Utility of an Informant Interview

to Enhance Diagnostic Discrimination in Psychopathology†

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Abstract

Seventeen young, male patients were randomly selected from recent admissions to a state hospital for participation in a forced-choice auditory threshold task. Standard profile scores, obtained from a structured interview of each patient subsequent to psychophysical testing, were compared with profile scores obtained from structured interviews given to informants. Patient rankings, in order of increasing profile scores, derived from the patient interview were found to correlate positively with patient rankings derived from the informant interview. However, more detailed comparison revealed that informants reported more behavior pathology than did patients for the symptom areas of mood disturbance and disorganization and specifically for the factors of depression, retarded speech, reported belligerence, and non-social speech. When evaluated with respect to auditory threshold, a diagnostic discrimination of patients determined by ratings of behavior pathology based upon patient sources was not any better than a diagnostic discrimination of patients determined by ratings of behavior pathology based upon informant sources. However, a similar analysis based upon a combined classification achieved a greater reduction in variability as well as higher thresholds for patients who exhibited both mood disturbance and disorganization than was obtained with information supplied by a single source. The implementation of a structured interview of an informant along with the traditional patient interview was suggested as an adjunct research instrument.

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The problem of "superficially determined class distinctions" for sub-groups of hospitalized psychiatric patients has long been recognized as confounding attempts to replicate many studies reported in the literature of psychophysical research in behavior pathology. Shakow pointed out that when class distinctions are based upon "careful description" (e.g., behavioral classification), a more rigorous criterion for class membership emerges.

An objective of contemporary psychophysical research in psychopathology has been to obtain comparable objective (e.g., signal detection) measures for the performance of sub-groups of patients and non-patients. Less consideration has been given to obtaining sophisticated diagnostic measures with respect to these groups. While the psychophysical data may be reliable, the problem of validity, arising as a consequence of diagnostic imprecision, remains unsolved. Sutton suggested the use of an iterative method, which is a special case of the use of converging operations for construct validation. Alternation in the specification of which is the dependent and which is the independent variable is suggested as the approach for ultimately obtaining valid relationships between psychophysical criterion and behavioral classification.

It has been pointed out that traditional diagnosis, as contrasted with behavioral classification, falls far short of the needs of contemporary research, both because of its low reliability and because of its inability to reveal something about etiology. The entire spectrum of behavior needs to be examined to provide reliable classification and to achieve enhanced discrimination of patient groups. The provision of homogeneous groups is indispensable for good classification. The cross-national study of diagnosis of the mental disorders investigated the

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source of observed differences between the United States and the United Kingdom in the frequencies of diagnostic categories assigned to hospitalized patients. This study casts doubt upon the utility of American hospital diagnoses in providing adequate diagnostic discrimination for research purposes.10

The patient has been considered to be the main source of information from which to establish meaningful classification, whether the evaluators are hospital personnel or researchers employing structured interview schedules. However, it is possible that additional information can be obtained from behavioral ratings of the patient, furnished by a source other than the patient. Salzinger, Feldman and Portnoy11 have shown that laymen can learn to describe abnormal behavior in precise ways. Agreement between patient and informant sources of information relating to role functioning has been demonstrated using the Psychiatric Status Schedule12 and the Structured and Scaled Interview to Assess Maladjustment (SSIAM).13

Zimmerman14 has established the validity and reliability of family ratings of psychiatric patients to be adequate for research purposes. His study has shown that family ratings contribute information not obtainable in ward ratings, most clearly identifying the pathology of a "miscellaneous group" of behavioral pathology which disrupts the home and social situation. Hudgens, Robins and DeLong15 have also described reliable differences between patient and informant reports of recent stressful events; differences were greatest in estimates of the relationship of these events to the patient's illness. The greater the number of events reported within a given category of stress, the greater was the disagreement between informants and patients as to the occurrence

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of those events.

The present study assesses, within an iterative framework, the value of informant information in assisting with the discrimination of diagnostic sub-groups. Informant information is compared with patient information and each of these as well as their combination is considered in relation to performance on an auditory forced-choice threshold task. Should informant information aid in the prediction of auditory forced-choice threshold performance, then informant interviews would be seen as an adjunct research instrument. Three sets of patient rankings were independently obtained from patient scores, informant scores, combined interview scores, and a forced-choice auditory threshold task. The relative success of the three sets of interview based rankings was assessed with respect to the criterion of psychophysical performance. The assumption is that homogeneity of performance on an objective psychophysical task for a particular diagnostic sub-group would help validate the diagnosis as well as have etiological implications.

