SELECTED BEHAVIORAL EFFECTS OF FOOD SENSITIVITY

DISSERTATION

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The problem of this study was the ingestion of certain foods and their observed effects on behavior. The purpose of the study was to investigate the possible relationships between specific foods and (1) weight loss and gain; (2) hunger urges; (3) depression scores; (4) hand-eye coordination; (5) short-term auditory memory; and (6) heart rate.

The subject in this study had previously been diagnosed as having sensitivities to certain foods. To determine the effects of certain foods on the subject a repeated measure design was employed. Specifically, an A-B-B-A-B-A design was used where A phases represented a 6-day period in which the subject ate foods to which she was sensitive. During earlier testing, the subject was found to be sensitive to corn, citrus fruit, pork, lamb, carrots, nuts, watermelon, and pineapple. These foods were found to induce irregular psycho-behavioral and physiological characteristics upon repeated and systematic testing procedures. Her non-reactive foods include fish, chicken, most green and yellow vegetables, bananas, cantaloupe, pears, apples, strawberries, and blueberries.
Hypothesis One predicted that the subject would lose weight when she consumed a diet of nonreactive foods during the A phase (good diet) and gain weight in the B phase (bad diet), in spite of the constant limit of caloric intake.

Hypothesis Two predicted that the subject would have a higher frequency of urges to eat during those experimental phases when reactive foods were eaten.

Hypothesis Three predicted that the subject would perform better on the Pursuit Rotor task during phases when non-reactive foods were eaten.

Hypothesis Four predicted the subject would perform higher on the Symbol-Digit Coding task during those phases when non-reactive foods were eaten.

Hypothesis Five predicted that the subject would perform higher on the Letter-Digit Coding task during those phases when non-reactive foods were eaten.

Hypothesis Six and Seven predicted that the subject would score higher on the depression scales of the Depression Adjective Check List and the Multiple Affect Adjective Check List during those phases when reactive foods were eaten.

Using clinical significance as the evaluation index, all hypotheses in this study were supported.

Based upon the data in the study, it is recommended that further studies be carried out to determine the behavioral effects of food sensitivity. Particular emphasis should be placed on research designs employing the double blind method.
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CHAPTER I

INTRODUCTION

Mental health professionals seek a variety of ways to diagnose and treat the behavioral and physical complaints presented by their clients. Anxiety, depression, headaches, fatigue, irritability, obesity, and hyperactivity are but a few of the common problems for which professional help is sought. Most of these problems are treated by the psycho-behavioral therapies which range from non-directive counseling to the specific techniques of contingency management. Those problems that cannot be managed by these methods are generally referred to physicians who attempt to control symptoms by prescribing medication. In any event, the long term solutions to these problems have yet to be discovered. A major difficulty is that most professionals focus on the treatment of symptoms at the expense of understanding etiology and prevention practices (Randolph, 1980). The treatment of anxiety will serve as an example. The counselor-therapist might enter into a series of treatment sessions employing relaxation training to help the client become more relaxed. On the other hand, a physician might prescribe tranquilizers to reduce the symptoms by effecting chemical changes in the autonomic nervous system. In both cases only passing
attention is likely to be paid to the probable cause, or causes, of such symptoms.

A growing body of literature suggests that many causes of behavioral and physical complaints are related to individual food and chemical sensitivities (Dickey, 1976; Randolph, 1980). These sensitivities may produce allergic reactions. Many people are allergic to dust, pollen, molds, and animal hair, and the extent to which they are affected by such allergies ranges from mild irritation to almost total disability (Rupp, 1979). But other ecological factors can also influence behavior. Because ecological illness (food and chemical sensitivity) is not yet fully recognized or understood there are no statistics compiled to describe its occurrence. However, it is estimated that as high as thirty percent of all emotional and behavioral disorders can be traced exclusively to food and chemical sensitivity, and another thirty percent for which food and chemicals are partially related (Mackarness, 1976). John Fry, of the Royal College of General Practitioners in England, maintains that identification and elimination of these foods and chemicals which make these people ill can produce a complete cure in eighty to ninety percent of the cases (1974). Theron Randolph (1962), in his book Human Ecology and Susceptibility to the Chemical Environment, has stressed the uniqueness of individuals in response to environmental variables. In other words, one person may demonstrate sensitivity to
broccoli, corn, salt, beef, and sugar, while another person may react to a completely different set of foods, chemicals, and atmospheric substances. According to Mandell (1979), a variety of symptoms have been reported and treated by individual elimination of specific foods and chemicals, including the following:

- upset stomach
- nausea
- nasal congestion
- watery eyes
- rash
- edema
- hives
- asthma
- frequent urinating
- eye and ear syndromes
- pain syndromes
- cardio-vascular disease
- fatigue
- apathy depression
- impaired attention
- impaired comprehension
- learning disabilities
- paranoia
- delusions
- hallucinations
- amnesia
- hyperactivity
- insomnia
- alcoholism
- obesity
- anxiety
- muscle tension
- enuresis
- itching

Most professionals involved in the treatment of ecologic illness and behavioral symptomatology are primarily concerned with the outcome of their treatment. Most patients are more interested in the improvement of their condition than experimental research that might help other people in the future. Consequently, there is little research employing adequate dependent measures to convince other professionals that the field of ecologic illness and treatment has anything to offer the mental health professional (O'Banion, 1978). To date, much of the reported research is anecdotal. Health care practitioners have manipulated the diets of their patients in hopes of seeing behavioral changes, but they have mostly been concerned with what the patient says about how he/she feels. Subjective experience ("I am feeling better," "I seem to be able to concentrate better," etc.) has been the
biggest criterion of success with little attention paid to the measured changes in behavior as a function of experimental manipulation.

A comprehensive study designed to measure the functional relationships between food exposures and adverse responses is definitely needed. Until a variety of objective measures are thoroughly researched there will be limited use made of potentially important treatment and prevention practices for behavior and physical disorders.

Statement of the Problem

The problem of this study was the ingestion of certain foods and observed effects on behavior.

Purposes of the Study

The purpose of this study was to investigate the possible relationships between

1. specific foods and weight loss and gain;
2. specific foods and hunger urges;
3. specific foods and depression as measured by paper and pencil scales;
4. specific foods and performance on hand-eye coordination;
5. specific foods and short-term auditory memory;
6. specific foods and heart rate.

A further purpose of this study was to provide information that may be useful with regard to future research involving the behavioral effects of food sensitivity.
Hypotheses

To carry out the purpose of this study, the following hypotheses were formulated.

1. Despite the fact that caloric intake will remain relatively constant throughout all experimental phases, the subject will gain an irregular amount of weight during the phases when reactive foods are eaten; weight will be lost during the phases when non-reactive foods are eaten.

2. The subject will have a higher frequency of urges to eat during those experimental phases when reactive foods are eaten; conversely, the total number of urges to eat will be lower during those phases when non-reactive foods are eaten.

3. The subject will perform better on a visual motor task (Pursuit Rotor test) during those experimental phases when non-reactive foods are eaten than when reactive foods are consumed.

4. The subject will score higher on the Symbol Digit Coding Task during those experimental phases when non-reactive foods are eaten than when reactive foods are consumed.

5. The subject will score higher on the Letter Digit Coding Task during those experimental phases when non-reactive foods are eaten than when reactive foods are consumed.

6. The subject will score higher on the Depression Adjective Checklists during those experimental phases when reactive foods are eaten than when non-reactive foods are consumed.
7. The subject will score higher on all scales of the Multiple Affect Adjective Checklist when reactive foods are eaten than when non-reactive foods are consumed.

Synthesis of Related Literature

Behavioral and emotional disorders may be shaped by a variety of events. The physical and social environments have evolved to a state of great complexity and health problems have increased proportionately. The interaction between man and the environment is only beginning to be understood and the knowledge generated by science has scarcely taught us how to solve these health problems. Millions of people suffer from ailments for which no causes have been found and for which current treatments appear inadequate. However, a growing body of literature suggests that many of the complaints presented to health care professionals are produced by food and chemical allergy (O'Banion, 1978).

The concept of food and chemical sensitivity, or ecologic illness, is most closely associated with the work of Theron Randolph. Randolph (1962), in his book *Human Ecology and Susceptibility to the Chemical Environment*, emphasized the uniqueness of individuals regarding their sensitivities to environmental influences. It is highly likely that ten individuals may show a sensitivity to a particular food and react to it in a different manner; one may have a headache, another may become depressed, another might become hyperactive, and so on. Another factor that contributes to individuality is
the fact that an individual's sensitivities may change over
time so that a food reacted to if eaten often may not be
reacted to if eaten occasionally (Randolph, 1976). Commonly,
the foods that are most often eaten are the most suspect
reactants.

The literature shows that various symptoms have been
directly related to food sensitivities (Mackarness, 1976). There is now evidence that schizophrenic behavior patterns
are related to the ingestion of wheat (Singh & Kay, 1976;
Sullivan, 1975). Psychotic episodes have been produced by
chemical exposures (Randolph, 1974), as well as exposure to
mold (Mandell, 1976b).

A major problem in describing the relationship between
food and behavior is that most of the research is inadequate.
Rappaport (Rappaport & Linde, 1970) describes the need for
better research when he says:

A number of other allergists have documented the many
mental symptoms and behavioral problems caused by food
additives and food allergies. If mental illness caused
by allergies was recognized more, and emotional factors
not always sought to explain mental disturbances, a
great deal of time and money could be saved, and
patients' mental conditions eliminated. There are
millions of patients enduring needless suffering. One
can only guess at the number of major and minor trage-
dies that are enacted daily because of misinterpreted
symptoms and inappropriate therapy (p. 17).

Depression has also been reported in patients subsequent
to the presentation of food and chemical substances (Baldwin,
Kittler, & Ramsey, 1968; Mandell & Rose, 1968). Randolph
(1976b) has explained the occurrence of manic-depressive
states by suggesting that manic states are typical of stimulatory phases and depression typical of withdrawal phases of an allergic reaction.

One of the most common food-related symptoms is headaches. As early as 1905, an Australian physician noted that one of his patients was relieved of migraine headaches when the patient was placed on a high protein, low fat diet (Hare, 1905). In 1921, the occurrence of migraine headaches was related to such foods as cereal grains, sugar, beef, and milk (Brown, 1921).

Another area in which food allergy may play an important role is obesity. It has been suggested that excessive eating is due to insatiable hunger produced by withdrawal conditions in the food addict (Randolph, 1976a; Philpott, Nielson, & Pearson, 1976). In other words, an individual who is sensitive to certain foods is likely to crave those foods if he/she has not eaten them for some period of time. Randolph (1976a) further notes that reducing the intake of specific foods, but not avoiding them completely, will only increase the urges to eat.

Alcoholism has also been related to food allergy (Dees, 1949; Randolph, 1950a). It has been reported that alcohol ingestion would temporarily relieve allergic symptoms (Brown, 1947). Randolph (1976) maintains alcoholism is a result of food addiction. Various foods are contained in alcohol such as wheat, barley, fruits, corn, yeast, and potato. The
individual may be addicted to some of these specific foods and alcohol may be the vehicle in which these food products enter the blood. Randolph further noted that refined foods and sugars are particularly amenable to addiction because of their rapid rate of absorption and alcohol is high in these contents.

The relationships between hyperactivity and sensitivities to specific foods, chemicals, and airborne substances has been noted for many years (Randolph, 1945, 1947a; Speer, 1958; Crook, 1963). Randolph (1976b) has described hyperkinetic characteristics as being typical of many individuals who are in a stimulatory phase of reaction to specific substances. Feingold (1976) has published research suggesting a relationship between hyperactivity and the ingestion of artificial food colors and flavors in certain foods. Reactions to such additives have also been noted by Lockey (1976) and Pfeiffer (1976). One problem with the Feingold research, however, is the avoidance of certain foods with artificial additives necessarily eliminates the foods in which the additives are found. Therefore, it is difficult to determine what factor or combination of factors are causing the change in behavior (O'Banion, 1978).

The behavioral and physical symptoms associated with neurosis have also been related to food allergy (Randolph, 1976b). These symptoms include anxiety, muscle tension, apprehension, frustration, irritability, and so on. Clark
(1948) reported nervousness in children induced by sensitivities to pollens, feathers, animal hairs, and foods. Cerebral or neurological reactions to foods have also been reported by Mandell (1969). Mandell has observed these problems in his patients and suggests that the increase of neurotic behavior has risen parallel to the rise of the use of hydrocarbon producing substances.

George von Hilsheimer (1974), in his book Allergy, Toxins, and the Learning-Disabled Child, emphasizes the importance of controlling ecological variables when structuring a program for children with learning disabilities. Crook (1975) suggests that although learning disabilities may be caused by brain irritation, genetic factors, and psychological factors, the majority of the problems may be in specific adverse or allergic reactions to foods and chemicals. Dickey (1976) has found a relationship between learning disabilities and chemical exposures found in the school, such as carpeting, tile, glue, and janitorial supplies. Further, Morgan (1976) found a variety of reactions to water contaminants such as pesticides, heavy metals, cobalt, beryllium, fluoride, phenols, and many industrial chemicals.

Again, the major weakness in the investigation of ecologetic illness is the lack of experimental evidence. Most studies reported were simple descriptions, with few attempts to manipulate independent variables in such a way as to provide empirical data.
Limitations of the Study

One limitation that must be recognized in this study is that no attempt was made to control for the effects of airborne substances.

It should further be noted that this is a single-subject experiment; consequently, the data cannot be generalized beyond this single individual.

An additional limitation in this study is the fact that the subject was aware of how she might react to the individual foods in her diet. Therefore, the lack of double blend methodology could influence the outcome of the data.


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CHAPTER II

REVIEW OF THE LITERATURE

This chapter contains a brief history of the health field known as clinical ecology and a review of health problems related to food sensitivity. Particular emphasis will be on symptoms that are so-called psychological in nature.

Clinical ecology is the study of the effects in susceptible people of maladaptation to specific inhalants, contactants, and ingestants in their physical environment. The effects may involve several systems at the same time, presenting either as polysymptomatic syndromes which tend to be dismissed as functional after standard tests for pathology have proved negative, or as recognized clinical entities with pathological changes of unknown etiology. Clinical ecology came into official being in 1965 as a specialty separate from general allergy, toxicology, and public health oriented environmental medicine. In that year the Society for Clinical Ecology was founded by a group of physicians who believed that many of the health problems they were dealing with were related to environmental factors including food, water, inhalants, and chemicals. Many of these physicians were trained in allergy, including Herbert Rinkel and Theron Randolph who did the pioneering work in the area of
food allergy. In 1951 Rinkel, Randolph, and Zeller published a book entitled Food Allergy. This book marked a new era in the understanding of how foods might be related to a variety of diseases. Although previous authors had written extensively on the subject (Coca, 1942, Rowe, 1937, Vaughn, 1939), it was not until the 1960's that, with the founding of the Society for Clinical Ecology, clinicians began to collectively study the effects of food and disease. Randolph has been the most prolific writer in this area and his contribution to the understanding of not only foods, but chemical factors in disease has been monumental. Recent years have shown an explosion of interest in food allergy. Although there is much controversy over terminology and theoretical concepts, it is quite clear that clinicians are becoming more aware of these facts, as is evidenced by the variety of specialists who are beginning to incorporate ecologic concepts into their practice. However, it must be pointed out that the majority of the medical and scientific community is still unaware of the writings of such men as Randolph. Additionally, there are many who would say that ecologic practices are little more than faddist. The critical issue is the fact that very little research has been conducted on the relationship between individual food sensitivity and disease. The lay literature is full of reports that claim health benefits from a variety of dietary programs, but there is little scientific evidence to substantiate the claims. The data
that do exist are mostly in the form of clinical anecdotes and case reports. However, the increasing awareness of how our food and water supply, not to mention the air we breath, is being contaminated by toxic chemicals is finally catching the attention of science.

The purpose of this review is to survey the literature of psychological and behavioral effects of food sensitivity. Psychological and behavioral manifestations of food reactions may include fatigue, depression, apathy, learning disabilities, enuresis, hallucinations, hyperactivity, irritability, insomnia, aggression, obesity, alcoholism, anxiety. In addition, there are many symptoms that are likely to be produced by specific foods that are considered "cerebral" reactions. These symptoms include vague changes in mentation and usually are articulated in terms of "feelings" and "states of mind." Commonly, these patients complain of feeling "spaced out" and confused, and they often describe pressure in the head as if "there was a tight band wrapped around it." A review of the theoretical and conceptual work of clinical ecology can be found by reading Clinical Ecology by Lawrence Dickey (1976).

Hyperkinesis

That certain foods might produce states of restlessness, irritability, and disturbed sleep was in the medical literature in the early 1900's (Schofield, 1908, Schloss, 1912, Cooke, 1922; Hoobler, 1916; Cambell, 1927; Keston et al.,
1935; Alvarez, 1946; Black, 1942). Randolph (1947) and Rowe (1950, 1972) observed that hyperkinetic individuals varied in their behavior from total fatigue to extreme hyperactivity. It has been further noted that certain foods would produce periods of depression, hostility, and irritability (Davison, 1949, 1952). Speer (1954) has referred to the hyperactive syndrome as the allergic-tension-fatigue syndrome and has concentrated his work on central nervous system allergy, which includes a variety of symptoms related to the ingestion of certain foods. Crook (1961) described fifty patients with allergic-tension-fatigue syndrome and found that 75 percent of these children also had typical allergic symptoms such as hay fever, asthma, and eczema. In the same publication Crook described one of the first double-blind studies to determine the relationship between the ingestion of food and the effects of that food on patient symptomatology. He was able to determine that milk would produce, in this patient, headache, stomach pain, depression, and irritability. Buisseret (1973) studied seventy-nine milk-allergic children with multiple complaints and found that their symptoms repeatedly subsided when milk was omitted from their diets and recurred when it was ingested. Finn and Cohen (1978) described three patients with food sensitivity who were tube fed non-offending foods and offending foods. On five occasions in each patient, the offending food produced the problem symptoms, while placebo challenges with water or
non-offending food items caused no symptoms. Most of the research on diet and the hyperactivity syndrome has not focused on individual food sensitivity. Rather is has centered on food additives. The major proponent of this approach has been Ben Feingold. In his 1975 book, *Why Your Child is Hyperactive*, Feingold concludes that hyperactivity is mainly due to artificial food coloring, artificial flavor, and natural salicylates. Though he admits that some children are also affected by other food items, dust, pets, pollens, and odors, he does not believe that allergy is directly related to hyperactivity. There have been many studies attempting to assess the efficacy of the Feingold diet. Most of these are clinical reports that are characterized by their uniformly positive results, but are shadowed by questions resulting from a lack of experimental control and inadequate dependent measures. Additionally, the Feingold hypothesis has been criticized for the publicity generated by the media in the absence of experimental data (Spring & Sanders, 1976). Rose (1978) and Hoavik, Altman, and Woelk (1979) have employed acceptable research methodologies and have demonstrated a positive relationship between food additives and the hyperactivity syndrome. However, it is not clear to what extent the food substances themselves may be related to this syndrome because there have been no reliable studies done to test the food sensitivity hypothesis. Randolph (1962) has suggested that reactions to food additives are highly individualized
phenomena. He further states that reactions to the same additives in the same individual may be different at different times depending on many factors considered to be "state of the organism" variables (Randolph, 1976a). Lockey (1971, 1973, 1975) has also stressed the individuality of reactions and has noted that patients might react to different doses of a substance at different times. Rapp (1979) has written a book entitled Allergies and the Hyperactive Child where she describes many cases of hyperactive symptoms produced by foods that have no additives.

Depression

Depression is a common complaint presented to physicians, psychologists, social workers, and mental health counselors. There are hundreds of books written on the subject reporting a variety of theories regarding the nature of depression and an equal number of treatment modalities. Again, the lack of experimental evidence relating foods to depression forces a reliance upon clinical case reports. Mandell (1979) reports treating one of his first patients for sinus problems. While testing her for sensitivity to catsup the patient began to cry. When asked why she was crying, she said she did not know but she felt very depressed. Further questioning brought forth no clear reason why she should be depressed. Mandell concluded that her brain was reacting to the combined allergic effects of tomato and catsup, and her allergic symptom was depression. This woman admitted that she ate catsup
every day and frequently craved this substance. The craving of specific foods, or any substance is consistent with the addiction hypothesis outlined by Randolph (1956). Randolph (1955) studied 50 patients with depression symptoms and found these symptoms to be produced by exposures to gas and combustion products of gas, oil, and coal found in the home environment. When these patients removed these substances from their homes, they reported their depression, as well as other symptoms, greatly decreased or completely disappeared. Rea (1980) has also reported high incidence of depression related to natural gas exposure. Randolph (1976b) further described manic-depressive states in terms of the addiction process by talking about the stimulatory or withdrawal stages of reaction to specific substances to which an individual may be sensitive; manic states are typical of stimulatory phases and depression typical of withdrawal phases. Philpott (1976) has claimed that depression is so characteristically caused by food, chemicals, inhalants, and contactants that there is very little call for antidepressants if the allergy management is properly under control.

Headaches

Headache is one of the most common symptoms presented to members of the health profession. As early as 1905, an Australian physician reported a case of migraine headache which quickly went away with the elimination of certain foods (Hare, 1905). Brown (1921) has made observations concerning
the relationship of migraine headaches to such foods as cereal grains, sugars, beef, and milk. Mandell (1979) has found headaches produced by apple cider vinegar, chocolate, rice, tuna, and pineapple that ceased to occur when the suspected foods were eliminated. Randolph (1976b) has written about the common occurrence of headache symptoms due to withdrawal phases of allergic reactions. He further noted that in many cases, headaches would go away once the allergic food was eaten again. This finding is consistent with the addiction hypothesis formulated by Randolph (1956) and Philpott and Kalita (1980). Rea (1978) studied a series of one hundred patients in an environmentally controlled unit of a hospital and found that 94 of 100 patients studied became headache-free after a five-day fasting period. After fasting, the patients began a testing phase during which they ate one food per meal of organic foods. This was followed by a phase during which commercial, chemically contaminated foods were tested, and finally, patients were tested (by inhalation), double blind, on ambient doses of common chemicals including alcohol, chlorine, insecticide, phenol, and formaldehyde. All patients who cleared of headache during the fast had their headache reproduced by one or more of the challenge tests. Rinkel, Randolph, and Zeller (1951) described a number of patients who had concomitant food reactions in specific pollen seasons. One example was a woman who, during the pig weed pollinating season, would develop headache after
ingesting fruits, particularly peaches and other members of the plum family. These foods could be eaten with no problem of headache at the same time of the year in areas where pig weed pollens did not exist. The most important factor bearing upon the apparent failure of most clinicians to recognize the relationship between the ingestion of certain foods and headache or other symptoms is probably due to the fact that there is not always a point-to-point correspondence between the ingestion of a specific food and the production of symptoms. This phenomenon is discussed in terms of fixed allergy and cyclic allergy (Rinkel, Randolph, & Zeller, 1951). In the typical case of fixed food allergy, a food may have been avoided completely for a period of several years, yet the first ingestion after that period of omission will be followed by definite and often severe symptoms. In cyclic allergy, a food may produce symptoms on one occasion while causing no problem on another occasion. Cyclic allergy is by far the most common of these phenomena and, as mentioned above, the most difficult to demonstrate cause and effect.

The importance of Randolph's addiction hypothesis should again be noted with regard to headache. Headache is perhaps the most common withdrawal symptom from a substance to which one has become addicted. This is true whether the addictive substance is a food, chemical, tobacco, or drug. It is common for an individual to develop headache when the addictive substance has been avoided for a brief time (withdrawal) and
headache will likely diminish when that substance is again contacted (Randolph, 1962).

Obesity

Obesity, a major health risk, appears to be an increasing problem in this country (Pritikin, 1979). When body weight significantly exceeds the ideal weight for height, age, and sex, there is an increased likelihood that individuals will develop hypertension, degenerative disease, diabetes mellitus, gout, lymphedema, venous stasis, and respiratory problems. Speculation on the causes of obesity range from purely psychological factors to physiological addiction. Mackarness (1958), an English psychiatrist, became interested in weight control and began prescribing a diet of high fat, high protein, and low carbohydrates. He found that his patients could follow this diet and lost weight, even if they did not limit the total number of calories. Curiously, he noted that many of his patients' psychiatric problems became much less severe when they followed the diet. At this point, Mackarness was unaware of food sensitivity or food allergy. He soon became aware of the writings of Rowe, Rinkel, and Randolph and began to see that the ingestion of certain foods in susceptible individuals would often produce psychiatric symptoms (Mackarness, 1959). In 1976, Mackarness published a book entitled Eating Dangerously: The Hazards of Hidden Allergies, in which he incorporated his interest in weight
control with the problem of individual susceptibility. Like Randolph, Mackarness emphasized the role of addiction in obesity. Mandell (1979) describes food addiction, observing,

The obese person has no idea that his daily food cravings or eating habits are based on a physiologic need to stop the withdrawal symptoms caused by food addiction. All he knows is that at night he is uncomfortable until he finally yields to the need to eat the special snack he placed on the night table before retiring. This nightly ritual is followed in order to save himself a sleepless barefoot trip to the kitchen when his regular symptoms arrive right on schedule in the middle of the night. However, within a few hours after eating a food to which he is both allergic and addicted (and despite the initial good effects that may have been noted), he begins to experience familiar addictive withdrawal ("hangover") symptoms that can range from slight fatigue to severe anxiety, excruciatingly painful migraine headaches, abdominal cramps, severe depression, violent anger, generalized itching, and very painful muscle ache. (p. 108)

Randolph (1976a) has noted that diets designed to reduce caloric intake without considering individual susceptibility and the avoidance of certain foods, are very often difficult to maintain. In fact, many individuals will continue to gain weight, even when decreasing calories, if they continue to eat foods to which they are intolerant. Randolph further emphasizes the relationship between obesity and chemical sensitivity by noting how common it is for individuals with chemical sensitivities to have a ravenous appetite after being exposed to certain chemicals. It is Randolph's conclusion that these chemically sensitive people can reduce the intensity of symptoms produced by chemical exposure by eating foods to which they have become addicted. However, this
reduction is short-lived and the symptoms may reappear at a greater intensity sometime later (Randolph, 1980).

**Alcoholism**

Because of the variety of foods contained in alcoholic beverages, it has been suggested that alcoholism may be significantly related to food sensitivity (Dees, 1949; Randolph, 1956, 1976, 1980). The most common of these foods include wheat, barley, fruits, corn, yeast, and potato, all of which are common reactive foods. Randolph (1980) has noted that few people would choose to drink pure ethyl alcohol, even if given the chance. He particularly suspected corn, which is found in most alcoholic beverages as well as many other commercial food products. It is Randolph's hypothesis that alcohol is simply a vehicle that insures that these food products will be quickly absorbed into the blood stream, a critical factor in developing and maintaining an addiction. Randolph reports about an alcoholic who had stopped drinking but continued to complain of extreme fatigue and almost constant headaches for several years. In preparation for food ingestion tests for corn and wheat, the patient avoided these foods for four days. His fatigue was worse for the first two days, but he was improved by the fourth. The test ingestion of wheat produced nasal obstruction and fatigue, as well as neck pain and dizziness. These reactions persisted for several days. During the next food ingestion test of corn
he immediately felt fatigued and began to stagger. The next morning he woke up with a bad hangover, in spite of the fact that he had not consumed any alcoholic beverage for almost two years. By the avoidance of wheat, corn, and a few other incriminating foods, his headache and fatigue subsided. Additionally, his craving for alcohol disappeared (Randolph, 1980).

