,
Kornblith and Greenwald (1983), in a study comparing self-instructional
training to paradoxical intention for agoraphobia, also found significant
gains from posttreatment to follow-up for the self-instructional
training group.

The data from these studies are in no way conclusive but they do
provide some suggestion that cognitive behavioral techniques can be
effective with anxiety disorders. As a group, the studies examine
relatively specific anxiety disorders, using very brief interventions.
The population examined, the techniques employed and manner of imple-
mentation are important issues to consider for future research. It

may be that cognitive behavior therapy techniques are more applicable to some of the anxiety states than to others. For instance, behavioral exposure treatments might be more effective with the situation specific anxiety disorders (i.e., simple phobias, agoraphobias). Cognitive interventions might be more effective with anxiety states, where avoidance behavior is not as prominent as with possibly social phobia (see Butler, Cullington, Munby, Amies, & Gelder, 1984; Emmelkamp, Mersch, & Vissia, 1985 and Mathews & Shaw, 1977). Further research should pay close attention to the interaction between interventions and different anxiety disorders.

Careful consideration also needs to be given to the specific techniques examined. It is a misnomer to speak of 'cognitive behavior therapy' as though it were a single procedure. There are a wide variety of types of cognitive behavior therapies. Evidence that one specific type is not an effective treatment for a given condition should not be taken as evidence that none of the types of cognitive therapy are effective. It is important to note that almost all comparisons of cognitive and exposure treatment employ a coping skills model. Participants are taught to use self-instructions or cognitive distraction techniques to replace dysfunctional cognitions. These treatments have not focused on a collaborative empirical approach to the identification and amelioration of dysfunctional automatic thoughts, information processing biases, or core cognitive constructs (Safran, Vallis, Segal & Shaw, in press). The cognitive therapy protocol explicated by Beck and his colleagues (Beck, Rush, Shaw, & Emery, 1979; Beck & Emery, 1985) which combines cognitive interventions with behavioral exposure has not been compared to in vivo exposure alone.

Finally, the way in which the cognitive coping techniques are implemented is an important issue. All of the studies cited above involved very brief training in cognitive techniques. Cognitive therapy is often a much more extensive and detailed intervention, however. The extreme brevity in existing studies might account for the findings of a 'sleeper effect' for the cognitive coping strategies. That is, insufficient time might be spent on these strategies during treatment to allow the demonstration of their full efficacy. After treatment has stopped, participants might continue to employ the techniques with the result being an increase in effectiveness from posttreatment to follow-up. The consistency of this finding suggests that the brevity of training in cognitive techniques has resulted in a low power test of their efficacy.

Biran (1985) criticizes existing studies on cognitive therapy for anxiety as being overly focused on surface, rather than deep, structures. Self-instructional training intervenes at the level of conscious cognitions and does not deal with underlying meaning structures and their modification. Borrowing heavily from the theoretical model of Guidano and Liotti (1983) Biran suggests that cognitive therapy would be particularly effective in the maintenance and generalization of gains made by exposure. Thus, her model attempts to integrate behavioral and cognitive perspectives at a more structural level of analysis. Biran reports to be currently evaluating the efficacy of this cognitive therapy model in a group of agoraphobics, and while the construct validity of the cognitive structures she hypothesizes about are still in question, the results of this study may prove quite interesting nonetheless.

Symptom prescription has also been employed as a treatment for anxiety disorders (Katz, 1984). This intervention provides a

rationale plus instruction for engaging in the problematic behavior. Ascher (1981) reported paradoxical intention to be superior to graduated in vivo exposure in the treatment of agoraphobia. The study by Mavissakalian et al. (1983) in which paradoxical intention was found to be superior to self-statement training immediately after treatment (but not at follow-up), has been already cited. These studies are suggestive and highlight the need to examine this technique further. It is particularly important to examine paradoxical intention relative to prolonged exposure in vivo. Graded exposure (in which exposure is terminated when anxiety increases) and self-statement training are less adequate comparison conditions.

