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Psychological Themes in Chronic Insomnia

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Psychological Themes in Chronic Insomnia

by

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DEDICATION

For Lindell Bradley, M.D., the fellow traveler without whom there would have been no success at the end of the journey, nor indeed the journey itself.

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converge, people who like Lindell, have made their goals your own.

Thank you, friends and fellow Docs!

VITA

The author, Miss Dalma Kalogjera was born in Zagreb, Yugoslavia
on February 11, 1954. She is the daughter of Ing. Jaksa Kalogjera
and Mrs. Biserka Kalogjera neé Erak.

Miss Kalogjera attended elementary school in Zagreb, Yugoslavia
from 1960 to 1968 and high school (Gymnasium) from 1968 to 1972. Her
high school curriculum entailed the usual liberal arts background as
well as an additional emphasis on mathematics, chemistry, biology,
physics and solid geometry. She matriculated in 1972 and was, as a
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of her matriculation thesis was "Zen and Japanese Culture."

Upon graduation she attended the University of Zagreb (1972-
1973) where she studied Comparative Literature and the English
Language and Literature. After successful completion of her first
year she emigrated to the U.S. where she continued her undergraduate
schooling at Milwaukee Area Technical College (1973-1974) with a
major in psychology. In May of 1974 she received the Chemistry Award.
At that time she was offered an academic scholarship at Pepperdine
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continued with her degree in psychology. Following a summer term at
UCLA she returned to the Midwest in the autumn of 1975 in order to
work with Dr. Roger Ulrich, an experimental psychologist noted for
his experiments in elicited aggression, at Western Michigan University,

Kalamazoo, Michigan. She completed her undergraduate studies (major in Experimental Psychology; minor in Philosophy) and graduated summa cum laude in December of 1977. She spent the remaining eight months prior to her entry to the M.A. program in Clinical Psychology at Western Michigan taking advanced courses in German. In spring of 1978 she received a grant to work with Dr. Hermann Teichert of the German Department as his assistant, collaborating on the workbook for his courses and tutoring students. She also continued her work as a tutor of foreign languages (German, Russian, French, and Croatian at the Center for Educational Opportunity).

During the academic year 1978-1979 she was enrolled in the M.A. program in Clinical Psychology at Western Michigan. In April of 1979 she terminated her studies at Western and in August of 1979 enrolled in the Ph.D. program in Clinical Psychology at Loyola University of Chicago. During her first year at Loyola she was an assistant to Dr. Deborah Holmes and participated in her research on the long-term effects of prematurity and illness on infants' social and cognitive functioning. In September of 1980 she passed the Ph.D. Qualifying Exam with distinction. In the course of her studies at Loyola she was granted two additional assistantships with Dr. Thomas Petzel (1980-1981) and Dr. Frank Kobler (1982-1983). Miss Kalogjera took her pre-internship clinical training at Hines V.A. Hospital (Clerkship I in 1981 and Clerkship II in 1982) where she worked with Drs. Trimakas, Graham, and Doyle. From July, 1983 through June, 1984 she

interned at Temple University Hospital in Philadelphia. Subsequently,
she returned to Chicago where she took a specialty internship in
clinical sleep disorders at Rush-Presbyterian-St. Luke's Medical
Center where she worked with Dr. Rosalind Cartwright. She will be
awarded the Ph.D. in May, 1986.

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INTRODUCTION

The present investigation is intended to explore psychological
issues in patients with certain types of chronic insomnia. Research
studies pertaining to this issue have largly used the Minnesota
Multiphasic Personality Inventory (MMPI) as the method of assessing
psychological adjustment.

Review of Related Literature

Insomnia is a vague term which refers to insufficient sleep.
In the sleep disorders literature this is defined as "disorder(s) of
initiation or maintenance of sleep or DIMS" (according to the Diagnos-
tic Classification of Sleep and Arousal Disorders, 1979 which is the
official nosology of the field). It is functionally related to a
number of dissimilar etiologic conditions ranging from mainly psycho-
logical to primarily organic, i.e., medical pathologies. In recogni-
tion of the heterogeneity of its etiology, DCSAD subdivided insomnia
into the following categories: "1) Psychophysiological DIMS, 2) DIMS
associated with Psychiatric Disorders, 3) DIMS associated with Use
of Drugs and Alcohol, 4) DIMS associated with Sleep-Induced Respira-
tory Impairment (e.g., sleep apnea and alveolar hypoventillation),
5) DIMS associated with Sleep-Related Nocturnal Myoclonus and
"Restless Legs," 6) DIMS associated with Other Medical, Toxic and
Environmental Conditions, 7) Childhood-Onset DIMS, 8) Other DIMS
Conditions (e.g., atypical polysomnographic features such as "alpha-

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delta sleep") and 9) No DIMS Abnormality (e.g., short sleeper)"
(Sleep, 1979).

In the absence of a demonstrable medical disorder directly
relevant to sleep disturbance, insomnia has traditionally been
regarded as attributable to some degree of psychopathology. This
topic has been researched extensively, from a variety of theoretical
viewpoints and using a variety of methods. The picture which emerges
from the findings is complex, but generally supports the hypothesis
that insomnia is related to psychopathology.

Briefly, insomnia is found concurrently in many psychopatholog-
ical conditions, but is particularly characteristic of those disorders
in which depression and/or anxiety are significant features (Sleep,
1979). Difficulty in sleeping may occur in response to a variety of
emotionally demanding or stressful events, either situational or
those which have been a part of a person's life circumstances
chronically (Sleep, 1979). Insomnia is especially common in affective
disorders, both unipolar and bipolar. Substance abuse, particularly
alcohol, over a long period of time, has a very damaging effect on
sleep as well (Sleep, 1979).

The importance of emotional maladjustment in chronic insomnia
was well documented in a study by Tan, Kales, Kales, Soldatos and
Bixler (in press). One hundred insomniac subjects were diagnosed in
terms of DSM-III criteria on the basis of extensive data on their
psychological and medical characteristics. All of the subjects
were found to have psychiatric conditions, either on Axis I or Axis II.
On Axis I, affective disorders were most prominent (66% of the cases),

especially compulsive traits (reported in Kales & Kales, 1984).

While the degree of association between insomnia and emotional maladjustment varies from sample to sample, the Tan et al. study emphasizes a relation of the two phenomena and in that sense provides an introduction to specific issues which will be examined in the study to be reported here.

In the broader context of research on the psychopathology of insomnia, there is a subset of studies which focus on the MMPI performance of insomniacs as an index of their psychological vulnerability. It is this work that provides the theoretical framework for the present research. It also serves as a source of methodological guidelines. The MMPI provides a good operational measure of psychopathology for the purposes of this investigation, because it is a well-standardized instrument with well-documented properties (Dahlstrom, Welsh, & Dahlstrom, 1973, 1975; Graham, 1977; Greene, 1980).

Studies that deal with psychological issues in insomnia will be classified here into two broad categories: 1) those that are primarily concerned with establishing the relation between insomnia and psychopathology by comparing insomniac and non-insomniac groups, mostly on their MMPI status, and 2) those that examine the importance of certain specific variables such as physiological activation, attribution, anxiety and others. Clearly, this distinction is an imperfect one since the studies involved do overlap to some extent. Nevertheless, it will be retained here, because it represents a relatively uncomplicated way of organizing research findings.

In general, findings relating insomnia to psychopathology

suggest that insomniacs as a group tend to show a moderate degree of neurotic distress on a number of clinical scales of the MMPI (Kales, Caldwell, Preston, Healey, & Kales, 1976; Kales, Caldwell, Soldatos, Bixler, & Kales, 1983; Roth, Kramer, & Lutz, 1976). Futhermore, depressive features of various degrees of severity are symptomatically prominent (Kales et al., 1976; Roth, Kramer, & Lutz, 1976; Zorick, Roth, Hartze, Piccione, & Stepanski, 1981).

In one of the most relevant studies to date, Kales, Caldwell, Preston, Healey, and Kales (1976) investigated the MMPI characteristics of 124 insomniacs. Their definition of insomnia was based on the subject's reports and included both difficulty in initiating and maintaining sleep. Kales and his associates examined both individual MMPI scales and their elevations and also MMPI profile patterns or codes (a code refers to two or three highest scores in the profile, whether they are in the normal or pathological range). This particular set of variables enabled them to establish not only the overall level of distress (i.e., scores in relation to a $\underline{T}$-score of 70 and above which is the typically observed criterion of deviation), but also the score clusters which yielded information about frequently occurring symptom and characterologic constellations. With regard to the overall frequency of pathology, Kales and his co-workers found that 85% of their subjects had MMPI profiles in which at least one scale was in the pathological range. Kales interpreted this as indicating "a remarkable degree of psychopathology." This statement is somewhat misleading, because it might be interpreted as meaning that psychopathology of insomniacs is rather severe which is generally

not supported when insomniacs are seen as a group. When means and

standard deviations of scores on various clinical scales are examined,

it becomes evident that the means are often in the sixties and the

variability indices suggest that approximately 66% of scores do not

approach, still less exceed, a $\underline{T}$-score of 80 which is recognized as

an indication of severity (Greene, 1980). In addition to finding

that the majority of insomniacs evidenced at least some degree of

psychopathology on the MMPI, Kales et al. found that certain scales

tended to be elevated more frequently than others. The three most

highly represented scales were Depression, Psychasthenia and Hysteria.

They also found that the Depression scale ($\underline{D}$) was in the pathological

range for as many as 61% of the subjects. This suggests that

depressive difficulties were more common among his insomniac subjects

than other forms of maladjustment. Finally, a substantial number of

profile codes fell into one of the four categories: 278, 231, 274,

and 48. According to Kales's summary of the intepretive hypotheses

of Gilberstadt and Duker (1965) and Marks and Seeman (1974), these

patterns are associated with the following clinical features:

> 278 code type (Depression-Psychasthenia-Schizophrenia) reflects
> chronic ruminative depression and schizoid identity confusion.
> 231 code (Depression, Hysteria, Hypochondriasis) reflects a
> subset of somatized depression profiles that are characterized
> "smiling depressions" with inhibition and repression.
> 274 code (Depression, Psychasthenia, Psychopathic Deviate)
> reflects anxiety and depression in passive-dependent person-
> alities.
> 48 and 482 (Psychopathic deviate, Schizophrenia and Depression)
> reflect estrangement and alienation with distrust, self-
> destructiveness, poorly socialized behavior and negative self-
> image, frequently accompanied by recurring episodes of anxiety
> and depression (Kales et al., 1976).

On the basis of these findings, as well as data from other studies, Kales concluded that insomnia occurred as a result of "internalization of psychological disturbance." This is a process whereby psychological issues and concerns which are not adequately dealt with during waking life induce a state of heightened physiological arousal which is biologically incompatible with sleep. Psychological problems are focalized and expressed somatically. In that sense, the pathogenesis of insomnia resembles the pathogenesis of other psychosomatic disorders.

Kales supported his internalization hypothesis of heightened physiological arousal with the data from a study by Monroe (1967). Monroe had found that poor sleepers were physiologically more aroused than good sleepers, both before and during sleep on the following variables: rectal temperature, vasoconstrictions, body motility, heart rate, and pulse volume.

In their 1983 investigation, Kales, Caldwell, Soldatos, Bixler and Kales basically confirmed most of the trends observed in Kales's 1976 study, but offered a more differentiated picture. Using a larger sample (279 chronic insomniacs from Pennsylvania as the experimental group), as well as a control group of non-insomniacs, they again examined elevations for each clinical scale, as well as high-point codes. Their data revealed that as many as 70% of insomniacs showed evidence of some degree of psychopathology which supported their earlier finding that psychological maladjustment was common in insomniacs. They also found that insomniac subjects scored higher than the non-insomniacs on a number of scales: Hypochondriasis (Hs-1),

Depression (D-2), Hysteria (Hy-3), Psychopathic Deviate (Pd-4),

Paranoia (Pa-6), and Schizophrenia (Sc-8). Regarding the code

patterns, this study verified the 1976 finding of a high incidence of

code patterns including scale 2 (Depression). These represent var-

iations of depressive symptomatology in conjunction with anxiety,

somatic features and passive-dependent and passive-aggressive char-

acter trends. This time, however, the range of code patterns was

somewhat higher and included the following combinations: 278, 231,

237, 127, 234, 247, and 248.

In sum, the Kales et al. (1976, 1983) studies suggest a moderate

degree of what might be termed "generic neurotic distress" which is

manifested in various combinations of neurotic trends that do not

conform to any discrete neurotic syndrome. Rather, they represent

neurotic constellations with a primary depressive core in conjunction

with anxiety and somatization of varying degrees of severity, and

also internalization of distress and passive-dependent and passive-

aggressive character features.

Similar conclusions were drawn in several other studies. For

example, support for the presence of depressive elements in insomnia

was found in an investigation by Zorick, Roth, Hartze, Piccione, and

Stepanski (1981). They examined the MMPI profiles of a variety of

insomniac subjects and found that elevations on the Depression scale

were most common in three sub-categories of insomnia, namely those

associated with psychiatric disorders, alcohol, and drug abuse and

insomnia characterized by atypical polysomnographic features.

Similarly, Roth, Kramer, and Lutz (1976) observed a T-score of 70

or above on the Depression scale in 63% of their sample of 56 patients. The preponderance of basically neurotic, as opposed to antisocial (acting out as the main defense) and psychotic elements was also confirmed in the above study by scale peaks on the Depression, Hysteria and Hypochondriasis scales which are consistent with neurotic disturbances.

Data obtained by other investigators point to the presence of moderating variables that tend to refine Kales's findings. The most relevant to the present study is a report by Zorick et al. (1981). In this study, a sample of 84 insomniacs was separated into 10 categories, similar to the DCSAD nosology. These categories included patients with both organic and psychological etiologies, as well as patients with circadian rhythm disturbances. When various sub-categories were compared with respect to their MMPI profiles, it became apparent that emotional maladjustment was not uniformly present, but was limited to three categories: psychiatric disorders, alcohol, and druge abuse and atypical polysomnographic findings. Zorick concluded that there was no one-to-one correspondence between insomnia and psychopathology and that insomniacs were psychologically heterogeneous (Zorick et al., 1981).