There are many factors involved in understanding alcoholism and the role of food addiction seems worthy of investigation in the maintenance and treatment of this disease.

**Neurobehavioral Deficits**

A final area of consideration are those symptoms referred to as "cerebral." Unfortunately, there is no technical or operational definition of this term, but its use refers to mood changes and mentation problems. These symptoms range from mild and barely noticeable irritations to acute forms of psychosis. These problems have been known to cause small discomforts (occasional listlessness, mild insomnia), mild reactions (minor headaches, irritability, restlessness), more severe symptoms (anxiety, depression, outbursts of violence, memory loss), and even problems that are clearly psychotic (hallucinations, catatonia) (Sheinkin, Schaeter, & Hutton, 1979). Randolph refers to this syndrome as "brain-fog," a term that is found in Webster's dictionary as a synonym for mental exhaustion. According to Randolph, brain-fog is a
form of mental fatigue, although a much more serious and debilitating symptom than physical tiredness. It is characterized by mental confusion, slowness of thought, lack of initiative and ambition, irritability, occasional loss of sex drive, despondency, as well as bodily fatigue, weakness, and aching (Randolph, 1980). These neurobehavioral symptoms probably account for the majority of food and chemical problems. There have been many case studies reporting the relationship between the ingestion of certain foods and changes in so-called mental functioning. This is a critical factor in the understanding of behavior problems, hyperactivity, learning disabilities, and a variety of other psychological problems. The lack of controlled experimental data, however, has made this information slow to be appreciated by the many practitioners who deal with these problems.
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CHAPTER III

METHODS

Subject

A 32-year-old female served as the subject for this study. She was referred by the Institute for Health Psychology, a division of the Psychology Department of North Texas State University. The subject, having been evaluated by the Institute for Health Psychology, in accordance with the procedure established by Randolph (1962), was known to have sensitivities to a variety of foods, including citrus fruits, coffee, beef, corn, wheat, grapes, plums, pork, peas, milk products, eggs, potatoes, and cane sugar. The subject reported a variety of symptoms that occurred when she ate these particular foods, including uncontrollable weight gain, depression, inability to concentrate, nervousness, and periods of confusion. At the beginning of this study, the subject said that she had not been eating the foods to which she was sensitive and no symptoms were reported.

Research Design

A repeated measurement design was employed for the study. Specifically, an A-B-B-A-B-A design was used (Harsen & Barlow, 1976). The A phases represented the period in which the subject ate only the foods to which she showed no previous
reaction. The B phases represented the period in which the subject ate foods to which she did react during previous testing. The rationale for two consecutive B phases was to prevent possible cyclic effects and assess the cumulative effects of eating reactive foods. Each experimental phase lasted six days.

The subject was asked to record all foods eaten and their specific caloric value, and to maintain a maximum intake of 1000 calories per day throughout the study. In addition, she was asked to record the frequency of urges or desires to eat each of the good and bad food categories.

Instruments

Several behavioral and physiological measures were obtained in an attempt to assess as many of this subject's irregular behavioral and physiological conditions as possible during the different experimental phases. The following instruments were employed during the testing procedure.

1. The Depression Adjective Check List is a paper and pencil test designed by Bernard Lubin (1967) to measure depression. Seven separate forms, each containing a list of adjectives, are included. Raw scores are converted to standard scores which are based on normative data collected from the college population (see Appendix A).

2. The Multiple Affect Adjective Check List is a paper and pencil test designed by Marvin Zuckerman and Bernard Lubin (1965) to measure anxiety, depression, and hostility.
Standard scores reported on this depression scale also are based on normative data taken from the college population (see Appendix B).

3. The Symbol Digit Modality Test is a written test designed by Aaron Smith (1967) in the form of a match to sample task similar to the coding task used in the Wechsler Adult Intelligence Scale (see Appendix C).

4. The Letter Digit Modality Test designed to assess short-term memory of letter and number associations. The associations are practiced by the subject and then tested by randomly presenting letters and requiring the subject to write the digit corresponding to that letter. Letters are presented by prepared tapes played on a cassette tape recorder. This particular test, developed by the author, can be given at different speeds (see Appendix D).

5. The Pursuit Rotor Task is a hand-eye motor coordination test in which the subject attempts to maintain contact between a stylus and a metal contact point rotating on a wheel. The wheel runs for 20 seconds and the number of seconds contact is maintained is cumulatively recorded by a digital print out. The rotation speed can be adjusted to either 15, 30, 45, or 60 revolutions per minute (see Appendix E).

6. A behavioral wrist counter was worn by the subject during all waking hours and was used to count urges to eat certain categories of food.
7. A stop watch was used to time pulse rate per minute.

8. Calorie consumption per day was calculated based on the book *Calories and Carbohydrates* by Barbara Kraus (1975).

9. The subject was weighed each day on a Detecto Doctor's Scale. The same scale located in the same position was used throughout the study.

Procedure for the Collection of Data

The experimental sessions took place twice daily (6 a.m. and 6 p.m.) for 36 consecutive days. Only the experimenter and subject were present during the testing session. Data were gathered in the same manner and sequence during each testing period. First, the subject was weighed and her pulse rate taken. The pulse rate was measured at least twice for 60-second periods. If these two recordings varied more than 2 beats per minute, the pulse rate was measured until a consistent rate, not varying more than 2 beats per minute, was obtained. The subject then was administered the Multiple Affect Adjective Check List and one of the seven correlated forms of the Depression Adjective Check List, which were rotated at each session. Next, the subject was administered the Pursuit Rotor Task for 20 seconds on each speed (15, 30, 45, and 60 r.p.m.) using the subject's dominant hand. Data were obtained from a digital printout after each 20-second period. The subject then was administered the Symbol Digit Modality Test for a 90-second period, followed by the Letter
Digit Modality Test. In this latter task, the subject had 2 minutes to memorize a list of letters corresponding to numerals 1 through 9. After the 2 minutes, a tape recording randomly presented a list of 20 letters at 4-second intervals. The subject was to write the numeral corresponding to the letter called by the tape recorder. The subject again was given 2 minutes to study the key card, after which time the procedure was repeated with the tape recorder presenting the letters at 2-second intervals. Three separate tapes with different letter orders were used to minimize the subject's ability to become familiar with the sequencing of the association presentation. Letter-number associations remained constant throughout the study.

During each morning session, the subject presented the experimenter with a list of all foods she had consumed on the previous day and corresponding caloric values; the frequency of hunger urges as recorded on the behavioral wrist counter for the two food groups also was obtained and recorded by the experimenter.

Analysis of the Data

The data collected from the research are reported in descriptive, graphic form. The use of statistics in N = 1 research is debatable, and many applied researchers argue that clinical significance is more appropriate and meaningful than statistical significance in the single case (Barlow
& Hersen, 1973; Chassan, 1960; Bergin, 1966). This position is nicely stated by Hersen and Barlow (1976) when they wrote:

... statistical significance is not a substitute for clinical significance. It might seem appropriate to rely on statistical tests in those instances in which behavior change has not been obvious and some method is required to determine whether there is any effect. However, if treatment effects are not obvious, a fortiori, then clinical value probably has not been demonstrated. This condition is not rectified by assessing statistical significance. (p. 311)
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CHAPTER IV

PRESENTATION AND DISCUSSION OF RESULTS

The problem of this study was the ingestion of certain foods and their observed effects on behavior. The purposes of the study were to investigate the possible relationships between specific foods and (1) weight loss and gain; (2) hunger urges; (3) depression; (4) hand-eye coordination; (5) short-term auditory memory; and (6) heart rate.

The subject in this study had previously been diagnosed as having sensitivities to certain foods by a psychologist employing the method described by Randolph (1962).

Experimental data are presented descriptively in graphic form. Figure 1 includes data gathered during both the a.m. and p.m. sessions on each data day on the Symbol-Digit Coding task. Visual inspection of the data during good diet phases suggests a general increase in performance rate over time which is characteristic of a learning or acquisition curve. However, there are clear decreases in performance rate during the three phases when reactive foods were eaten, which is defined as the bad diet. Consistent with other data presented, effects from eating bad foods may be cumulative in nature, showing a gradual onset. In addition, once the subject returns to a good diet phase, data slowly return to previous levels.
Figure 1. Data gathered during the a.m. and p.m. sessions on each data day on the Symbol-Digit Coding task.
Performance on the Pursuit Rotor Task is presented in Figure 2. In the first good diet phase there is an apparent acquisition curve for the more rapid speeds (45 and 60 r.p.m.), with no apparent learning effects for the slower speeds (15 or 30 r.p.m.). Decrements in performance can easily be seen during the bad diet phases as compared with performance during good diet phases. The data indicate greater variability of motor performance with increased speeds.

Figure 3 represents the subject's performance on the Letter Digit Modality Test. The first good diet phase indicates an acquisition curve. Performance on the slow presentation speed does not seem as marked as other data, possibly due to the general simplicity of the task.

The subject's performance on the Depression Adjective Check List and the Multiple Adjective Check List are presented in Figure 4 as standard scores based on each test's normative data. General inspection of the data indicates a close correspondence in performance between the two depression scales. As is consistent with other data, the subject shows a gradual increase in depression scores with the onset of the bad diet phases and a gradual decrease in depression scores when good diet phases are begun.

The bottom graph of Figure 5, which represents the total caloric intake during each 6-day phase, indicates that the subject maintains a low caloric intake without much variability from phase to phase. Variability in calorie intake
Figure 2. Data gathered during the a.m. and p.m. sessions on each data day on the Pursuit Rotor task.
Figure 3. Data gathered during the a.m. and p.m. sessions on each data day on the Letter-Digit Coding task.
Figure 4. Data gathered during the a.m. and p.m. sessions on each data day on the Depression Adjective Check List and the Multiple Adjective Check List.
Figure 5. Subject weight gain/loss and caloric intake for each day of data collection.
between phases is relatively insignificant when considering that one pound is equal to 3500 calories. In the top portion of Figure 5 the subject's weight is graphed. These data indicate a rapid and considerable increase in weight during bad diet phases 2 and 3 which cannot be accounted for by changes in calorie intake. During these two phases a total of 13 pounds is gained in 12 days even though calorie intake remains relatively constant. Weight begins to decrease during good diet phase 4 and again increases during bad diet phase 5. The last good food diet phase 6 again shows a decrease in weight. Such drastic changes in weight, even though calorie intake remains constant, is a common phenomenon with many individuals who have problems losing weight and may be accounted for by the retention of fluids when an individual eats foods to which he or she is sensitive (Randolph, 1962). This water retention was apparent to the experimenter during the bad diet phases due to the subject's bodily puffiness and swelling in the face and hands. Figure 6 presents data related to the difficulty of losing and then maintaining weight loss via a reduced caloric intake without considering specific food sensitivities. As indicated by the data, a limited caloric intake is related to an increase in urges only for foods to which this individual is sensitive. Urges to eat good foods remain low consistently across phases, whereas urges to eat bad foods increase and remain high only during the bad diet phases. Furthermore, urges for bad foods
URGES TO EAT

Figure 6. Urges to eat good and bad foods across phases.
increase slowly as the bad diet phases begin and decrease slowly when the good diet phases are begun. Urges for bad foods are extremely low during certain portions of the good diet phases.

Additional data gathered during this study which add substantial evidence to a physiological component to this subject's problems are presented in Figure 7. Pulse rate obtained during each morning session is presented in Figure 7. These data indicate a relatively low and stable pulse rate during good diet phases and a substantial increase in pulse rate during bad diet phases. In general, these data correspond with changes in performance measures; there is a gradual increase in pulse rate when bad diet phases begin and a gradual decrease in pulse rate when good diet phases begin. Differences in average pulse rate per phase between good and bad diet phases range from 8 to 12 beats per minute. Changes in pulse rate have been related to food sensitivity by a number of researchers (Coca, 1956; Mackarness, 1976; O'Banion et al., 1978).

Chapter IV has presented graphic representation of the results of this study. It is clear from visual inspection of the data that changes in the dependent variables were functionally related to changes in the independent variable, i.e., changes in diet.
Figure 7. Pulse rate obtained during each morning session.


CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The problem of this study was the ingestion of certain foods and their observed effects on behavior. The purpose of the study was to investigate the possible relationships between specific foods and (1) weight loss and gain; (2) hunger urges; (3) depression scores; (4) hand-eye coordination; (5) short-term auditory memory; and (6) heart rate.

The subject in this study had previously been diagnosed as having sensitivities to certain foods. To determine the effects of certain foods on the subject a repeated measure design was employed. Specifically, an A-B-B-A-B-A design was used where A phases represented a 6-day period in which the subject ate foods to which she previously showed no sensitivity, and B phases represented a 6-day period in which the subject ate foods to which she was sensitive. During earlier testing, the subject was found to be sensitive to corn, beef, milk products, wheat, eggs, cane sugar, coffee, citrus fruit, pork, lamb, carrots, nuts, watermelon, and pineapple. These foods were found to induce irregular psycho-behavioral and physiological characteristics upon repeated and systematic testing procedures. Many of these foods are commonly reacted
to by sensitive individuals (Dickey, 1976). Her non-reactive foods include fish, chicken, most green and yellow vegetables, bananas, cantaloupe, pears, apples, strawberries, and blueberries.

Hypothesis One predicted that the subject would lose weight when she consumed a diet of nonreactive foods during the A phase (good diet) and gain weight in the B phase (bad diet), in spite of the constant limit of caloric intake. The data indicate that her weight fluctuated during experimental phases. It has been suggested that weight gain as a function of food sensitivity is due to additional fluid retention during reacting stages (Mandell, 1979). Hypothesis One was supported.

Hypothesis Two predicted that the subject would have a higher frequency of urges to eat during those experimental phases when reactive foods were eaten. The data indicate that urges to eat are much higher when reactive foods are eaten. It is common for overweight persons to feel hungry, increasing the probability food will be eaten, even after large quantities are consumed. However, when quantity of intake is reduced without consideration of specific foods eaten, there may be extreme difficulty in maintaining weight loss due to an increase in urges. These urges may not only be under the control of external stimulus conditions, but also may be greatly controlled by internal stimulus conditions. Internal stimuli are more likely to be present for a
greater period of time than the transient stimuli found in
the external environment. Hypothesis Two was supported.

Hypothesis Three predicted that the subject would
perform better on the Pursuit Rotor task during phases when
non-reactive foods were eaten. This visual motor task was
employed because the subject had reported that she was
"nervous and shaky" during periods in which she ate reactive
foods. In addition to the changes visible in the data, the
experimenter noted that the subject's hands were unsteady and
quivering during those phases when she was eating reactive
foods. Hypothesis Three was supported.

Hypothesis Four predicted the subject would perform
higher on the Symbol-Digit Coding task during those phases
when non-reactive foods were eaten. The subject reported
that she was unable to concentrate during her bad diet
phases. While the number of mistakes did not vary greatly,
the total number completed did. Hypothesis Four was sup-
ported.

Hypothesis Five predicted that the subject would
perform higher on the Letter-Digit Coding task during those
phases when non-reactive foods were eaten. A major problem
for the subject on this task was again related to her inabil-
ity to concentrate. She would frequently attempt to remember
an answer, and, in doing so, she would not keep up with the
pace of the tape recorder. During the good diet phases this
problem did not occur. Hypothesis Five was supported.
Hypotheses Six and Seven predicted that the subject would score higher on the depression scales of the Depression Adjective Check List and the Multiple Affect Adjective Check List during those phases when reactive foods were eaten. The data clearly demonstrate this trend and a visual inspection of these data shows that changes in depression scores are consistent between the two tests. Furthermore, the subject appeared somewhat despondent during the bad diet phases. There were noticeable changes in the subject's behavior throughout the study. The data indicate that changes were not immediate upon changes in the experimental phase. It usually took two to three days for the data to reflect these changes and observation of the subject's affect, movement, and verbal behavior were consistent with the data. Hypotheses Six and Seven were supported.

Conclusions

Behavioral and physiological responses that have no obvious physiological base have often been treated with traditional psychological methods. In this study, changes in depression, motor and academic performances, weight, and heart rate are related to the ingestion of certain foods.

From the data presented in this study, the following conclusions were drawn:

1. Changes in performance during phases when reactive foods were eaten become more noticeable as the task becomes more difficult, as demonstrated in the Pursuit Rotor Task
and the Letter-Digit Modality test. Thus, changes in physiological states may alter the probability of certain responses under a set of unchanged environmental conditions.

2. Total number of urges to eat foods from the bad diet are higher when reactive foods are eaten, and urges drastically decrease during the good diet. The number of urges to eat foods from the good diet is consistently low throughout all phases of the study. It is common for an obese person to "feel" hungry, increasing the probability of eating, even after large quantities of foods have been consumed. This suggests that internal physiological stimuli may result from a particular sensitivity and this internal stimuli serves as a discriminative stimulus for eating. Additionally, internal stimuli are more likely to be present for a greater period of time than the transient stimuli found in the environment.

3. Constant exposures to which one is sensitive may set up a state of addiction (Randolph, 1966; Mackarness, 1976) with all of its aversive withdrawal symptoms. Just as in alcohol or drug addiction, the food sensitive person may become addicted to a specific food. Usually, a person will actually feel better after the ingestion of this food and, sometime later, experience a withdrawal effect (Philpott, 1976). It is common for the "food addict" to crave a certain food, much like individuals who smoke cigarettes often have a craving to smoke. In this study, this was noticed as
the subject experienced a dramatic increase in urges during the periods when she was eating foods to which she was sensitive.

4. The subject in this study gained weight during phases when reactive foods were eaten and lost weight during phases when non-reactive foods were eaten, despite the fact that caloric intake remained relatively constant throughout the study. This conclusion should be of particular interest to researchers and clinicians who attempt to control weight by simply decreasing the number of calories in a diet. While this may be satisfactory in many cases, there are many others where the limited calorie method will be ineffective. Furthermore, reducing the intake of specific foods but not avoiding them altogether not only accentuates the clinical features of obesity, but virtually precludes following a limited calorie diet by many individuals. Far more satisfactory therapeutic results may be obtained by identifying specifically incriminating or addictive foods (Randolph, 1956; Matsumura, Kurovme, & Amava, 1971).

An addiction view of compulsive eating has been stated by Marshall Mandell, M.D. (1979), where he concludes:

... the compulsive eater knows he must eat a certain food to relieve or prevent mental sluggishness, irritability, fatigue, weakness, headache—his entire gamut of symptoms. A few bites of the 'right' food and suddenly he is bursting with energy, his head feels fine, his personality becomes pleasant, his energy and strength return, and his thinking becomes clear again. The compulsive eater is not overwhelmed with emotional problems
or an unfulfilled need for love that requires oral gratification. He is a chronic foodaholic with a serious but easily diagnosable and not too difficult to manage non-psychological ailment. (p. 109)

Recommendations

Based upon the research findings and conclusions of this study in conjunction with the literature and theory associated with food sensitivity (ecologic illness), the following recommendations are made:

1. Pulse rate, which seems to be one dependent measure which indicates stress due to specific food consumption for some individuals (Coca, 1956; O'Banion, 1977) should be further assessed.

2. The concept of food addiction (Randolph, 1976) should be further investigated, with particular emphasis on the stages of addiction, as found in drug and alcohol addiction.

3. Testing for food sensitivity should be employed for chronic health problems with unknown etiology. Many individuals complain for years of various symptoms and spend a great deal of time and money seeking the help of health professionals, and still report no relief. A food testing diagnostic procedure as described by Randolph (1976) and Dickey (1976) could clearly demonstrate if an individual's symptoms were related to ecologic variables (food, air, water, chemicals). Furthermore, this relationship can be determined in as little time as one week.
4. Considering the data in this study, the relationship between food sensitivity and depression should be further assessed. The basic issue here is the use of appropriate dependent measures. Most of the literature in this area has been anecdotal or clinical reports. The collection of empirical data would certainly demonstrate the utility of this procedure in the treatment of depression.

5. The double blend method of research should be employed, if possible, in future studies of this nature. This would certainly minimize effects associated with subject expectations.
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APPENDIX A

DEPRESSION ADJECTIVE CHECK LISTS
MANUAL for the

DEPRESSION
ADJECTIVE
CHECK
LISTS

1981 EDITION
By Bernard Lubin
THE AUTHOR

Bernard Lubin is Professor and Chairman, Department of Psychology, and Professor of Medicine, University of Missouri-Kansas City. Dr. Lubin's research interests lie in fields of depression, small group processes, community psychology, and psychological aspects of the aging process. He has had books and numerous articles published in these areas. He obtained his Ph.D. from Pennsylvania State University, is a Diplomate in Clinical Psychology (ABPP) and a Diplomate in Experimental Hypnosis (ABPH). He is a Fellow of the American Psychological Association, the American Association for the Advancement of Science, and the American Group Psychotherapy Association.

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INTRODUCTION

Although depression (melancholia) has been identified in the earliest recorded literature, it has only been during the past few years that attempts have been made to study the phenomenon objectively. The acceleration of recent interest in the study of depression seems largely due to the recognition that symptoms of depression are found in a large proportion of psychiatric and medical patients regardless of their primary diagnosis and the fact that depressive symptoms can be alleviated by individual and group psychotherapy, convulsive shock treatment, anti-depressant medications and behavioral and self-management techniques.

Considerable lack of agreement among theorists and researchers exists on the defining characteristics of depression. There is some degree of agreement, however, that lowered mood is a necessary component of the definition (Levitt & Lubin, 1975). As a way of resolving the conceptual problems surrounding depression, reasons have been advanced for considering self-reported depressed mood as a necessary component of the definition (Levitt & Lubin, 1975).

Following psychology's shift away from a radical behavioristic stance, the legitimacy of the study of cognitive and affective processes was restored. Interest in the study of mood and affect as a general psychological phenomenon and not just as an aspect of psychopathology has been increasing (Brewer, Doughite, & Lubin, 1980; Hale & Strickland, 1980; Haley & Strickland, 1980; and Giambra, 1978).

Objective study, of course, requires adequate measurement. The Depression Adjective Check Lists (DACL) were developed in order to provide brief, reliable and valid measures of self-reported depressive mood. The adjective checklist format was chosen because of its ease of administration and its high degree of subject acceptance (Masterson, 1974).

The equivalent forms of the lists within each of the two sets meet the need for alternate forms to be used when repeated measurement designs are required. Confidence in the Depression Adjective Check Lists has facilitated the current increase in the study of mood and affect.

DEVELOPMENT OF THE CHECK LISTS

Two separate item-analyses (X^2) were conducted which resulted in the development of the seven depression adjective check lists.

ITEM-ANALYSIS I

A pool of 171 adjectives connoting varying degrees of depression and elation was compiled. These adjectives were administered to a sample of 48 female neuropsychiatry patients who had been rated as “marked” or “severely” depressed after psychiatric interview on a four point scale of observable depression and to a sample of 179 normal females.\(^1\)

Item-analyses yielded 128 adjectives which significantly differentiated the two criterion groups in terms of checking frequency, 88 checked more frequently by depressed patients (positive adjectives, i.e., positive indicators of depression) and 40 checked significantly more frequently by normals (negative adjectives, i.e., negative indicators of depression). A scale consisting of the differentiating adjectives distinguished depressed from nondepressed patients at the .001 level.\(^2\)

Four balanced lists (A, B, C, D) were constructed from the differentiating adjectives. These four lists are referred to as Set 1. Each list contained 22 positive adjectives and ten negative adjectives. Also, the average differentiating power of each list was similar. For the purpose of computing the split-half reliabilities, each list was divided into two sets of items each of which contained 11 positive and five negative adjectives.

ITEM-ANALYSIS II

The original pool of 171 adjectives was administered to a sample of 100 male normals and a sample of 47 male psychiatric patients rated as marked or severely depressed after psychiatric interview. A total of 108 adjectives significantly differentiated the criterion groups, 72 positive adjectives and 36 negative adjectives.

A scale consisting of the differentiating adjectives separated the depressed and nondepressed patients at the .01 level. One hundred and two of the most discriminating adjectives were assigned to three lists (E, F, G) consisting of 34 adjectives each. These three lists are referred to as Set 2. Each list contained 22 positive adjectives and 12 negative adjectives.

The fact that only 108 adjectives differentiated male criterion groups, whereas 128 adjectives differentiated female criterion groups, tends to support the hypothesis of culturally-conditioned sex differences in self-reporting. Such a word as “gay” for example, which was checked significantly more frequently by normal females, failed to differentiate the male criterion groups and was checked very infrequently by either group of males, possibly because of the word’s homosexual connotation.

Age and education characteristics of criterion groups used in Item-Analysis I and II are presented in Table 1.

| TABLE 1 |
| Age and Education Characteristics of Groups |
| Used in Item-Analyses I and II |

<table>
<thead>
<tr>
<th>Sex</th>
<th>Normals</th>
<th>Depressed Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>100 22.27 4.83</td>
<td>47 36.41 11.33</td>
</tr>
<tr>
<td>(Item-Analysis II)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>179 21.27 4.84</td>
<td>48 30.40 10.05</td>
</tr>
<tr>
<td>(Item-Analysis I)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>100 13.02 1.16</td>
<td>47 11.22 3.09</td>
</tr>
<tr>
<td>(Item-Analysis II)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>179 14.37 0.81</td>
<td>48 12.20 2.81</td>
</tr>
<tr>
<td>(Item-Analysis I)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ADMINISTRATION AND SCORING

Each of the seven lists of the standard form of the DACL contains the following standard instructions:

"Below you will find words which describe different kinds of moods and feelings. Check the words which describe How You Feel Now - Today. Some of the words may sound alike, but we want you to check all the words that de-
scribe your feelings. Work rapidly and check all of the words which describe how you feel “Now... Today.”

Depending upon the specific research needs, the “Now... Today” time set may be altered to a more specific time period, such as, “during the last five minutes,” “during the last hour,” “during the experiment,” etc.

The list should be scanned before scoring for unusual response tendencies. Checking all items or checking none of the items is so rare that either of these occurrences might be considered to make the protocol invalid.

One key will score all seven lists. The pattern of plus (+) and minus (0) adjectives on each list is the same. To score, place the adjectve that is checked and one point for each minus (0) adjective that is not checked. The score for each list consists of the total number of plus (+) adjectives checked and minus (0) adjectives not checked. The total score should be inserted in the space at the top of the form.

Although each list of Set 1 contains 32 adjectives and each list of Set 2 contains 34 adjectives, the single stencil will score all lists.

Experience indicates that normal Ss require about two and a half minutes to complete each list, psychiatric patients require slightly longer.

The DACL was developed and validated as a self-administered instrument (Lubin, 1965). Occasionally, however, a subject is not able to complete the instrument in the standard manner, e.g., s/he has a manual or visual handicap or is functionally illiterate. An alternative at such times is to have the examiner read each adjective and record the subject’s “yes” or “no” response. A recent study found no difference between self-administered and examiner-administered DACLs (Lubin, Marone & Nathan, 1978).