Ascher (1981) suggests that the effects of paradoxical intention are mediated by interrupting a spiralling sequence of anxiety. Anxious patients attempt to control their anxiety, but this attempt is unsuccessful. Failure to control or reduce anxiety produces more anxiety, which results in more failed attempts to cope. Prescribing the symptom interrupts this cycle of performance anxiety. This model deserves further evaluation. Process oriented studies might be particularly useful to address this issue.

The interpersonal context of anxiety has not been ignored, leading to an examination of the relationship between marriage difficulties and agoraphobia from both an etiological and therapeutic perspective (Vandereycken, 1983). While much has been written on the role of interpersonal issues in agoraphobia (e.g, Hafner, 1984; Chambless & Goldstein, 1982; Kleiner & Marshall, 1985), there have been relatively few empirical evaluations of the effects of adding marital therapy to the treatment of anxiety disorders. O'Brien, Barlow, and Last (1982) review the literature on marital therapy and note that the few studies available do not clearly identify marital therapy as effective. This should not be taken to indicate that the marital context is unimportant (Vandereycken, 1983). Yet future work is necessary to document in what way and under what conditions, marital intervention can be useful. The form of the intervention needs be considered as well. It can vary from direct marital therapy to the spouse's involvement in exposure therapy as a 'cotherapist' (Vandereycken, 1983).

Integration

The main intent of this text has been to represent the multiple perspectives involved in our attempts at understanding and treating anxiety disorders. Biological, behavioral, and cognitive perspectives on the etiology and amelioration of anxiety states have been presented. While each of these perspectives have contributed to the treatment of anxiety disorders, one is left with the problem of how to integrate the different perspectives in a way that maximizes treatment efficacy. For example, direct comparisons of behavior therapy, pharamcotherapy, and their combination indicate that the two treatments do not interact to increase treatment efficacy (Mavissakalian, et al., 1983; Marshall & Segal, 1986). There are too few studies examining cognitive behavioral techniques to know whether their effects are potentiated with medication. The literature in depression, however, suggests that combining cognitive-behavior therapy and medication does not potentiate treatment effects.

Even if treatment efficacy is not potentiated by combining interventions integration is important for theoretical reasons; particularly as a means of facilitating our understanding of how treatments work.

As outlined above, biological perspectives in the study of anxiety have contributed to the classificatory realignment which will inform future diagnoses of these disorders. Such concept-ualizations of anxiety (e.g., Carr & Sheehan, 1984; Klein, 1981) are no less pervasive than behavioral models of the same phenomenon and so it is somewhat surprising to see that little attention has been paid to the study of the process of change in treatments based on these models. In this respect, the literature on depression can inform our efforts as it seems that researchers in that field have started to consider the locus of symptom change and its relation to the modality of intervention employed. Simons, Garfield and Murphy (1984), for example, have shown that changes in depressive cognition can arise as a result of psychological or biologically oriented treatment. The next question to ask is whether successful psychological treatment can alter biological markers of the disorder (Zimmerman, Coryell & Corenthal, 1984).

This line of inquiry can be profitably applied to the anxiety disorders with the intent being to map the process of change in the different sectors of the symptom cluster. The first step in the process would be the identification of a number of psychological and biological markers for the disorder. Some candidates already identified might be responsivity to the lactate challenge (Leibowitz et al., 1984) or the presence of cognitive distortions related to estimates of threat or risk of personal injury (Beck, this volume).

Investigations of patients successfully treated for panic by cognitive behavioral methods could then measure changes in anxiety related distortions as well as patients' posttreatment response to lactate infusion. If their posttreatment response did not differ from that of a normal control group then it may suggest that the biological and psychological symptoms represent different levels of analysis of the same system which is being altered by effective treatment. Similarly panic patients who are treated with antidepressants ought to show less reactivity to lactate infusion posttreatment (Leibowitz et al., 1984) as well as score in the normal range on measures of anxiety related cognition.

While few studies have adhered to this type of conceptualization its potential value lies in reminding us that different levels of analysis (e.g., psychological, biochemical) do not necessarily represent different 'systems' of a disorder, but may reflect differing levels of analysis of the same system (Akiskal & McKinney, 1975; Beck, 1984; Simons et al., 1984).