Similar conclusions as to the heterogeneity of psychological characteristics of various subtypes of insomnia were reached in studies by Stepanski, Hartze, Roth, Zorick, and Piccione (1979) and Williams and Karacan (1978).

Stepanski et al. (1979) employed a variant of the DCSAD nosology. They used: DIMS associated with Use of Drugs and Alcohol, DIMS

related to Nocturnal Myoclonus/Restless Legs Syndrome, No DIMS Abnormality, Atypical Polysomnographic Findings, and DIMS associated with Psychiatric Disorders. They reported that the subgroups differed with respect to the degree of psychopathology on the MMPI. The subjects with the diagnoses of Atypical Polysomnographic Findings, DIMS associated with Psychiatric Disorders and Alcohol and Drug Abuse were, on the whole, more pathological than those with no objective findings or nocturnal myoclonus. Specifically, psychological difficulties in these three subgroups were characterized by features measured by the Depression (D-2) and Psychasthenia (Pt-7) scales, most importantly, depression and anxiety.

The first finding, namely a higher degree of psychopathology in categories of Atypical Polysomnographic Findings, Drugs and Alcohol Abuse, and Psychiatric Disorders is not surprising as two of these, Psychiatric Disorders and Drugs and Alcohol Abuse, are expected to exhibit emotional maladjustment independent of any sleep problems. It is, therefore, felt that the inclusion of substance abuse and psychiatric disorders categories may have biased the findings to some extent, in the direction of greater psychopathology. Nevertheless, the study has merit in its use of the DCSAD nosology. This represents a methodological advance since it implies a recognition of psychological diversity of insomniac patients (Stepanski et al., 1979).

The DCSAD nosology, while offering the most comprehensive method of distinguishing various forms of insomnia is not the only possible classification. Williams and Karacan (1978) used a more

limited but clinically popular distinction of initiation/maintenance difficulty to which they added subjects who complained of both of those problems, as well as a subgroup who evidenced neither. Initiation insomnia refers to difficulty falling asleep, whereas maintenance insomnia refers to difficulty staying asleep which is manifested in frequent awakenings throughout the night, early morning awakening, or a combination of the two (DCSAD nosology, Sleep, 1979). The assignment of insomniacs into the four categories was based on polysomnographic data (all-night EEG sleep recordings). The results revealed some basic similarities among the four subgroups, as well as some differences. Not surprisingly, insomniacs as a group, had greater elevations of the Hypochondriasis (Hs-1), Depression (D-2), and Hysteria (Hy-3) scales of the MMPI, which suggests more neurotic distress in insomniacs than in the comparison sample of non-insomniacs. Of more interest, however, is the authors' conclusion that different forms of insomnia might be associated with different kinds of emotional maladjustment. Patients with sleep initiation problems seemed to be less disturbed than those who suffered from inability to maintain sleep. In addition to the differences in the degree of maladjustment, Williams and Karacan hypothesized that the two groups differed with regard to the nature of emotional disturbance. They found that the psychological profile of insomniacs with initiation difficulty was characterized by various neurotic difficulties, whereas those patients who had maintenance problems showed evidence of characterologic problems such as antisocial traits. Patients with maintenance problems also tended to have poor emotional rapport with others, to

be interpersonally isolated, and to be cognitively less efficient.
Not surprisingly, the fourth subgroup which suffered from neither
initiation nor maintenance problems was found to be psychologically
unremarkable, i.e., without distinct, clinically relevant features
(Williams & Karacan, 1978).

On the basis of the studies heretofore reviewed, several con-
clusions can be drawn. First, insomniacs as a group are likely to
show at least some degree of emotional maladjustment. Their psycho-
pathology, however, is not evenly distributed among all of the various
sub-categories of insomnia, i.e., it is not equally represented in
all of the subtypes which differ on the basis of etiology and clin-
ical features. Some forms of insomnia, such as those associated
with psychiatric illnesses or substance abuse, seem to be more close-
ly tied to emotional disturbances (Stepanski et al., 1979; Zorick
et al., 1981). However, more data are needed to formulate the prin-
ciples which differentiate the subtypes of insomnia which are "more
disturbed psychologically" from those which are "less disturbed."

In spite of the complexity of the picture and the fact that
research cautions against premature generalizations about the psycho-
pathology of insomnia, certain specific and recurring psychological
traits and processes have been identified in insomniacs. Among these
are depressive difficulties and the tendency to bind anxiety through
somatization and internalizing modes of reacting to stress, rather
than through acting out. Thus, a "typical" insomniac is likely to
display one or more psychological difficulties on the spectrum of
neurotic illness. On the other hand, he is less likely to be

hypomanic, blatantly hostile or even particularly assertive.

In addition to these core psychological traits, there are other issues and characteristics that add to our understanding of insomnia. One of them is dependency and the specific difficulties that insomniacs are believed to have in integrating and handling this important issue.

Although dependent trends have been referred to by Kales (1976) in his comments on the characterologic features of insomniacs, and are also implied in high scores on the Hysteria scale of the MMPI (Greene, 1980), it was Kellerman (1981) who devoted particular attention to this issue. He described the role of dependency in the overall psychological context of insomnia. On the basis of the analysis of clinical and empirical findings, and within the conceptual framework of Object Relations theory (Bowlby, 1973; Erikson, 1963; Kohut, 1977; Mahler, 1968; Winnicott, 1983, cited in Kellerman, 1981), he inferred the following:

> In dependent persons with insomnia, it is proposed that early
> childhood experiences were also characterized by inadequate
> attachments and the appearance of corresponding subsequent
> intense dependency needs. Persons with insomnia may have had
> early family experiences with parental figures who were, perhaps,
> overly self-absorbed and not terribly affectionate and reassur-
> ing. Such parents may have expected their children to perform
> without much supervision. Many persons with insomnia crave
> attachments which will guarantee caring and permanence in
> relationships. The assurance of permanence in some ways
> replaces frustrated past needs for affection and love. . . .
> Children of formal and "objective" parents tend to develop
> rigid and guarded personality styles, as well as a tendency
> to be dissatisfied and distrustful. Such children may grow up
> feeling resistive to the world. However, they may appear quite
> socially agreeable overtly. Beneath the surface, however, there
> is a highly guarded and ungiving personality inclination.
> (Kellerman, 1981, pp. 196-197)

In addition to psychopathology, the question of age-related changes will also be considered. Since insomnia is largely a chronic illness with many fluctuations and a considerable potential for exhausting the psychological resources of a person, this issue is pertinent. Monroe and Marks (1977) examined the association between difficulty in sleeping and psychopathology in adolescents. They worked with a clinical sample, namely adolescents in psychotherapy (a face-valid criterion of psychological disturbance). The subjects were assigned to "poor sleeper" and "good sleeper" categories ($\underline{N}$ of 53 in each) on the basis of the therapist's assessment of the degree to which sleep problems were prominent in the clinical picture. The MMPI profiles of the adolescents who were poor sleepers, as opposed to "good sleepers," had significant elevations on the Hypochondriasis, Hysteria, and Depression scales which differentiated them from the controls. This particular combination of scales signifies neurotic distress with depressive "coloring" and somatization. This is similar to the results of many other studies of insomniacs. Low scores on the Hypomania scale and high scores on Social Isolation argue against acting out and in favor of internalization of distress as a method of coping. This lends support to Kales's internalization hypothesis.

The impact of age-related changes in insomnia was also examined by Kales et al. (1983). They found issues pertaining to identity as well as anxious, ruminative symptoms to be characteristic of the younger group, whereas the older subjects tended to reveal more somatic concerns. Depressive manifestations were present in both groups, but not in the same form. In younger subjects, depressive

symptoms occurred in conjunction with anxiety and obsessional features, while in the older group, depression was linked to somatization. This conclusion is very similar to Kales's observations on this issue derived from the 1976 data and is in accordance with developmental changes in the relative balance in the arrangement of defenses (discussed by Pfeiffer in Birren & Schaie, 1977).

A higher degree of psychopathology in individuals with sleep complaints compared with normal sleepers is a rather robust research finding from which it would be easy to infer a direct negative correlation between mental health and insomnia. Saskin, Spielman, and Thorpy (1984) were concerned with this particular aspect of the relationship and, interestingly, discovered that such was not entirely the case. In the context of a study of the effects of sleep restriction therapy, they examined the MMPI status of two subgroups of insomniac patients--"more severe" and "less severe"--using the total sleep time of 5.5 hours a night as a cut-off point. They reported more evidence of psychopathology in the less severe group which manifested significantly higher scores on a number of clinical scales: Depression, Hysteria, Psychasthenia, Psychopathic Deviate, and Schizophrenia. Several factors may have contributed to this finding. First, the criterion of 5.5 hours of total sleep time is somewhat arbitrary and the choice of total sleep time alone is insufficient since both clinical and experimental data suggest that other factors may not only play a role, but may also be of more decisive importance. These include the patient's attitude toward his symptom, the quality and depth of sleep, absence of interruptions, attribution of sleep

problems ("Who is to blame for symptoms?"), and other psychological characteristics. Length of sleep alone does not seem a reliable criterion.

On a more general level, it is useful to bear in mind that complex phenomena such as insomnia and psychopathology, while being quantifiable, are not intrinsically or purely quantitative concepts and a strong reciprocal relationship between them is, therefore, unlikely.

Studies heretofore reviewed have dealt with nonpsychiatric insomniacs and while the focus of present analysis is not on psychiatrically-ill patients, it is interesting to note that a similar connection between emotional distress and sleep problems has also been observed in that population. For example, Sweetwood, Grant, Kripke, Gerst, and Yager (1980) addressed this question in a prospective study in which they compared a large sample of 86 outpatients with 103 nonpsychiatric controls. Of most direct relevance to the present issue are two dependent variables which were assessed at bimonthly intervals for 18 months by means of a symptom checklist (index of psychopathology) and a sleep questionnaire which dealt with various sleep difficulties such as those pertaining to the initiation and maintenance of sleep. The authors found that the outpatient group was much more likely to complain of sleep difficulty (predominantly insomnia) than the controls (51% of the former group, as compared to 16.5% of the latter). They also noted that sleep problems in patients tended to be more "tenacious" and last longer than was the case with the controls (Sweetwood et al., 1980).

Next, the group of outpatients was subdivided into two groups: those who were troubled by sleep difficulties were compared with those who were not, on their symptom checklist (SCL) scores. The insomniac patients had more disturbed SCL profiles than the comparison group. Thus, the relation between difficulty sleeping and psychopathology was found both in the psychiatrically-ill patients and the controls. Subjects who had difficulty sleeping (regardless of their psychiatric status) were generally more disturbed than those who were not insomniac (Sweetwood et al., 1980).

The association between sleep difficulties and emotional adjustment in psychiatric patients was also examined in a study by McDonald and King (1975). The subjects were nineteen inpatients (neurotic, psychotic, character disorder, and organic diagnoses). Quality of sleep was assessed by a combination of the available clinical information and a measure of the extent of motor activity in sleep (an indirect measure of evaluating sleep). Psychological status was derived from MMPI performance. In addition to the usual clinical scales, the authors also established a "Complaints of Sleep Disturbance" (CSD) Scale which was based on 20 MMPI items related to sleep. They examined the relation between clinical information about sleep, motor activity in sleep, and the MMPI scores. They found that clinical data and measures of motor activity correlated with the CSD scale. This is not surprising in view of the fact that the CSD deals specifically with sleep and, therefore, has a similar construct validity as the other two measures. By contrast, clinical information and data on motor activity during sleep did not correlate with any of the

clinical MMPI scales, which is probably due to the fact that insomnia is not confined to any single form of psychopathology. When the patients who had reported a greater degree of difficulty with sleep on the MMPI (high CSD group) were compared with those who reported less (low CSD), the former were found to have higher means on the Psychasthenia, Psychopathic Deviate, and Schizophrenia scales, and lower scores on scales K and L (McDonald & King, 1975). These findings confirm the connection between disruption of sleep and emotional distress. Regarding the nature of distress, McDonald and King's data point to the presence of problems of a more serious nature, tapped by the F, Psychopathic Deviate and Schizophrenia scales, as opposed to predominantly neurotic difficulties which other authors have found in connection with insomnia.

Mechanisms Which Are Presumed to Mediate the Development and Maintenance of Insomnia

While a relation between insomnia and psychopathology has been generally accepted, the basis of this association is unclear. Several intermediate variables and mechanisms have been proposed to account for it (Lichtstein & Rosenthal, 1980). Studies to be reviewed in this section attempted to examine the contribution of these variables and their possible etiological relevance in insomnia. Among the mechanisms advanced to deal with this complex phenomenon, the hypothesis of heightened physiological activity (Monroe, 1967) has received a good deal of attention. A part of its appeal is perhaps due to the fact that it seems so compatible with clinical material that insomniacs present in treatment.

Monroe (1967) investigated "good" and "poor" sleepers on those classes of variables that he maintained might be involved in the complaint of insomnia. His sample of poor sleepers consisted of students and community subjects who endorsed items dealing with difficulty initiating and maintaining sleep in a questionnaire. The results from the polysomnographic data confirmed the lighter and less efficient sleep, without gross abnormalities of sleep architecture, for the subjectively poor sleepers. Of particular interest were his findings regarding physiological measures and the MMPI data. Poor sleepers evidenced higher rectal temperatures, higher heart rates, more body motility and a higher rate of vasoconstrictions--all of which suggests a greater degree of physiological mobilization. A lower basal skin resistance in the insomniac group was the only physical finding that ran contrary to this trend. The MMPI findings of poor sleepers in this study also revealed significantly higher scores on the Hypochondriasis, Hysteria, Paranoia, Psychasthenia, Schizophrenia, Social Isolation, F, and Masculinity/Femininity scales. On the special research scales, the poor sleepers also scored in a more pathological direction on the Wiggins Anxiety Scale. Given the overall trend suggestive of a greater degree of emotional disturbance among poor sleepers relative to controls, it is not surprising that the former group was also significantly lower on scales K and Ego Strength, both of which are related to psychological characteristics which enable a person to contend with expectable life tasks (Barron, 1954; Greene, 1980).