NORMATIVE DATA

Means and standard deviations for form E of the DACL derived from a national probability sample are presented in Table 2 by sex and age group. The adult sample was drawn nationally by means of area probability sampling procedures. Adolescents were found in the homes of the sampled adults but do not constitute a random sample (Levitt & Lubin, 1975). For the adult sample, mean age was 44.5 years (S.D. = 17.1); and mean educational level was 11.1 years (S.D. = 3.5). Fifty-one and nine-tenths percent were female; 87.8% were white, and 77.9% were married.

Table 3 presents percentile norms for adults and for adolescents, separately for each sex. It can be seen that raw scores of 13 are quite rare for adults, indicating that the distributions are skewed toward the left.

Table 4 shows means and standard deviations for the component scores of form E. The data were collected in the National Depression Survey (Levitt & Lubin, 1975).

Means and standard deviations of the DACL for selected nonpsychiatric samples are presented in Table 5.
The student group (Table 5) consists of Ss at the high school, college, and graduate school levels, although predominantly college level. Mean scores for the male prisoner sample are very similar to those shown in the next Table for depressed psychiatric patients. The degree of psychopathology in this group is confirmed by other data (Lubin, Horned & Knapp, 1977).

The female adolescent delinquent group were from a residential center. The resemblance between the means of this group and those of the female depressed psychiatric patients is partly a reflection of the large amount of psychological disturbance among these adolescents. Factors which may have affected scores of this adolescent group are the emotional volatility of adolescence, behavioral disorders, and psychiatric disturbance.

The first three psychiatric patient samples in Table 6 were used in the cross validation of the DACL and have been previously reported (Lubin, 1965). The three samples were combined because of small Ns. The sample labeled "Royal Victoria Infirmary" was reported for the first time in the first edition of the manual (Lubin, 1967).

Means and standard deviations on the lists of Set 2 of the

---

### Table 5

**Means and Standard Deviations for Non-Psychiatric Patient Samples**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sex</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>College, and</td>
<td>N</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>265</td>
</tr>
<tr>
<td>High-school,</td>
<td>N</td>
<td>8.53</td>
<td>8.02</td>
<td>8.63</td>
<td>8.71</td>
<td>8.08</td>
<td>8.78</td>
<td>8.78</td>
</tr>
<tr>
<td>Graduate School</td>
<td>N</td>
<td>4.91</td>
<td>5.10</td>
<td>4.77</td>
<td>4.97</td>
<td>5.41</td>
<td>4.83</td>
<td>5.47</td>
</tr>
<tr>
<td>Students</td>
<td>F</td>
<td>591</td>
<td>591</td>
<td>591</td>
<td>591</td>
<td>591</td>
<td>591</td>
<td>591</td>
</tr>
<tr>
<td>Prison</td>
<td>N</td>
<td>7.78</td>
<td>7.32</td>
<td>7.87</td>
<td>8.00</td>
<td>8.12</td>
<td>7.72</td>
<td>7.72</td>
</tr>
<tr>
<td>Delinquents</td>
<td>N</td>
<td>7.74</td>
<td>7.25</td>
<td>6.59</td>
<td>7.86</td>
<td>7.86</td>
<td>7.86</td>
<td>7.86</td>
</tr>
</tbody>
</table>

The student group (Table 5) consists of Ss at the high school, college, and graduate school levels, although predominantly college level. Mean scores for the male prisoner sample are very similar to those shown in the next Table for depressed psychiatric patients. The degree of psychopathology in this group is confirmed by other data (Lubin, Horned & Knapp, 1977).

The female adolescent delinquent group were from a residential center. The resemblance between the means of this group and those of the female depressed psychiatric patients is partly a reflection of the large amount of psychological disturbance among these adolescents. Factors which may have affected scores of this adolescent group are the emotional volatility of adolescence, behavioral disorders, and psychiatric disturbance.

The first three psychiatric patient samples in Table 6 were used in the cross validation of the DACL and have been previously reported (Lubin, 1965). The three samples were combined because of small Ns. The sample labeled "Royal Victoria Infirmary" was reported for the first time in the first edition of the manual (Lubin, 1967).

Means and standard deviations on the lists of Set 2 of the

---

### Table 6

**Means and Standard Deviations for Psychiatric Patient Samples**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sex</th>
<th>Status</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination of three psychiatric patient samples</td>
<td>M</td>
<td>Depressed</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>15.76</td>
<td>14.33</td>
<td>14.95</td>
<td>13.90</td>
<td>15.58</td>
<td>14.39</td>
<td>15.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.D.</td>
<td>4.81</td>
<td>5.85</td>
<td>5.27</td>
<td>5.13</td>
<td>6.24</td>
<td>5.70</td>
<td>5.99</td>
</tr>
<tr>
<td>Non-depressed</td>
<td>F</td>
<td>Depressed</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>10.40</td>
<td>9.88</td>
<td>10.81</td>
<td>9.66</td>
<td>11.30</td>
<td>11.09</td>
<td>11.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.D.</td>
<td>5.37</td>
<td>5.77</td>
<td>5.67</td>
<td>4.47</td>
<td>6.09</td>
<td>5.43</td>
<td>5.99</td>
</tr>
<tr>
<td>F</td>
<td>Depressed</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>16.03</td>
<td>14.55</td>
<td>15.71</td>
<td>14.95</td>
<td>20.39</td>
<td>18.35</td>
<td>18.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.D.</td>
<td>5.68</td>
<td>5.74</td>
<td>6.00</td>
<td>5.44</td>
<td>6.07</td>
<td>6.23</td>
<td>6.65</td>
</tr>
<tr>
<td>Non-depressed</td>
<td>F</td>
<td>Depressed</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.D.</td>
<td>6.03</td>
<td>6.11</td>
<td>6.00</td>
<td>5.35</td>
<td>6.34</td>
<td>5.58</td>
<td>5.95</td>
</tr>
<tr>
<td>Royal Victoria Infirmary</td>
<td>F</td>
<td>Depressed</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>16.14</td>
<td>15.31</td>
<td>15.25</td>
<td>14.43</td>
<td>18.93</td>
<td>17.07</td>
<td>18.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.D.</td>
<td>5.36</td>
<td>3.13</td>
<td>5.30</td>
<td>4.97</td>
<td>6.57</td>
<td>5.74</td>
<td>4.85</td>
</tr>
</tbody>
</table>
TABLE 7

DACL Means and Standard Deviations for Inpatient Samples At A Comprehensive Mental Health Center

<table>
<thead>
<tr>
<th>Diagnostic Category</th>
<th>N</th>
<th>M</th>
<th>S.D.</th>
<th>M</th>
<th>S.D.</th>
<th>M</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychoses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia: Paranoid</td>
<td>192</td>
<td>11.87</td>
<td>7.18</td>
<td>12.29</td>
<td>6.84</td>
<td>11.81</td>
<td>6.87</td>
</tr>
<tr>
<td>Acute Schizophrenic Episode</td>
<td>16</td>
<td>13.08</td>
<td>8.41</td>
<td>12.42</td>
<td>7.99</td>
<td>13.09</td>
<td>8.23</td>
</tr>
<tr>
<td>Schizoaffective Type</td>
<td>63</td>
<td>15.15</td>
<td>9.34</td>
<td>15.25</td>
<td>8.38</td>
<td>15.26</td>
<td>8.79</td>
</tr>
<tr>
<td>Chronic Undifferentiated</td>
<td>121</td>
<td>12.53</td>
<td>7.32</td>
<td>13.30</td>
<td>7.20</td>
<td>13.02</td>
<td>7.44</td>
</tr>
<tr>
<td>Affect Disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involuntary Melancholia</td>
<td>10</td>
<td>13.18</td>
<td>9.36</td>
<td>15.50</td>
<td>10.97</td>
<td>14.67</td>
<td>9.64</td>
</tr>
<tr>
<td>Manic-Depressive (Manic)</td>
<td>15</td>
<td>10.13</td>
<td>8.14</td>
<td>9.33</td>
<td>7.50</td>
<td>9.94</td>
<td>7.35</td>
</tr>
<tr>
<td>Psychotic Depressive Reaction</td>
<td>24</td>
<td>16.77</td>
<td>9.27</td>
<td>15.21</td>
<td>8.25</td>
<td>16.29</td>
<td>8.38</td>
</tr>
<tr>
<td>Neuroses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hysteria</td>
<td>10</td>
<td>11.80</td>
<td>6.30</td>
<td>11.60</td>
<td>5.93</td>
<td>12.22</td>
<td>6.38</td>
</tr>
<tr>
<td>Depressive Reaction</td>
<td>230</td>
<td>15.22</td>
<td>8.09</td>
<td>15.27</td>
<td>7.57</td>
<td>15.33</td>
<td>8.25</td>
</tr>
<tr>
<td>Personality Disorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hysteroid</td>
<td>15</td>
<td>15.40</td>
<td>8.22</td>
<td>14.57</td>
<td>7.99</td>
<td>15.64</td>
<td>7.19</td>
</tr>
<tr>
<td>Anti-Social</td>
<td>12</td>
<td>15.45</td>
<td>8.36</td>
<td>16.27</td>
<td>8.87</td>
<td>15.09</td>
<td>9.20</td>
</tr>
<tr>
<td>Passive-Aggressive</td>
<td>34</td>
<td>16.00</td>
<td>9.00</td>
<td>16.30</td>
<td>8.35</td>
<td>17.15</td>
<td>8.02</td>
</tr>
<tr>
<td>Alcoholism</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Episodic Excessive Drinking</td>
<td>22</td>
<td>14.62</td>
<td>8.11</td>
<td>14.67</td>
<td>7.88</td>
<td>13.91</td>
<td>7.50</td>
</tr>
<tr>
<td>Habitual Excessive Drinking</td>
<td>48</td>
<td>14.61</td>
<td>9.73</td>
<td>15.02</td>
<td>8.92</td>
<td>15.48</td>
<td>9.44</td>
</tr>
<tr>
<td>Alcoholic Addiction</td>
<td>18</td>
<td>13.11</td>
<td>8.46</td>
<td>14.59</td>
<td>8.08</td>
<td>14.17</td>
<td>7.50</td>
</tr>
<tr>
<td>Drug Dependence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opium Alkaloids and their Derivatives</td>
<td>15</td>
<td>10.50</td>
<td>3.94</td>
<td>10.60</td>
<td>3.06</td>
<td>11.00</td>
<td>4.92</td>
</tr>
<tr>
<td>Transient Situational Disturbance</td>
<td>13</td>
<td>12.62</td>
<td>5.97</td>
<td>13.15</td>
<td>5.96</td>
<td>13.92</td>
<td>5.53</td>
</tr>
</tbody>
</table>

TABLE 8

Means and Standard Deviations for the DACL (Form E), by Psychiatrists' Global Ratings of Depression (N = 309)

<table>
<thead>
<tr>
<th>Psychiatrists' Global Ratings</th>
<th>Subjects</th>
<th>DACL (E)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>0</td>
<td>203</td>
<td>66</td>
<td>5.32</td>
<td>3.06</td>
</tr>
<tr>
<td>1</td>
<td>75</td>
<td>24</td>
<td>6.69</td>
<td>4.01</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>8</td>
<td>8.13</td>
<td>4.77</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>2</td>
<td>13.86</td>
<td>7.04</td>
</tr>
<tr>
<td>44</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All subjects</td>
<td>6.06*</td>
<td>3.89</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*F = 16.31, df = 3,305, p<.001 (one-way analysis of variance).

DACL for a number of diagnosed psychiatric inpatients can be found in Table 7. Inspection of this Table reveals considerable overlap in DACL mean scores among categories. Psychotic Depression and Neurotic Depressive Reaction are at one end and Manic-Depressive (Manic) and Drug Dependence (Opium, Opium Alkaloids and their Derivatives) are at the other end of the dimension of depressed mood.

Also of interest, in terms of norms for the DACL, are data provided in Table 8. Means and standard deviations for normals rated at different levels of depression are presented (Christenfeld, Lubin & Satin, 1978). In this study, staff of a mental hospital from lowest to highest ranks volunteered to complete instruments and be interviewed by two psychiatrists. Differentiation among the levels of rated depression by DACL score was significant beyond the .01 level.

Standard score equivalents for the seven lists of the DACL for each sex separately can be seen in Tables 9 and 10. These standard score equivalents are based upon the Student sample (Table 5).
Table 11 presents information about the reading level of the seven lists as indicated by their Thorndike-Lorge counts (1944). The column, “Number of Words Above Grade 8” is an over-estimate as all words which were not listed in the Thorndike-Lorge count were included in this column together with words listed at the ninth, tenth, and eleventh grade levels. The likelihood of overestimation easily can be seen by the fate of the word “lousy.” This word appears very infrequently in printed literature and because it does not appear in Thorndike-Lorge has been assigned the 13th grade level. Most grade school children, however, know and can read this word.

The relatively low median grade level of the lists and the inflation of the column, “Number of Words Above Grade 8”
suggest that the lists can be considered to be at or below the eighth grade reading level.

**RELIABILITIES**

**INTERNAL CONSISTENCY**

The internal consistency of each of the seven Depression Adjective Check Lists is presented in Table 12. The internal consistency index was computed from a two-way analysis of variance in keeping with the method suggested by Winer (1962, pp. 127-131).

**ALTERNATE FORM**

Alternate form reliability is presented in terms of intercorrelations of the seven lists. Coefficients range from .83 to .92 for males and .80 to .93 for females. These data are presented in the next section under “Intercorrelation of the Check Lists.”

**SPLIT-HALF RELIABILITY**

Each list of Set 1 (A, B, C, and D) contained 22 positive adjectives and ten negative adjectives. Each of these lists was printed in two columns, each of which contained 11 positive and five negative adjectives. Each list of Set 2 (E, F, and G) contained 22 positive adjectives and 12 negative adjectives. Each list of Set 2 was printed in two columns, each of which contained 11 positive and six negative adjectives. Each list of Set 2 (E, F, and G) was presented in all possible orders to another group of normal males (N = 156) and normal females (N = 132). Table 13 presents the split-half reliabilities for each of the seven lists for each sex individually and for both sexes combined. The reliabilities for lists E, F, and G are slightly lower than those for A, B, C, and D for the normals. Overall, the reliabilities range between .82 and .93 for normals, and between .86 and .93 for patients. For the normal groups there is a consistent tendency for reliabilities to be higher for the sex on which the original item-analysis was conducted, e.g., females are higher on lists A, B, C, and D and males higher on E, F, and G. The same tendency can be seen in the patient group for lists A, B, C, and D, but there is a reversal of the trend for lists E, F, and G. For the patient groups, females have higher reliabilities on all lists.

**CORRELATIONS AMONG THE COMPONENT SCORES**

As mentioned on page 6 total score on the DACL consists of the sum of the positive score and the negative score. Correlations among these part scores is displayed in Table 14.

**TABLE 14**

**Correlations Between Component Scores For Forms E, F, and G of the DACL (N = 172)**

<table>
<thead>
<tr>
<th></th>
<th>DACL</th>
<th>$E_p$</th>
<th>$F_p$</th>
<th>$G_p$</th>
<th>$E_N$</th>
<th>$F_N$</th>
<th>$G_N$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.75**</td>
<td>.78**</td>
<td>.41**</td>
<td>.37**</td>
<td>.33**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>.77**</td>
<td>.75**</td>
<td>.36**</td>
<td>.32**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>.78**</td>
<td>.39**</td>
<td>.40**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>.82**</td>
<td>.83**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*$E_p$ = Positive Score (Positive Indicator of Depression)

*$E_N$ = Negative Score (Negative Indicator of Depression)

**TEST-RETEST RELIABILITY**

An instrument that purports to measure state depression should not show a high level of test-retest reliability as it should be sensitive to mood fluctuations. For a sample of 75 subjects, correlations of .19 for form E, .24 for form F, and .22 for form G were found on retest after a one week interval (Lubin & Himelstein, 1976).

**EQUIVALENCE OF LISTS**

**INTERCORRELATION OF THE CHECK LISTS**

All seven lists were stapled together in scrambled order and administered to a new group of male normals (N = 51) and a new group of female normals (N = 35). Table 15 presents the matrix of intercorrelations among the seven lists for each sex separately and for the combined group. The smallest correlation between any two lists for males is .83, for females is .80, and for the combined groups is .85. The highest correlation in
TABLE 15

Intercorrelations Among Seven Lists for Male Normals, Female Normals, and for Combined Male and Female Normals

<table>
<thead>
<tr>
<th>List</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.88</td>
<td>.86</td>
<td>.88</td>
<td>.80</td>
<td>.84</td>
<td>.88</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>.91</td>
<td>.88</td>
<td>.90</td>
<td>.89</td>
<td>.88</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>.85</td>
<td>.89</td>
<td>.91</td>
<td>.90</td>
<td>.90</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>.91</td>
<td>.92</td>
<td>.89</td>
<td>.88</td>
<td>.87</td>
<td>.93</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>.88</td>
<td>.92</td>
<td>.88</td>
<td>.92</td>
<td>.89</td>
<td>.88</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>.86</td>
<td>.88</td>
<td>.83</td>
<td>.89</td>
<td>.89</td>
<td>.82</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>.90</td>
<td>.91</td>
<td>.86</td>
<td>.92</td>
<td>.86</td>
<td>.88</td>
<td></td>
</tr>
</tbody>
</table>

A matrix (.93) occurs between lists D and G for female correlations are significant beyond the .01 level.

It is important to note that actual independence of lists (number of overlapping items) exists only among lists A, B, C, and D (set 1) and among lists E, F, and G (set 2). Despite the overlapping items, however, it is interesting to find that the average intercorrelation of A, B, C, D, with E, F, and G (.88) is almost identical to the average intercorrelation of A, B, C, D (.87) and E, F, G (.87). Correlations in brackets for E, F, and G are from an independent replication (Lubin & Himelstein, 1976).

The correlations in Table 15 were transformed to z scores and the relationship between z scores and number of overlapping items among the seven lists was plotted. Visual inspection indicated no relationship.

COMPARABILITY OF SCORES

All four lists of set 1 were administered in scrambled order to 135 normal females. None of the six paired-comparison t tests was significant.

Set 2, (lists E, F, and G) of the DACL was administered to 74 Ss who participated in a one week sensitivity training conference. Set 2 was administered just prior to the onset of the conference, at the end of the second small group meeting, and at the end of the conference (Lubin, et al, 1967). The summary of the analysis of variance can be seen in Table 16. No significant differences among the three lists on any of the three occasions were found. In addition, a three way analysis of variance showed no significant list-by-occasion interaction.

In another study (Lubin, Caplan & Collins, 1980)-additional evidence for the comparability of set 2 is presented. Forms E, F, and G intercorrelated significantly at the .01 level when subjects completed the DACL either as they actually felt or when asked to "fake good," "fake bad," or to create "an impression of a 'average' person."

These findings together with the high intercorrelations among the lists of set 1 and set 2 presented in Table 15 indicate that the lists within set 1 and those within set 2 can be considered to be parallel forms.

TABLE 16

Comparability of Set 2 of the Depression Adjective Check Lists (E, F, and G) at Three Test Periods (N = 74)

<table>
<thead>
<tr>
<th>Testing Session</th>
<th>Source of Variation</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Subjects</td>
<td>73</td>
<td>70.69</td>
<td>2.06</td>
</tr>
<tr>
<td></td>
<td>List</td>
<td>2</td>
<td>6.58</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>146</td>
<td>3.20</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>Subjects</td>
<td>73</td>
<td>162.25</td>
<td>1.17</td>
</tr>
<tr>
<td></td>
<td>List</td>
<td>2</td>
<td>4.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>146</td>
<td>4.09</td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>Subjects</td>
<td>73</td>
<td>104.04</td>
<td>2.93</td>
</tr>
<tr>
<td></td>
<td>List</td>
<td>2</td>
<td>7.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>146</td>
<td>2.43</td>
<td></td>
</tr>
</tbody>
</table>

VALIDITY

CROSS VALIDATION

The lists were administered to new groups of normals, rated nondepressed and depressed psychiatric patients of both sexes. In scrambled order, S completed either set 1 (A, B, C, and D) or set 2 (E, F, and G). Age and education characteristics of the new groups of normals, nondepressed patients and depressed patients can be seen in Table 17.

TABLE 17

Age and Education Characteristics of Groups Used in Crossvalidation of The Depression Adjective Check Lists

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>Normals</th>
<th>Mean</th>
<th>SD</th>
<th>Nondepressed Patients</th>
<th>Mean</th>
<th>SD</th>
<th>Depressed Patients</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>M</td>
<td>156</td>
<td>24.23</td>
<td>8.55</td>
<td>56</td>
<td>32.59</td>
<td>10.27</td>
<td>28</td>
<td>35.96</td>
<td>13.02</td>
</tr>
<tr>
<td>F</td>
<td>469</td>
<td>22.77</td>
<td>8.20</td>
<td>118</td>
<td>32.71</td>
<td>11.80</td>
<td>100</td>
<td>31.27</td>
<td>10.37</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>M</td>
<td>156</td>
<td>13.13</td>
<td>2.38</td>
<td>56</td>
<td>12.38</td>
<td>2.90</td>
<td>28</td>
<td>11.68</td>
<td>3.58</td>
</tr>
<tr>
<td>F</td>
<td>469</td>
<td>12.76</td>
<td>1.99</td>
<td>118</td>
<td>11.82</td>
<td>2.71</td>
<td>100</td>
<td>11.02</td>
<td>2.09</td>
<td></td>
</tr>
</tbody>
</table>
Depressed patients are presented in Table 17. Subjects were from essentially the same sources as those in the item analyses. Inspection of Table 17 indicates an ascending order for age in the groups (normals, nondepressed patients and depressed patients) and a descending order in regard to education for the same groups.

Analyses of variance in the 2 by 3 table (sex by group) were computed for each of the seven lists by the method of weighted squares of means” (Steel & Torrie, 1960). Summaries of the analyses of variance for Set 1 and Set 2 are presented in Tables 18 and 19.

Table 20 presents the means of the seven lists for each sex and group. It can be seen that the significant sex differences on Set 2 (Table 20) were due primarily to the patient groups. Female patients consistently show higher means. These results tend to confirm the clinical observation that female psychiatric patients are more free in expressing depressive complaints. The tendency for normal males to score higher on Set 1 than female normals is nonsignificant. For normals, only list D revealed a significant sex difference.

**CONCURRENT VALIDITY**

Correlations between the DACL and other indicators are presented in the following order: correlations with another self-report adjective checklist, with a state measure of depression, with another state self-report measure of depression, with subjects' ratings of depressed mood, with judges' ratings of depression or depressed mood, with trait measures of depression, and then with mood-related measures.

**A self-report adjective check list measure of depressed mood**. Correlations between the seven lists and the MAACL Depression (D) Scale (Zuckerman & Lubin, 1965) for the two sexes separately and for the combined group can be seen in Table 21. The DACL was scored only for items which did not overlap with the D scale of the MAACL. All correlations are significant at well beyond the .01 level.

**A state measure of depression**. For a sample of 180 college students (90 males and 90 females), the DACL correlated .68 (p<.01) with the College Inventory of Depression, a state measure constructed from self-referent depressive statements (Lubin, Nathan & Nathan, in press).

**Self-ratings of depression**. As part of a larger study to be reported later, 73 patients, 39 males and 34 females, completed DACL form A and rated themselves on a 9 point scale of depressive affect (Fogel et al., 1966). Patients' self-rating of depression correlated .95 with total DACL score, .92 with positive DACL score, and .51 with negative DACL score. All correlations are corrected and are significant at the .01 level.

Ross (1979) administered DACL form E and a 13 point self-rating scale of depression to subjects categorized as depressed (N = 13) or nondepressed (N = 33). The correlation between DACL score and self-rating of mood was .89 for depressed subjects and .60 for non-depressed subjects. Both correlations were significant at the .01 level.
TABLE 21
Correlations Between the Seven Depression Adjective Check Lists and the MAACL-D Scale for Normal Subjects

<table>
<thead>
<tr>
<th>List</th>
<th>Males (N = 56)</th>
<th>Females (N = 89)</th>
<th>Combined (N = 145)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.79</td>
<td>.80</td>
<td>.80</td>
</tr>
<tr>
<td>B</td>
<td>.82</td>
<td>.87</td>
<td>.85</td>
</tr>
<tr>
<td>C</td>
<td>.79</td>
<td>.74</td>
<td>.76</td>
</tr>
<tr>
<td>D</td>
<td>.76</td>
<td>.79</td>
<td>.78</td>
</tr>
<tr>
<td>E</td>
<td>.77</td>
<td>.80</td>
<td>.79</td>
</tr>
<tr>
<td>F</td>
<td>.86</td>
<td>.84</td>
<td>.85</td>
</tr>
<tr>
<td>G</td>
<td>.84</td>
<td>.82</td>
<td>.83</td>
</tr>
</tbody>
</table>

1 Non-overlapping items
2 All correlations are significant at well beyond the .01 level.

In another study, (Lubin, 1967), correlations between patients' self-ratings of depressed mood (N = 82) and lists of Set 2 (E, F, and G) were of lower magnitude (.50, .53, and .48 respectively), but were significant at the .01 level.

Judges' ratings of depression. In the study mentioned previously (Fogel et al., 1966), each S was interviewed and rated by an experienced psychiatrist (Judge 1) and the interviews were observed and rated by two third-year psychiatric residents (Judges 2 and 3). The three psychiatrists rated each patient at the end of the interviews on a 9-point scale of depressive affect.

Judge 1's ratings (experienced psychiatrist) correlated .71 with total DACL score. .60 with positive DACL score and .51 with negative DACL score. Pooled ratings of Judges 2 and 3 correlated .59 with total DACL score, .45 with positive DACL score, and .52 with negative DACL score.

Trait measures of depression. Three of the more frequently employed trait measures of depression are the Beck Depression Inventory (BDI, Beck, et al., 1961) the Self-Rating Depression Scale (SDS, Zung, 1965), and Depression Scale of the Minnesota Multiphasic Personality Inventory (MMPI-D Scale, Hathaway & McKinley, 1951). The DACL has been correlated with each of these instruments.

In an earlier study, (Lubin, 1965) correlations between Set 1 (A, B, C, D) of the DACL and the BDI and the SDS were reported for 36 female psychiatric patients. These can be seen in Table 22. All correlations except between list A and SDS are significant at or beyond the .05 level.

TABLE 22
Correlations Between Set 1 of the DACL and the Beck Inventory of Depression, The Zung Depression Scale and a Global Rating of Depression for Female Psychiatric Patients (N = 36)

<table>
<thead>
<tr>
<th>List</th>
<th>Beck Inventory of Depression</th>
<th>Zung Depression Scale</th>
<th>Global Rating of Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.38*</td>
<td>.27</td>
<td>.36*</td>
</tr>
<tr>
<td>B</td>
<td>.47**</td>
<td>.38*</td>
<td>.38*</td>
</tr>
<tr>
<td>C</td>
<td>.50**</td>
<td>.32*</td>
<td>.35*</td>
</tr>
<tr>
<td>D</td>
<td>.49**</td>
<td>.34*</td>
<td>.32*</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.  
**Significant at the .01 level.