Another area meriting increased attention is the role of information processing in anxiety disorders. Studies of these processes have an importance which exceeds the parochial interests of cognitive theorists, since analyses along these lines can provide a common linkage for the different response modes. A study by Zahn, Insel and Murphy (1984) provides an illustration of the prevalent methodology. In their attempt to evaluate a tricyclic antidepressant against an MAO inhibitor for the treatment of obsessive-compulsive disorder the authors employed psychophysiological assessment as one of their outcome measures. Compared to placebo, both drugs reduced skin conductance measures of baseline arousal, yet only the antidepressant medication was associated with reductions in autonomic arousal to novel or aversive stimuli. The addition of a cognitive measure of hypervigilance would have enabled the investigators to consider not only the interaction between medication and cognitive functioning, but also the degree of covariation among their cognitive and physiological indicies. The point here is not to

criticize Zahn et al. (1984) for their failure to consider additional measures, but merely to point out the paucity of integrative research which considers the effects on more than one response system, of biologically or psychologically induced change. The continuing adaptation of cognitive science measures to clinical populations of interest, will help make the overall endeavour more feasible (Segal & Shaw, in press; Zubin & Steinhauer, 1981).

Working in this context Foa and McNally (in press) utilized a dichotic listening paradigm to test the degree of vigilance for fear in a sample of patients with Obessive-Compulsive Disorder. Pretreatment results portrayed patients as more vigilant for feared (e.g., contamination related) versus neutral stimuli. This finding was exhibited on both word detection and physiological reactivity (skin conductance) measures. Following behavioral treatment, detection of fear relevant and neutral words was not significantly different and skin conductance to both sets of stimuli was equivalent.

Another such application is reported by Mathews and MacLeod (1985) and Segal, Hood, Shaw and Higgins (1986) who used a modified version of the Stroop procedure to test for content specific self-schemata. Briefly, this task asks subjects to name the color of ink in which various words are printed. When the target word is a color word (e.g., the word GREEN printed in red ink) subjects typically demonstrate longer latencies to name the color of ink than when the target is a noun. This pattern of responding has been attributed to response competition, wherein, the meaning of the color word interferes with the meaning of the color of ink in which it is printed (Warren, 1972). The modified version of this procedure utilizes trait adjectives and measures the degree of interference in the color naming task provided by related versus unrelated pairs of adjectives. In this case, the first adjective serves as a prime for the second adjective whose color the subject must name. A structural relationship among the trait adjectives (e.g. clumsy, inadequate) would be evidenced by longer latencies for color naming the target in a related versus unrelated prime/target pair.

While some evidence has accrued in support of 'danger' related cognitive organizations in anxious patients (Butler & Mathews, 1983) the issue of whether this organization is represented at a structural level has not yet been addressed. Due to the fact that the Stroop methodology offers one way of testing for the structural representation of schematic information, the results of the above mentioned studies may well answer this question.

To summarize, an integrative perspective is important for several reasons. First, a model that integrates the variety of factors related to etiology and treatment can be flexible. If a given individual cannot accept a given treatment for whatever reasons (intolerance of medication side effects, opposition to engaging in exposure) feasible alternatives are available. Second, by integrating perspectives researchers can begin to search for predictor variables (be they process variables or otherwise) that are differentially associated with the efficacy of the different treatments. Different individuals are likely more amenable to the change process associated with a particular model and not another. The work of Ost and his colleagues is illustrative in this regard. Different treatments are diferentially effective for the different subgroups. Vallis and Bucher (1986) found similar results with small animal phobics. Third, an integrative perspective facilitates the development of an efficient treatment program. Rather than being restricted to a single treatment approach

multiple treatments can be combined. Treatments can be patterned
in a way that increases efficiency. For instance, exposure treatment
might be the best treatment initially. Perhaps self-exposure (Emmelkamp,
1982) could be tried first. If treatment gains are not forthcoming
therapist assisted exposure might be instituted. If this fails more
intensive therapy, involving cognitive-behavioral interventions,
might be attempted. Or, if resources are limited, medication might
be prescribed. In this way therapists can take advantage of all that
can be offered by the various perspectives on the etiology and treatment
of anxiety.

A fourth advantage is that the relapse problem can be considered
from different vantage points and hopefully the patterning of biological
and psychological markers of vulnerability will enable us to identify
individuals at risk with greater precision.

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