A study by Johns, Masterson, and Bruce (1971) also found

support for the view that insomniacs have greater autonomic mobiliza-
tion and increased emotional vulnerability. They studied the com-
plaint of insomnia in relation to the degree of arousal (operation-
alized by a single variable, namely the level of free urinary 11-
hydoxycorticosteroids) and psychological status (measured by the
MMPI) in healthy male medical students. Subjects with sleep difficul-
ties were contrasted with those who were generally not vulnerable to
insomnia on these two variables. It was found that poor sleepers
differed from good sleepers on both the adrenocortical and psycholog-
ical measures. The poor sleepers were more aroused and also somewhat
more distrubed psychologically, judging by their MMPI profiles which
were globally elevated in relation to the comparison group. Again,
nuclear neurotic symptoms and concerns were observed that were simi-
lar to those reported by other researchers (Johns et al., 1971).

In comparison with Monroe's findings, a study by Coursey, Buchs-
baum, and Frankel (1975) has a somewhat more pronounced cognitive/
affective, rather than autonomic, emphasis. Coursey et al. employed
a variety of psychological measures in what was probably the most
thorough assessment approach to the topic. Their measures included:
the MMPI, WAIS-R, Depression Adjective Checklist, Zung Self-Rating
Depression Scale, Taylor Manifest Anxiety Scale, Eysenck's Extro-
version-Introversion Scale, Byrne's Sensitization/Repression Index,
and others. To this battery of scales assessing symptomatic status
and trait characteristics of insomniacs, they added a new dimension,
namely a tendency to augment or reduce stimuli (Petrie, 1967, in
Coursey et al., 1975). This essentially refers to the style of

processing of sensory information and is typically operationalized as average evoked responses to sound and light (Soskis & Shagass, 1974, in Coursey et al., 1975). Coursey et al. hypothesized, on the basis of earlier research (Monroe, 1967; Silverman, 1967; Silverman & Buchsbaum, 1968; Silverman, Buchsbaum, & Hankin, 1969, in Coursey et al., 1975), that insomniacs might be reducers. Reducers in general "tend to show pronounced sensory input reduction for intense stimuli, because they actually possess hypersensitive sensory systems which require that they reduce in order to protect themselves from stimuli of high intensity" (Coursey et al., 1975).

The comparisons of the extensive data sets of the experimental sample of chronic insomniacs and controls revealed that the former scored in the more pathological direction on many variables, among them the MMPI scales for Depression, Psychasthenia, Hypochondriasis, and Hysteria, as well as Taylor Manifest Anxiety Scale, Zung Self-Rating Depression Inventory, Eysenck's Neuroticism, and Byrne's Sensitization Index (Coursey et al., 1975). In addition, they scored lower, vis-a-vis the controls, on Zuckerman's Sensation Seeking Scale. Coursey interpreted these patterns of scores as strengthening the impression of neurotic distress with anxiety and depression, as well as a tendency toward sensitization rather than repression mechanisms in handling stimuli. The sensitization/repression distinction is analogous to augmenting/reducing, but broader in scope in that it includes not only sensory data, but more global complex social stimuli as well.

In addition to these comparisons, the authors performed factor

analyses on their data. These analyses suggest that:

> Our insomniac subjects at many levels of their personality
> have processes each of which alone, at least in its more severe
> form, could cause insomnia. At the cognitive level, the
> insomniacs seem to engage in more obsessive worrying than
> normal sleepers and this rumination may well be responsible for
> maintaining arousal above that needed for sleep. At the affec-
> tive level, they appear to suffer from mild but chronic
> agitated depression. Finally, at the sensory processing level,
> the insomniacs appear to avoid stimulation and reduce the
> impact of sounds of normal room intensities. This may allow
> obsessive and affectively charged ruminations to continue
> unabated (Coursey et al., 1975).

Some aspects of the conclusions of both Monroe's and Coursey's

studies were challenged by Freedman and Sattler (1982) who conducted

an experiment designed to submit both hypotheses to careful scrutiny.

Like Monroe, they selected their subjects from a non-clinical popula-

tion, but were considerably more exacting in their inclusion criteria

with regard to the experimental group, requiring that insomnia be

documented both by the person's subjective assessment as well as by

polysomnography. They also restricted their insomniac sample to

chronic idiopathic insomniacs in an effort to minimize contaminating

influence of medical and psychological pathology. They included only

sleep onset, as opposed to both onset and maintenance insomniacs.

Four classes of dependent variables were employed: 1) poly-

somnography, 2) physiological measures, 3) the MMPI, and 4) mental

content reports which assess the nature of ideational activity at

various points of transitional and light sleep. These included: a

scale which measures the degree of awareness ranging from awake to

deep sleep; a scale for evaluating mentation as real or unreal; time

estimation tasks; and a measure of the extent to which thoughts

persist in a repetitive fashion. Freedman and Sattler (1982)

emphasized the advantage of using these detailed and very specific

cognitive measures as better operational criteria of cognitive trends

than the relatively global picture obtained by the MMPI, and other

methods used by previous investigators. With regard to the results

of physiological assessment prior to sleep, their findings supported

those of Monroe (1967) and others, but to a lesser degree. Of the

variety of physiological variables sampled, only two suggest a greater

arousal among insomniacs: higher frontalis EMG and lower finger

temperature.

Comparisons of ideational activities in the experimental group

versus the control group did not support the hypothesis of greater

proneness to obsessional ideation in insomniacs. The discrepancy

between Monroe's findings and those of Freedman and Sattler on this

issue may be partly attributed to differences in their subject selec-

tion procedures and the manner in which they operationalized their

dependent measures. In contrast to Monroe, Freedman and Sattler

used subjects with polysomnographic findings clearly indicative of

insomnia and contrasted them with subjects with findings clearly

indicative of the absence of insomnia. This criterion difference

could well have heightened the difference between insomniacs and

controls by focusing, in a sense, on "pure types" only. Also, a study

in which the subjects are selected on the basis of polysomnography

is likely to lead to different conclusions than an investigation in

which selection is based on subjective evaluation. This is not a

negligible point, because insomnia is a condition in which a person's

subjective sense of the quality of sleep and the adequacy of func-

tioning during the day are very important. Furthermore, Freedman and

Sattler excluded subjects with maintenance insomnia in the interest of

experimental purity. Because of these criteria, Freedman and Sattler's

insomniacs probably represent only a subset of the total population

of insomniacs at Sleep Disorder Centers and the latter are not a homo-

geneous group. These factors limit the generalizability of their

findings. In spite of these problems, however, their data are very

useful, because they offer a more measured view of the importance of

arousal and the magnitude of its influence on sleep. In a more

general way, they call into question single etiological explanations.

In discussing the nature of the insomniac's cognitions and their

role in sleep continuity, one cognitive phenomenon requires special

attention, namely the process of attribution. In the context of sleep,

attribution refers to an interpretation of what are otherwise amor-

phous, vauge and sometimes puzzling inner experiences by attributing

them either to oneself or to external sources (Schachter & Singer,

1962). Pioneering studies by Schachter and Singer, as well as the

research they inspired, have shown that the choice of an internal or

an external source as an explanatory anchor for behavior has a definite

influence on behavior (in Storms & Nisbett, 1970).

Influenced by this concept, Storms and Nisbett conducted an exper-

iment with 42 young insomniacs in whom they examined the contrasting

impact of a placebo-induced increase in arousal (Group 1) and a placebo-

induced decrease in arousal (Group 2). This was accomplished by simply

informing the subjects that the drugs were likely to affect them in a

particular way. Sleep latency and the degree of arousal were oper-
ationally defined in terms of the subject's self-report. The first
group, for which placebo-induced arousal was in effect, improved (i.e.,
showed less difficulty with insomnia relative to baseline), whereas the
second group, which expected less arousal, slept worse. Storms and
Nisbett suggested that the subjects who were more aroused improved
because they perceived the arousal state as something external to them-
selves and, therefore, something for which they were psychologically
not "responsible." This implies that arousal per se is not a suffic-
ient condition for insomnia.

The results of this experiment raised a number of important
questions that have relevance both to our conceptualization of factors
that play a role in insomnia, as well as to therapeutic intervention.
Of particular interest here is Storms and Nisbett's suggestion that
insomnia may have more to do with how one interprets what one feels
(i.e., whether one considers oneself responsible or attributes
responsibility to some circumstance external to oneself), than with
how one feels or sleeps. The latter position, as Nisbett and other
investigators who have worked with this phenomenon have discovered,
is psychologically more comfortable and less demanding. In that
sense, attribution, which may seem a purely cognitive process,
actually may have profound affective consequences. This implies
that even when an insomniac has difficulty sleeping and is auto-
nomically aroused, he may still be able to overcome the problem
provided that he does not consider himself directly responsible.
This is a hopeful notion since it does not require that one change

either the level of autonomic arousal or one's obsessional preoccupa-tions or temperament, but merely that one interpret whatever inter-feres with sleep as not generated by oneself.

Another study that dealt with insomniacs' interpretation of their condition, albeit from a somewhat different point of view, is one by Lichtstein and Rosenthal (1980). In their investigation which involved a large sample of chronic insomniacs, they obtained infor-mation about the subjects' interpretations of their sleep difficulty by instructing them to endorse one of four forced-choice options. These options dealt with unpleasant cognitive events, bodily com-plaints and arousal, a combination of these two, and, finally, a fourth choice which meant neither cognitive nor physical complaints. Lichtstein and Rosenthal found that unpleasant cognitive events, such as worry and obsessional concerns, were perceived as interfering with sleep far more often than the somatic complaints. Fifty-four percent of subjects endorsed the former as a principal cause of their insomnia, as opposed to 5.4% who fell into the latter category. The authors also found that unpleasant preoccupations were more disturbing and difficult to tolerate psychologically than physical problems.

Lichtstein and Rosenthal's findings are especially valuable not only because they suggest that the patient's thoughts before sleep are significant, but also because they reveal that many insomniacs are convinced that they are significant. This, in turn, means that the patient's interpretation is an important aspect of the overall phenomenology, quite independently of processes that take place on other levels (e.g., physiological). Quite simply, if a patient

believes that he cannot sleep because he is troubled by his persisting preoccupations, this belief will have to be dealt with as a separate clinical issue, regardless of whether he also has physical difficulties that may keep him awake, is too aroused, or, perhaps, as is the case with some insomniacs, has no objective sleep difficulties (Lichtstein & Rosenthal, 1980).

In addition to the variables discussed above, there are other aspects of the clinical picture that are useful to explore. Most of the studies reviewed here have focused on enduring psychological trends and important themes in insomniacs, or otherwise, on psychological processes that occur prior to sleep. Borkovec, Lane, and Van Oot (1981) conducted a polysomnographic investigation with a slightly different emphasis in that they attempted to evaluate the nature of cognitive experience in terms of sleeep/awake during brief awakenings from Stage 2 of sleep.[1] The subject was asked merely to assess if he had been awake or sleep at such times. When the answers of insomniac subjects were compared with those of non-insomniacs it was found that insomniacs were significantly more likely to evaluate their condition during Stage 2 as being awake rather than sleep. Borkovec and his colleagues speculated that:

> There may be some differential ability between insomniacs and good sleepers to process cognitive material during the initial stages of sleep. In fact, more anxiety and worry-related

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[1]Stage 2 is a form of light NREM sleep characterized by the presence of K-complexes and spindles in the EEG (Rechtschaffen & Kales, 1968).

mentations were found among insomniacs than among good sleepers. Also, insomniacs may experience cortical sleep differently or base their evaluation of sleep on a different set of internal and/or external cues relative to good sleepers. The only variable found to predict the occurrence of wakefulness report was the frequency of stage reversals prior to 5th minute of Stage 2 and insomniacs experienced a greater number of stage reversals. There are several ways in which frequent stage reversals and spontaneous arousals may influence the experience of sleep. For example, it may be that a smooth progress through the early stages of sleep is necessary for the experience or report of sleep and that frequent arousals or shifts to lighter stages may eliminate the experience or reduce its certainty. (Borkovec, Lane, & Van Oot, 1981)

In the preceding section complex processes have been reviewed which have been hypothesized to mediate the development and maintenance of insomnia. At this point, the influence of stress will be added to this overview. Evaluating the influence of stress is not easy because stress is a complicated concept with a variety of operational definitions. Consequently, research on this topic has yielded many different and at times contradictory conclusions. Nevertheless, stressful events are often judged important in the etiology and/or maintenance of psychiatric disorders and those somatic disturbances that are considered to have a psychological component. Insomnia is often regarded as a good example of the latter category. It may, therefore, be useful to examine some research findings which pertain to this issue. Two studies will be presented here which define stress in markedly different ways.

One way of defining stress operationally is in terms of life events that require an adjustment effort (i.e., that demand some form of psychological reorientation or change [Coleman, 1984]). This is often measured by the Schedule of Recent Experience

which summarizes the extent to which the person has been required to make recent complex changes. The Schedule of Recent Experience contains a list of 52 potentially stressful events which the patient is required to endorse according to his experience. The items refer to such events as "death of a spouse," "marriage," "change in residence," "son or daughter leaving home," and many others. The items are assigned weights, according to the presumed degree of stress they entail. This global or "molar" approach to the topic, as opposed to a more "molecular" emphasis on brief, transient stressful stimuli, is useful clinically because that is how patients themselves often conceptualize stress. This instrument is thus closer to the idiom of the patient than to the idiom of the laboratory.