TABLE 23
Correlations Between DACL Forms A, B, C and D And the Items of the Beck Depression Inventory (BDI) (N = 120)

<table>
<thead>
<tr>
<th>Symptom-Attitude Categories</th>
<th>BDI Item Number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressed mood</td>
<td>1</td>
<td>.62**</td>
<td>.56**</td>
<td>.49**</td>
<td>.54**</td>
</tr>
<tr>
<td>Pessimism</td>
<td>2</td>
<td>.64**</td>
<td>.59**</td>
<td>.61**</td>
<td>.64**</td>
</tr>
<tr>
<td>Sense of failure</td>
<td>3</td>
<td>.61**</td>
<td>.55**</td>
<td>.63**</td>
<td>.57**</td>
</tr>
<tr>
<td>Lack of satisfaction</td>
<td>4</td>
<td>.61**</td>
<td>.57**</td>
<td>.56**</td>
<td>.50**</td>
</tr>
<tr>
<td>Guilt feelings</td>
<td>5</td>
<td>.55**</td>
<td>.49**</td>
<td>.41**</td>
<td>.45**</td>
</tr>
<tr>
<td>Sense of punishment</td>
<td>6</td>
<td>.40**</td>
<td>.30**</td>
<td>.39**</td>
<td>.34**</td>
</tr>
<tr>
<td>Self hate</td>
<td>7</td>
<td>.40**</td>
<td>.30**</td>
<td>.32**</td>
<td>.34**</td>
</tr>
<tr>
<td>Self accusations</td>
<td>8</td>
<td>.46**</td>
<td>.38**</td>
<td>.36**</td>
<td>.36**</td>
</tr>
<tr>
<td>Self-punitive wishes</td>
<td>9</td>
<td>.43**</td>
<td>.38**</td>
<td>.32**</td>
<td>.33**</td>
</tr>
<tr>
<td>Crying spells</td>
<td>10</td>
<td>.23**</td>
<td>.21**</td>
<td>.15</td>
<td>.08</td>
</tr>
<tr>
<td>Irritability</td>
<td>11</td>
<td>.27**</td>
<td>.22**</td>
<td>.17</td>
<td>.17</td>
</tr>
<tr>
<td>Social withdrawal</td>
<td>12</td>
<td>.45**</td>
<td>.43**</td>
<td>.41**</td>
<td>.42**</td>
</tr>
<tr>
<td>Indecisiveness</td>
<td>13</td>
<td>.47**</td>
<td>.44**</td>
<td>.41**</td>
<td>.39**</td>
</tr>
<tr>
<td>Body image</td>
<td>14</td>
<td>.35**</td>
<td>.27**</td>
<td>.28**</td>
<td>.30**</td>
</tr>
<tr>
<td>Work inhibition</td>
<td>15</td>
<td>.63**</td>
<td>.56**</td>
<td>.57**</td>
<td>.57**</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>16</td>
<td>.21</td>
<td>.13</td>
<td>.18</td>
<td>.23**</td>
</tr>
<tr>
<td>Fatigability</td>
<td>17</td>
<td>.30**</td>
<td>.27**</td>
<td>.27**</td>
<td>.33**</td>
</tr>
<tr>
<td>Loss of appetite</td>
<td>18</td>
<td>.25**</td>
<td>.12</td>
<td>.10</td>
<td>.17</td>
</tr>
<tr>
<td>Weight loss</td>
<td>19</td>
<td>.02</td>
<td>.04</td>
<td>.11</td>
<td>.12</td>
</tr>
<tr>
<td>Somatic preoccupation</td>
<td>20</td>
<td>.34**</td>
<td>.27**</td>
<td>.27**</td>
<td>.32**</td>
</tr>
<tr>
<td>Loss of libido</td>
<td>21</td>
<td>.22</td>
<td>.24**</td>
<td>.19</td>
<td>.23**</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.  
**Significant at the .01 level.

*Correlations among the DACL lists are .81 or greater.
Correlations Between DACL Forms A, B, C and D
And the Items of the Self-Rating Depression Scale (SDS)

(N = 120)

<table>
<thead>
<tr>
<th>Symptoms of Depressive Disorder</th>
<th>SDS Item Number</th>
<th>DACL A</th>
<th>DACL B</th>
<th>DACL C</th>
<th>DACL D</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Pervasive Affective Disturbance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Depressed, sad, low, blue</td>
<td>1</td>
<td>.54**</td>
<td>.55**</td>
<td>.53**</td>
<td>.54**</td>
</tr>
<tr>
<td>2. Tearful</td>
<td>3</td>
<td>.26**</td>
<td>.30**</td>
<td>.25**</td>
<td>.32**</td>
</tr>
<tr>
<td>II. Physiological Disturbances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Diurnal symptom variation</td>
<td>2</td>
<td>.06</td>
<td>.04</td>
<td>.07</td>
<td>.09</td>
</tr>
<tr>
<td>2. Sleep disturbance</td>
<td>4</td>
<td>.21*</td>
<td>.19*</td>
<td>.22*</td>
<td>.23**</td>
</tr>
<tr>
<td>3. Appetite decrease</td>
<td>5</td>
<td>.01</td>
<td>.01</td>
<td>.04</td>
<td>.04</td>
</tr>
<tr>
<td>4. Decreased libido</td>
<td>6</td>
<td>.17</td>
<td>.16</td>
<td>.16</td>
<td>.14</td>
</tr>
<tr>
<td>5. Weight loss</td>
<td>7</td>
<td>.11</td>
<td>.11</td>
<td>.12</td>
<td>.11</td>
</tr>
<tr>
<td>6. Constipation</td>
<td>8</td>
<td>.11</td>
<td>.06</td>
<td>.07</td>
<td>.09</td>
</tr>
<tr>
<td>7. Tachycardia</td>
<td>9</td>
<td>.23**</td>
<td>.24**</td>
<td>.26**</td>
<td>.24**</td>
</tr>
<tr>
<td>8. Increased fatigue</td>
<td>10</td>
<td>.32**</td>
<td>.35**</td>
<td>.24**</td>
<td>.33**</td>
</tr>
<tr>
<td>III. Psychomotor Disturbances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Retardation</td>
<td>12</td>
<td>.36**</td>
<td>.39**</td>
<td>.37**</td>
<td>.42**</td>
</tr>
<tr>
<td>IV. Psychological Disturbances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Confusion</td>
<td>11</td>
<td>.46**</td>
<td>.49**</td>
<td>.49**</td>
<td>.52**</td>
</tr>
<tr>
<td>2. Hopelessness</td>
<td>14</td>
<td>.37**</td>
<td>.41**</td>
<td>.42**</td>
<td>.40**</td>
</tr>
<tr>
<td>3. Irritability</td>
<td>15</td>
<td>.38**</td>
<td>.39**</td>
<td>.29**</td>
<td>.34**</td>
</tr>
<tr>
<td>4. Indecisiveness</td>
<td>16</td>
<td>.29**</td>
<td>.32**</td>
<td>.35**</td>
<td>.38**</td>
</tr>
<tr>
<td>5. Personal devaluation</td>
<td>17</td>
<td>.41**</td>
<td>.41**</td>
<td>.39**</td>
<td>.35**</td>
</tr>
<tr>
<td>6. Emptiness</td>
<td>18</td>
<td>.52**</td>
<td>.58**</td>
<td>.52**</td>
<td>.51**</td>
</tr>
<tr>
<td>7. Suicidal rumination</td>
<td>19</td>
<td>.28**</td>
<td>.39**</td>
<td>.35**</td>
<td>.39**</td>
</tr>
<tr>
<td>8. Dissatisfaction</td>
<td>20</td>
<td>.35**</td>
<td>.34**</td>
<td>.31**</td>
<td>.30**</td>
</tr>
</tbody>
</table>

*Significant at the .05 level
**Significant at the .01 level

*Correlations among the DACL lists are .81 or greater.

Preliminary to conducting a factor analysis of the DACL, the BDI and the SDS, Giambra (1978) intercorrelated the three instruments. Correlations between DACL A, B, C, and D and the individual items of the BDI are shown in Table 23, whereas correlations between these four forms of the DACL and the individual items of the SDS are provided in Table 24. More of the correlations between the DACL and items of the BDI are significant than between the DACL and the SDS, possibly because the BDI contains proportionately more "psychological" and fewer "physiological" type items. Table 23 shows that 72 of 84 correlations are significant, whereas Table 24 reveals 57 of 80 correlations on the SDS are significant. For both the BDI and the SDS correlations with the DACL are higher for psychological items and lower for physiological items.

Further data on correlations between the DACL and the part scores of the SDS can be seen in Table 25 (Marone &

---

### Table 25

Relationships Between the DACL (Set 2) and the Self-Rating Depression Schedule (SDS)

<table>
<thead>
<tr>
<th>Sample</th>
<th>DACL</th>
<th>Total ZDS</th>
<th>Physiological Equivalent (ZDS)</th>
<th>Pervasive Affect (ZDS)</th>
<th>Psychological Equivalent (ZDS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission, Wards</td>
<td>E</td>
<td>.53**</td>
<td>.43**</td>
<td>.47**</td>
<td>.47**</td>
</tr>
<tr>
<td>(N = 51)</td>
<td>F</td>
<td>.60**</td>
<td>.41**</td>
<td>.51**</td>
<td>.57**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>.59**</td>
<td>.41**</td>
<td>.50**</td>
<td>.56**</td>
</tr>
<tr>
<td>Intensive Treatment, Wards</td>
<td>E</td>
<td>.63**</td>
<td>.51**</td>
<td>.65**</td>
<td>.54**</td>
</tr>
<tr>
<td>(N = 54)</td>
<td>F</td>
<td>.64**</td>
<td>.41**</td>
<td>.66**</td>
<td>.60**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>.54**</td>
<td>.33**</td>
<td>.55**</td>
<td>.50**</td>
</tr>
<tr>
<td>Student Nurses</td>
<td>E</td>
<td>.58**</td>
<td>.43**</td>
<td>.23</td>
<td>.55**</td>
</tr>
<tr>
<td>(N = 47)</td>
<td>F</td>
<td>.51**</td>
<td>.30**</td>
<td>.19</td>
<td>.52**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>.57**</td>
<td>.37**</td>
<td>.17</td>
<td>.57**</td>
</tr>
</tbody>
</table>

**Significant at the .01 level
In the earlier edition of this manual (Lubin, 1967), the results of a correlational study between Set 2 of the DACL and the clinical scales of the MMPI for 80 psychiatric patients were presented. They are shown again in Table 26. Correlations between the three lists and the clinical scales are positive and significant in all cases except for Pd and Ma for all three lists, and for list G in connection with Mf.

These findings were replicated in a larger study in which a total of 1,080 psychiatric inpatients (328 males and 752 females) were tested. Table 26 presents the correlations between each list of Set 2 (E, F, and G) and the clinical scales of the MMPI for both samples. Correlations from the replication are placed to the right of each diagonal. Due partly to the large N involved in the replication, all correlations are significant at the .01 level.

Table 27 shows the relationship between form E of the DACL and the Self-Anchoring Striving Scale (Cantril, 1965), and the Bradburn Happiness Scale (Bradburn, 1969), for a normal and a psychiatric patient sample.

Table 28 presents correlations between form E of the DACL and additional mood related measures.

**Significant at the .01 level.

---

**Table 26**

<table>
<thead>
<tr>
<th>List</th>
<th>Hs</th>
<th>D</th>
<th>Hy</th>
<th>Pd</th>
<th>Mf</th>
<th>Pa</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>.46**/.44**</td>
<td>.57**/.60**</td>
<td>.31**/.40**</td>
<td>.19/.27**</td>
<td>.25*/.18**</td>
<td>.33**/.38**</td>
</tr>
<tr>
<td>F</td>
<td>.41***/.46**</td>
<td>.55***/.59**</td>
<td>.31***/.39**</td>
<td>.16/.24**</td>
<td>.26*/.21**</td>
<td>.30***/.43**</td>
</tr>
<tr>
<td>G</td>
<td>.35***/.46**</td>
<td>.54***/.58**</td>
<td>.23***/.40**</td>
<td>.18/.28**</td>
<td>.16/.08**</td>
<td>.29***/.37**</td>
</tr>
</tbody>
</table>

---

**Table 27**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Scale/BDI</th>
<th>BDI</th>
<th>GCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient (N = 68)</td>
<td>DACL</td>
<td>.73**</td>
<td>.73**</td>
</tr>
<tr>
<td>Outpatient (N = 63)</td>
<td></td>
<td>.67**</td>
<td>.78**</td>
</tr>
<tr>
<td>Normal (N = 88)</td>
<td></td>
<td>.42**</td>
<td>.56**</td>
</tr>
</tbody>
</table>

---

**Table 28**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Normals (N = 48)</th>
<th>Psychiatric Patients (N = 387)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-anchoring Striving Scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>.61**</td>
<td>.45**</td>
</tr>
<tr>
<td>Past</td>
<td>.19</td>
<td>.10</td>
</tr>
<tr>
<td>Future</td>
<td>.05</td>
<td>.16**</td>
</tr>
<tr>
<td>Bradburn Scale</td>
<td>-.37**</td>
<td>-.47**</td>
</tr>
</tbody>
</table>

---

*(a) (Lubin, Roth, Dean & Hornstra, 1978) *(b) (Lubin, Hornstra & Dean, 1978)
TABLE 29
Correlations Between DACL Form E and Additional Mood Related Measures

<table>
<thead>
<tr>
<th>Scale</th>
<th>Normals† (N = 48)</th>
<th>Psychiatric Patients§ (N = 387)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center for Epidemiologic Studies Depression Scale</td>
<td>.77**</td>
<td></td>
</tr>
<tr>
<td>Self Esteem Scale</td>
<td>.54**</td>
<td></td>
</tr>
<tr>
<td>Index of Uncontrolled Drinking</td>
<td>.53**</td>
<td></td>
</tr>
<tr>
<td>Schizophrenia Scale</td>
<td>.53**</td>
<td></td>
</tr>
<tr>
<td>Anxiety Scale</td>
<td>.49**</td>
<td></td>
</tr>
<tr>
<td>Mental Health Status</td>
<td>.42**</td>
<td></td>
</tr>
<tr>
<td>Katz Adjustment Scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1 (Symptoms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2 (Level of Performance of Socially Expected Activities)</td>
<td>-.24**</td>
<td></td>
</tr>
<tr>
<td>S4 (Level of Free Time Activities)</td>
<td>-.27**</td>
<td></td>
</tr>
<tr>
<td>S5 (Level of Satisfaction with Free Time Activities)</td>
<td>.15**</td>
<td></td>
</tr>
<tr>
<td>Experienced Control Scales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(From Internal)</td>
<td>.18**</td>
<td></td>
</tr>
<tr>
<td>(From External)</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>(Over Internal)</td>
<td>-.29**</td>
<td></td>
</tr>
<tr>
<td>(Over External)</td>
<td>-.26**</td>
<td></td>
</tr>
<tr>
<td>Twenty Statements Problem (<em>Who Am I?</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>-.17**</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>.13**</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress Scale</td>
<td>.22**</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level
**Significant at the .01 level
†(Lubin, Roth, Dean & Hornstra, 1978)
§(Lubin, Hornstra & Dean, 1978)

Eighty-two hospitalized psychiatric patients completed a self-rating scale of depressive mood, Set 2 of the DACL and received ratings of projective description of mood, neuroticism, and psychoticism based upon their performance on several psychological tests. (The correlations between the DACL and the self-rating scale were presented on page 13). These relationships can be found in Table 30.

As can be seen in Table 30, all correlations between the three lists and Projective Description of Mood (the latter was scored in the reverse direction) are significant. Neuroticism, and Psychoticism are significant except for the relationship between Psychoticism and list E.

The same group of hospitalized patients also completed the Interpersonal Check List (LaForge & Suczek, 1955). The correlations are shown in Table 31.

All correlations between the lists of Set 2 and Self for Dominance and Love Scales of the Interpersonal Check List are significant and in a negative direction. All correlations between the lists of Set 2, except list G, and Self-Ideal discrepancy on the Dominance and Love Scales of the Interpersonal Check List are significant and in a positive direction. These findings are expected, for higher levels of depressive mood should be associated with lower evaluation of self, and one would expect larger discrepancies between perceived self and ideal to be associated with high levels of depressive mood.

CONSTRUCT VALIDITY

FACTORS UNDERLYING THE DACL

Although there is high face validity for the existence of two factors in the DACL, until the study to be described, the actual number of independent components had not been determined.

Nine hundred and fifty-three Kansas City residents selected through probability sampling procedures received a personal interview. Eight hundred and eight of these subjects responded to a telephone reinterview one week later. The 17 adjectives in the left hand column of form E were completed on both occasions (Roth & Lubin, in press).
A factor analysis using the OSIRIS II software package was performed. A principal axis factor analysis was carried out with squared multiple correlations in the diagonals. The scree test indicated two factors which accounted for 34.7 percent of the total variance. The two identified factors were rotated to an oblique approximation of simple structure.

The first factor loads high on the 11 positive adjectives and might be called "Depressed Mood:" the second factor consists of the six negative adjectives. The latter may be called a factor of "Elevated Mood." The correlations between these factors in the primary pattern is .21. Table 32 presents the

TABLE 32
Biquartimin Solution for the Depression Adjective Checklist (N = 933)

<table>
<thead>
<tr>
<th>Item</th>
<th>Primary Structure</th>
<th>Primary Pattern</th>
<th>Mean</th>
<th>Initial Item Score</th>
<th>Initial Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Unhappy</td>
<td>.64</td>
<td>.63</td>
<td>.03</td>
<td>10</td>
<td>.30</td>
</tr>
<tr>
<td>83 Dispirited</td>
<td>.59</td>
<td>.58</td>
<td>.07</td>
<td>07</td>
<td>.25</td>
</tr>
<tr>
<td>81 Blue</td>
<td>.56</td>
<td>.56</td>
<td>.01</td>
<td>07</td>
<td>.26</td>
</tr>
<tr>
<td>82 Downcast</td>
<td>.59</td>
<td>.56</td>
<td>.12</td>
<td>08</td>
<td>.27</td>
</tr>
<tr>
<td>84 Distressed</td>
<td>.54</td>
<td>.51</td>
<td>.12</td>
<td>07</td>
<td>.26</td>
</tr>
<tr>
<td>87 Lost</td>
<td>.46</td>
<td>.47</td>
<td>.04</td>
<td>03</td>
<td>.16</td>
</tr>
<tr>
<td>90 Forlorn</td>
<td>.45</td>
<td>.45</td>
<td>.02</td>
<td>02</td>
<td>.14</td>
</tr>
<tr>
<td>86 Lonely</td>
<td>.41</td>
<td>.42</td>
<td>.04</td>
<td>.11</td>
<td>.32</td>
</tr>
<tr>
<td>88 Broken</td>
<td>.38</td>
<td>.39</td>
<td>.02</td>
<td>02</td>
<td>.15</td>
</tr>
<tr>
<td>89 Burdened</td>
<td>.41</td>
<td>.39</td>
<td>.08</td>
<td>.12</td>
<td>.33</td>
</tr>
<tr>
<td>85 Cheerless</td>
<td>.36</td>
<td>.34</td>
<td>.10</td>
<td>.07</td>
<td>.26</td>
</tr>
<tr>
<td>93 Free</td>
<td>.08</td>
<td>.03</td>
<td>.53</td>
<td>.48</td>
<td>.50</td>
</tr>
<tr>
<td>94 Good</td>
<td>.35</td>
<td>.24</td>
<td>.48</td>
<td>.33</td>
<td>.47</td>
</tr>
<tr>
<td>96 Peaceful</td>
<td>.23</td>
<td>.13</td>
<td>.49</td>
<td>.30</td>
<td>.46</td>
</tr>
<tr>
<td>91 Active</td>
<td>.18</td>
<td>.08</td>
<td>.47</td>
<td>.33</td>
<td>.47</td>
</tr>
<tr>
<td>92 Composed</td>
<td>.09</td>
<td>.01</td>
<td>.48</td>
<td>.57</td>
<td>.50</td>
</tr>
<tr>
<td>95 Vigorous</td>
<td>.10</td>
<td>.00</td>
<td>.47</td>
<td>.70</td>
<td>.46</td>
</tr>
</tbody>
</table>

primary factor pattern after rotation with Kaiser normalization, the primary factor structure, the correlations among the factors, and the means and standard deviations for the initial scores. Only loadings with an absolute value of .30 or more were considered salient.

The results of this analysis indicated that the positive adjectives and negative adjectives constitute two different dimensions rather than bipolar positions on a single dimension.

By means of transformation analysis, it was determined that the "depressed mood" and "elevated mood" factors were identical during both time periods (initial interview and one week later telephone interview). Internal consistancy reliability of each factor was determined by the Kuder-Richardson formula. KR-20 coefficients for the positive adjectives at time one was .74 and for negative adjectives it was .68. For time 2 the coefficients were respectively .82 and .68. The estimated correlation of the obtained DACL factors with the total score in time 1 was .86 for the positive adjectives and .82 for the negative adjectives. In time 2 the correlations were .91 and .82 respectively.

We can conclude from these analyses that the DACL factors show a high degree of reliability and validity.

Two additional factor analyses involving the DACL should be mentioned. Lubin, Bangert and Hornstra (1974) examined the factor structure of a series of instruments, including DACL form E, administered routinely to a cohort of applicants for service at a comprehensive mental health center. In addition to the DACL form E, 387 adults completed the Katz Social Adjustment Scales (Hogarty et al., 1967), the Bradburn Happiness Scale, (Brubard, 1969), the Self-anchoring Striving Scale (Cantril, 1969), the Experienced Control Scales (Tiffany, 1969), the Stress Index (Michaux et al., 1969), and the Twenty Statements Problem (Kuhn & McParland, 1954). For each patient, a relative completed suitable scales from the Katz Social Adjustment Scales.

Two principal components were extracted from the variable correlation matrix: (I) a general level of emotional-behavioral disturbance, and (II) depression. All variables loading at .50 and above on Factor I are measures completed by a family member about the patient, whereas all variables that load at .50 and above on Factor II (depression) are patient's self-report measures. Table 33 presents the factor loadings for each patient, relative completed suitable scales from the Katz Social Adjustment Scales.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factors I</th>
<th>Factors II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Katz Adjustment Scale, R1, General Psychopathy</td>
<td>91</td>
<td>-04</td>
</tr>
<tr>
<td>Helplessness</td>
<td>76</td>
<td>13</td>
</tr>
<tr>
<td>Suspicousness</td>
<td>75</td>
<td>-12</td>
</tr>
<tr>
<td>Bizarreness</td>
<td>75</td>
<td>-12</td>
</tr>
<tr>
<td>Negativism</td>
<td>75</td>
<td>07</td>
</tr>
<tr>
<td>Anxiety</td>
<td>73</td>
<td>02</td>
</tr>
<tr>
<td>Verbal Expressiveness</td>
<td>73</td>
<td>-19</td>
</tr>
<tr>
<td>Hyponatomy</td>
<td>71</td>
<td>01</td>
</tr>
<tr>
<td>Confusion</td>
<td>70</td>
<td>08</td>
</tr>
<tr>
<td>Belligerence</td>
<td>69</td>
<td>-13</td>
</tr>
<tr>
<td>Nervousness</td>
<td>64</td>
<td>12</td>
</tr>
<tr>
<td>Stability</td>
<td>59</td>
<td>-01</td>
</tr>
<tr>
<td>Discrepancy Scale, R3-R2</td>
<td>59</td>
<td>-00</td>
</tr>
<tr>
<td>Level of Expectation of Performance of Socially Expected Activities Minus Level of Performance of Socially Expected Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Katz Adjustment Scale, RS5</td>
<td>57</td>
<td>08</td>
</tr>
<tr>
<td>Level of Satisfaction with Free-time Activities</td>
<td>56</td>
<td>-02</td>
</tr>
<tr>
<td>Katz Adjustment Scale, R2</td>
<td>56</td>
<td>-02</td>
</tr>
<tr>
<td>Level of Performance of Socially Expected Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DACL, Total Score</td>
<td>-00</td>
<td>81</td>
</tr>
<tr>
<td>Self-anchoring Striving Scale, Present Score</td>
<td>05</td>
<td>-71</td>
</tr>
<tr>
<td>DACL, Positive Score</td>
<td>02</td>
<td>69</td>
</tr>
<tr>
<td>Katz Adjustment Scale, SI</td>
<td>11</td>
<td>64</td>
</tr>
<tr>
<td>Symptom Scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bradburn Happiness Scale</td>
<td>00</td>
<td>60</td>
</tr>
<tr>
<td>DACL, Negative Score</td>
<td>-05</td>
<td>57</td>
</tr>
<tr>
<td>Katz Adjustment Scale, S2</td>
<td>02</td>
<td>-52</td>
</tr>
<tr>
<td>Level of Performance of Socially Expected Activities (Self-report)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experienced Control, Over Internal Scale</td>
<td>06</td>
<td>05</td>
</tr>
</tbody>
</table>
Factor I of the Beck Depression Inventory includes items related to self-hatred, guilt, emptiness, lack of confidence, work inhibition, social isolation, and suicidal ideation. The Zung SDS items load on Factor I, reflecting domains such as emptiness, lack of satisfaction, pessimism, guilt feelings, work inhibition, social withdrawal, self-punitive wishes, sense of failure, and self hate.

The DACL Factor II includes items that are stable dimensions of depression, such as a stable dimension of depression and probably the dominant dimension. The same set of Beck Depression Scale items that loaded on Factor I in this study have loaded in a similar pattern in other factor analyses.

**Discriminant Validity**

Although his major purpose was to validate a new "General Contentment Scale," Byerly (1979) also produced valuable data about the discriminant validity of the DACL. He studied the four lists loaded, respectively, .86, .86, .88, and .83. The DACL did not load on any other factor.

<table>
<thead>
<tr>
<th>Table 35</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form E of Depression Adjective Check List Items and Standardized Discriminant Function Coefficients for Female Patients and Male Normals</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DACL Item</th>
<th>Coefficient</th>
<th>DACL Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.12757</td>
<td>18</td>
<td>.02551</td>
</tr>
<tr>
<td>2</td>
<td>.17047</td>
<td>19</td>
<td>.22593</td>
</tr>
<tr>
<td>3</td>
<td>-.30842</td>
<td>20</td>
<td>.01437</td>
</tr>
<tr>
<td>4</td>
<td>.02578</td>
<td>21</td>
<td>.07916</td>
</tr>
<tr>
<td>5</td>
<td>-.11647</td>
<td>22</td>
<td>.26610</td>
</tr>
<tr>
<td>6</td>
<td>.40733</td>
<td>23</td>
<td>.18698</td>
</tr>
<tr>
<td>7</td>
<td>.30600</td>
<td>24</td>
<td>.28043</td>
</tr>
<tr>
<td>8</td>
<td>-.19196</td>
<td>25</td>
<td>.23945</td>
</tr>
<tr>
<td>9</td>
<td>-.15389</td>
<td>26</td>
<td>.25109</td>
</tr>
<tr>
<td>10</td>
<td>-.32282</td>
<td>27</td>
<td>.11769</td>
</tr>
<tr>
<td>11</td>
<td>-.16948</td>
<td>28</td>
<td>.34399</td>
</tr>
<tr>
<td>12</td>
<td>.02432</td>
<td>29</td>
<td>-.03936</td>
</tr>
<tr>
<td>13</td>
<td>-.06211</td>
<td>30</td>
<td>-.12250</td>
</tr>
<tr>
<td>14</td>
<td>.36995</td>
<td>31</td>
<td>.03032</td>
</tr>
<tr>
<td>15</td>
<td>-.15303</td>
<td>32</td>
<td>.37217</td>
</tr>
<tr>
<td>16</td>
<td>.02837</td>
<td>33</td>
<td>-.22120</td>
</tr>
<tr>
<td>17</td>
<td>-.00827</td>
<td>34</td>
<td>.05464</td>
</tr>
</tbody>
</table>

Table 38 summarizes the percent correct classification based upon the DACL for the four discriminant function analyses. Overall percent correct classification ranged from 74.8 to 92.9 with a mean of 84.8. Thus, for overall correct classification, the DACL performed better than the Generalized Contentment Scale (82%) and the Beck Depression Inventory (81.6%).

<table>
<thead>
<tr>
<th>Table 36</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form E of Depression Adjective Check List Items and Standardized Discriminant Function Coefficients for Female Patients and Male Normals</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DACL Item</th>
<th>Coefficient</th>
<th>DACL Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-.13490</td>
<td>18</td>
<td>.05913</td>
</tr>
<tr>
<td>2</td>
<td>.37977</td>
<td>19</td>
<td>.05740</td>
</tr>
<tr>
<td>3</td>
<td>-.14814</td>
<td>20</td>
<td>.01099</td>
</tr>
<tr>
<td>4</td>
<td>.09130</td>
<td>21</td>
<td>-.19890</td>
</tr>
<tr>
<td>5</td>
<td>-.00106</td>
<td>22</td>
<td>-.00413</td>
</tr>
<tr>
<td>6</td>
<td>.20420</td>
<td>23</td>
<td>.18930</td>
</tr>
<tr>
<td>7</td>
<td>-.23711</td>
<td>24</td>
<td>.07135</td>
</tr>
<tr>
<td>8</td>
<td>.03358</td>
<td>25</td>
<td>.03773</td>
</tr>
<tr>
<td>9</td>
<td>-.46464</td>
<td>26</td>
<td>-.18408</td>
</tr>
<tr>
<td>10</td>
<td>-.04295</td>
<td>27</td>
<td>.02379</td>
</tr>
<tr>
<td>11</td>
<td>-.16827</td>
<td>28</td>
<td>.12653</td>
</tr>
<tr>
<td>12</td>
<td>-.11530</td>
<td>29</td>
<td>-.11671</td>
</tr>
<tr>
<td>13</td>
<td>.09503</td>
<td>30</td>
<td>-.31834</td>
</tr>
<tr>
<td>14</td>
<td>.07735</td>
<td>31</td>
<td>.04558</td>
</tr>
<tr>
<td>15</td>
<td>-.07088</td>
<td>32</td>
<td>.34052</td>
</tr>
<tr>
<td>16</td>
<td>-.03980</td>
<td>33</td>
<td>-.08277</td>
</tr>
<tr>
<td>17</td>
<td>-.11646</td>
<td>34</td>
<td>-.04653</td>
</tr>
</tbody>
</table>

Standardized discriminant function coefficients for each of the four discriminant function analyses (Tatsuoka, 1969) are presented in Tables 34 through 37.
SENSeitivity To Change

The crucial test for a state measure of depressive mood is its ability to measure change.

Sensitivity Training

The sensitivity training format depends heavily upon emotional arousal as an important ingredient of a mood change (Lubin & Eddy, 1970). Data collected for the study of the comparability of Set 2 of the DACL (Table 16) also provided an opportunity to test the sensitivity of the three lists to mood changes over sessions in an emotionally stimulating situation (Lubin, Dupre & Lubin, 1967).

The summary of the analyses of variance for the testing of the comparability of the three lists (Table 16) indicates that there are highly significant changes over testing occasions. The pattern of these changes as shown in Table 16 is similar to that found in a previous study of sensitivity training (Reisel, 1959).

Evidence for the ability of the DACL to measure change in depressive mood over a 12 month period in psychiatric patients is provided in the article by Lubin, Hornstra and Love (1974) which reports on the use of DACL form E with applicants for service to a community mental health center, three months later and 12 months later. The findings, a significant drop from application to three months but no significant drop from three months to 12 months, were expected as most patients were no longer in treatment beyond three months.

An additional indication that the “Now-Today” version of the DACL measures short duration depressive mood can be seen in the comparative size of the correlations of the DACL with “Today” and “In General” time sets and the MMPI-D scale. The latter is generally accepted as a measure of longer term, chronic depression. Mean correlation between the “To-MMPi” of Set A and the MMPI-D scale was .39 (range from .32 to .47), whereas mean correlation between the “In General” version of Set 1 and the MMPI-D scale was .48 (range from .42 to .55) (Lubin, 1967).

Response Sets

Correlations with Number of Items Checked

It would be expected that an instrument with a scoring system such as the DACL might be susceptible to checking tendency. Table 39 reveals that 21 of the 28 correlations are significant. The larger number of significant correlations for patients than for normals is probably a reflection of the fact that each of the lists contains more positive than negative

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
<th>Correct Classification</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Patients</td>
<td>131</td>
<td>Patient: 107 (81.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Normals</td>
<td>88</td>
<td>Normal: 24 (18.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Male Patients</td>
<td>67</td>
<td>Male Patients: 61 (91.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Male Normals</td>
<td>32</td>
<td>Male Normals: 6 (9.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Female Patients</td>
<td>64</td>
<td>Female Patients: 53 (82.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Female Normals</td>
<td>56</td>
<td>Female Normals: 6 (10.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Diagnosed Depressed</td>
<td>36</td>
<td>Diagnosed Depressed: 27 (75.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Nondiagnosed Depressed</td>
<td>95</td>
<td>Nondiagnosed Depressed: 24 (25.3%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
adjectives, and patients more so than normals, of course, check more adjectives connoting depression. This explanation also would seem to account for the fact that the significant correlations for normals are negative, whereas the significant correlations for patients are positive.

There is no evidence at this point that the DACL is susceptible to a general checking tendency. The report by Lubin, Horned and Knapp (1977) presents data to the contrary. That study found no significant relationship between DACL score and number of adjectives checked on the Adjective Check List (Gough & Heilbrun, 1965). More study is required before a definitive conclusion can be reached.

EFFECTS OF CHANGING THE DACL RESPONSE FORMAT

In the first edition of this manual (Lubin, 1967), a study by Cobb was reported in which the mean score on DACL form E was 4.7 (S.D. = 5.00), below the normative mean, for adult males when the instrument was administered by an examiner with a True/False response format. As the method involved two departures from standard administration, e.g., examiner administration and True/False response format no clear conclusion could be drawn. The controlled investigation by Lubin, Marone and Nathan (in press) found no significant difference between self-administration and examiner-administration, leaving the role of response formats still to be studied.

Lubin, Nathan and Nathan (in press) compared the scores of 144 college students on three response formats of the DACL: true-false (T-F), forced choice (FC) (e.g., "Check the seven adjectives that best describe how you feel"), and the standard format (SF) for forms E, F, and G. In addition, a specially constructed population-specific measure of state depression, the College Inventory of Depression and the Social Desirability Scale (Crowne & Marlowe, 1964) were administered.

As can be seen in Table 40 the intercorrelations among the three response formats of the DACL were significant and the level approached the average of the inter-list reliabilities for forms E, F, and G (.87).

Scores on the DACL (SF) and (TF) correlated significantly but weakly with scores on social desirability. The means and standard deviations of the DACL score on the standard format and the true-false format are \( M = 9.37, \) \( SD = 6.49 \) and \( M = 8.67, SD = 7.80 \) respectively. A \( t \) test for matched data indicates that these means are not significantly different (\( t(143) = 1.96, p > .05 \)).

The score on DACL (SF) did not correlate significantly with the number of depressive adjectives checked, whereas the score on DACL (TF) did correlate significantly with number of depressive adjectives endorsed (\( r(143) = .497, p > .001 \)).

SOCIAL DESIRABILITY

Evidence of the susceptibility of the DACL to a social desirability response set was reported in the earlier version of the manual (Lubin, 1967). For Set 1, Significant correlations with a scale of need for social approval (Crowne & Marlowe) of -.31, -.26, -.26, and -.28 were found for 100 normal females. All correlations were significant at the .01 level indicating that acknowledgement of depressive mood is not compatible with the need for social approval among normal females.

The findings of more recent studies, however, have produced equivocal evidence on this issue. Christenson, Lubin and Satin (1978) found non-significant correlations for both normal males and females. On the other hand, as mentioned earlier, Lubin, Nathan and Nathan (in press) found a significant relationship between the DACL (standard format) and social desirability although the relationship was not strong. Thus, the issue requires further study for in some cases the evidence seems to suggest that the social desirability relationship is largely an attitudinal set of the sample, and in other cases it seems to be more meaningful to think of social desirability as a characteristic of the instrument. The findings of the study reported later under "Response Manipulation," however, provides strong evidence that certain situations produce strong attitudinal sets.

CORRELATIONS WITH THE MMPI VALIDITY SCALES

Correlations between Set 2 of the DACL and L, F, and K scales of the MMPI are shown in Table 41. The significant negative correlations between Set 2 and the L and K scales is

---

**Table 39**: Correlations Between DACL and Number of Adjectives

<table>
<thead>
<tr>
<th></th>
<th>Number of Adjectives Checked</th>
<th>Psychiatric Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>List</td>
</tr>
<tr>
<td>---</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Males</td>
<td>A</td>
<td>-.08</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>-18</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>-14</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>.42**</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>-.44**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>-.82**</td>
</tr>
<tr>
<td>Females</td>
<td>A</td>
<td>-.24*</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>-.18</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>-.63**</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>-.55**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>-.52**</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.
**Significant at the .01 level.

---

**Table 40**: Correlations Between Scores on Three Formats of the DACL, the CID, and the SD Scale

<table>
<thead>
<tr>
<th></th>
<th>DACL (SF)</th>
<th>DACL (TF)</th>
<th>DACL (FC)</th>
<th>CID</th>
<th>SD Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>1.00</td>
<td>.84**</td>
<td>.82**</td>
<td>.68**</td>
<td>.73**</td>
</tr>
<tr>
<td>Females</td>
<td>1.00</td>
<td>.82**</td>
<td>.84**</td>
<td>.66**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**p<.05**
**p<.001**
TABLE 41
Correlations Between Set 2 of the DACL and the Validation Scales of the MMPI for Hospitalized Psychiatric Patients (N = 80)

<table>
<thead>
<tr>
<th>DACL List</th>
<th>MMPI Validity Scales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td>E</td>
<td>- .21**</td>
</tr>
<tr>
<td>F</td>
<td>- .23*</td>
</tr>
<tr>
<td>G</td>
<td>- .24*</td>
</tr>
</tbody>
</table>

*Significant at the .05 level
**Significant at the .01 level

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Actual (N=240)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Percentile</td>
</tr>
<tr>
<td>E</td>
<td>8.64</td>
<td>6.55</td>
<td>83</td>
</tr>
<tr>
<td>F</td>
<td>9.07</td>
<td>5.70</td>
<td>87</td>
</tr>
<tr>
<td>G</td>
<td>8.90</td>
<td>6.23</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Fake “Good” (N=80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>3.41</td>
<td>2.83</td>
<td>30</td>
</tr>
<tr>
<td>F</td>
<td>4.90</td>
<td>2.71</td>
<td>53</td>
</tr>
<tr>
<td>G</td>
<td>3.50</td>
<td>2.80</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Fake “Bad” (N=80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>28.10</td>
<td>5.03</td>
<td>99+++</td>
</tr>
<tr>
<td>F</td>
<td>28.16</td>
<td>4.44</td>
<td>99+++</td>
</tr>
<tr>
<td>G</td>
<td>27.84</td>
<td>4.97</td>
<td>99+++</td>
</tr>
<tr>
<td></td>
<td>Fake “Average” (N=80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>10.01</td>
<td>4.65</td>
<td>90</td>
</tr>
<tr>
<td>F</td>
<td>9.79</td>
<td>4.54</td>
<td>90</td>
</tr>
<tr>
<td>G</td>
<td>10.37</td>
<td>4.92</td>
<td>93</td>
</tr>
</tbody>
</table>

The findings suggest that a measure of test-taking attitude such as the MMPI-K Scale should be administered along with "obvious" measures whenever it is important to detect possible response manipulation, e.g., assessment for employment purposes, etc.

TABLE 43
Correlations Between DACL and Age and Education for Normals, Nondepressed Patients and Depressed Patients

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>A</td>
<td>156</td>
<td>- .16*</td>
<td>.01</td>
<td>56</td>
<td>.18</td>
<td>.08</td>
<td>28</td>
<td>.37*</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>156</td>
<td>- .11</td>
<td>.05</td>
<td>56</td>
<td>.17</td>
<td>.18</td>
<td>28</td>
<td>.30</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>156</td>
<td>- .15</td>
<td>.02</td>
<td>56</td>
<td>.13</td>
<td>.16</td>
<td>28</td>
<td>.33</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>156</td>
<td>- .18*</td>
<td>.01</td>
<td>56</td>
<td>.16</td>
<td>.07</td>
<td>28</td>
<td>.51*</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>185</td>
<td>- .14</td>
<td>.04</td>
<td>99</td>
<td>.06</td>
<td>.37*</td>
<td>33</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>185</td>
<td>- .08</td>
<td>.01</td>
<td>99</td>
<td>.11</td>
<td>.36*</td>
<td>33</td>
<td>.30</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>185</td>
<td>- .22*</td>
<td>.11</td>
<td>99</td>
<td>.15</td>
<td>.30*</td>
<td>33</td>
<td>.28</td>
</tr>
<tr>
<td>Female</td>
<td>A</td>
<td>469</td>
<td>- .04</td>
<td>.06</td>
<td>118</td>
<td>.03</td>
<td>.03</td>
<td>100</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>469</td>
<td>- .08</td>
<td>.02</td>
<td>118</td>
<td>.02</td>
<td>.03</td>
<td>100</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>469</td>
<td>- .09</td>
<td>.01</td>
<td>118</td>
<td>.02</td>
<td>.02</td>
<td>100</td>
<td>.09</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>469</td>
<td>- .13*</td>
<td>.06</td>
<td>118</td>
<td>.00</td>
<td>.02</td>
<td>100</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>371</td>
<td>- .12*</td>
<td>.03</td>
<td>91</td>
<td>.09</td>
<td>.14</td>
<td>72</td>
<td>.09</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>371</td>
<td>- .07</td>
<td>.03</td>
<td>91</td>
<td>.07</td>
<td>.19</td>
<td>72</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>371</td>
<td>- .08</td>
<td>.02</td>
<td>91</td>
<td>.10</td>
<td>.16</td>
<td>72</td>
<td>.12</td>
</tr>
</tbody>
</table>

*Significant at .05 level.
RELATIONSHIPS BETWEEN THE DACL AND AGE AND EDUCATION

The relationship between DACL score and age and education were reported for all seven forms in the earlier manual for normals, nondepressed patients, and depressed patients (Lubin, 1967). These are shown again in Table 43. The seven significant correlations out of 42 for age are almost exactly at chance expectancy. On the other hand, a slight but significant relationship between DACL score on form E and age was found (r (3,009) = .05, p < .01) in the National Depression Survey (Levitt & Lubin, 1975).

A chance relationship between DACL score and education is strongly suggested by the fact that only four correlations out of 42 in Table 43 are significant. The National Depression Survey, however, found a significant analysis of variance of the means in Table 44 and also a significant correlation between education in years and DACL scores (r (3,009) = -.15, p < .01). There is some suggestion that the relationship might be curvilinear, but it is definitely negative.

In trying to evaluate the apparent discrepancy between the data in Table 43 and Table 44, it should be borne in mind that Table 43 is based upon samples of convenience, whereas Table 44 is based upon data drawn by area probability sampling methods.

TRANSLATIONS OF THE DACL

The DACL has been translated into Spanish, French, Portuguese, Hebrew, and Chinese. Translations into additional languages are being prepared. The author welcomes inquiries regarding additional translations.

The Spanish version of the DACL was presented at the XVI InterAmerican Congress of Psychology (Lubin, 1976), and in two articles (Lubin, Millham & Paredes, 1980; and Lubin, Schoenfeld, Rinck & Millham, submitted).

A report on the Hebrew version of the DACL was presented at the Second International Conference on Stress in Peace and War (Lomranz, Lubin, Eyal & Medini, 1978), and two articles (Lomranz, Lubin, Eyal & Medini, in press; and Lomranz, Lubin, Eyal & Medini, in press).

A standard procedure was used for the development of all of the translated lists of Set 2 of the DACL and for the reliability and concurrent validity determinations. In each case, the translation was accomplished by one or more persons for whom the translated language was primary. Reliability (inter-list, split-half, part-whole, and test-retest) was then determined. Concurrent validity was studied by correlating forms E, F, and G with the Bradburn Happiness Scale (Bradburn, 1969), the Self-anchoring Striving Scale (Cantril, 1969), and the Katz Social Adjustment Scale, Symptom Subscale (Hogarty et al., 1967).

Table 45 shows the alternate form reliabilities among forms E, F, and G for the English, Spanish, Hebrew, and Chinese translations. All correlations are significant beyond the .01 level and are remarkably similar.

Split-half reliabilities for the translations can be seen in Table 46. Again, all correlations are significant beyond the .01 level, and again are quite similar.

TABLE 44

<table>
<thead>
<tr>
<th>Years of Education</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 8</td>
<td>9.62</td>
<td>4.30</td>
</tr>
<tr>
<td>8</td>
<td>8.79</td>
<td>4.19</td>
</tr>
<tr>
<td>9 to 11</td>
<td>8.91</td>
<td>4.72</td>
</tr>
<tr>
<td>12</td>
<td>8.00</td>
<td>4.07</td>
</tr>
<tr>
<td>13 to 15</td>
<td>7.86</td>
<td>5.53</td>
</tr>
<tr>
<td>16</td>
<td>6.77</td>
<td>4.19</td>
</tr>
<tr>
<td>17</td>
<td>8.24</td>
<td>3.70</td>
</tr>
<tr>
<td>19</td>
<td>7.34</td>
<td>3.81</td>
</tr>
</tbody>
</table>

* Differences significant beyond the .01 level.

** Significant at the .01 level

TABLE 45

<table>
<thead>
<tr>
<th>Language</th>
<th>Form</th>
<th>DACL</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (N = 86)</td>
<td>E</td>
<td>.89**</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>.89**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>.86**</td>
</tr>
<tr>
<td>Spanish (N = 70)</td>
<td>E</td>
<td>.88**</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>.89**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>.91**</td>
</tr>
<tr>
<td>Hebrew (N = 167)</td>
<td>E</td>
<td>.84**</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>.84**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>.88**</td>
</tr>
<tr>
<td>Chinese (N = 1307)</td>
<td>E</td>
<td>.87**</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>.87**</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>.90**</td>
</tr>
</tbody>
</table>

** Significant at the .01 level

 Concurrent validity for the Spanish version of the Spanish DACL is presented in Table 47. All correlations are significant at the .01 level except for the Self-anchoring Striving Scale, "Past" which was not significant. This is to be expected for a state measure with normals for how one feels today should have no necessary relationship with one's perspective in the past.

** Significant at the .01 level
TABLE 47
Concurrent Validity of the Spanish Version of the DACL
(Male and Female Combined; N = 70)

<table>
<thead>
<tr>
<th>Instruments</th>
<th>DACL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E</td>
</tr>
<tr>
<td>Psychosomatic-</td>
<td></td>
</tr>
<tr>
<td>Psychophysiological</td>
<td>.47**</td>
</tr>
<tr>
<td>Symptom Scale*</td>
<td></td>
</tr>
<tr>
<td>Self-anchoring Striving</td>
<td>-.40**</td>
</tr>
<tr>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Past</td>
<td>-.05</td>
</tr>
<tr>
<td>Future</td>
<td>-.23**</td>
</tr>
</tbody>
</table>

*Katz Social Adjustment Scale, S1
*Significant at the .01 level

Means and standard deviations for the English version and the three translations are shown in Table 48. The progression in size of mean is Spanish, English, Hebrew and Chinese.

**TABLE 48**
Means and Standard Deviations for the Depression Adjective Check Lists in Various Languages

<table>
<thead>
<tr>
<th>Language</th>
<th>Form</th>
<th>E Mean</th>
<th>S.D.</th>
<th>F Mean</th>
<th>S.D.</th>
<th>G Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (N = 856)</td>
<td></td>
<td>8.04</td>
<td>5.43</td>
<td>8.45</td>
<td>4.80</td>
<td>8.25</td>
<td>5.48</td>
</tr>
<tr>
<td>Spanish (N = 70)</td>
<td></td>
<td>6.55</td>
<td>4.88</td>
<td>7.48</td>
<td>4.87</td>
<td>8.30</td>
<td>5.78</td>
</tr>
<tr>
<td>Hebrew (N = 167)</td>
<td></td>
<td>9.74</td>
<td>4.84</td>
<td>9.38</td>
<td>4.37</td>
<td>9.21</td>
<td>4.58</td>
</tr>
<tr>
<td>Chinese (N = 1307)</td>
<td></td>
<td>10.77</td>
<td>6.15</td>
<td>10.40</td>
<td>5.14</td>
<td>10.20</td>
<td>6.35</td>
</tr>
</tbody>
</table>

**TABLE 49**
Inter correlations Among 14 Brief Depression Adjective Checklists for the Combined Normal Group (N = 126)

<table>
<thead>
<tr>
<th>List</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.72</td>
<td>.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>.72</td>
<td>.69</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>3</td>
<td>.82</td>
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<td>.71</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
<td>.79</td>
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<td>.79</td>
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<td>.81</td>
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<td>.81</td>
<td>.81</td>
<td>.81</td>
<td>.81</td>
</tr>
<tr>
<td>5</td>
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<td>.79</td>
<td>.79</td>
<td>.79</td>
<td>.79</td>
<td>.79</td>
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<td>.79</td>
<td>.79</td>
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<tr>
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<td>.81</td>
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<tr>
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<tr>
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<tr>
<td>10</td>
<td>.76</td>
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<td>.76</td>
<td>.76</td>
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<tr>
<td>12</td>
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<td>.76</td>
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<td>.76</td>
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<tr>
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<td>.76</td>
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<td>.76</td>
<td>.76</td>
<td>.76</td>
<td>.76</td>
</tr>
</tbody>
</table>

**VALIDITY**

**DISCRIMINANT VALIDITY**

The discriminant validity of the half lists was determined by checking their ability to differentiate between male and female groups of normals (N = 427) and rated depressed (N = 105) and non-depressed psychiatric patients (N = 190). ANOVAs in the 3x2 table (sex by group) were computed for each of the 14 lists by the method of "weighted squares of means" (Steel & Torrie, 1960). For all 14 lists, F tests for groups (normals, non-depressed, and depressed patients) are significant at the .0005 level. Although sex differences are
TABLE 50
Correlations Among Component Scores of the DACL
Brief Lists 9 Through 14
(S = 172)

<table>
<thead>
<tr>
<th>DACL</th>
<th>9P</th>
<th>10P</th>
<th>11P</th>
<th>12P</th>
<th>13P</th>
<th>14P</th>
</tr>
</thead>
<tbody>
<tr>
<td>9P</td>
<td>.61**</td>
<td>.66**</td>
<td>.75**</td>
<td>.60**</td>
<td>.66**</td>
<td></td>
</tr>
<tr>
<td>10P</td>
<td>.67**</td>
<td>.68**</td>
<td>.68**</td>
<td>.69**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11P</td>
<td></td>
<td>.71**</td>
<td>.62**</td>
<td>.76**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12P</td>
<td></td>
<td>.65**</td>
<td>.69**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13P</td>
<td></td>
<td></td>
<td>.71**</td>
<td>.76**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14P</td>
<td></td>
<td></td>
<td></td>
<td>.65**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significant at the .01 level

**Positive Score

**Negative Score

TABLE 51
Internal Consistency for Brief Lists of the DACL, One Through Fourteen

<table>
<thead>
<tr>
<th>Lists</th>
<th>Sex</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>.72**</td>
<td>.64**</td>
<td>.69**</td>
<td>.66**</td>
<td>.81**</td>
<td>.74**</td>
<td>.67**</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>.78**</td>
<td>.74**</td>
<td>.78**</td>
<td>.73**</td>
<td>.79**</td>
<td>.78**</td>
<td>.71**</td>
</tr>
<tr>
<td>8</td>
<td>(N=105)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>.73**</td>
<td>.81**</td>
<td>.73**</td>
<td>.81**</td>
<td>.68**</td>
<td>.82**</td>
<td>.80**</td>
</tr>
<tr>
<td></td>
<td>(N=136)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significant at the .01 level

not significant for lists 1 through 8, they are significant for lists 9 through 14. The interaction between group and sex is significant for lists 6, 7, 9, 10, 11, 12, 13, and 14. Means and standard deviations for each sex on the 14 lists are presented in Table 53 for normals, nondepressed patients and depressed patients.

TABLE 52
Summary of Analysis of Variance for Brief Lists of the DACL, 1 Through 6

<table>
<thead>
<tr>
<th>List</th>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Groups</td>
<td>2</td>
<td>48.27</td>
<td>0.0005&gt;p</td>
<td>0.0005&gt;p</td>
<td>3.38</td>
<td>0.0005&gt;p</td>
<td>23.99</td>
<td>0.0005&gt;p</td>
<td>0.10&gt;p&gt;0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>0.82</td>
<td>0.50&gt;p&gt;0.25</td>
<td>0.73</td>
<td>0.50&gt;p&gt;0.25</td>
<td>1.03</td>
<td>0.50&gt;p&gt;0.25</td>
<td>0.02</td>
<td>0.90&gt;p&gt;0.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>2</td>
<td>2.53</td>
<td>0.10&gt;p&gt;0.05</td>
<td>0.39</td>
<td>0.75&gt;p&gt;0.50</td>
<td>1.79</td>
<td>0.25&gt;p&gt;0.10</td>
<td>0.67</td>
<td>0.75&gt;p&gt;0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within cells</td>
<td>670</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>List</th>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Groups</td>
<td>2</td>
<td>49.74</td>
<td>0.0005&gt;p</td>
<td>0.0005&gt;p</td>
<td>3.73</td>
<td>0.0005&gt;p</td>
<td>31.79</td>
<td>0.0005&gt;p</td>
<td>0.05&gt;p&gt;0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>0.62</td>
<td>0.50&gt;p&gt;0.25</td>
<td>0.57</td>
<td>0.50&gt;p&gt;0.25</td>
<td>1.29</td>
<td>0.50&gt;p&gt;0.25</td>
<td>0.22</td>
<td>0.75&gt;p&gt;0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>2</td>
<td>0.78</td>
<td>0.50&gt;p&gt;0.25</td>
<td>0.59</td>
<td>0.50&gt;p&gt;0.25</td>
<td>5.77</td>
<td>0.005&gt;p&gt;0.001</td>
<td>0.60</td>
<td>0.10&gt;p&gt;0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within cells</td>
<td>670</td>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>List</th>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Groups</td>
<td>2</td>
<td>113.97</td>
<td>0.0005&gt;p</td>
<td>0.0005&gt;p</td>
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*The analyses of variance actually performed were three-way analyses, the third dimension being Age, in four levels. The main effect and interactions including Age, however, were generally nonsignificant and have been omitted here.
### TABLE 53
Means and Standard Deviations of Lists 1 Through 14 of the Brief DACLs for Normals and Psychiatric Patients

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### CONCURRENT VALIDITY

Relationships between the brief lists and other instruments measuring depression or related to that construct are presented next.