Healey, Kales, Monroe, Bixler, Chamberlin, and Soldatos (1981) conducted one of the most comprehensive studies of this type. They compared the extent, nature and patterning of life stressors of clinical insomniacs and matched non-insomniac controls over a 5-year period (with the year of onset of insomnia serving as the mid-point of the interval). They collected data on a number of variables including current sleep characteristics, general mental health, subject's self-assessment of his emotional status and worth, and medical history, all of which enabled them to obtain a rich, longitudinal picture of psychological backgrounds of the two groups. They found differences between the two groups both in the degree and the type of stressful stimuli. Insomniacs, compared to the controls, were exposed to more stress during the period preceding the development of sleep symptoms. This finding suggests that the number of

adverse environmental changes per se may be an important factor in

the development of insomnia. Thus, insomniacs may actually be more

"burdened" than non-insomniacs in addition to reacting differently to

various demands placed upon them. Healey et al. further found that

certain types of life events were characteristic of the "stress pro-

file" of the insomniac group. These included separations, losses, and

somatic problems. This finding supports Kellerman's (1981) hypothesis

(based on clinical observation) that insomnia is related to events

which affect a person's sense of connectedness with other people. A

disruption of the sense of affiliation with others contributes to

difficulty in sleeping.

The data pertaining to childhood adjustment of insomniacs

suggest that they, in comparison with controls, had experienced more

neurotic difficulties manifested in such symptoms as dysphoria and

nightmares. Furthermore, insomniacs reported lower self-esteem than

the non-insomniacs, which is not surprising in view of the fact that

they saw themselves as having experienced more stress, more signifi-

cant losses, and having been unhappy as children. They not only

evaluated themselves less favorably than the controls, but they also

perceived themselves as neither progressing nor improving. This

implies that insomniacs may feel as if they were on a treadmill,

always working and never getting anywhere (consistent with depressive

features). Specifically, insomniacs reported fewer characteristics

measured by the Defensiveness, Self-Control, Personal Adjustment,

Achievement, and Affiliation scales than the controls, which is con-

sistent with their overall feeling of dissatisfaction, both with

themselves and their life circumstances. Interestingly, they scored higher on the Aggression scale than normals, but lower on the Dominance scale. This particular combination of scores suggest a conflict in the management of aggression. Insomniacs may feel a good deal of aggression, yet have difficulty expressing it constructively or channeling it into acceptable social roles such as leadership. Healey and his colleagues concluded that the overall picture supported the hypothesis of internalization of distress in insomanics.

Healey's findings are significant in a number of ways. They are compatible with the conclusions of other research that insomniacs are, on the whole, more compromised psychologically than non-insomniacs. Another question raised by this study concerns a more difficult problem of why some people tend to develop insomnia as opposed to some other symptom, or why they become symptomatic at all (Healey et al., 1981). As many authors dealing with a variety of psychopathological phenomena and approaching the problem from different viewpoints have implied, people who became symptomatic may interpret or process stressful stimuli differently. Borkovec, Lane, and Van Oot (1981) proposed this idea specifically in relation to insomniacs. Establishing the specific mechanisms whereby a particular style of processing stressful stimuli leads to insomnia is a next step required to develop Healey's findings more fully. Additionally, the study points to the importance of studying the total stress profile, and over a long period of time, i.e., taking a longitudinal approach, as opposed to focusing only on the present circumstances. This notion has direct clinical importance.

The problem of stress and its influence can be approached on a rather different, more molecular level, by focusing on brief stimuli that are presumed to be experienced as stressful. For example, Haynes, Adams, and Franzen (1981) defined stress in terms of solving non-trivial mathematical tasks before sleep (i.e., tasks that could not be mastered by mere recall of overlearned material in a semi-automatic way, but needed a fair amount of concentration). Young, non-clinical subjects with chronic sleep-onset insomnia were compared with their non-insomniac peers with respect to the manner in which they reacted to what the authors referred to as "cognitive stress." They examined the influence of this particular variable on the subject's subjective sense of his ability to fall asleep, as well as changes in his polysomnographic data.

Contrary to what might have been expected, given the prevalent notion that stress is harmful to sleep, the authors found that their insomniac subjects actually benefited by solving mathematical tasks before bed in terms of their sense of having had less difficulty initiating sleep. This subjective evaluation was corroborated by polysomnography. Non-insomniacs, however, reacted in the opposite direction. They perceived and objectively reacted to the stressor as an interference. Haynes and his colleagues offered the following interpretation: "If ruminative cognitive activity, sleep related thoughts or attributions of internal causality for sleeping difficulty serve etiological functions in sleep-onset insomnia, disruption of these cognitive events will result in shorter sleep onset latencies." This conclusion can be readily accommodated within the context of

Coursey's hypothesis that insomniacs are sensory reducers who tend to attenuate the magnitude of surrounding stimuli and are thus rendered more vulnerable to the 'circulus vitiosus' of obsessional (i.e., inner) pressures.   Focus on mathematical problems is an excellent way of "rerouting" the cognitions back to the external world.   Parenthetically, it may be added that this intervention operates on a similar principle as the one inherent in the folk remedy of counting backwards from 100, although it is more powerful, because counting can be performed with minimal attention, and is therefore not sufficiently demanding to break the futile mental operations which plague some insomniacs.

These two studies on stress highlight the differential impact of major stressful events on the one hand, and limited and transient stressful stimuli on the other.   It is precisely because their impact varies to such an extent that it is important to make the distinction between kinds and magnitude of stressors in evaluating their relevance to insomnia.

Related to stress and the processing of and adapting to stressful stimuli is the concept of anxiety.   This concept is basic to the study of various phenomena of clinical psychopathology and it is, therefore, not surprising that it should emerge as a contributing variable in insomnia.   Like stress, it can be operationalized in a number of ways.   Among them, the patient's self-report or, rather, his self-evaluation of the frequency and intensity of various inner states (presumed to make up the concept of anxiety) is commonly used. Muscle tension (EMG levels) is also a correlate of certain forms of

anxiety. The association between anxiety (assessed by the Manifest Anxiety Scale), muscle tension and the complaint of sleep difficulty was examined by Haynes, Follingstad, and McGowan (1974) in 101 college students. They found that anxiety, indeed, negatively affected both the ability to initiate and maintain sleep, whereas high EMG levels were associated mainly with maintenance difficulty.

The majority of studies reviewed here have focused on the contributions of psychological and psychophysiological variables to insomnia. Very few studies have examined the role of biological and constitutional factors such as temperament. While various components of temperament such as, for instance, the degree of stimulation a person needs to function optimally and the intensity and duration of his emotional reactions, are all primarily biologically determined, they do have an obvious impact on the way a person functions psychologically. Since sleep is an area in which psychological and biological processes are so closely interconnected, any data on the influence of temperament would be useful. Interesting information on the role of temperament was contributed by two British studies. Tune (1969) investigated the role of temperament in the context of a large research project which involved 509 non-clinical subjects. He correlated sleep-chart data on various aspects of sleep with scores on a personality inventory and found significant negative correlations between total sleep time and introversion. A similar connection was obtained in Costello and Smith's study (1963) of a large sample of psychiatrically hospitalized patients. In this case, sleep data were based on the nurse's visual inspection of the patient's behavior

during the night and were, thus, a function of her subjective assess-
ment. The assignment of subjects into an extroverted or introverted
group was based on scores on the Maudsley Personality Inventory.
Highest scorers were judged to be extroverted for the purposes of the
study. The results indicated that introverted subjects had signifi-
cantly lower total sleep time in comparison with the extroverts. It
is important to emphasize that both independent variables were oper-
ationalized in a somewhat crude manner and that the extroversion/
introversion distinction has meaning mainly within the boundaries of
their particular sample. Furthermore, the subject's self-report may
not be an optimal measure of temperament. Self-report, no matter how
informative, is a verbal measure and thus may not adequately repre-
sent complex biological variables and processes which constitute
temperament.

While the above limitations make the connection between total
sleep time and temperament tentative, they offer an interesting
hypothesis for further exploration that is consistent with certain
research findings, and that is, at least theoretically, compatible
with Kales's hypothesis of internalization of distress in insomniacs.

Summary

Taken together, the studies reviewed above deal with the
phenomenology of insomnia from different points of view. At the
present time, not all of their contributions can be integrated into
a coherent picture with clearly defined cause-effect mechanisms.
Nevertheless, the following summary statements can be made which
pertain to insomniacs viewed as a group in many cases.

First, the MMPI profiles of insomniacs in relation to non-insomniacs tend to show somewhat higher elevations on a number of scales, which suggests a higher likelihood of essentially moderate (as opposed to severe) psychopathology. Thus, the modal level of disturbance is not extreme although, clearly, any individual insomniac could be either more successfully adapted or more intensely disturbed.

With respect to the nature of psychological disturbance it can be said that, although a number of different pathological features have been reported, they tend to cluster around fundamentally neurotic distress indicators with an accent on depressive symptomatology, as well as certain pathological character traits with the exception of antisocial behaviors.

With regard to etiology, insomnia is an excellent example of a disorder which is, as Freud put it, multiply determined. Deviations from the optimal level of autonomic arousal in certain parameters have been pointed out as important (Monroe, 1967), as have tendencies toward ruminative, unproductive reworking of issues along obsessional lines and a certain inward focus (Coursey et al., 1975). Insomniacs thus emerge as anxious "internalizers of distress" (Kales, 1976), beleaguered by several classic neurotic symptoms, whose sleep (especially in early stages) may be subtly different and less robust than the sleep of people who do not suffer from insomnia (Borkovec, Lane, & Van Oot, 1981). Insomniacs' interpretation of various sleep information as well as the nature of their attributions as to causality, and the source (external versus internal) of their experience at the particular point when they have trouble sleeping, may also be

different (Lichtstein & Rosenthal, 1980; Storms & Nisbett, 1970).

It is important to emphasize that these generalizations are intended to apply only to populations included in the material reviewed. Most of these are students and community volunteers and, to a lesser degree, patients seen at Sleep Disorder Centers. The latter group, generally speaking, consists of patients who do not have a primary affective disorder and in whom insomnia exists as a relatively independent problem which does not need to be viewed in the context of a more directly or pervasively influential disorder.

The present study is intended to explore psychological characteristics of patients who suffer from certain types of chronic insomnia. Based on the reviewed research, it is hypothesized that not all insomniacs are equally emotionally disturbed and that etiology of insomnia may be an influential factor in determining the extent of emotional disturbance, as assessed by the MMPI. In particular, it is hypothesized that the psychological issues identified by Kales and other researchers may be largely restricted to a group of insomnias of predominantly psychological origin, and may not be present in those subtypes of insomnia which have medical etiology.

In this investigation, two groups of insomniacs will be examined with respect to their psychological characteristics: subjects whose insomnia is presumed to have psychological etiology (Group 1) and subjects with medically-based insomnia (Group 2). The underlying assumption is psychological heterogeneity of insomniac patients and the aim of the study is to determine whether the etiology of the sleep disorder is a contributing factor.

The present study will address issues which deal with group differences, both with respect to the overall level and nature of the psychopathology. The following hypotheses will be tested.

1) Patients in Group 1 whose insomnia is presumably due to psychological causes will show a higher overall level of psychopathology on the MMPI than patients in Group 2 whose insomnia is related to medical causes.

2) Patients in Group 1 will evidence specific forms of psychological disturbance, which are predominantly neurotic and consistent with the internalization of distress (Kales, 1976). As these are manifested by elevations on the Depression, Psychasthenia and Hysteria scales, it is predicted that scales D, Pt, and Hy will be significantly higher in Group 1 than in Group 2.

3) Psychological characteristics measured by Paranoia (Pa) and Hypomania (Ma) scales are inconsistent with internalization of distress. Therefore, it is predicted that scores on Pa will be lower in Group 1 than in Group 2, and that scores on Ma will be lower in Group 1 than in Group 2.

4) Depressive features are predicted to be more common than any other single form of psychological maladjustment in Group 1. It is, therefore, predicted that the T-score on the Depression scale will be equal to or above 70 in a higher proportion of cases in Group 1 than in Group 2.

5) Since it is possible that the tendency toward internalization may be characteristic of insomniacs regardless of whether it

is expressed to a pathological or non-pathological extent, the Depression, Psychasthenia, and Hysteria scales may represent frequent profile peaks in Group 1, regardless of their absolute elevations. It is thus predicted that the Depression scale will be the highest profile peak in a larger proportion of cases in Group 1 than in Group 2. The same is predicted for the Hysteria and Psychasthenia scales.

6) On the basis of Kellerman's observations on the importance of conflicts over dependency in insomniacs, it is hypothesized that insomniacs as a group (i.e., Groups 1 and 2 combined) will exceed the norm (T-score of 50) on the Dependency scale.

   It is further hypothesized that the insomniacs in Group 1 will score higher on the Dependency scale than insomniacs in Group 2.

METHOD

Subjects

Fifty-eight subjects were recruited from the population of

patients at the Sleep Disorders Center at Rush-Presbyterian-St. Luke's

Medical Center. Thus, they constitute a clinical population, as

opposed to students or members of the community who consider themselves

poor sleepers, but are not formally diagnosed patients. This choice

was based on the assumption that insomnia was more clearly expressed

in those patients who sought help. The act of seeking clarification

and relief is a significant aspect of the phenomenology of the disorder,

regardless of actual polysomnographic, physiological, and other "objec-

tive" correlates. This assumption is based, in part, on Clift's con-

clusion (1975) that patients who sought help for insomnia were

psychologically different in certain respects from those who did not.

Also, only chronic insomniacs were selected, because patients

with transitory sleep disturbances are probably best conceptualized

as being phenomenologically distinct from those with enduring diffi-

clties.