Correlations between all 14 lists and two additional measures of depression, the Minnesota Multiphasic Personality Inventory Depression Scale (MMPI-D) and the Beck Depression Inventory, are shown in Table 54. Patient groups were subsets of the patient groups. Norms were not the ones used in the analyses of variance. All correlations are significant at least at the .05 level except for the correlations between lists 10 and 13 and the MMPI-D Scale for male normals, and between 10, 11, and 13 and the Beck Depression Inventory for male patients.

Correlations between the brief DACLs and the MAACL-D Scale can be seen in Table 55 for males and females separately and combined. All correlations are significant beyond the .01 level. For males, the correlations range from .60 to .86, from .65 to .87 for females, and from .66 to .85 for the combined.

The overall summary of the ANOVAs for lists 9 through 14 for four diagnostic groups is shown in Table 56. Fs for 9, 11, 13, and 14 are significant; Fs for 10 and 12 are not significant.

Means and standard deviations for lists 9 through 14 for the diagnostic groups can be seen in Table 57. All comparisons between "Psychotic Depression" and each of the other groups was significant on all six lists. The "Personality Disorder" group consistently produced the smallest means. The order of means for the remaining three groups from lowest to highest is "Schizophrenia," "Psychoneurosis," and "Psychotic Depression" for lists 9, 10, 13. "Schizophrenia" produces slightly higher means than "Psychoneurosis" on lists 11, 12, and 14.

### TABLE 54
Correlations Between the Brief Lists 1 Through 8 of the DACL and the BDI, and the MMPI-D Scale

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<td>.41**</td>
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<td>.38**</td>
<td>.42**</td>
<td>.58**</td>
<td>.41**</td>
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<td>.36**</td>
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<td>.47**</td>
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<td>.34**</td>
<td>.51**</td>
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<td>.35**</td>
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<td>.44*</td>
<td>.51**</td>
<td>.50*</td>
<td>.46*</td>
<td>.45*</td>
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<td>.50**</td>
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<td>.57**</td>
<td>.60**</td>
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<td>.50**</td>
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*Significant at the .05 level  ** Significant at the .01 level

(Table continued on next page)
TABLE 54 (Cont.)
Correlations Between the Brief Lists 9 Through 14 of the DACL and the BDI, and the MMPI-D Scale

<table>
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<th>Test and Group</th>
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<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
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<td>.19</td>
<td>.34**</td>
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<td>.39**</td>
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<td>.36*</td>
<td>.41**</td>
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<td>.61**</td>
<td>.65**</td>
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*Significant at the .05 level
**Significant at the .01 level

TABLE 55
Correlations Between Fourteen Brief DACL Lists and the MAACL-D Scale

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<th>Females (N = 89)</th>
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<td>.76**</td>
<td>.71**</td>
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<td>.70**</td>
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<td>list 7</td>
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<td>.77**</td>
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<td>list 8</td>
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<td>list 9</td>
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<td>.74**</td>
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<tr>
<td>list 10</td>
<td>.71**</td>
<td>.78**</td>
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<tr>
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<td>.81**</td>
</tr>
<tr>
<td>list 12</td>
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<td>.75**</td>
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<td>list 13</td>
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</tr>
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</table>

**Significant at the .01 level

TABLE 56
Summary of Analyses of Variance of DACL Lists 9 Through 14 for Four Diagnostic Groups

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<td>3/95</td>
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<td>3/95</td>
<td>5.95</td>
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<td>3/95</td>
<td>3.29</td>
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<td>18.44</td>
<td>3/95</td>
<td>4.53</td>
<td>p&lt;.05</td>
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<td>78.51</td>
<td>13.27</td>
<td>3/95</td>
<td>5.91</td>
<td>p&lt;.05</td>
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TABLE 57
Means and Standard Deviations on DACL Lists 9 Through 14 for Four Diagnostic Groups

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<th>Neurosis</th>
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<td>7.61</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>19</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>S.D.</td>
<td>4.29</td>
<td>4.67</td>
<td>3.75</td>
<td>4.58</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>19</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.59</td>
<td>4.57</td>
<td>4.01</td>
<td>3.46</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>19</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>S.D.</td>
<td>7.14</td>
<td>5.11</td>
<td>11.42</td>
<td>6.56</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>19</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>S.D.</td>
<td>4.05</td>
<td>4.79</td>
<td>3.65</td>
<td>3.88</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>19</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.90</td>
<td>4.09</td>
<td>3.45</td>
<td>3.09</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>19</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>S.D.</td>
<td>6.90</td>
<td>6.26</td>
<td>11.58</td>
<td>6.94</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>19</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.68</td>
<td>3.64</td>
<td>3.58</td>
<td>3.60</td>
</tr>
</tbody>
</table>

NORMS
We are able to present national probability sample norms for lists 1 and 2 as each column of Form E of the National Depression Survey was reanalyzed. Means and standard deviations for each sex separately are presented in Table 58 for list 9 and in Table 59 for list 10. A reanalysis of the data on forms E, F, and G which were administered under instructions either to "fake good," "fake bad," or "fake average" provides us with information about the intercorrelation of lists 9
TABLE 58
Means and Standard Deviations of Brief DACL List 9 for Adults by Sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>Mean</th>
<th>S.D.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>3.63</td>
<td>2.20</td>
<td>1,444</td>
</tr>
<tr>
<td>Females</td>
<td>3.88</td>
<td>2.22</td>
<td>1,561</td>
</tr>
</tbody>
</table>

*(Levitt & Lubin, 1975)*

TABLE 59
Means and Standard Deviations of Brief DACL List 10 for Adults by Sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>Mean</th>
<th>S.D.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>3.98</td>
<td>2.30</td>
<td>1,444</td>
</tr>
<tr>
<td>Females</td>
<td>4.29</td>
<td>2.18</td>
<td>1,561</td>
</tr>
</tbody>
</table>

*(Levitt & Lubin, 1975)*

TABLE 60
Means and Standard Deviations for DACL Brief Lists 9 Through 14 for Manipulated and Actual Instructional Sets

<table>
<thead>
<tr>
<th>DACL Brief Lists</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fake Good (N=80)</td>
<td>1.66</td>
<td>1.73</td>
</tr>
<tr>
<td>9</td>
<td>1.75</td>
<td>1.83</td>
</tr>
<tr>
<td>10</td>
<td>2.29</td>
<td>1.67</td>
</tr>
<tr>
<td>11</td>
<td>2.61</td>
<td>1.46</td>
</tr>
<tr>
<td>12</td>
<td>1.65</td>
<td>1.71</td>
</tr>
<tr>
<td>13</td>
<td>1.85</td>
<td>1.64</td>
</tr>
<tr>
<td>14</td>
<td>14.57</td>
<td>2.62</td>
</tr>
<tr>
<td>10</td>
<td>13.52</td>
<td>2.53</td>
</tr>
<tr>
<td>11</td>
<td>14.66</td>
<td>2.69</td>
</tr>
<tr>
<td>12</td>
<td>13.50</td>
<td>2.77</td>
</tr>
<tr>
<td>13</td>
<td>14.24</td>
<td>2.63</td>
</tr>
<tr>
<td>14</td>
<td>13.55</td>
<td>2.81</td>
</tr>
<tr>
<td>Fake Bad (N=80)</td>
<td>4.84</td>
<td>2.91</td>
</tr>
<tr>
<td>9</td>
<td>5.17</td>
<td>2.92</td>
</tr>
<tr>
<td>10</td>
<td>4.62</td>
<td>2.99</td>
</tr>
<tr>
<td>11</td>
<td>5.16</td>
<td>2.24</td>
</tr>
<tr>
<td>12</td>
<td>4.44</td>
<td>3.03</td>
</tr>
<tr>
<td>13</td>
<td>5.94</td>
<td>2.83</td>
</tr>
<tr>
<td>14</td>
<td>4.74</td>
<td>3.70</td>
</tr>
<tr>
<td>10</td>
<td>4.36</td>
<td>3.28</td>
</tr>
<tr>
<td>11</td>
<td>4.51</td>
<td>3.71</td>
</tr>
<tr>
<td>12</td>
<td>4.99</td>
<td>2.42</td>
</tr>
<tr>
<td>13</td>
<td>4.16</td>
<td>3.32</td>
</tr>
<tr>
<td>14</td>
<td>5.27</td>
<td>3.24</td>
</tr>
</tbody>
</table>

 SUMMARY

As can be seen, the reliability and validity determinations for the 14 brief lists are a bit smaller, but of the same general magnitude as the complete lists of the DACL. As the Pearson product-moment correlation is influenced by the size of N, the magnitude of these correlations despite a 50% reduction in the number of adjectives is worthy of note.

The brief lists would be of use in studies in which a large number of instruments are required or in studies in which the phenomenon under investigation is likely to influence depressive mood rather quickly.

It should be remembered that lists of Set 1 (lists 1 through 8) do not contain overlapping items and can, therefore, be considered alternate forms. This is also the case for Set 2 (lists 9 through 14), but lists 9 through 14 contain overlapping items with lists 1 through 8.

TRAIT FORMS OF THE DACL

In order to develop an instrument for the measurement of longer term depressive mood, a study is underway to determine the most suitable time-set to use in the instructions. Various subsets of a college student sample completed the MMPI-D Scale, the BDI, the SDS and form E of the DACL, the latter with one of the following time sets: “In General,” “During the Past Year,” “During the Past Six Months,” or “During the Past Month.” All subjects completed the “Today” form of the DACL. In this case, we are interested both in divergent and convergent validity. This on-going study will compare the various time sets in terms of correlations with trait measures of depression (MMPI-D Scale, the BDI, and the SDS) and the state form of the DACL (“Today”). We are looking for high correlations with trait measures and low correlation with the state measure. The reliability and validity of the trait form of the DACL then will be determined.

USES OF THE DACL

The Depression Adjective Check Lists have been used in a variety of experimental, clinical and epidemiological studies. The following subject index should be useful as a categorization of the literature on the DACL as of this date. Most of the references were drawn from Science Citation Index and Social Science Citation Index.

A number of the studies listed in the following section provide additional data for the reliability and validity of the DACL. They are listed here, however, without development as to the further light that they throw upon basic characteristics of the DACL.
SUMMARY

The Manual indicates that the characteristics of the Depression Adjective Check Lists have received considerable study. Adequate reliability and validity have been demonstrated. Norms for the instrument are based upon a national probability sample. The alternate forms are very useful for repeated measures designs. Translations of the DACL into several languages will facilitate cross-cultural study of depressive mood. The brief lists make the DACL even more adaptable to a variety of research needs. In addition, trait versions of the DACL have been developed and are being studied.

For further information concerning the availability and use of these forms of the DACL contact the publisher.

FOOTNOTES

1. For item-analyses 1 and 11, one pair of clinicians rated 60 patients, 26 males and 34 females, with perfect agreement in 48 cases. Assuming chance probability of .25, this proportion of perfect agreements is significant at well beyond the .05 level (22 or more perfect agreements required for significance at the .05 level). Another pair of clinicians rated 32 additional patients, 15 males and 17 females, with perfect agreement in 22 cases. Again assuming chance probability of .25, this proportion of perfect agreement is significant at well below the .05 level (13 or more perfect agreements required for significance at the .05 level).

2. For both females and males, college students and volunteers community service organizations served as normals; patients were from an adult psychiatric clinic (65%), an acute intensive treatment hospital (25%), and the psychiatric ward of a general hospital (10%).

3. It is important to remember that “positive” means “positive indicator of depressed mood.”

4. The description of the procedure can be found in Roth and Lubin (in press).

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MANUAL FOR THE

MULTIPLE AFFECT

ADJECTIVE CHECK LIST

By
Marvin Zuckerman
and
Bernard Lubin

EdITS publishers
San Diego, California 92107
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ALL RIGHTS RESERVED.
Affect may be defined as the psychological aspects of emotion, or the emotional response which is assessed by means of verbal reports. There has been considerable study of emotional change as reflected by physiological measures. However, most psychological measures are constructed to assess affect as a trait rather than a state. Such questionnaires phrase their items in terms which ask the subject how he "generally" or "occasionally" feels rather than specifying the time referent, e.g., "today" or "now". These tests often show decreases in mean scores as the subjects become adapted to the test items. Furthermore, many of them are time consuming so that the subject's mood may change before he finishes the test. Because of the lack of adequate instruments for measuring changes in affect, psychologists have frequently resorted to poorly standardized and ad hoc self-rating scales.

The Multiple Affect Adjective Check List (MAACL) was designed to fill the need for a self-administered test which would provide valid measures of three of the clinically relevant negative affects: anxiety, depression, and hostility. No attempt has been made to measure positive affects but some of the evidence indicates that the scales are bipolar, and that low scores on the full scales will indicate states of positive affect.

The MAACL is brief, seldom requiring more than five minutes to administer. It is flexible in that the time set can be changed in the instructions without the need to change the items. Considerable data has been amassed relating the scores to clinical observations and to experimental manipulations. However, the test is still in a research phase and is not yet recommended for routine applied use. The publisher and authors would appreciate communications on any studies undertaken and results obtained using the MAACL.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Initial Criteria</th>
<th>Cross-Validation Criteria</th>
<th>Additional Criteria</th>
<th>Final No. Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Significant differences (p &lt; .05) in checking frequency between high anxiety psychiatric patients and non-anxious normals</td>
<td>Significant changes (p &lt; .05) in frequency of checking items by normals going from hypnotized state to a state of anxiety induced by suggestion while hypnotized</td>
<td>Words not above 8th grade reading level</td>
<td>21</td>
</tr>
<tr>
<td>Depression</td>
<td>Significant differences (p &lt; .05) in checking frequency between markedly or severely depressed males and normal males</td>
<td>Significant differences (p &lt; .05) in checking frequency between markedly or severely depressed females and normal females</td>
<td>Words not above 8th grade reading level - Words not contained in Anxiety Scale</td>
<td>40</td>
</tr>
<tr>
<td>Hostility</td>
<td>Significant changes (p &lt; .05) in checking frequency going from normal state to hypnotically induced hostility state</td>
<td>No cross validation</td>
<td>Words not above 8th grade reading level - Words not contained in Anxiety or depression scales</td>
<td>28</td>
</tr>
</tbody>
</table>

The Affect Adjective Check List (AACCL) measure of anxiety was developed in response to a need for a test instrument designed to measure changes in verifiable "anxiety" (21). Two forms of the test were used: a "General" form and a "Today" form. Both used the same set of items but the former had instructions for the subject to check words describing how he "generally" felt while the latter had instructions asking how he felt "now" or "today". Two new scales for depression and hostility were added (27) to the check list increasing the total number of items from 61 to 132. The extended scale is called the Multiple Affect Adjective Check List (MAACL). The items comprising the Anxiety scale are the same in the earlier AACCL and the MAACL. Considerable data has been accumulated on these scales from their use in various studies and a bibliography of these research investigations is included in the References Section at the end of this manual.

The methods by which the Anxiety scale items were selected are described by Zuckerman (21) and the derivations of the Depression and Hostility scales are described by Zuckerman, Lubin, Vogel and Valerius (27). The empirical method of item selection was used. Table 1 shows the criteria for item selection.

The words in each scale are listed below in Table 2. In scoring the test, plus items are scored if the subject checks them, while minus items are scored if the subject does not check them. This method of scoring is a partial control of the influence of the checking response set.

In most cases empirically selected items have an obvious connection in meaning with the affective state. But, in some cases, words with obvious connotations...
Table 2. Keyed Words for MAACL

<table>
<thead>
<tr>
<th>Anxiety</th>
<th>Depression</th>
<th>Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plus</strong></td>
<td><strong>Minus</strong></td>
<td><strong>Plus</strong></td>
</tr>
<tr>
<td>afraid</td>
<td>calm</td>
<td>angry</td>
</tr>
<tr>
<td>desperate</td>
<td>cheerful</td>
<td>bitter</td>
</tr>
<tr>
<td>fearful</td>
<td>/contented</td>
<td>cruel</td>
</tr>
<tr>
<td>frightened</td>
<td>happy</td>
<td>disagreeable</td>
</tr>
<tr>
<td>nervous</td>
<td>joyful</td>
<td>enthusiastic</td>
</tr>
<tr>
<td>panicky</td>
<td>loving</td>
<td>fine</td>
</tr>
<tr>
<td>tense</td>
<td>pleasant</td>
<td>free</td>
</tr>
<tr>
<td>terrified</td>
<td>secure</td>
<td>glad</td>
</tr>
<tr>
<td>upset</td>
<td>steady</td>
<td>good</td>
</tr>
<tr>
<td>worrying</td>
<td>thoughtful</td>
<td>healthy</td>
</tr>
</tbody>
</table>

*Items marked with an (x) indicate words scored on the briefer scales (a, d, & h) described on page 21 of this manual. They represent the items showing highest correlations with their respective full scales relative to their correlations with the other full scales. Two hostility words, in parentheses, are only scored on the briefer scales, since they were not derived from the initial empirical study.

were not actually responded to. For instance, in a study using hypnotized hostile subjects these subjects did not increase their responses to "aggressive", "annoyed", "indignant" or even "hostile" itself. On the other hand, it is of interest to note that they decreased their response to the word "willful" thereby causing it to be included in the hostility minus list.

**ADMINISTRATION**

The standard instructions for the administration of the MAACL are given on each Check List form. The time set may be changed for particular applications, but the tester should note that the norms given in this manual apply to the "... how you feel now-today" instruction. A separate set of norms is also provided for the "how you generally feel" Anxiety scale. The administrator of the test should read the instructions to the respondent. The only amplifications should concern the time set. For instance, if a response indicating the current day's affect is required, the "today" might be explained to the subject as "from the time you got up this morning until now." If a more specific period of time is required the "today" might be crossed out on the form and the subject instructed to describe how he felt "during the last minute" or "right now" or "during the experiment", etc.

The Check List has purposely been made as simple as possible for the respondent. The response alternatives are to make a check or no check, in the box next to each adjective. No quantitative rating scales are used, since it is felt that these open the door to additional response sets and needlessly complicate the tasks. All words are at or below an eighth grade reading level. Subjects below this level in education, or younger children, should not be given the Check List unless there is evidence that they can comprehend the words used in the test. Occasionally a subject may request a clarification of a word. If it is a question of ambiguity the subject should be told to accept whichever connotation he prefers. If it is a question of non-comprehensibility the word may be defined for the subject staying as close to the standard definition as possible. Excessive requests for definition probably mean that the subject cannot comprehend the test, or is too confused to give a valid record.

**SCORING**

Before scoring a MAACL the completed form should be checked, particularly if filled out by psychotic patients who sometimes demonstrate unusual extremes of response set. If none of the items, or all of the items are checked the record is probably invalid. Further work is needed to determine the limits of the range of number of items checked for the validity of the record.

To obtain the Anxiety score use the key marked A. Place the key over the answer sheet and count the num-


number of + items checked and the number of 0 items not checked. It is better to make separate counts of plus and minus items in order to avoid errors incurred by changing the scoring set. The total anxiety score is the number of + items checked plus the number of 0 items not checked.

Proceed to score the Depression scale in the same manner using the key marked D. Score the Hostility scale using the key marked H.

Enter the number of items checked, A, D, and H scores in the spaces indicated at the top of the form.

Scoring keys are also available for a set of briefer anxiety (a), depression (d) and hostility (h) scales consisting of items showing the highest correlations with their respective full scales relative to their correlations with the other full scales. These scales were constructed in an attempt to develop purer scales and are discussed on page 21 of this manual. These scales are scored in the same manner as the full scales. Scores on all three brief scales, and anxiety in particular, are very restricted in range and have skewed distributions. The users of these scales should consider their limitations discussed on page 21.

### NORMATIVE DATA

The job applicant sample (Table 3) was drawn from a population of 1200 job applicants at the Indiana University Medical Center personnel office. The 200 subjects constituting this sample were stratified by age, sex, and education to match the census distribution of these variables. The college student sample of 75 students was obtained from introductory psychology classes at Adelphi College in New York. Two samples of psychiatric patients were obtained from Larue D. Carter Memorial Hospital in Indiana; another sample of patients was tested at Central Islip Hospital in New York, and two samples of V.A. patients were obtained from the Mt. Alto V.A. Hospital in Washington, D.C. and the St. Cloud V.A. Hospital in Minnesota. All patients with the exception of the St. Cloud V.A. patients were tested within a few weeks after admission. The St. Cloud patients were part of a drug study and were tested after the completion of drug treatment. The Mt. Alto patients received a retest with the MAACL eight days after the first test. Significant differences between normal and patient samples are indicated in Table 3.

Table 3. Means and S. D.'s of Normal and Patient Samples

<table>
<thead>
<tr>
<th>Samples</th>
<th>Sex</th>
<th>N</th>
<th>Mean Age</th>
<th>Mean Educ</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Job Applicants</td>
<td>M</td>
<td>100</td>
<td>30</td>
<td>11.7</td>
<td>5.8</td>
<td>3.3</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>100</td>
<td>28</td>
<td>11.4</td>
<td>6.7</td>
<td>3.8</td>
<td>11.1</td>
</tr>
<tr>
<td>College Students</td>
<td>M</td>
<td>44</td>
<td>19</td>
<td>13.4</td>
<td>6.9</td>
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<td>12.2*+</td>
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<td></td>
<td>11.5*+</td>
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<td>St. Cloud V.A. Patients at end of drug treatment</td>
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<td>11.0</td>
<td>7.2</td>
<td>5.5</td>
<td>14.5*</td>
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*significantly higher than Job Applicants: p < .05
*significantly higher than College Students: p < .05
The clinical samples are more similar to the job applicant than the college sample in educational and age characteristics. The Carter samples, in particular, are well matched with the job applicants because they came from the same geographical area. However, the job applicants were in a situation which might make for attempts to minimize affect despite a guarantee of anonymity and assurances of the tester that the results had no relevance to their job application. The applicant males were significantly lower than the college males on the Depression and Hostility scales. For this reason, patient samples were compared with the college sample as well as with the job applicant sample. A prior study (23) indicated no relationship between age and education and the Anxiety scale of the MAACL so that the differences between the college and patient samples on these variables may not be important. Further age and education comparisons will help determine the extent of the influence of these variables on the MAACL scales.

In general, the patient samples were most consistently higher than normals on the Depression and least consistently higher on the Hostility scale. Tolor and Mabli (18) found that schizophrenics were significantly higher than normals on the Anxiety and Depression scales, but not on the Hostility scale.

The MAACL T score equivalents of the raw score scales are given in Table 4, using the data from the job applicant sample and the data from the college sample. In both cases the data for males and females were combined since there were no significant sex differences within the samples.

Table 5 contains standard score equivalents of the MAACL General Anxiety scale. The mean of 5.46 and S.D. of 3.44, used in constructing this distribution of t scores, were obtained from the means and standard deviations based on three samples.

1. Zuckerman (21), 84 male and female college students
2. Hayes: 67 Nursing Students
3. Siller & Chipman (13), 283 male and female college students

COMPARISON OF DIAGNOSTIC GROUPS WITHIN PATIENT SAMPLES

Thirty-seven males and 78 females in the Carter II and Central Islip samples had been diagnosed using the standard psychiatric nomenclature. For the males, 25 schizophrenics were compared with 14 non-schizophrenic patients. Because of the large N in the female group it was possible to subdivide the group into the following categories: 35 schizophrenics, 9 involutional psychotics, 6 psychotic depressives, 4 adjustment reactions, 15 psychoneurotics, and 9 personality disturbances.

The male schizophrenics were significantly lower than the non-schizophrenic males on the Depression scale (t = 2.64, p < .05). They tended to be lower on the Anxiety scale also but this difference was not significant (t = 1.52). The difference on the Hostility scale was negligible.

None of the F tests between the female diagnostic groups yielded significant F ratios. On the Anxiety and Depression scales the personality disturbances were lowest and the psychoneurotics were highest among the patient subgroups.

Patients in the Carter I sample had been rated on a "Psychoticism" scale. Comparisons of high and low rated subjects yielded no significant differences on any of the MAACL scales.

With the exception of the lower scores of male schizophrenics on the Depression scale, the MAACL scales do not seem to vary markedly with diagnostic characteristics considered within the present patient group.

VALIDITY

1. Examination Anxiety

In the first study (21) on this topic, a class of 32 students was given the Today form of the MAACL Anxiety scale on consecutive class meetings a week apart. In each case the anxiety scale showed a significant increase, relative to the baseline, on days when it was given just prior to an examination. (see Figure 1). The rise was significantly greater for students who obtained low grades on the exams than for students who obtained high grades.

This effect was replicated in a second study (23) and in addition it was found that students who rated themselves as more worried about the exam showed significantly greater increases than students who rated themselves as less worried about the exam. The worry ratings were obtained after the MAACL Anxiety scale was given and before the exam was taken.

The third replication was obtained in the study by Zuckerman et al. (27) where additional data were provided on the two new scales for depression and hostility. In this study, the MAACL was administered on three baseline days, a week apart. On the fourth week the experimenter entered with an examination which was not supposed to be given until the following week. This unannounced exam threat was intended to elicit hostility as well as anxiety. The exam was actually given on the subsequent week. During the final week falsified low grades were returned just prior to taking the MAACL. The results in standard scores are plotted in Figure 2. The replicated result can be seen on the real exam day where Anxiety scale scores were the only scale scores significantly elevated above the baseline level. The baseline level of the Anxiety scale in raw score form was 7.1 and the pre-exam level was 10.8. The Hostility and Depression scales were significantly affected by the exam threat and the low grades stress as was the Anxiety scale. The Hostility scale showed a significantly greater response to the exam threat than the Depression scale.

A fourth replication was reported by Lieberman (personal communication 1961) whose results for a class of 26 college students are given in Table 6.

As in the first study by Zuckerman (21) the effects on the second exam day were not as strong as the effects on the first examination day. The General form showed no significant change on examination days bearing out the hypothesis that the time-set is important in tests, and that tests using a general time-set may not be ap-
Table 4. T Score Conversions for MAACL Raw Scores, Today Form

<table>
<thead>
<tr>
<th>College Norms (N = 75)</th>
<th>Raw Scores</th>
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<th>Depression</th>
<th>Hostility</th>
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A fifth replication was reported by Winter, Ferreira, and Ransom (20). They tested 19 college students prior to two examinations and used a day after reviewing a humorous film as a baseline. The mean baseline score was 7 and the mean score on the Anxiety scale increased to 11 on the examination days. The difference was significant.

A sixth replication has been reported by Carol Hayes (personal communication 1964). Using 67 student nurses as subjects, the MAACL Anxiety scale was given on lecture days a week apart. The results are plotted in Figure 3. Note that the Anxiety scale scores remain somewhat elevated just after the examination.

A seventh replication has been reported by Lieberman (9) who found that all three MAACL scores were significantly elevated on days when students were expect-
Table 5. T Score Conversion

<table>
<thead>
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<th>T Score</th>
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Table 6. Changes in MAACL Mean Anxiety Scores During Examinations (N = 28)

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<td>4.83</td>
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<tr>
<td>Today</td>
<td>8.65</td>
<td>13.30**</td>
<td>11.35*</td>
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</table>

*Significantly different than pre-exam score
**p < .05
*p < .01

MAACL was taken on the evening after the morning of the exam so that the Depression scale may have been affected by the experience of failure (as in the study by Zuckerman et al., (27)) where only the Anxiety scale reflected a response to the pre-examination situation and both the Anxiety and Depression scales reflected a response to low grades given back after the examination.

The results from these studies are not theoretically important in simply confirming that students are anxious before examinations, but they are important in establishing the sensitivity of the MAACL to this anxiety. The MAACL promises to be extremely useful in the study of the variables affecting examination anxiety and the consequences of examination anxiety in performance.

2. Hypnotically Induced Anxiety

Levitt, Persky and Brady (7) have reported the results of a series of experiments on the hypnotic induction of anxiety. In four of the experiments the MAACL Anxiety scale was used. The results are given in Table 7.

<table>
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<tr>
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<td>C</td>
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<td>D</td>
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<td>30.78</td>
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<tr>
<td>Pooled  Data</td>
<td>4.53 (N = 43)</td>
<td>16.65 (N = 32)</td>
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</tr>
</tbody>
</table>

Since the Anxiety scale items were initially selected from an hypnotically induced anxiety procedure the highly significant results are to be expected. However, 21 of the 24 adjectives which differentiated anxiety patients from normals also differentiated the hypnotic anxiety state from the control state. This would lead to the conclusion that the self-reported responses of normals under hypnotically induced anxiety are quite similar to those of patients manifesting a clinically observable anxiety condition. It is interesting that the baseline anxiety Check List scores under hypnosis are lower than normal. This may be due to the relaxing effect of the hypnotic trance.

3. Perceptual Isolation

Zuckerman has used the MAACL Anxiety scale in a series of experiments on perceptual isolation. Perceptual isolation consists of confining a subject and restricting his vision, hearing, and tactual sensitivity during the period of confinement. Control groups or conditions in these experiments have included confinement without visual restriction and with auditory stim-
Figure 1. Changes in MAACL Anxiety scores during 13 class meetings.

Figure 2. Changes in mean MAACL standard scores from baseline to experimental days.

Figure 3. Changes in MAACL Anxiety scale scores during 11 class meetings.

Figure 4. Changes in mean MAACL Anxiety and Depression scale scores over 77 consecutive days.

Table 8. MAACL Anxiety Scale Changes for 49 females in 6-7 Hour Isolation and for Control Conditions

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Pretest</th>
<th>Post Test</th>
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<td>Percept. Isol.</td>
<td>25</td>
<td>5.8</td>
<td>11.4</td>
<td>5.6</td>
</tr>
<tr>
<td>Confinement</td>
<td>13</td>
<td>7.0</td>
<td>8.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Control</td>
<td>11</td>
<td>6.5</td>
<td>7.0</td>
<td>0.5</td>
</tr>
</tbody>
</table>

The amateur group responded only slightly more to anxiety than did the professional group and the difference between the groups was not significant. Both groups showed significant increases in Anxiety scale scores when the Check List was given just prior to their performance.

4. "Stage Fright"

An interesting study on this widely known form of anxiety has been reported by Atkinson (personal communication, 1964). The subjects were 30 actors and 10 actresses. Half of the subjects were classified as amateurs and half as professionals. All subjects took the MAACL Anxiety scale on days prior to or after their performance (stress). The results under the non-stress and stress conditions are given in Table 11.
Table 9. MAACL Anxiety Scale Changes for 14 Males Tested Under 2 Conditions

<table>
<thead>
<tr>
<th></th>
<th>Pre Test</th>
<th>Post Test</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceptual Isolation</td>
<td>6.57</td>
<td>10.43</td>
<td>3.86</td>
</tr>
<tr>
<td>Confinement</td>
<td>8.93</td>
<td>9.36</td>
<td>.43</td>
</tr>
</tbody>
</table>

*p < .05

Table 10. Pre versus Post Isolation Difference Scores for MAACL Anxiety Scale

<table>
<thead>
<tr>
<th>Duration of Perceptual Isolation</th>
<th>1 Hour</th>
<th>3 Hours</th>
<th>6-8 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>0.8</td>
<td>1.7</td>
<td>3.9</td>
</tr>
<tr>
<td>Females</td>
<td>---</td>
<td>0.3</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Table 11. MAACL Anxiety Scores Prior to a Performance (Stress)

<table>
<thead>
<tr>
<th></th>
<th>Non Stress</th>
<th>Stress</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>5.9</td>
<td>10.3</td>
<td>4.68</td>
<td>.01</td>
</tr>
<tr>
<td>S.D.</td>
<td>1.6</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Changes Induced by Pictorial Stimuli

A group of 34 college students were shown a 20 minute film, "The Blood of the Beasts", a documentary of the detailed procedures in a slaughter house (27). The General and Today forms of the MAACL Depression and Anxiety scales were given prior to the film and the latter form was given after the film. As can be seen in Table 12, the changes in anxiety and depression were significant for women but not significant for men.

Table 12. Mean MAACL Scores Before and After Film

<table>
<thead>
<tr>
<th></th>
<th>Pre Film</th>
<th>Post-Film</th>
<th>Pre vs. Post Film t Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anxiety</td>
<td>Depression</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Males</td>
<td>9.00</td>
<td>15.95</td>
<td>10.42</td>
</tr>
<tr>
<td>Females</td>
<td>5.87</td>
<td>12.40</td>
<td>10.73</td>
</tr>
<tr>
<td>t's Males vs Females</td>
<td>2.09*</td>
<td>1.24</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05 **p < .01

6. Clinical Observations

Hankoff, Rudorfer, and Paley (6) have reported a relationship between baseline anxiety ratings in 50 psychiatric patients (primarily schizophrenic and anxiety reactions) using the Target Symptom Rating Scale and the MAACL Anxiety scale. The relationship is shown below in Table 14. Their "none" and "mild" categories were combined because there was only one patient in the "none" category.

MAACL Anxiety scores tend to increase with clinically rated anxiety but the vulnerability of the scale to denial is seen in their comparison of the patients' attitude toward their illness and the scores given in Table 15.

However, the denial of mental illness may be actually related to low manifest anxiety levels. The problems in interpreting these data are similar to those in
A second study relating observed anxiety (during testing) to MAACL scores is reported by Zuckerman, Lubin, and Robins (26). As can be seen in Table 16, only the Anxiety scale was significantly related to observed anxiety and it was significantly related to rated anxiety in both male and female patients. However, the Anxiety scale only discriminated at the upper end of the rating scale for males and at the lower end of the rating scale for females. Whether this is a function of the rating scale used or the MAACL scale is not known.

Ward Ratings of the "Paranoid-Belligerence" factor from Lorr's (10) Psychotic Reaction Profile were compared with MAACL scores in a group of 33 V.A. patients (26). The results are given in Table 17.

Table 13. Changes in MAACL Scores After Viewing Maternity Film

<table>
<thead>
<tr>
<th>MAACL Scale</th>
<th>Mean Score Before Film</th>
<th>Mean Score After Film</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>7.12</td>
<td>5.98</td>
<td>2.63</td>
<td>.05</td>
</tr>
<tr>
<td>Depression</td>
<td>12.88</td>
<td>9.78</td>
<td>4.76</td>
<td>.001</td>
</tr>
<tr>
<td>Hostility</td>
<td>8.68</td>
<td>6.63</td>
<td>5.14</td>
<td>.001</td>
</tr>
</tbody>
</table>

Table 14. Relationship Between Anxiety Ratings & the MAACL Anxiety Scale

<table>
<thead>
<tr>
<th>Anxiety Rating</th>
<th>N</th>
<th>Mean Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>None - Mild</td>
<td>14</td>
<td>10.71</td>
</tr>
<tr>
<td>Moderate</td>
<td>32</td>
<td>13.94</td>
</tr>
<tr>
<td>Severe</td>
<td>4</td>
<td>19.25</td>
</tr>
</tbody>
</table>

F = 6.91 p < .01

Table 15. Attitudes Toward Illness and MAACL Anxiety Scores

<table>
<thead>
<tr>
<th>Attitude</th>
<th>N</th>
<th>Mean Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denies all mental illness</td>
<td>24</td>
<td>11.54</td>
</tr>
<tr>
<td>Admits only in past</td>
<td>5</td>
<td>11.80</td>
</tr>
<tr>
<td>Admits when questioned</td>
<td>16</td>
<td>15.75</td>
</tr>
<tr>
<td>Admits readily</td>
<td>5</td>
<td>17.20</td>
</tr>
</tbody>
</table>

F = 4.80 p < .01

There was a significant relationship between observed hostility and MAACL Hostility scale scores but MAACL Anxiety scale scores were also related to hostility ratings. Furthermore, the Hostility scale was only discriminating at the upper end of the rating scale and the middle rated group was actually lowest on the scales.

In another hospital, a group of 43 patients were rated on Lorr's (11) Inpatient Multidimension Psychiatric Scale from behavior in a psychiatric interview. Five hostility items of the Scale were used for comparisons with the MAACL. Although the mean Hostility scores tended to rise from the low group (M = 7.0) to the medium group (M = 8.4) to the high group (M = 9.9), the overall F ratio was not significant. The results for Anxiety and Depression scales were also non-significant.

Zuckerman et al. (1965 in preparation) interviewed, tested and rated 19 psychiatric patients (neurotics) and 21 normals, for three affects: anxiety, depression and hostility. Two kinds of anxiety ratings were used: a set of eight specific behavioral scales incorporating such signs as voice, muscle tension, subjective reports, somatic complaints, restlessness and cognitive impairment, and a global anxiety rating. Two kinds of global anxiety, depression and hostility ratings were made: one based on observation and direct report, and the other based on clinical inference about the patient's
potential behavior. The interjudge reliability between the two observed ratings is given in Table 18. As one might expect, the observed ratings are generally higher than the inferred ratings. Table 18 shows the correlations between the ratings and the MAACL scales given to the subjects on the first day of the study, the mean of 5 consecutive days of MAACL scores, and the General form MAACL scores. The underlined correlations are the validity coefficients.

Fogel et al. (3) rated 75 patients for four affects: anxiety, depression, hostility, and cheerfulness. They used the MAACL Anxiety scale and the Lubin (12) Depression scale. The correlations, uncorrected and corrected are listed in Table 19.

The Anxiety and Depression scales were both significantly and positively correlated with anxiety and depression ratings, and negatively correlated with cheerfulness ratings. None of the correlations with hostility ratings were significant.

The results relating MAACL measured affects to clinical ratings indicate some low order relationships. The inexactitude of the relationship may be attributable to a number of reasons:

1. The low reliability of the ratings.
2. The separation in time between the ratings and the MAACL testing in some studies. (It should be noted that the "Today" form of the MAACL was used in most of these comparisons).
3. Denial defenses of the patient in self-evaluation in relation to the social undesirability of admitting anxiety, depression, or hostility (particularly hostility).

The results relating MAACL measured affects to clinical ratings indicate some low order relationships. The inexactitude of the relationship may be attributable to a number of reasons:

Table 18. Correlations Between Affect Ratings and MAACL Scales (N = 40 patients and normals)

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Observed</td>
<td>Inferred</td>
<td>Observed</td>
</tr>
<tr>
<td>Reliability</td>
<td>78</td>
<td>59+</td>
<td>48+</td>
</tr>
<tr>
<td>MAACL A</td>
<td>53</td>
<td>45+</td>
<td>50</td>
</tr>
<tr>
<td>1 day D</td>
<td>49+</td>
<td>41+</td>
<td>29</td>
</tr>
<tr>
<td>H</td>
<td>29a</td>
<td>29a</td>
<td>16</td>
</tr>
<tr>
<td>MAACL A</td>
<td>64+</td>
<td>58+</td>
<td>64+</td>
</tr>
<tr>
<td>5 day Mean D</td>
<td>63+</td>
<td>61+</td>
<td>65+</td>
</tr>
<tr>
<td>H</td>
<td>48+</td>
<td>45+</td>
<td>45+</td>
</tr>
<tr>
<td>MAACL General A</td>
<td>44+</td>
<td>35x</td>
<td>33x</td>
</tr>
<tr>
<td>D</td>
<td>35+</td>
<td>26</td>
<td>28a</td>
</tr>
<tr>
<td>H</td>
<td>23</td>
<td>20</td>
<td>17</td>
</tr>
</tbody>
</table>

+ p < .01, x p < .05, a p < .10

^Decimals omitted. Correlations are uncorrected for reliabilities of ratings.
4. A general lack of congruence between overt behavior and self-ratings due to lack of insight, misinterpretation of words or other factors.

7. Drug Studies

Hankoff, Rudorfer, and Paley (6) studied the hypothesized anxiety-reducing effects of three drugs, chlordiazepoxide, chlorpromazine, meprobamate and a placebo. The results, given in Table 20, indicate that chlordiazepoxide and chlorpromazine had significant effects in reducing Anxiety scale scores while meprobamate and placebo did not produce significant changes. Similar results were indicated using the global psychiatric ratings.

The same authors (Hankoff, Rudorfer & Paley (5)) used the same design on a new drug, pyrbenzindole, and failed to find a significant effect on the Anxiety scale of the MAACL.

The effect of drug treatment in a psychiatric population can also be seen in Table 3, presenting the normative data. It will be noted that the sample of St. Cloud V. A. psychiatric patients tested at the end of a period of drug treatment has mean Anxiety and Hostility scores which were not significantly different than those for normal males. In contrast, the Mt. Alto V. A. group, tested twice after admission without any systematic drug therapy were significantly higher than normal groups on all scales.

8. Correlations with Physiological and Biochemical Measures

In a recent study (Zuckerman et al., in preparation) the Today MAACL, five day mean MAACL, and MAACL General form, were correlated with a variety of hormones of the anterior pituitary and its target glands. MAACL scores were also correlated with heart and breathing reactions to a cold-pressor test. The five day mean MAACL Anxiety and Depression scores showed some low significant positive relationships with 17-Ketogenic steroids (from adrenal cortex) and breathing rate increase after the cold-pressor stress. These correlations are shown in Table 21.

### Table 19. Correlations Between MAACL Anxiety, Depression and Hostility Scales and Affect Ratings (N = 78)

<table>
<thead>
<tr>
<th></th>
<th>Anxiety</th>
<th>Depression</th>
<th>Hostility</th>
<th>Cheerfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating Reliability</td>
<td>.68*</td>
<td>.65*</td>
<td>.83*</td>
<td>.73*</td>
</tr>
<tr>
<td>MAACL Anxiety</td>
<td>.34*</td>
<td>.40*</td>
<td>00</td>
<td>-.44*</td>
</tr>
<tr>
<td>corrected r</td>
<td>(.50)</td>
<td>(.53)</td>
<td>(00)</td>
<td>(-.54)</td>
</tr>
<tr>
<td>Lubin Dep (F-A)</td>
<td>.34*</td>
<td>.44*</td>
<td>.02</td>
<td>-.39*</td>
</tr>
<tr>
<td>corrected r</td>
<td>(.50)</td>
<td>(.59)</td>
<td>(02)</td>
<td>(-.45)</td>
</tr>
</tbody>
</table>
*significant at or beyond .05 confidence level

### Table 20. Effects of Drugs and Placebo on MAACL Anxiety Scale Scores

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Baseline</th>
<th>2 Wks.</th>
<th>D</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlordiazepoxide</td>
<td>20</td>
<td>13.80</td>
<td>11.45</td>
<td>-2.35</td>
<td>3.23*</td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td>16</td>
<td>14.25</td>
<td>12.06</td>
<td>-2.19</td>
<td>2.68*</td>
</tr>
<tr>
<td>Meprobamate</td>
<td>24</td>
<td>12.29</td>
<td>12.08</td>
<td>.29</td>
<td>N.S.</td>
</tr>
<tr>
<td>Placebo</td>
<td>38</td>
<td>11.79</td>
<td>11.51</td>
<td>.18</td>
<td>N.S.</td>
</tr>
</tbody>
</table>
*p < .01
Table 21. Correlations between 5 Day Mean MAACL and 17 KGS and Breathing Rate Increase (Cold Pressor)¹

<table>
<thead>
<tr>
<th>MAACL, 5 day mean</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 KGS - Day 1</td>
<td>.38*</td>
<td>.35*</td>
<td>.21</td>
</tr>
<tr>
<td>17 KGS - 5 Day mean</td>
<td>.35*</td>
<td>.31*</td>
<td>.21</td>
</tr>
<tr>
<td>BR A</td>
<td>.36*</td>
<td>.33**</td>
<td>.26</td>
</tr>
</tbody>
</table>

¹ 17 KGS N = 40, BR N = 30
* p < .05  ** p < .10

Giddon (4) did not find any significant correlations between the mean anxiety scores and Wenger's autonomic Balance Score and its component physiological measures.

Winter et al. (20) did not find a significant correlation between the MAACL Anxiety scale and a palmar sweat index.

9. Correlations with Taylor Manifest Anxiety Scale

A frequently used test for anxiety in recent years has been the Taylor (16) Manifest Anxiety Scale (MAS). Initially validated in a construct validity experiment (17), this test has also shown significant correlations with clinically rated anxiety (14). However, it has shown high loadings on the major factor of the MMPI which would suggest that it measures general psychopathology as well as anxiety.

The correlations between the MAACL Anxiety scale and the MAS are presented in Table 22.

Table 22. Correlation of Taylor MAS and MAACL Anxiety Scale

<table>
<thead>
<tr>
<th>MAACL Form</th>
<th>Sample</th>
<th>N</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>College Students</td>
<td>50</td>
<td>.18</td>
</tr>
<tr>
<td>General</td>
<td>College Students</td>
<td>246</td>
<td>.37**</td>
</tr>
<tr>
<td>General</td>
<td>College Students</td>
<td>32</td>
<td>.58**</td>
</tr>
<tr>
<td>General</td>
<td>Male Normals</td>
<td>21</td>
<td>.56**</td>
</tr>
<tr>
<td>General</td>
<td>Psychiatric Patients</td>
<td>32</td>
<td>.62**</td>
</tr>
<tr>
<td>General</td>
<td>Psychiatric Patients</td>
<td>19</td>
<td>.47*</td>
</tr>
<tr>
<td>Month</td>
<td>Pregnant Women</td>
<td>51</td>
<td>.55**</td>
</tr>
<tr>
<td>Today</td>
<td>College Students</td>
<td>50</td>
<td>.29*</td>
</tr>
<tr>
<td>Today</td>
<td>College Students</td>
<td>32</td>
<td>.32</td>
</tr>
<tr>
<td>Today, mean 10 non-exam days</td>
<td>College Students</td>
<td>32</td>
<td>.52**</td>
</tr>
<tr>
<td>Today, mean 6 days</td>
<td>College Students</td>
<td>19</td>
<td>.44*</td>
</tr>
<tr>
<td>Today</td>
<td>Male Normals</td>
<td>21</td>
<td>.54*</td>
</tr>
<tr>
<td>Today, mean 5 days</td>
<td>Male Normals</td>
<td>21</td>
<td>.58*</td>
</tr>
<tr>
<td>Today</td>
<td>Psychiatric Patients</td>
<td>32</td>
<td>.52**</td>
</tr>
<tr>
<td>Today</td>
<td>Psychiatric Patients</td>
<td>49</td>
<td>.58**</td>
</tr>
<tr>
<td>Today</td>
<td>Psychiatric Patients</td>
<td>19</td>
<td>.32</td>
</tr>
<tr>
<td>Today, mean 5 days</td>
<td>Psychiatric Patients</td>
<td>19</td>
<td>.69**</td>
</tr>
</tbody>
</table>

*p < .05  **p < .01
Inspection of that table will show that the results are fairly consistent. With the exception of the first college sample, the General form of the MAACL Anxiety scale correlates between .57 and .62 with the MAS. With the first college sample, the Today form of the Anxiety scale correlates considerably lower (.29 & .32). However, if the subjects' means for a number of days are correlated with their MAS scores the correlations are considerably higher (r's = .52 & .44) than the single day MAACL correlations. In psychiatric patients, the Today form of a single day correlates about as high with the MAS as does the General form for college students. If the MAS is considered to be a general time set test, then the results are not surprising. It would be expected that the General MAACL would correlate more highly with the general MAS than the more time specific Today MAACL. An average of a series of Today MAACL scores is the equivalent of a General MAACL as far as correlations with the MAS are concerned. The results are somewhat different for two of the three psychiatric patient groups where the Today form of the MAACL correlated almost as highly with the MAS as did the General MAACL form. This ties in with the results on the greater test-retest reliability of the Today form in psychiatric patients. Apparently a day’s anxiety measure for a psychiatric patient is a more generalizable measure for him than a day’s anxiety measure for a normal. If it is assumed that the normal’s anxiety is in response to occasional environmental stresses while the patient’s anxiety is a response to persistent internal conflict, these results make sense.

10. Correlations with Other Anxiety Tests

The correlations in Table 23 are similar in magnitude to the ones between the MAACL and the MAS and indicate moderate overlap between these measures of anxiety.

11. Correlations with MMPI Scales

The pattern of correlations between the MAACL and three samples given the MMPI can be seen in Table 24. The General form of the Anxiety scale correlates with a broader range of MMPI scales than the Today form of the Anxiety scale. This would indicate that the General form measures more of general psychopathology than the Today form. The MMPI scales which are most consistently correlated significantly with the Today Anxiety scale are the Depression and Psychasthenic scales which are the classical anxiety scales of the original MMPI scales. The Depression scale of the MAACL is also correlated with those two scales and with the Schizophrenia scale as well. The Hostility scale of the MAACL is mainly associated with the MMPI Psychasthenic and Schizophrenic scales although in female patients it is also significantly correlated with the MMPI Depression and Paranoia scales.

<table>
<thead>
<tr>
<th>MAACL Form</th>
<th>Questionnaire</th>
<th>Sample</th>
<th>N</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Welsh A Scale</td>
<td>College</td>
<td>283</td>
<td>.65*</td>
</tr>
<tr>
<td>General</td>
<td>Welsh A Scale</td>
<td>High School</td>
<td>229</td>
<td>.49*</td>
</tr>
<tr>
<td>General</td>
<td>Maslow Security</td>
<td>College</td>
<td>283</td>
<td>-.69*</td>
</tr>
<tr>
<td>General</td>
<td>Maslow Security</td>
<td>High School</td>
<td>229</td>
<td>-.58*</td>
</tr>
<tr>
<td>General</td>
<td>Cattell’s IPAT</td>
<td>Normal Males</td>
<td>21</td>
<td>.63</td>
</tr>
<tr>
<td>General</td>
<td>Cattell’s IPAT</td>
<td>College</td>
<td>246</td>
<td>.56*</td>
</tr>
<tr>
<td>General</td>
<td>Cattell’s IPAT</td>
<td>Psychiatric Pts.</td>
<td>19</td>
<td>.38</td>
</tr>
<tr>
<td>Today</td>
<td>Cattell’s IPAT</td>
<td>TV Performers</td>
<td>20</td>
<td>.44*</td>
</tr>
<tr>
<td>Today</td>
<td>Cattell’s IPAT</td>
<td>non-stress conditions</td>
<td>20</td>
<td>.79*</td>
</tr>
<tr>
<td>Today</td>
<td>Cattell’s IPAT</td>
<td>Normal Males</td>
<td>21</td>
<td>.55*</td>
</tr>
<tr>
<td>Today</td>
<td>Cattell’s IPAT</td>
<td>Psychiatric Pts.</td>
<td>19</td>
<td>.27</td>
</tr>
<tr>
<td>Today</td>
<td>Welsh Anxiety Index from (MMPI)</td>
<td>Psychiatric Pts.</td>
<td>49</td>
<td>.53*</td>
</tr>
<tr>
<td>Today</td>
<td>Rosen Anxiety Reaction Scale</td>
<td>Psychiatric Pts.</td>
<td>49</td>
<td>.47*</td>
</tr>
</tbody>
</table>

*p < .01
12. Correlations with Other Personality Trait Measures

Giddon (4) found low non-significant correlations between the mean Today MAACL Anxiety score and the following Edwards Personal Preference Schedule scales: achievement, orderliness, endurance, aggression, nurturance and abasement.

Siller and Chipman (15) found a number of significant relationships between the General MAACL and Gough Adjective Checklist scales (see Table 25).

Table 24. Correlations between MAACL and MMPI

<table>
<thead>
<tr>
<th>In General</th>
<th>Today Anxiety</th>
<th>Today Anxiety</th>
<th>Today Depression</th>
<th>Today Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M &amp; F</td>
<td>M &amp; F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>N</td>
<td>32</td>
<td>32</td>
<td>25</td>
<td>44</td>
</tr>
<tr>
<td>Hs</td>
<td>.48**</td>
<td>.29</td>
<td>.39</td>
<td>.34*</td>
</tr>
<tr>
<td>D</td>
<td>.61**</td>
<td>.51**</td>
<td>.42**</td>
<td>.41**</td>
</tr>
<tr>
<td>Hy</td>
<td>.75**</td>
<td>.35</td>
<td>.40*</td>
<td>.27</td>
</tr>
<tr>
<td>Pd</td>
<td>.48**</td>
<td>.21</td>
<td>.16</td>
<td>.24</td>
</tr>
<tr>
<td>Mf</td>
<td>.06</td>
<td>-.31</td>
<td>.15</td>
<td>-.05</td>
</tr>
<tr>
<td>Pa</td>
<td>.30</td>
<td>.25</td>
<td>.01</td>
<td>.27</td>
</tr>
<tr>
<td>Pt</td>
<td>.62**</td>
<td>.48**</td>
<td>.48**</td>
<td>.47*</td>
</tr>
<tr>
<td>Sc</td>
<td>.53**</td>
<td>.25</td>
<td>.35</td>
<td>.44*</td>
</tr>
<tr>
<td>Ma</td>
<td>.15</td>
<td>-.08</td>
<td>-.19</td>
<td>-.14</td>
</tr>
<tr>
<td>Si</td>
<td>.75**</td>
<td>.45**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05 **p < .01

Table 25. Highest Correlations between Anxiety Scale Only of MAACL and Gough ACL Scales

<table>
<thead>
<tr>
<th>ACL Scale</th>
<th>r</th>
<th>ACL Scale</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Succorance</td>
<td>.72</td>
<td>Social Pulse &amp; Presence</td>
<td>-.70</td>
</tr>
<tr>
<td>Deviance</td>
<td>.60</td>
<td>Likeability</td>
<td>-.61</td>
</tr>
<tr>
<td>Self-Criticism</td>
<td>.64</td>
<td>Personal Adjustment</td>
<td>-.60</td>
</tr>
<tr>
<td>Aggression</td>
<td>.46</td>
<td>Nurturance</td>
<td>-.55</td>
</tr>
<tr>
<td>Abasement</td>
<td>.41</td>
<td>Self Acceptance</td>
<td>-.50</td>
</tr>
<tr>
<td>Other Scales</td>
<td></td>
<td>Affiliation</td>
<td>-.50</td>
</tr>
<tr>
<td>Zaks-Walter Hostility</td>
<td>.37</td>
<td>Intraception</td>
<td>-.50</td>
</tr>
<tr>
<td>Winnie Neuroticism</td>
<td>.36</td>
<td>Self Insight</td>
<td>-.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Endurance</td>
<td>-.46</td>
</tr>
<tr>
<td>Other Scales</td>
<td></td>
<td>Barron Ego Strength</td>
<td>-.46</td>
</tr>
</tbody>
</table>
RELIABILITIES

In considering the difference between a test with a "general" time set and an immediate or "today" time set it was predicted that a different reliability pattern would obtain for each. Both kinds of tests were expected to show high internal (split-half or item intercorrelation) reliability on a single test occasion, but while the "general" test was expected to yield high test-retest reliability, the "today" test was not expected to be as reliable from day to day. Subjects' moods vary from day to day and, while persons at the extremes, such as chronic depressives, may stay "reliably" depressed, most people in the normal population will fluctuate in mood. A test attempting to measure mood should not be statistically reliable from day to day if it is truly sensitive to these individual fluctuations. A trait test such as the Taylor Manifest Anxiety Scale, which asks people how they generally feel, is probably measuring a mixture of the chronic psychopathology, chronic high levels of anxiety and some of the current, immediate level of anxiety.