Another important methodological decision was the choice of the

Diagnostic Classification of Sleep and Arousal Disorders (Sleep, 1979)

which distinguishes among many types of insomnia. DCSAD is the

official nosology of the field of sleep disorders. This allowed a

formal and standardized approach to the question of heterogeneity of

insomnia.

The standard evaluation procedure at the Sleep Disorders Center involves a comprehensive review of clinical, polysomnographic, and psychometric features of the patient's sleep condition. Each patient is requested to complete the Sleep Screening Battery which consists of the MMPI, Spielberger's State-Trait Anxiety Inventory, Schedule of Recent Experience (list of potential stressors within the past year), a detailed Sleep Questionnaire, and a two-week sleep log. An evaluation interview is then conducted in which a history is taken, including general (medical, family, social), as well as particular history pertaining to the patient's sleep problem. Insomniac patients are also evaluated by means of a specialized insomnia questionnaire. Following the interview, a medical exam may be performed. The patient is then scheduled for an all-night polysomnographic evaluation. This sleep record is scored by trained technicians according to standard criteria (Rechtschaffen & Kales, 1968). The patient is subsequently assigned diagnostically to one of the sub-categories of insomnia included in the Diagnostic Classification of Sleep and Arousal Disorders (DCSAD).

The present group consists of 58 subjects (32 men and 26 women) who all meet the criteria for being chronic insomniacs with a duration of insomnia of at least six months. Most of them have had insomnia for several years. The mean number of hours of sleep per night, according to the patients' subjective estimates, was 5.11 in Group 1 and 5.77 in Group 2. The subjects vary in age from 19 to 77 with the mean age of 44.5. They are predominantly Caucasian, middle-class patients from urban areas surrounding Chicago. The classification of

subjects into Group 1 or Group 2 was based on the diagnosis given to the patient by the responsible clinician according to the above specifications.

Group 1 - Psychologically-based insomnias -- includes the following: Persistent Psychophysiological DIMS (Alb) and DIMS associated with Symptom and Personality Disorders (A2a).

Group 2 - Medically-based insomnias -- includes DIMS associated with Respiratory Impairment (e.g., Sleep Apnea DIMS Syndrome or A4a); Sleep-related Myoclonus DIMS Syndrome (A5a) and "Restless Legs" DIMS Syndrome (A5b); Other Medical, Toxic and Environmental Conditions (A6); Childhood-Onset DIMS (A7), and Other DIMS Conditions (A8).

Several DCSAD categories were omitted from consideration for Group 1: DIMS associated with Affective Disorders, DIMS associated with Other Functional Psychoses (e.g., schizophrenia), and DIMS associated with Use of Drugs and Alcohol. This choice was made in order to eliminate subjects who were likely to have experienced psychological compromises of various degrees of intensity which were not related to sleep. The extent of psychopathology present in these disorders might have "inflated" the degree of psychopathology in Group 1 and thus misrepresented the actual extent of differences in psychological adjustment between Group 1 and Group 2. Also excluded were patients with multiple overlapping diagnoses, i.e., those who had been diagnosed to have conditions which placed them both in Group 1 and Group 2.

It is important to emphasize that the criteria that classify a patient as belonging to Group 1 or Group 2 are determined objectively, and are based, in part, on polysomnography which has a standard basis for interpretation. This is especially obvious with patients who suffer from sleep apnea or nocturnal myoclonus. Group 2 can be regarded as one with predominantly pathophysiological features, whereas Group 1 is defined by the absence of these features, as well as the absence of major psychiatric syndromes and substance abuse.

Procedure

Each patient's MMPI record was scored by the investigator at least three times in order to minimize the likelihood of error. Of the available pool of eligible patients (i.e., those with appropriate diagnoses), only those whose MMPI records were valid and complete were selected. Patients who omitted more than 10 questions out of the total of 566 were not included.

In order to establish the degree of reliability with which the subjects could be classified as belonging to Group 2 (medical basis for sleep disorder) or Group 1 (insomnia not due to medical causes, or to major psychiatric disorders, or substance abuse), a reliability check was run by one of the senior staff members at the SDC. Twenty charts were selected for review, 10 from Group 1 and ten from Group 2. The drawing of charts from each group was random. The results of the reliability check indicate a 90% agreement. Two out of 20 subjects were diagnosed as having conditions which fell outside of the domain of both groups. One patient was considered to be a short sleeper and not an insomniac, whereas the second one was classified as suffering

from excessive somnolence related to sleep apnea and not insomnia due

to apnea. A 90% agreement suggests that the criteria for classifying

subjects into the two experimental groups were reliable.

In order to protect the confidentiality, each patient was

assigned a code number (1-58) and his age, sex, and MMPI data were

coded according to this number. The data were then subjected to the

following analyses:

1) In order to test the first hypothesis that Group 1 has a

higher level of psychopathology than Group 2, the proportion of cases

in which one or more scales equal or exceed a T-score of 70 was com-

puted for each group and the scores compared by means of the Fisher

Exact Test with Tocher procedure. This method was selected because it

is applicable under circumstances which are similar to those which

require χ^2, but it is more powerful.

2) In order to test that Group 1 has a higher degree of neurotic,

specifically internalizing forms of psychopathology than Group 2,

group means on Depression, Psychasthenia, and Hysteria scales were

computed for both groups and compared by means of analysis of variance.

3) Since internalizing modes of distress typically do not include

characteristics measured by elevations on Paranoia (Pa) and Hypomania

(Ma) scales, Pa and Ma scores in Group 1 were expected to be lower

than in Group 2. Group means on these two scales were computed for

each group and compared by means of analysis of variance.

4) Group 1 was expected to show a higher frequency of depression

than Group 2. In order to test this hypothesis, the proportion of

cases in which Depression equals or exceeds the T-score of 70 was

computed for each group and the proportions compared by means of the
Fisher Exact Test with Tocher procedure.

5) To test the hypothesis of a greater preponderance of internal-
izing forms of psychopathology in Group 1 than in Group 2, the propor-
tion of cases in each group in which the Depression scale is the high-
est scale in the profile, regardless of its elevation, were compared.
The same data were computed for the Hysteria and Psychasthenia scales.
The respective proportions were compared by means of the Fisher Exact
Test with Tocher procedure.

6) The group mean for the Dependency scale of the sample as a
whole was computed and compared to the normative mean ($\underline{T}$-score of 50)
by means of analysis of variance. Also, the mean score on this scale
for Group 1 was compared with the score for Group 2 by means of
analysis of variance.

RESULTS

When the first hypothesis was tested by comparing the two groups
on the proportion of cases in which one or more clinical scales were
equal to or higher than a T-score of 70, contrary to expectation, the
two groups were not significantly different (p > .05).

It was intended that Hypothesis 2 be tested by univariate F-
tests. However, the two groups were found to differ with regard to
sex distribution. In Group 1, the male/female ratio was 12:17, whereas
in Group 2, it was 20:9. In order to remove any confounding effects
of unequal sex distribution, a two-way ANOVA was employed, with group
membership as Factor 1 and sex (male versus female) as Factor 2 (see
Table 1). The results show no significant differences between the
groups on the Depression, Hysteria, and Psychasthenia scales. These
findings are inconsistent with the hypothesis that these particular
forms of neurotic disturbance are restricted to or exist in a higher
degree in patients with "psychologically" based insomnia.

The third hypothesis states that psychopathological tendencies
reflected in elevations on the Paranoia ($\underline{Pa}$) and Hypomania ($\underline{Ma}$) scales
will be lower in Group 1 than in Group 2, respectively. However, the
results of the two-way ANOVA revealed no significant differences
between Group 1 and Group 2 on these two scales, either as a function
of group membership, or the patient's sex.

The fourth hypothesis states that in Group 1 the Depression scale

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Table 1

Summary of Two-Way ANOVAs

Outcome Variable	Group	Sex	Group X Sex
Hs	$F = 3.5121$	$F = .0932$	$F = .1370$
D	$F = .4530$	$F = 1.1254$	$F = 1.4901 \times 10^{-3}$
Hy	$F = 1.9898$	$F = 1.3694$	$F = .1662$
Pd	$F = .0150$	$F = 9.487 \times 10^{-5}$	$F = .0357$
Mf	$F = 2.4677$	$F = 90.755***$	$F = 1.24$
Pa	$F = 2.2049$	$F = 1.6153 \times 10^{-3}$	$F = 2.8457$
Pt	$F = 1.2898$	$F = 1.089$	$F = .0750$
Sc	$F = .1323$	$F = .8657$	$F = 2.2492$
Ma	$F = .2211$	$F = .2272$	$F = .4232$
Si	$F = .0432$	$F = .1693$	$F = .1658$
ES	$F = 2.5404$	$F = 6.1480*$	$F = 1.4456$
Dy	$F = .0161$	$F = .2251$	$F = 2.1103$

Note. $df = 1,54$ for all F's

*$p < .05$

***$p < .001$

For G_1, $N = 29$; For G_2, $N = 29$

For Males, $N = 32$; For females, $N = 26$

For Males in Group 1, $N = 12$; For Females in Group 1, $N = 17$

For Males in Group 2, $N = 20$; For Females in Group 2, $N = 9$

Means for Mf: $G_1 = 52.47$; $G_2 = 56.25$

Means for Mf: Males = 65.82; Females = 42.90

Hs = Hypochondriasis; D = Depression; Hy = Hysteria

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia

Table 1 (continued)

Ma = Hypomania; Si = Social Isolation; ES = Ego Strength

Dy = Dependency

will be in the pathological range (T-score > 70) more often, i.e., in a higher proportion of cases, than in Group 2. Results of the Fischer Exact Test with Tocher procedure do not support this prediction (p > .05). This suggests that the etiology of insomnia may not predispose a patient differentially to depression.

Hypothesis 5 states that the Depression, Hysteria, and Psychastenia scales will be the highest scales in the profile (regardless of their elevation) in a higher proportion of cases in Group 1 than in Group 2. The results of Fischer's Exact Test do not support this hypothesis with regard to any of the scales. There is no significant difference in the proportion of cases in which Depression is the profile peak in Group 1 relative to Group 2 (p > .05), nor is there a significant difference in the case of Hysteria (p > .05) or Psychastenia (p > .05).

Finally, it was hypothesized that insomniac patients would have higher scores on the Dependency scale of the MMPI than the normal population. More specifically, insomniacs' mean score on the Dependency scale was expected to exceed the normative mean (T-score of 50). The results show that the overall sample mean (M = 51.56, SD = 10.4059) does not differ significantly from the normative population mean of 50, $F(1,57)$ = 1.3185, p = .2544. This suggests that insomniac patients may not be psychologically more dependent than normals.

Furthermore, when the two subgroups of insomniacs were compared, i.e., those with "psychological etiology" (Group 1) and those with medical etiology (Group 2), no significant differences were found on the Dependency scale, $F(1,56)$ = .0126, p = .8760. The group means for

the Dependency scale were within one $\underline{T}$-point of each other: for Group

1, $\underline{M}$ = 51.41, for Group 2, $\underline{M}$ = 51.72. No significant differences in

dependency were obtained when males in the entire sample were compared

with females, either, $\underline{F}(1,56)$ = .3305, $\underline{p}$ = .5745 (for Group 1, $\underline{M}$ =

52.28, whereas for Group 2, $\underline{M}$ = 50.69). The above results suggest that

scores on the Dependency scale may not be specifically related to the

etiology of insomnia, to the patient's sex, or to insomnia as a con-

dition.

As the review of the results indicates, the present study has

failed to support the basic hypotheses, among them the notion that the

etiology of insomnia is a (single) determinative factor in either the

degree or the nature of psychological distress in insomniac patients,

as measured by their MMPI performance. It seems that "psychological"

etiology, as opposed to medical etiology does not necessarily lead to

either a greater degree of psychological maladjustment or to a greater

proneness to internalizing modes of coping with life's demands.

Specifically, the data suggest that depressive manifestations are not

more prevalent in the psychologically-based insomnias as compared to

the medically-based. This implies that the etiology of insomnia may

not have a differential impact on proneness to depression.

Additional Analyses

In light of the failure of the present study to support the

original hypotheses, group differences were explored further. First,

Group 1 was compared to Group 2 with regard to the remainder of the

clinical MMPI scales: Hypochondriasis, Masculinity/Femininity, Psycho-

pathic Deviate, Schizophrenia, and Social Isolation, as well as the two

research scales, Ego Strength and Dependency. The results are reported

in Table 1. No significant effects of group membership were found

although the group difference on Hypochondriasis approached significance

(p = .063). The patients in Group 2 scored higher than the patients in

Group 1. In order to establish the reliability of this finding, Groups

1 and 2 were further compared on Hypochondriasis by means of a univar-

iate F-test. It was felt that the absence of a significant sex/group

interaction on that variable justified the use of a less powerful test.

The results of the univariate F-test show that patients in Group 2

scored significantly higher on Hypochondriasis as compared to patients

in Group 1, $F(1,56)$ = 3.7928, p = .05. This finding suggests that

those patients whose insomnia is related to a medical disorder are more

concerned with matters of health and illness than those whose insomnia

is related primarily to psychological factors.

With regard to the second factor in the analyses (sex), signifi-

cant main effects were obtained on two scales: Masculinity / Femininity

(Mf) and Ego Strength (ES). Males scored significantly higher than

females on Mf (See Table 2). This finding was further confirmed by

comparing males and females in the sample (disregarding group membership)

by means of a univariate F-test. Males were again found to be signi-

ficantly higher on Mf than females, $F(1,56)$ = 103.2359, p <.001. This

implies that the males in the entire sample were generally less inter-

ested in or acknowledged less stereotypic masculine interests and

reported less adherence to their sex role stereotype than the women did

to theirs.