But assuming that the daily changes in affect are randomly distributed within a group, the group should not change significantly from occasion to occasion unless the whole group is exposed to some common stress situation on one occasion. The group means were stable for the three baseline days in the study by Zuckerman et al. (27) using college students and in the study by Tolor and Mabli (18) who used schizophrenics tested over 6 to 9 consecutive days.

Table 26 shows the reliability correlations for four samples. Only the last two samples took the MAACL containing the Depression and Hostility scales. No data have been collected for the General form of the MAACL.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Sample</th>
<th>N</th>
<th>Internal Reliability</th>
<th>Retest Reliability (7 day interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I General Anxiety</td>
<td>College Students</td>
<td>35</td>
<td>.72*</td>
<td>.68*</td>
</tr>
<tr>
<td>Today Anxiety</td>
<td></td>
<td></td>
<td>.85*</td>
<td>.31</td>
</tr>
<tr>
<td>II Today Anxiety</td>
<td>Nursing Students</td>
<td>67</td>
<td>----</td>
<td>only 22 out of 78 correlations between 9 lecture days were significant. Most significant r's in range .30-.49</td>
</tr>
<tr>
<td>III Today Anxiety</td>
<td>College Students</td>
<td>46</td>
<td>(odd vs. even items) (7 day interval)</td>
<td>.79*</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
<td>.92*</td>
<td>.21</td>
</tr>
<tr>
<td>Hostility</td>
<td></td>
<td></td>
<td>.90*</td>
<td>.15</td>
</tr>
<tr>
<td>IV Today Anxiety</td>
<td>Psychiatric Patients</td>
<td>50</td>
<td>(plus vs. minus items) (8 day interval)</td>
<td>.73*</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
<td>.65*</td>
<td>.79*</td>
</tr>
<tr>
<td>Hostility</td>
<td></td>
<td></td>
<td>.24</td>
<td>.84*</td>
</tr>
<tr>
<td>V Anxiety</td>
<td>Psychiatric Patients</td>
<td>78</td>
<td>(plus vs. minus items)</td>
<td>.17</td>
</tr>
<tr>
<td>Depression+</td>
<td></td>
<td></td>
<td>.30</td>
<td></td>
</tr>
</tbody>
</table>

*p < .01
+ original Lubin Depression scale, not the one used in MAACL
The reliability correlations from the first three samples composed of college and nursing students show the predicted pattern. Internal reliability coefficients are significant and high while test-retest correlations are low and only occasionally of moderate significance. The results in the fourth and fifth samples of psychiatric patients were not entirely congruent with the hypotheses concerning the nature of pure "state" tests. The internal reliability coefficient of the Hostility scale was not significant in the fourth study and the Anxiety and Depression scales, plus and minus items were not correlated in the fifth study. In part, this may be due to the fact that plus items and minus items were correlated instead of odd and even items. Positive words may be measuring something other than negative words where lack of response indicates the affect. Despite this, the test-retest reliability of the total Hostility scale as well as the reliability of the Anxiety and Depression scales were high and significant. Perhaps affect in patients tends to be chronically elevated which might produce greater reliability in that group. Another possibility is that patients do not adequately discriminate between "general" and "today" items.

The actual correlations between the General and Today forms of the MAACL Anxiety scale in a psychiatric sample \((r = .52)\) was only slightly higher than that found in a college population \((r = .43)\).

**RESPONSE SETS**

The validity of the personality inventories has been challenged by the work of the past several years on the question of response sets. Two major types of response set have been identified: social desirability, or the tendency to respond to items in terms of their social desirability value rather than their content, and acquiescence or the tendency to choose the "true" or "agreed" categories rather than the "false" or "disagree" categories of response. A number of scales have been developed to measure these tendencies in order to assess their influence in other tests. Three of the original validity scales of the MMPI, the L, F, and K scales were originally intended to detect defensiveness (K), lying (L) and general response deviancy (F). Recent studies would seem to indicate that the L and K scales are almost as good measures of the social desirability (SD) response set as the Edwards SD scale. The Edwards SD scale has been criticized because the items confound psychopathology with response set. Twenty-two of the 39 items in the scale are the same items as in the Taylor Manifest Anxiety Scale (scored opposite for SD) which only consists of 50 items in itself. It is not surprising that Merrill and Heathers (13) report a -.84 correlation between the TMAS and the Edwards SD scale. Undoubtedly, anxiety is socially undesirable but this is different than saying the Manifest Anxiety Scale is a measure of Social Desirability Response Set. This should be kept in mind when examining the correlations between the MAACL and the measures of Social Desirability given in Table 26. The Crowne-Marlowe (2) Social Desirability Scale was developed to avoid this defect of the Edwards SD scale. It utilizes items which have little implication of psychopathology, but if answered in the keyed direction would tend to indicate a tendency to exaggerate for the sake of making a good impression. It is like the L scale of the MMPI, only somewhat more subtle. However, this and other measures of response set are not free of the influence of content. The search for a pure response set test of some generality seems to be as difficult as the search for a completely culture-free intelligence test.

The correlations between the Anxiety scale of the MAACL and the social desirability response set measures in Table 27 are all significant but, with the exception of the correlation of -.57 with the Edwards SD in one sample, not remarkably high. These correlations involve only the General form of the MAACL. Judging from the data in Table 29 where both forms were used, the correlations between SD and the Today form would be lower.

The correlations between the Anxiety scale of the MAACL and the acquiescence response set measures are given in Table 28. Although six of the eight correlations are significant, the magnitude of the correlations are low and indicate that little of the variance of the MAACL can be explained by acquiescence response. In the case of the most relevant type of acquiescence, the agreement score based on the number of MAACL item types checked, the correlation is low but significant in the college sample and insignificant in the high school sample.

<table>
<thead>
<tr>
<th>SD Measure</th>
<th>Sample</th>
<th>N</th>
<th>(r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edwards SD</td>
<td>College(^1)</td>
<td>283</td>
<td>-.67(^*)</td>
</tr>
<tr>
<td>Edwards SD</td>
<td>College(^2)</td>
<td>246</td>
<td>-.33(^*)</td>
</tr>
<tr>
<td>Edwards SD</td>
<td>High School(^1)</td>
<td>229</td>
<td>-.46(^*)</td>
</tr>
<tr>
<td>Crowne-Marlowe SD</td>
<td>College(^1)</td>
<td>283</td>
<td>-.37(^*)</td>
</tr>
<tr>
<td>Crowne-Marlowe SD</td>
<td>High School(^1)</td>
<td>229</td>
<td>-.26(^*)</td>
</tr>
</tbody>
</table>

\(^*\) \(p < .01\)

1 From Siller and Chipman (15)
2 From Tucker (19)

Table 29 contains the correlations between Check List scales and MMPI response set measures. The Anxiety scale of the General form of the MAACL was positively related to the F scale measure of response deviancy and negatively related to the K scale and the Page and Hanley measures of defensiveness. Only one of the 21 correlations between the scales of the Today MAACL and the L, F, and K scales reached significance, although the weak tendency toward positive correlation with the F scale and negative correlation with the K scale is in evidence.

Thus, the above data suggest that response sets do not appear to be an important influence in MAACL, particularly not in the Today forms of these tests.
Table 28. Correlations Between MAACL Anxiety Scale (General Form) and Acquiescence Scales from Siller and Chipman Study

<table>
<thead>
<tr>
<th>Acquiescence Scale</th>
<th>Sample</th>
<th>N</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couch-Keniston A.S.</td>
<td>College</td>
<td>283</td>
<td>.18^x</td>
</tr>
<tr>
<td>Agreement Score ACL items</td>
<td>College</td>
<td>283</td>
<td>.26^x</td>
</tr>
<tr>
<td>Agreement Score ACL type items</td>
<td>High School</td>
<td>229</td>
<td>.05</td>
</tr>
<tr>
<td>Agreement Score MMPI type items</td>
<td>College</td>
<td>283</td>
<td>.48^x</td>
</tr>
<tr>
<td>Agreement Score MMPI type items</td>
<td>High School</td>
<td>229</td>
<td>.28^x</td>
</tr>
<tr>
<td>Fulkerson A.S.</td>
<td>College</td>
<td>283</td>
<td>.27^x</td>
</tr>
<tr>
<td>Fulkerson A.S.</td>
<td>High School</td>
<td>229</td>
<td>.05</td>
</tr>
</tbody>
</table>

\[^x p < .01\]

Relationship of MAACL Scales to Intelligence, Aptitudes, Age, Education and Sex

Table 30 shows the correlations between the MAACL Anxiety scale General and Today forms and measures of intelligence and aptitudes.

With the exception of the small significant correlation between verbal ability on the College Board test and the General MAACL Anxiety scale, none of these correlations were significant and most were close to zero.

Giddon (4) found no significant correlations between mean MAACL Anxiety scores and science, social studies, information, numerical ability and study reading aptitude scores.

Tucker (19) found no relationships between the general MAACL Anxiety scale and a variety of learning tasks involving retroactive inhibition. None of his other anxiety measures correlated with performance on these tasks.

Zuckerman, Lubin & Robins (26) found no differences on any of the three MAACL scales between patients rated as below average, average and above average in intelligence.

Age was not significantly correlated with the General MAACL Anxiety scale \(r = .08\) or the Today MAACL \(r = -.01\) in 84 college students in the Zuckerman (21) study. Further, age was not significantly correlated with the month version of the MAACL in the pregnant women sample \(r = -.12\), or with the general MAACL in Siller and Chipman (15) high school students \(r = .02\). Some evidence of a curvilinear relationship between age and education was found in a psychiatric patient sample (23) where the 30 to 39 year old group had significantly higher anxiety scores than the younger than 30 and older than 39 groups. This relationship was not found in a second psychiatric sample (26). Correlations were computed between age and the Anxiety, Depression, and Hostility scales of the Today and General forms of the MAACL in a group of 40 patients and normals. None of these correlations were significant at the .05 level (Zuckerman et al., in preparation).

Table 29. Correlations between Checklist Scales and MMPI Response Set Scales

<table>
<thead>
<tr>
<th>Checklist Scale</th>
<th>Sample</th>
<th>N</th>
<th>MMPI Scale</th>
<th>L</th>
<th>F</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety (General)</td>
<td>Psychiatric Patients</td>
<td>32</td>
<td>.06</td>
<td>.37**</td>
<td>.50**</td>
<td></td>
</tr>
<tr>
<td>Anxiety (Today)</td>
<td>Psychiatric Patients</td>
<td>32</td>
<td>-.03</td>
<td>-.09</td>
<td>-.01</td>
<td></td>
</tr>
<tr>
<td>Anxiety (Today)</td>
<td>Male Psychiatric Patients</td>
<td>25</td>
<td>-.24</td>
<td>.21</td>
<td>-.24</td>
<td></td>
</tr>
<tr>
<td>Depression (Today)</td>
<td>Male Psychiatric Patients</td>
<td>25</td>
<td>-.13</td>
<td>.22</td>
<td>-.16</td>
<td></td>
</tr>
<tr>
<td>Hostility (Today)</td>
<td>Male Psychiatric Patients</td>
<td>25</td>
<td>-.04</td>
<td>-.30</td>
<td>-.29</td>
<td></td>
</tr>
<tr>
<td>Anxiety (Today)</td>
<td>Female Psychiatric Patients</td>
<td>44</td>
<td>-.01</td>
<td>.13</td>
<td>-.29</td>
<td></td>
</tr>
<tr>
<td>Depression (Today)</td>
<td>Female Psychiatric Patients</td>
<td>44</td>
<td>-.09</td>
<td>.29</td>
<td>-.25</td>
<td></td>
</tr>
<tr>
<td>Hostility (Today)</td>
<td>Female Psychiatric Patients</td>
<td>44</td>
<td>-.04</td>
<td>.32**</td>
<td>-.23</td>
<td></td>
</tr>
</tbody>
</table>

Additional data from Tucker (1964)

| Anxiety (General) | College Students 246 | -17** | .37**| -.29**|

\[^* p < .05 \quad ^{**} p < .01\]
Table 30. Correlations between MAACL Anxiety Scale and Intelligence and Abilities

<table>
<thead>
<tr>
<th>Intelligence Measure</th>
<th>Sample</th>
<th>N</th>
<th>General MAACL Anxiety</th>
<th>Today MAACL Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wechsler A.I.S. Verbal IQ</td>
<td>Psychiatric Pts.</td>
<td>32</td>
<td>.02</td>
<td>-.01</td>
</tr>
<tr>
<td>Performance IQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Scale IQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholastic Aptitude</td>
<td>Dental Hygiene</td>
<td>71</td>
<td>.04</td>
<td>.07</td>
</tr>
<tr>
<td>Verbal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Board</td>
<td>College Students</td>
<td>246</td>
<td>.14*</td>
<td>-.07</td>
</tr>
<tr>
<td>Verbal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

Education

Significant correlations between education and the MAACL Anxiety scale have not been found in the pregnant women group (28) or in the psychiatric patient groups (26, 23). In examining the norms for two normal groups in Table 3, the job applicants, whose mean educational level was somewhat less than four years of high school, and the college students, it can be seen that college males were significantly higher than job applicant males on the Depression and Hostility scales of the MAACL. However, the differences between these two groups may be due to reasons other than education. Correlations were computed between education and the Anxiety, Depression and Hostility scales of the Today and General forms of the MAACL. In a group of 40 patients and normals where only one correlation was significant: the General Anxiety scale which was negatively correlated with education (r = -.35).

Sex Differences

Sex differences from MAACL scales were not significant for any of the normal samples except for one class of students where, just prior to a film, males scored higher than females on the Today MAACL Anxiety scale (27). Sex differences were found in two of three psychiatric samples (26). The female patients scored significantly higher on the Anxiety and Depression scales in both samples and on the Hostility scale in one sample. Similar sex differences between male and female patients on Depression scales have been reported by Lubin (12). Tolor and Mabli (18) did not find sex differences on the MAACL in normals, but schizophrenic women were significantly higher on the Anxiety scale than schizophrenic men. Users of the MAACL are probably safe in combining male and female data in normal samples but sex comparisons should be made before combining male and female data in psychiatric patient samples.

Table 31. Correlations among MAACL Scales

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>Anxiety vs. Depression</th>
<th>Anxiety vs. Hostility</th>
<th>Depression vs. Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td>College, males &amp; females</td>
<td>46</td>
<td>.75</td>
<td>.72</td>
<td>.72</td>
</tr>
<tr>
<td>Psychiatric Patients, males</td>
<td>26</td>
<td>.86</td>
<td>.72</td>
<td>.73</td>
</tr>
<tr>
<td>Psychiatric Patients, females</td>
<td>47</td>
<td>.85</td>
<td>.50</td>
<td>.62</td>
</tr>
</tbody>
</table>

1 All r's significant, p < .01
than that traits the high correlations between them do not necessarily invalidate their use as separate scales.

**BRIEF SCALES FOR THE MAACL**

Because of the high intercorrelations between the full scales of the MAACL, an attempt was made to develop shorter and more independent scales for anxiety, depression, and hostility. A sample of 200 normal and 278 patients was used for an item analysis. Each item in the MAACL was correlated with each of the three full scale anxiety, depression, and hostility scores using biserial correlation. Items that correlated most highly with their own scale, relative to their correlations with the other two scales, were selected for use in the brief scales. A total of 10 anxiety items, 24 depression items, and 14 hostility items met these criteria. The selected items are starred in Table 2. The anxiety and depression items most highly related to total scores, and most discriminating were mainly "plus" items, while most of the discriminating hostility items were "minus" items. It seems as if "good" anxiety and depression items consist of what one admits, while "good" hostility items consist of what one omits.

The extent to which the brief scales were successful in reducing the interscale correlations between anxiety, depression, and hostility, and the relative validity of the brief scales relative to the full scales are indicated in Table 32. The records of 40 patients and normals who had been rated for the three affects and given the MAACL on two consecutive days were rescored for the brief scales on both days. The results with the brief scales can be compared with the results using the full scales.

**CORRELATIONS BETWEEN SCALES**

The full scales were very highly intercorrelated in this heterogeneous sample. The brief scales did not reduce the correlation between the Anxiety and Depression scales very much (.84 to .82) but substantially reduced the correlations between Anxiety and Hostility (.82 to .31) and Depression and Hostility scales (.82 to .47). Thus the item selections were only partially successful in separating the three affects. In the correlations between ratings, anxiety and depression were also highly correlated (.72) while neither was correlated with ratings of hostility (.03 and -.03). If we accept the ratings as the extent of genuine correlation between the affects then we must admit that, while approaching the true correlations, considerable method variance still remains in the brief scales.

**CORRELATIONS BETWEEN THE BRIEF AND FULL SCALES**

The correlations between the brief and full scales (a = .92, d = .93 and h = .92) indicates that the short forms of the depression and hostility scales are adequate substitutes for the longer scales. The relationship between the short and full anxiety scales is satisfactory, but probably limited by the small, extremely skewed distribution on the brief scale.

**CHECKING AND FAKE-GOOD RESPONSE SETS**

In view of the fact that the brief scales are very imbalanced for the plus and minus items one would expect them to be extremely vulnerable to the checking response set. This set is measured by the total number of items checked in the 132 item test. The checking set is not significantly related to Anxiety and Depression scales in either the full scales or the brief scales. It is significantly and negatively related to the Hostility scale in both the full and brief scales, and the elimination of most of the plus items in the brief scale has raised the correlation from -.42 to -.62. By reducing the relationship between the Hostility scale and the other two scales, we have made it more vulnerable to the set to check fewer or many items. The MMPI Lie scale was used as a measure of the tendency to "fake-good". None of the MAACL scales were significantly correlated with this set.

**VALIDITY OF THE BRIEF SCALES**

Comparing the correlations of the brief and full scales with the affect ratings from the interviews and the questionnaires, we see the same pattern. The convergent validity of the brief anxiety and depression scales is high and just about the same as the validity of the full scales. Neither the brief nor full hostility scales show any validity in terms of their correlations with affect ratings or questionnaires.

**RELIABILITIES**

According to the theory of state scales, test-retest reliabilities are not expected to be high for affect measures with a "today" time set. However, as noted in the discussion of reliability, it was found that affect scales did prove reliable on retest in patient groups but not in normal groups. Since the present group consists of mixed patient and normals, the low to moderate test-retest reliabilities are to be expected. Despite the curtailment of the range of the brief scales they are just about as reliable as the full scales, and one of them, the hostility scale, is even higher.

The small number of items in the brief scales have curtailed the range of scores on these scales and the distributions are markedly skewed, particularly on the anxiety scale. Although the reduction of range on the brief scale does not appear to have affected their reliability or validity in a heterogeneous group, it might make the scales rather insensitive to small differences in groups of normals.

**SUMMARY**

The brief scales have accomplished part of the purpose of their construction in reducing the high correlations between the Anxiety and Depression scales and the Hostility scale. This has been accomplished with no reduction in the reliability or validity of the scales, but has had two unfortunate consequences: the brief hostility scale is more responsive than the complete Hostility scale was to the checking response set and the range of scores on all scales is curtailed.

**SOME SUGGESTED USES OF THE MAACL**

1. Testing the effects of psychotherapy, drugs or other types of therapy.
2. Stress experiments requiring before and after measures of affect.
3. Measures of natural stress such as operations, examinations, etc.
Table 32. Intercorrelations Among MAACL Brief Scales (a, d, h) and Full Scales (A, D, H), Checking Response Set, Interview Based Ratings, and Questionnaire and Test-Retest Reliabilities.

<table>
<thead>
<tr>
<th>Brief Scales</th>
<th>MAACL Brief Scales</th>
<th>MAACL Full Scales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>d</td>
</tr>
<tr>
<td>a</td>
<td></td>
<td>84*</td>
</tr>
<tr>
<td>d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Scales</td>
<td></td>
<td>82*</td>
</tr>
<tr>
<td>A</td>
<td>82*</td>
<td>76*</td>
</tr>
<tr>
<td>D</td>
<td>88*</td>
<td>92*</td>
</tr>
<tr>
<td>H</td>
<td>67*</td>
<td>68*</td>
</tr>
<tr>
<td>Checking Response</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>Ratings Anxiety</td>
<td>69*</td>
<td>55*</td>
</tr>
<tr>
<td>Depression</td>
<td>63*</td>
<td>66*</td>
</tr>
<tr>
<td>Hostility</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>Questionnaires</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td>64*</td>
<td>66*</td>
</tr>
<tr>
<td>MMPI D</td>
<td>61*</td>
<td>72*</td>
</tr>
<tr>
<td>Buss. Host.</td>
<td>28</td>
<td>18</td>
</tr>
<tr>
<td>MMPI Lie</td>
<td>-12</td>
<td>-13</td>
</tr>
<tr>
<td>Retest</td>
<td>46*</td>
<td>42*</td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant beyond .01 confidence level,  **significant beyond .05 confidence level

1. N = 40 including 19 patients
N = 38 for retest reliabilities

4. Studies of the menstrual cycle.
5. Comparisons of physiological, biochemical and affect measures over occasions.
6. Studies of the effects of hypnotic suggestions of emotional states or stress situations.

The Today form of the MAACL is ideally suited for studies requiring repeated measurements of affect over time. The General MAACL form Anxiety scale may be used to obtain a quick estimate of the general level of anxiety (anxiety as a trait). The Depression and Hostility scales have not yet been assessed for this purpose but it is possible that they could serve as substitutes for longer questionnaires.

One of the possibilities offered by a check list such as the MAACL is the bridging of the theoretical chasm between affect as a clinical phenomenon and affect as a normal stress phenomenon. As an illustration, let us summarize some of our results on the MAACL Anxiety scale.

Clinical Anxiety Anxiety as Stress Response

<table>
<thead>
<tr>
<th>T Scores</th>
<th>Raw Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very</td>
<td>92--19</td>
</tr>
<tr>
<td>Severe</td>
<td>83--19</td>
</tr>
<tr>
<td>Mild</td>
<td>77--15</td>
</tr>
<tr>
<td>Normal</td>
<td>52--7</td>
</tr>
</tbody>
</table>

Hypnotically induced anxiety
Unexpected Examination
Perceptual isolation, Stage Fright, Expected Examination
Hypnotically induced relaxation
Relaxation
As can be seen, the normal anxiety a student has before an examination can be compared with mild clinical anxiety seen in patients. Of course, in the patients the mood is sustained over longer periods of time. Hypnotically induced anxiety comes close to very severe anxiety seen in patients.

The following is a behavior description typical of normal subjects in an hypnotically induced anxiety state who score in the upper range (18-21) of the Anxiety scale (7): "...facial expression is one of distress ...crying common... concentration and attention impaired... speech disturbances, like halting, blocking... stuttering... voice unsteady and highly pitched ...s S reports feeling tense and apprehensive... marked tremor, restlessness, hand and finger manipulations ...increase in perspiration, depth and rate of breathing, sighing, flushing or pallor." (7, p. 127)

The following is a behavior description typical of clinical subjects observed during an interview: These subjects also scored in the upper range of the anxiety scale. "Voice very low or frequent changes in intensity or pitch... some stammering, sits rigidly... heavy breathing, excessive swallowing or gulping, visible perspiration, teary eyed...overapprehensive over minor illnesses... squirms and fidgets... aimless movements of legs or hands... thinking in conflict, sighing, flushing or pallor." (From an unpublished rating schedule being used by Persky & Zuckerman for the study of clinical and hypnotically induced affects).

One can see that these behavioral descriptions have much in common. If the MAACL proves to be adequately correlated with these kinds of behavioral descriptions it will provide a useful instrument for the measurement of affect, which can operationally tie clinical and experimental observations into a unified construct.

ACKNOWLEDGEMENTS

The authors wish to thank Thomas Hines, J.J. Lasky, Peter Lewinsohn, Sidney Roberts and George Siskind for collecting data on clinical samples. Lawrence Vogel played a major role in the development of the Hostility scale. Elizabeth Valerius and D. Vincent Blaze have also contributed considerably to the development of the MAACL.

The author and publisher will welcome receiving score distributions, normative or other statistical data and reports of studies in which the MAACL has been used.

Please address communications to Educational and Industrial Testing Service, Box 7234, San Diego, California 92107.

REFERENCES


APPENDIX C

SYMBOL DIGIT MODALITY TEST
**KEY**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
</table>

\[
\begin{array}{c|c|c|c|c|c|c|c|c|c}
\hline
\( \div \ & \div & \div & \div & \div & \div & \div & \div & \div & \div \\
\hline
\end{array}
\]

**TOTAL SCORE =** [ ]
APPENDIX D

LETTER DIGIT MODALITY TEST

The Letter Digit Modality Test was designed by the author to test short-term auditory memory. The numerals 1-9 were written on a 3'X5' index card. Below each number was a letter from the alphabet. The subject was allowed to memorize the letter-digit sequence. A cassette tape recording was made on which the letters were spoken at 2- and 4-second intervals. When the tape was played back, the subject was instructed to write the digit number corresponding to the spoken letter.
APPENDIX E

PURSUIT ROTOR TASK

The Pursuit Rotor Task includes a turntable with four speeds (15, 30, 45, and 60 r.p.m.). There is a small metal disc about the size of a dime implanted in the turntable. Connected to the turntable by a wire is a stylus with a metal contact point. The subject is instructed to make contact with the stylus on the metal disc as the turntable revolves. The total number of seconds that contact is made during a given interval is recorded on a digital readout instrument connected to the turntable.
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