Additionally, the sex of the patient yielded significant main

Table 2

Mean t-Scores

Outcome Variable	Males in Group 1	Females in Group 1	Males in Group 2	Females in Group 2
Hs	59.50	61.41	65.85	65.67
D	72.42	68.76	70.15	66.22
Hy	62.08	66.18	66.80	68.78
Pd	62.50	63.18	62.75	62.00
Mf	62.58	42.35	69.05	43.44
Pa	58.58	63.00	59.10	54.89
Pt	68.33	64.24	63.95	61.56
Sc	61.83	63.47	65.o0	58.11
Ma	58.17	54.53	54.55	55.11
Si	55.42	53.29	54.90	54.89
ES	54.00	50.41	52.90	42.59
Dy	54.67	49.12	50.85	53.67

Note. Hs = Hypochondriasis; D = Depression; Hy = Hysteria; Pd = Psychopathic Deviate;
Mf = Masculinity/Femininity; Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;
Ma = Hypomania; Si = Social Isolation; ES = Ego Strength; Dy = Dependency

effects on the Ego Strength scale. Males scored significantly higher than females (see Table 2). This particular sex difference was confirmed by a univariate F -test which compared males in the sample with the females regardless of group membership: $F(1,56) = 4.2329$, $p =$ .0417. On the most obvious level, this finding suggests that male insomniacs are psychologically more robust and are oriented toward a productive, problem-solving approach to life's tasks to a higher degree than female insomniacs. The above results suggest that etiology may not be influential in determining the psychological profile of insomniacs on the MMPI, but sex differences may. This conclusion raises another question. Does the interaction between group membership and the patient's sex have a significant effect on the nature of psychological adjustment in insomniacs?

The two-way analysis yielded no significant interactions. On the Paranoia scale, however, a trend was obtained (p = .093). While this value is not statistically significant, the issue was explored further by means of a univariate F-test. Females in Group 1 were compared with females in Group 2 on the Paranoia scale. The results indicate that the females in Group 1 scored significantly higher on Pa than females in Group 2, $F(1,24) = 4.9770$, p = .0333. This finding suggests that females whose insomnia is rooted mainly in unresolved psychological issues may tend to use more projection and be more insecure and ready to ascribe hostile motivations to others than females whose insomnia is medically-based. When males in Group 1 were compared with males in Group 2, on Paranoia, no significant differences were obtained, $F(1,24) = .0215$, p = .8558. In order to explore

possible differences in other scales, females in Group 1 and Group 2 were compared on the remainder of the scales. No significant results were obtained. The comparisons between males in Group 1 and Group 2 on the remainder of the scales also did not yield significant results. This suggests that males with "psychologically"-based insomnia and males with the medically-based insomnia do not respond differentially on the MMPI.

In addition to studying the impact of sex differences, age-related changes were also examined. The entire sample ($\underline{N}$ = 58) was stratified into two groups according to age. Group 1 consisted of subjects under the age of 50, and Group 2 included subjects who were 50 years of age or older. The two groups were compared with respect to all the clinical scales as well as Ego Strength and Dependency by means of $\underline{F}$-tests (two-tail). The results (See Table 3) indicate that younger subjects scored significantly higher on the Psychopathic Deviate and Paranoia scales. In order to explore the relationship between age and the $\underline{Pd}$ and $\underline{Pa}$ scales further, the three variables were correlated. Age was found to correlate negatively with both $\underline{Pd}$ ($\underline{r}$ = -.28) and $\underline{Pa}$ ($\underline{r}$ = -.278). Both correlations were significant at the .05 level.

Thus, the present findings indicate that younger subjects had more characteristics related to hostility, externalization of blame, and insecurity ($\underline{Pa}$) than the older group, and were also less conventional and less accepting of the dominant societal rules and requirements ($\underline{Pd}$). These findings were not anticipated and they differ considerably from Kales's observations (1983). On the basis of age trends in scale elevations described by Kales and his colleagues (1983), it

Table 3

Summary of ANOVAs Comparing Patients 50 Years and Older With Those

Younger Than 50 on 12 MMPI Scales

Outcome Variable

Hs	F = .35866
D	F = .31501
Hy	F = 5.2373 x 10^{-4}
Pd	F = 4.48716*
Mf	F = .28860
Pa	F = 6.7668*
Pt	F = 2.49776
Sc	F = 1.3979
Ma	F = .3029
Si	F = .6772
ES	F = 1.007
Dy	F = 2.1347

Note. *p < .05

df = 1.56

	Mean for Pd		Mean for Pa	
< 50	65.63		< 50	61.97
50 and older	58.26		50 and older	55.7

Hs = Hypochondriasis; D = Depression; Hy = Hysteria;

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

was expected that age differences would probably occur in the scores

on the Depression and Hypochondriasis scales.

In order to examine the relationship between age and depression

the two variables were correlated. No significant correlation was

obtained.

Normative Comparisons

Group comparisons were helpful in addressing the issue of the

importance of etiology of insomnia in shaping psychological manifesta-

tion. The data could, however, be approached from another point of

view which would pose a different research question. If both groups

were combined and the sample considered as a whole[2], what kind of

psychological picture would emerge? How would it compare with the MMPI

norms and would it yield a picture similar to the one which emerged

from the findings of Kales and other investigators? For this phase of

the analysis and interpretation of data, mean $\underline{T}$-score values on the

clinical scales, as well as Ego Strength and Dependency, were compared

with two separate reference points. The first one included the original

MMPI norms with the mean of 50 and standard deviation of 10 (Dahlstrom,

Welsh, & Dahlstrom, 1972). The second standard for comparison was

Kales's sample of 279 insomniacs from his 1983 investigation.

MMPI standard score norms. Three separate comparisons were per-

formed with regard to the original MMPI norms: 1) sample as a whole

(G1 + G2) versus the norms, 2) G1 versus norms, and 3) Group 2 versus

norms. When the entire sample is compared to the norms (See Table 5)

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[2]Means and standard deviations are reported in Table 4.

Table 4

Means and Standard Deviations of the Entire Sample (N = 58)

on 12 MMPI Scales

Outcome Variable	Mean	SD
Hs	63.2068	10.358
D	69.6034	12.7773
Hy	65.9482	9.42081
Pd	62.706	13.3482
Mf	55.9137	14.8870
Pa	59.4827	9.4316
Pt	64.5689	11.1985
Sc	62.8620	10.44021
Ma	55.3793	11.49802
Si	54.5344	9.20186
ES	50.7931	10.6355
Dy	51.5689	10.4059

Note. Hs = Hypochondriasis; D = Depression; Hy = Hysteria;
       Pd = Psychopathic Deviate; Mf = Masculinity/Femininity
       Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;
       Ma = Hypomania; Si = Social Isolation;
       ES = Ego Strength; Dy = Dependency

Table 5

Summary of ANOVAs Comparing the Entire Sample (N = 58) With the

MMPI Norms (Mean = 50, SD = 10) on 12 MMPI Scales

Outcome Variable

Hs	F = 94.2912***
D	F = 136.5244***
Hy	F = 166.2183***
Pd	F = 52.5603***
Mf	F = 9.1525**
Pa	F = 58.6304***
Pt	F = 98.1662***
Sc	F = 88.0299***
Ma	F = 12.695**
Si	F = 14.0842***
ES	F = .3225
Dy	F = 1.3185

Note. df = 1,57 for all F's

**p <.01

***p <.001

Hs = Hypochondriasis; D = Depression; Hy = Hysteria

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

it is clear that the insomniacs are significantly higher on all clin-

ical scales (Hs, D, Hy, Pd, Mf, Pa, Pt, Sc, Ma, and Si), but not on

the two research scales, Ego Strength and Dependency. This suggests

that, as a group, insomniacs acknowledged more psychological distress

on the majority of MMPI dimensions.

Interestingly, the insomniacs scored higher on the Masculinity/

Femininity scale as well. When T-scores of males and females are

combined, the average elevation is not very pronounced (approximately

a half of one standard deviation above the mean), but it is still

significant. However, since the males in the sample scored signifi-

cantly higher on Mf than the females, the interpretation for this

finding may be specific to them.

Group 1 versus the norms (See Table 6). A pattern very similar

to the preceding one emerged when Group 1 only was compared to the

norms, with the exception of Mf. Mf was the only clinical scale on

which Group 1 did not score higher than the norms.

Group 2 versus the norms (See Table 7). When Group 2 was com-

pared to the norms, the clinical scales were all significantly higher

in Group 2. The fact that the mean on Masculinity/Femininity in Group

2 exceeded the normative mean, whereas the Mf in Group 1 did not, is

probably due to the difference in the male/female ratio between the

two groups. In Group 2 there were considerably more males who, being

generally higher on Mf than females,"loaded" the Mf in Group 2 in the

atypical direction.

In general, however, Groups 1 and 2 presented a similar psycho-

logical picture when compared with the MMPI norms.

Table 6

Summary of ANOVAs Comparing Group 1 With the MMPI Norms

on 12 MMPI Scales

Outcome Variable	
Hs	F = 37.5253***
D	F = 86.308***
Hy	F = 68.8639***
Pd	F = 25.6818***
Mf	F = .0896
Pa	F = 38.5071***
Pt	F = 75.547***
Sc	F = 59.6272***
Ma	F = 6.7401*
Si	F = 5.6997*
ES	F = .9407
Dy	F = .5429

Note. df = 1,28 for all F's

     *p <.05
  ***p <.001

     Hs = Hypochondriasis; D = Depression; Hy = Hysteria;
     Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;
     Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia
     Ma = Hypomania; Si = Social Isolation;
     ES = Ego Strength; Dy = Dependency

Table 7

Summary of ANOVAs Comparing Group 2 With the MMPI Norms

on 12 MMPI Scales

Outcome Variable	
Hs	F = 61.6202***
D	F = 53.7722***
Hy	F = 100.0518***
Pd	F = 25.9895***
Mf	F = 15.8432***
Pa	F = 21.6981***
Pt	F = 32.8399***
Sc	F = 34.0814***
Ma	F = 5.80121***
Si	F = 8.32461***
ES	F = .0239
Dy	F = .7586

Note. df = 1,28

***p <.001

Hs = Hypochondriasis; D = Depression; Hy = Hysteria;

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

Comparisons with Kales's Sample

There are certain limitations inherent in the comparisons between the present sample and the historical norms, with regard to drawing conclusions about the nature and extent of psychopathology in insomnia. First, the norms are old and while they are still more appropriate for this research than the new ones (because all the studies described here reported their results in terms of old norms), they are nevertheless somewhat limited, largely due to cohort and social class differences. Furthermore, comparisons between a clinical sample and the normative sample are likely to highlight the pathology in the clinical sample. Third, comparisons with the norms may well show elevations on the majority of scales in clinical subjects (as was the case here), and thus obscure specific forms of pathology which prevail in insomnia. For these reasons, it was felt that Kales's large sample of insomniacs from his 1983 study would serve as a more appropriate reference point.

Comparisons were performed in a step-wise fashion, by juxtaposing Kales's data with the equivalent data in the present sample. Using the simplest index of overall pathology, namely the percentage of cases in which one or more scales exceeded a T-score of 70, it was found that 79.3% of cases in the current sample met this criterion of psychopathology, as compared to 76% of cases in Kales's sample of insomniacs. This finding suggests that the number of profiles with at least some degree of disturbance is high.

Comparisons of the two samples with respect to mean T-scores on scales Hs, D, Hy, Pd, Mf, Pa, Pt, Sc, and Ma (Kales excluded Si) again suggest a great deal of similarity between the present findings

and Kales's results (see Table 8). Mean scores on most scales are within a few T-score points (less than a half of a standard deviation) of their counterpart in the other sample. This suggests that, on the average, subjects in both samples tended to deviate from the normative mean of 50 in the same direction and, furthermore, tended to have score elevations to a roughly equivalent degree. This, in turn, supports one of the main hypotheses of the present study, namely that insomniacs as a group show overall, moderate elevations on the MMPI.

When MMPI scores were rank-ordered from highest to lowest (Table 9), there was again considerable similarity between the two samples. As Table 9 indicates, the three highest scales in Kales's group are Depression ($\underline{D}$), Psychasthenia ($\underline{Pt}$), and Hysteria ($\underline{Hy}$), whereas the three highest in the present sample are $\underline{D}$, $\underline{Hy}$, and $\underline{Pt}$. This degree of similarity corresponds to the rank-correlation score of .86 which is significant at the .05 level. This validates some of the most frequent MMPI findings in the literature on the psychology of insomnia, namely the preponderance of essentially neurotic (as opposed to psychotic or antisocial) disturbances, and also the prominence of depression.

Consider that in the present sample, the Depression scale (Table 10) is equal to or exceeds the T-score of 70 in a greater number of cases (51.72%) than any other scale. $\underline{Pt}$ and $\underline{Hy}$ follow, with 34.48% and 32.75%, respectively. In Kales's sample, $\underline{D}$ is elevated in 53% of the cases, followed by $\underline{Pt}$ (42%) and $\underline{Hy}$ (38%). This degree of similarity corresponds to the rank-correlation score of .98, which is significant at the .01 level.

Next, the MMPI records were classified according to the two

Table 8

Mean t-Scores on 9 MMPI Scales

Outcome Variable	Present Sample (N = 58)	Kales's 1983 Sample (N = 279)
Hs	63.2	63.2
D	69.603	71.6
Hy	65.94	66.8
Pd	62.7	65.0
Mf	55.9	Males = 65.5 Females = 45.2
Pa	59.48	60.7
Pt	64.56	67.7
Sc	62.86	66.4
Ma	55.37	57.2

Note. Hs = Hypochondriasis; D = Depression; Hy = Hysteria;

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

Table 9

Mean t-Scores on 8 MMPI Scales Rank-Ordered From Highest to Lowest

	Present Sample	Kales et al., 1983
	D = 69.603	D = 71
	Hy = 65.94	Pt = 67.7
	Pt = 64.56	Hy = 66.8
OUTCOME	Hs = 63.2	Sc = 66.4
VARIABLE	Sc = 62.86	Mf(males) = 65.5
	Pd = 62.7	Pd = 65.0
	Mf = 55.9	Hs = 63.2
	Ma = 55.37	Ma = 57.2
		Mf(females) = 45.2

Note. Hs = Hypochondriasis; D = Depression; Hy = Hysteria;

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

Table 10

Percentage of Cases in Which a Given MMPI Scale

Equals or Exceeds a t-Score of 70

	Present Sample	Kales et al., 1983 ($\underline{N}$ = 279)
	Hs = 27.5%	Hs = 31%
	D = 51.7%	D = 53%
	Hy = 32.7%	Hy = 38%
OUTCOME	Pd = 22.41%	Pd = 29%
VARIABLE	Pa = 15.5%	Pa = 20.4%
	Pt = 34.48%	Pt = 42%
	Sc = 22.41%	Sc = 34%
	Ma = 12.06%	Ma = 15.4%
	D, Pt, Hy = highest	D, Pt, Hy = highest

Note. Hy = Hypochondriasis; D = Depression; Hy = Hysteria;

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

highest scores, regardless of elevation, and the percentage of cases was computed in which each scale was the highest in the profile (See Table 11). The Depression scale again "leads" with 29.3% of cases (in which it is the highest scale) as compared with 35% of cases in Kales's study. D is followed by Hy (17.24%, Mf (13.79%), and Pd (10.34%) in the present sample.

As a further elaboration of the above findings, the number of cases in the current sample in which each scale was either the first or second highest in the profile was tabulated (see Table 12). A similar picture emerged, with D being most widely represented (in 53.44% of profiles, compared with 42.8% in Kales). The next highest is Hy (32.75%), and the third highest, Hs (27.58%). Finally, and very much in accordance with the preceding data, scales D, Hy, and Hs are first or second highest in as many as 82.75% of cases in the present study, i.e., one of them is represented in 82.75% of high-point codes.

Table 11

Percentage of Cases in the Present Sample in Which a Given MMPI Scale

is Highest in the Profile, Regardless of Its Score

	Hs = 8.62%
	D = 29.3%
	Hy = 17.24%
OUTCOME	Pd = 10.34%
VARIABLE	Mf = 13.79%
	Pa = 1.72%
	Pt = 6.89%
	Sc = 3.44%
	Ma = 6.89%
	Si = 1.72%

Note. Hs = Hypochondriasis; D = Depression; Hy = Hysteria;

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

Table 12

Percentage of Cases in the Present Sample in Which a Given MMPI

Scale is Either First or Second Highest, Regardless of its t-Score

OUTCOME

VARIABLE

Hs = 27.58%

D = 53.44%

Hy = 32.75%

Pd = 20.68%

Mf = 18.96%

Pa = 8.62%

Pt = 12.06%

Sc = 5.17%

Ma = 12.06%

Si = 8.62%

Note. Hs = Hpochondriasis; D = Depression; Hy = Hysteria;

Pd = Psychopathic Deviate; Mf = Masculinity/Femininity;

Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia;

Ma = Hypomania; Si = Social Isolation;

ES = Ego Strength; Dy = Dependency

DISCUSSION

The analysis of differences between Group 1 and Group 2 with

regard to psychological characteristics measured by the MMPI has

revealed that the two groups are much more similar than different.

Thus, the results of the present investigation do not support the

hypothesis that etiology is determinative of psychological differences

in chronic insomniacs. This, of course, does not deny the presence of

psychological and other differences observed in various subclasses of

insomnia. It merely questions the importance of etiology per se in

shaping specific psychopathological manifestations on the MMPI,

reported in insomnia. The major hypotheses of the study have thus not

been supported.

The present investigation has identified only one psychological

difference between the "psychologically"-based and medically-based

insomniac patients, namely higher mean scores on the Hypochrondriasis

scale in Group 2 relative to Group 1. On the basis of this observation

it can by hypothesized that medically-based insomniacs may be more

attuned to matters of physical well-being and may tend to experience

and deal with psychological matters as if they were physical symptoms.

Given the fact that sleep apnea and nocturnal myoclonus, as well as

other diagnoses included in Group 2, have a definite medical pathogen-

esis, it is not difficult to understand why medical insomniacs tend to

have such a pronounced "physical focus." Furthermore, medical

problems legitimize, to an extent, such behaviors as seeking attention

and nurturance (ostensibly because one is sick, but actually because

one does not or will not ask for them directly). This particular

pattern is common in patients with elevations on Hs. Thus, a high Hs

score reflects not only the awareness of and worry about physical

illness, but also the patient's reactions to illness and the psycholog-

ical function which the illness serves (discussed in Graham, 1975;

Greene, 1980). One of these functions consists of using illness as a

sole criterion of well-being which, in turn, enables one to omit from

consideration troublesome and anxiety-producing psychological issues.

These trends may be more pronounced in medical insomniacs, because

those insomniacs whose sleep disorders are psychologically-based may

not have a ready "excuse" for their insomnia and may thus be less likely

to use somatization and denial as their main defenses. This interpre-

tation, however, requires further validation, as the data on which it

is based are statistically weak.

With the exception of the difference on Hypochondriasis, no other

significant difference between Group 1 and Group 2 was found in the

present study.

The paucity of psychological differences between the two groups

which vary on the basis of the diagnosis of sleep disorder may be due

to several reasons. First, we may consider the possibility that,

contrary to what the data show, the two groups are indeed psycholog-

ically distinct, but that our inclusion criteria were too restrictive.

It will be recalled that Group 1 was limited to two diagnostic cate-

gories: A2a (Symptom and Personality Disorders) and A1b (Chronic

Psychophysiological DIMS). We have excluded categories dealing with alcohol and drug abuse, and those with major psychiatric disorders, such as major affective and thought disorders (e.g., schizophrenia, bipolar illness). These categories were excluded because it would have been difficult to determine whether psychological as opposed to medical factors were primary contributors to insomnia. The second reason had to do with the fact that these three categories contain persons with clear psychopathology which may or may not be the cause of insomnia (the relationship is, at any rate, difficult to determine). The extent of psychopathology present in the three groups would have biased the present findings in favor of a higher degree of psychopathology in Group 1. This, in turn, could have resulted in the misleading conclusions that the psychopathology in Group 1 was determinative of insomnia when, in fact, it could well be that alcohol abusers and schizophrenics, for instance, are very disturbed _and_ are insomniacs, as opposed to being insomniac _because_ they are disturbed. It was the second relationship which was of interest in the present study.

It is, nonetheless, possible that our choice of eligible diagnostic categories for Group 1 might have been too stringent, which leaves open the possibility that medically-based insomniacs do differ psychologically from the psychologically-based, but this could only become apparent by using some other set of stratifying criteria (not only the diagnoses listed in DCSAD). It is also possible that psychological differences which are based on etiology are either too subtle to be detected by the MMPI, or, perhaps, they "cut across" several scales. In other words, the nature of conflicts in insomnia may not be readily

described in terms of classical, clinical categories such as Hysteria and other dimensions measured by specific scales.

Thus, the use of the MMPI as a single measure of psychological adjustment limited, to an extent, the amount of information available for analysis. The same is true of using only the individual clinical scales. It is possible that item-analysis may have revealed subtler differences between the two groups.

As the preceding discussion suggests, the nature of the relation between the etiology of insomnia and psychological adjustment is complex. In addition to the already discussed methodological and conceptual issues which contribute to the complexity, yet another con-sideration may be added. It is possible that Group 1 and Group 2 differ psychologically, but not with regard to the clinical character-istics which lead to differential performance on the MMPI, but rather with respect to characteristics which DCSAD listed as prominent in the clinical picture. In the case of Psychophysiological DIMS (A1b) (one of the categories in Group 1), these features include the role of learning in the development and maintenance of insomnia and psycho-physiological arousal and anxiety (Sleep, 1979). It is hypothesized that psychophysiological insomniacs (A1b) have learned to be insomniacs by the process of classical conditioning whereby sleep becomes assoc-iated with a variety of responses which are incompatible with it, such as anxiety and physiological arousal (Sleep, 1979).

Given the possibility that the MMPI performance may be too global and too crude a measure for assessing psychological differences between medical and non-medical insomniacs, it may be useful to conceptualize

these two groups as different on specific psychophysiological traits such as arousal and conditionability. For example, psychophysiological insomniacs, in comparison with medical insomniacs, may have a higher baseline level of arousal, such as body motility, number of vasoconstrictions per minute, and heart rate. Non-medical insomniacs may also have higher levels of free urinary 11-hydroxycorticosteroids and may tend to reduce, rather than augment, sensory stimuli. In sum, various psychophysiological traits, which Monroe (1967), Johns et al. (1971), and Coursey et al. (1985) found to be characteristic of insomniacs in general, may apply to a higher degree to non-medical insomniacs. Furthermore, psychophysiological insomniacs may be more readily conditionable than medical insomniacs. For example, they may learn to associate anxiety and sleeplessness with a greater range of previously neutral stimuli than medical insomniacs.

In speculating about the variables on which insomniacs in Group 1 may differ from insomniacs in Group 2, it may be useful to consider not only psychophysiological mechanisms, but also historical factors such as sleep and psychological adjustment in childhood. Research on insomnia in children points to a variety of factors which affect the child's ability to sleep. Anders (1979) studied the nature and frequency of nighttime awakenings in two groups of healthy infants, aged 2 and 9 months. Sleep characteristics of the subjects in his study generally supported the observation that infants consolidate their sleep as they mature, i.e., older infants are generally able to sleep with fewer awakenings than the younger ones. However, this developmental process does not imply a "perfect" night's sleep without any

awakenings. On the contrary, Anders found that awakenings were quite frequent in both age groups and that an uninterrupted night was more of an exception than a rule. Only 15% of infants at age 2 months, and 33% at the age of 9 months met this criterion. Thus, consolidation of sleep is a relative, rather than absolute, achievement with considerable individual differences. Research suggests that 20% (Richman, 1981) or 25% (Carey, 1974) of infants may have recurring difficulty sustaining sleep at night during their first year.

A variety of maturational, neurophysiological, and environmental factors affect the child's ability to consolidate sleep, such as, for instance, low sensory threshold. Temperament has also been suggested as a contributing factor (Weissbluth, 1981). Weissbluth (1981) observed that infants with the so-called difficult temperament (for example, negative mood and a tendency to withdraw) slept less than infants with easy temperaments.

These studies suggest that individuals differ in their capacity to consolidate sleep as early as infancy. The link between the various factors which influence this process and the ability to sleep in adulthood is not clear. However, it is possible that some adult insomniacs with no definite medical basis for insomnia may have been among those infants who had difficulty consolidating sleep. Additionally, they may have been more vulnerable to environmental distractions because of a lower sensory threshold or may have had more difficult temperaments, i.e., biological predisposition to negative moods and difficulty adapting to new situations.

The preceding two sections dealt with psychobiological and

childhood sleep variables on which medical and non-medical insomniacs

may possibly differ. These factors were explored here although they

are not specifically related to the present investigation, because they

help to extend the concept of psychological differences to include

psychophysiological traits and developmental factors.

The similarity between Groups 1 and 2 in the present study may

be alternatively interpreted as being due to the possibility that

non-etiological factors may be more directly determinative in shaping

the psychological profiles in insomnia. Several possibilities exist

here.

One of them may be the patient's reaction to his difficulty in

sleeping, especially his interpretation as to why he cannot sleep and

whether it is due to factors intrinsic as opposed to external to him-

self. Storms and Nisbett's (1970) discussion of this issue is very

pertinent here in that it provides an empirical anchor for the idea of

importance of the manner in which the fact of insomnia is construed by

each patient. After all, even if a group of people develop insomnia

for the same reason (i.e., the underlying mechanism, such as sleep

apnea, is the same), this still does not mean that they will all react

to it in a similar way and that insomnia will eventually become the

same psychological phenomenon for all of them. Etiology may thus be

merely one of many components which shape the final outcome.

In addition to subjective interpretation, it is also possible

that chronicity influences the psychological manifestations in insomnia

to a greater extent than etiology. Clinical experience shows that

insomniacs come to the attention of the clinician after they have

struggled with difficulty in sleeping for many years. Thus, it may

be useful to view insomnia as a chronic illness which shares certain

characteristics with other chronic illnesses, irrespective of their

specific manifestations. It would be interesting to explore specific

psychological changes that occur as a result of adaptation to an ill-

ness which, while not generally physically dangerous, causes persistent

frustration and undermines one's sense of mastery and control. The

knowledge of the interaction between pre-morbid personality style and

this specific psychological reality of a long frustration with no

definite or dramatic relief could be a further step in clarifying the

nature of insomnia.

The similarity of Group 1 and Group 2 on the MMPI brings into

question the justifiability of referring to Group 1 as "psychological-

ly-based." Another factor which makes the use of this term questionable

has to do with inclusion criteria for Group 1. It will be recalled

that the membership in Group 1 (Psychophysiological DIMS and DIMS

Associated with Symptom and Personality Disorders) was partly defined

by the absence of medically-based insomnias and insomnias related to

major psychiatric disorders. This factor, in combination with the

paucity of psychological differences on the MMPI, makes it difficult

to defend the term "psychological etiology" for Psychophysiological

DIMS and DIMS Associated with Symptom and Personality Disorders, in

the context of this study. In order to keep the names of experimental

groups as precise and as operationally meaningful as possible, it may

be preferrable to refer to A1b and A2a conservatively as Group 1

(meaning, not medically-based and not due to major psychiatric

syndromes). This does not deny the presence of psychopathological features in the two categories which make up Group 1 and which have been identified by clinical inquiry and observation. Rather, it challenges their causative role in the development of insomnia on the basis of present findings.

While group membership according to etiology has not been shown to yield substantial group differences (i.e., has not been found to be determinative of the nature of psychological disturance in insomniacs), the data in this study suggest that sex differences do play a role. The most consistent sex difference in our sample was the aforementioned tendency of males to score higher on the Mf scale than females, showing that an average male insomniac tends to depart to a greater extent from the conventional image of the male (robust, tough, unemotional, mechanically, rather than artistically, inclined), than does an average female insomnia from her respective conventional role. Why should this be the case? The hypothesis of "internalization of distress" discussed by Monroe and by Kales may be helpful to consider here. According to this view, insomnia is a manifestation of the internalization process, i.e., a symptom found in people who express difficulties with drives such as aggression by struggling with them inwardly and developing "acting in" symptoms such as depression and psychosomatic illnesses, rather than acting out. We may further speculate that these characteristics are more likely to be found in males who differ from the "pure masculine" stereotype, especially its by now out-dated form which corresponds to the old Mf norms for males. Thus, a male who suffers from insomnia is more likely to have "generic neurotic troubles" as

described by Kales and others, and is consequently less likely to con-
form to the image of a sturdy male who discharges emotional tensions
and conflicts through action (high Pd and Ma would be typical of such
a male).

By contrast, psychological characteristics of insomnia in females
are not really inconsistent with the female stereotype. More precisely,
they are not inconsistent with one particular feature of the female
image, namely, emotional passivity (which is related to internalization).
Some of the symptoms of internalization of distress such as depression
and difficulty expressing anger in a clear way are quite compatible
with the negative aspect of the concept of passivity, which has
classically been regarded as an appropriately feminine trait.

In addition to the differences on Mf, males and females in the
present sample have been found to differ with regard to several other
characteristics as well. Male insomniacs scored higher on the Ego
Strength (ES) scale than female insomniacs. The interpretation of
this finding is less straightforward than it may appear at first
glance. Higher scores in male insomniacs may, indeed, be due to their
greater ego strength. However, it should be recalled that the Ego
Strength scale tends to equate ego strength with psychological atti-
tudes and characteristics that are related to emotional adjustment in
males.[3] At the most obvious level this may lead to the conclusion

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[3]For the issue of higher ES scores in males relative to females,
and the various interpretations attached to the finding, see studies
by Diestler, May, and Tume (1964), Getter and Sundland (1962), and
Taft (1957), quoted in Graham (1980).

that insomniac males are psychologically stronger than insomniac females, when they may merely be stronger in a different way. When the finding that insomniac males are identified with the masculine style of mastery through instrumentality is juxtaposed with the previous finding that they see themselves as more sensitive and less conspicuously identified with the male image, an intriguing combination emerges. Perhaps male insomniacs strive toward the types of mastery and success which are considered appropriate to their gender, yet at the same time, they may be more sensitive, less direct, less inclined to be aggressive and rid themselves of tension by action than the hypothetical average male. In short, in his approach to the non-emotional aspects of his world, he is more masculine than he is in dealing with himself and his inner world of feelings and drives. Conceivably, this discrepancy may lead to vulnerability to the kinds of psychological problems characterized by internalization, of which insomnia is presumed to be a good example.

Another sex-linked difference, although more limited in scope, was found on the Paranoia (Pa) scale. On that scale, females in Group 1 scored significantly higher than females in Group 2. This is another unexpected finding which suggests that females whose insomnia cannot be attributed to any specific medical cause may tend to use more projection and be more insecure and ready to ascribe hostile motivations to others than females whose insomnia is medically-based. This particular finding does not follow directly from, and could thus not have been anticipated from, previous research. Indeed, the Paranoia scale is generally not conspicuous in the profile of insomniacs.

Depression, Hysteria and Hypochondriasis on the one hand, and Schizo-phrenia and Psychasthenia, on the other, are usually more prominent. However, some of the characteristics measured by the Pa scale, such as, for example, insecurity, mistrust, interpersonal anxiety, anger, etc. are consistent with the overall psychological stance of the insomniac. This may be even more true in the case of a female insomniac who does not have a clear organic basis for her disorder and, therefore, has to explain it by other means. Projection, externalization, and a tendency to view the world as populated by danger and threat may serve that purpose.

In addition to sex differences, age-related changes also have an impact on the overall psychological picture in insomnia. In the present sample, subjects under 50 scored higher on the Psychopathic Deviate (Pd) and Paranoia (Pa) scales than the subjects who were 50 years of age or older. Higher scores on the Pd scale in the younger group are consistent with general clinical knowledge of age differ-ences in certain types of psychopathology and contribute little new to our specific question beyond the well-known observation that people grow more conventional as they age, and that "psychopathic" features diminish or become less obvious.

Higher Pa scores in the younger group suggest (among other fea-tures) a greater degree of dissatisfaction, anger, projection, and a tendency to see external events and other people as determinative forces in one's life, rather than one's own feelings, attitudes, acquired habits, and styles of problem-solving. The reasons for this particular

finding are not quite clear. It is possible that another form of "burn out" is at play here. Insomniacs, who may well start out as "angry young people" (although they may not appear so) burn out eventually, under the strain of chronic frustration from difficulty in sleeping and their anger turns into depression. It should be added that the lower Pa in the older group could also be related to the extent to which the patient has been able to cope with insomnia over the years. A high degree of frustration (i.e., repeated failure) may well speed up the process of transformation of anger into depression.

The present findings differ from Kales's. Age-related changes in Pd and Pa were not prominent in his 1983 study. Rather, he found an increase in characteristics measured by the Depression and Hypochondriasis scales in the older group.

The reasons for the discrepancy between the present findings and Kales's are not clear. Possibly relevant is the fact that the present sample was considerably smaller than Kales's and the inclusion criteria were much more restrictive. Kales and his colleagues might have worked with a "richer" sample and been better able to identify various trends.

A basic question to be addressed in terms of these findings is whether age-related changes in characteristics measured by the Pd and Pa scales are limited to insomniacs or are found among non-insomniacs as well. In order to answer that question, age-related changes in various MMPI scales were examined for a large group of normal subjects who were a part of the normative sample used to establish the new MMPI

norms (Colligan, Osborne, Swenson, & Offord, 1983). It was found that the $\underline{Pd}$ and $\underline{Pa}$ scales were both negatively correlated with age. For $\underline{Pd}$ $\underline{r}$ ranges between -.22 and -.30; whereas for $\underline{Pa}$, it ranges between -.15 and -.19. All these correlations are statistically significant ($\underline{p} \leq$ .001). This pattern was found in both male and female subjects. While the magnitude of the correlations is small and the level of significance may have been inflated by the large sample size (762 females and 646 males), the data nevertheless suggest that the relationship between age and $\underline{Pd}$ and $\underline{Pa}$ scales found in the present sample of insomniacs may reflect a normative trend, rather than being specific to insomniacs.

In addition to exploring the role of such variables as the patient's age, sex, and etiology of insomnia, the present study addressed the issue of dependency. Clinical experience and observation suggest that insomniacs have unresolved issues in that area and seem to be highly ambivalent about their need for nurturance. Specifically, there seems to be a pattern of needing to be dependent and cared for, yet mistrusting that need and rejecting dependency, often indirectly (Kellerman, 1981). These features are presumably more pronounced in insomniacs than in normals. The results of the present investigation, however, failed to support the hypothesis of a greater need for dependency in insomniac patients, as compared to normals, at least insofar as dependency can be accurately measured by scores on the Dependency scale of the MMPI (devised by Navran, 1954).

These findings may be due to several reasons. First, the Dependency scale may not be an adequate instrument for evaluating this

issue. Dependency, as an MMPI dimension, is intended to measure a variety of dependent attitudes and behavior. The overall score presumably reflects the degree to which a person is dependent, i.e., it offers a quantitative assessment of a trait which may be either in the normal or pathological range. Kellerman, on the other hand, seems to have conceptualized dependency not so much as a character trait, but as one of the important motivations, such as, for instance, sexuality or aggression, with which every human being must somehow come to terms. Thus, Kellerman's view may imply the idea that dependency is a psychological task which becomes pathological only if approached or handled in ways which impede growth. Kellerman also postulated specific conflicts in the area of dependency. It is possible that these conflicts can only be measured reliably by an instrument specifically designed for that purpose. Thus, the Dependency scale of the MMPI may not be a suitable instrument either because its construct validity is too different from Kellerman's concept, or because it cannot address specific issues which Kellerman considered important.

There is an alternative interpretation which is related to the methodological issues discussed above. It is possible that insomniacs as a group are no more dependent than normals, but merely more conflicted about dependency. The MMPI, however, is not particularly useful in identifying the nature of conflicts in a given area, at least not directly. Of course, it is also possible that insomniacs as a group are neither more dependent, nor more conflicted about dependency than normals, and that the present results reflect the reality of this issue.

The present study also investigated the psychological profile of the insomniac sample as a whole with respect to two different reference points: the original MMPI norms and the sample of insomniacs studied by Kales (1983). Comparisons with the MMPI norms showed that insomniacs in the present study did, indeed, evidence a good deal of psychological distress. Their pathology was manifested in elevations on the majority of MMPI scales and was not restricted to any specific form of emotional maladjustment. The lack of selectivity may be due to several reasons. First, a comparison between a clinical population and a hypothetical normal ideal (operationally defined as the mean T-score of 50 and a standard deviation of 10) will ipso facto show more pathology in the clinical group. Therefore, this finding merely supports the observation that insomniacs as a group do show more psychological maladjustment than normals. Second, the current study used the old MMPI norms. The rationale for this choice had to do with the fact that the large body of literature from which the present hypotheses were formulated and in terms of which the findings were evaluated also used the old norms. The new norms have higher scores on the majority of scales, which means that the baseline has changed since the 1930s and 1940s. This, in turn, implies that the hypotheses concerning the degree of maladjustment in insomniac patients may need to be revised accordingly.

Finally, the present sample as a whole bears a remarkable resemblance to the insomniac subjects used by Kales and his colleagues in their 1983 study, both with respect to the overall level of psychopathology and the specific pathological constellations, namely the

preponderance of depression and other, primarily neurotic indicators.
Thus, the results of the current investigation support Kales's con-
clusions and confirm the presence of certain recurring psychological
difficulties in chronic insomnia. This finding also supports the view
that the sample in the study reported here is a fairly typical group
of insomniacs.

Summary and Suggestions for Further Studies

The present investigation addressed two research questions:
psychological differences on the MMPI between two groups of chronic
insomniac patients who differ with respect to the diagnosis of their
disorder and the characteristics of the sample as a whole in comparison
with the sample of insomniacs studied by Kales and his associates
(1983).

The two experimental groups consisted of subjects with medically-
based insomnias (Group 2) and those subjects whose insomnia was not
related to either medical disorders directly related to sleep or major
psychiatric syndromes (Group 1). The results suggested that the two
groups did not differ substantially, either with regard to the overall
degree of psychological distress or the nature of maladjustment. The
groups have shown considerable similarity on the majority of MMPI
scales. They differed only with respect to the scores on Hypochon-
driasis. It seems that the patients in Group 2 tend to be more intense-
ly focused on physical health than the patients in Group 1.

The psychological similarity of the two groups in the present
study may be related to several theoretical and methodological issues
and allows several possible interpretations. On the most conservative

level, it may point to the absence of psychological differences on the MMPI, based on the presumed etiology of insomnia. On the other hand, it is possible to speculate that the two groups do differ but not on the traditional clinical dimensions measured by the MMPI scales, but rather on psychophysiological characteristics and conditionability.

The insomnias included in Group 1 (Psychophysiological DIMS and DIMS related to Personality and Symptom Disorders) were originally assumed to be psychologically-based, i.e., psychological factors were presumed to play etiological role. In view of the fact that the present investigation showed Groups 1 and 2 to be so similar, and given the fact that insomniacs with major psychiatric disturbances were excluded from Group 1, this hypothesis was rejected. This does not suggest that psychological factors are not important in the two subtypes of insomnia included in Group 1, but it cautions against attributing them a causal role without further investigation.

Thus, the present study did not support the hypothesis that the presumed etiological factors were influential in shaping the psychological profile of insomnia. However, the results indicate that other variables, such as age and sex difference, may play a role. It seems that sex differences contribute to certain specific differences among insomniac patients, namely those related to issues of gender identity and coping style. It seems that an interaction between the sex of the patient and the etiology of insomnia also has an impact.

The results further suggest that the psychological profile of insomniac patients changes somewhat as a function of age, in the direction of greater conventionality, conformity, and integration of the

societal mores and expectation. Also, a slight decline in tendencies

and attitudes related to paranoia such as externalization of blame,

rigidity and anger was observed.

The question of the influence of the etiology of insomnia

requires further investigation. Future studies in this area should

introduce several methodological improvements. Those studies using the

MMPI should add item analysis to the traditional profile analysis. In

order to facilitate the management of the large body of data involved

in such a procedure, individual items which make up each scale could

be organized into content categories (see Greene, 1980). Furthermore,

the MMPI should be supplemented by another instrument which would help

identify the nature of the conflicts. In particular, it would be

desirable to study the psychology of insomniacs in terms of their

specific issues in handling dependency needs and aggression. The

additional instrument should not be limited to quantitative descrip-

tions of insomniac patients such as, for example, "Are they more

dependent and less aggressive than normals?" Rather, it should empha-

size or enable the study of qualitative features and patterns. The

concept of the psychological characteristics of insomniacs should be

extended to include psychophysiological variables which Monroe (1967)

and Coursey et al. (1975) found to be relevant. Self-report data on

childhood sleep may also be included. The interaction between the

etiology of insomnia and the patient's sex should be investigated

further. The present data suggest that females whose insomnia has no

definite medical basis seem to have more features related to paranoid

attitudes and feelings than females with a medical basis for their

insomnia. Future studies should test these hypotheses. Future studies should also investigate the reliability of changes in Paranoia and Psychopathic Deviate scales as a function of age and determine if the changes reported in the present study are significantly more pronounced in insomniacs than in normals. A longitudinal, as opposed to cross-sectional, approach would be preferrable.

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The final copies have been examined by the director of the dissertation
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necessary changes have been incorporated and that the dissertation
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The dissertation is therefore accepted in partial fulfillment of the
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