METHOD

Subjects

Ss were 17 recently hospitalized males at Brooklyn State Hospital. The length of current hospitalization for each patient was 5.2 days. Ss were randomly selected from all new admissions between the ages of 18-30 years who were known not to be mentally retarded, brain damaged, or addicted to drugs or alcohol. The mean age of the patients was 22.9 years.

Apparatus

Thresholds were measured in a sound attenuating booth. Clicks were
generated by a negative-going electrical pulse with an exponential return to base. The time constant of the exponential return to base (ie, the time required to reach 1/e of peak amplitude) was 0.1 msec. The clicks were monaurally presented by the right earphone of Sharpe Mark II circumaural earphones. A Hewlett-Packard attenuator permitted attenuation of the click intensity in 1 dB steps. The frequency response of the earphone is described elsewhere.\textsuperscript{16}

**Procedure**

**Forced-choice technique.** A three-interval temporal forced-choice technique was employed to assess auditory signal detectability. A click signal was presented in one of three observation intervals and the S had to indicate which of the intervals contained the signal. The advantages of this technique for patient research, ie, control of the criterion problem, dictated its use for this study.\textsuperscript{17, 5}

A Block Up-and-Down, Two Interval Forced-choice (BUDTIF) procedure\textsuperscript{18} was modified to permit the estimation of the click intensity needed for 67\% correct responses (50\% adjusted for chance) in the three interval forced-choice task. A detailed description of this procedure and the data for a larger sample of subjects is presented by Bruder, Sutton, Gurland and Yozawitz.\textsuperscript{19}

**Patient interview**

Within two days after estimation of auditory threshold, each S was interviewed by E using a structured current mental state interview adapted from the Present State Examination\textsuperscript{20} and from the Psychiatric Status Schedule\textsuperscript{21} by the Cross National Study Diagnostic Project\textsuperscript{9}.

The reliability of mental state ratings and their validity as a

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prognostic indicator of short-term outcome of hospitalization have been assessed.\textsuperscript{22, 23} Reports by the patient of his recent behavior over the past month, as well as observations of the patient's current behavior made by the psychologist during the interview, provided a basis for discrete ratings on the patient behavioral protocol. Standard scores on twenty factors of behavioral pathology were obtained from this information according to a prior factor analysis of the ratings of 500 patients from Brooklyn State Hospital and London's Netherne Hospital.\textsuperscript{24} Table A\textsuperscript{*} lists the items entering into each factor for the patient protocol. Profiles containing the standard score ($\bar{X} = 50, \ SD = 10$) on each factor of psychopathology were obtained for each patient.

**Informant interview**

Within two weeks after the patient interview, an informant for each patient was interviewed. The individual designated on the hospital admission form to be the "nearest relative" was contacted and interviewed if no other relative or friend was known to be more knowledgeable of the patient's recent behavior. All of the informants who were contacted consented to an interview and were fully cooperative. The informant was given the option of participating in a telephone interview or a "face-to-face" interview concerning the patient's recent behavior. Simon, Fisher, Fleiss and Gurland\textsuperscript{25} and Janofsky\textsuperscript{26} presented data suggesting that there is no loss of information in a telephone interview as compared to a "face-to-face" interview. Four informants were interviewed "face-to-face"; thirteen informants were interviewed by telephone.

Each informant was interviewed by the same psychologist who also conducted the patient interview. The psychologist interviewed each informant using a structured...
current informant mental state interview adapted from the Present State Examination\textsuperscript{20} and from the Psychiatric Status Schedule\textsuperscript{21} by the Cross National Study Diagnostic Project\textsuperscript{9}.

Reports of the patient's recent behavior by the informant provided a basis for discrete ratings on the informant behavioral protocol. The nature of the informant as a source of information allowed only seventeen factors of behavioral pathology to be obtained. Three factors derived from the patient interview, observed belligerence, bizarre behavior, and flat affect contained items which are completely determined from the patient protocol via subjective patient reports or by E's observations. Therefore, these factors necessarily dropped out of the informant protocol. Certain other items which enter into other factors of the patient protocol were also not amenable to informant report and could, therefore, not be compared to corresponding items in the informant protocol. A new patient protocol was, therefore, derived ad hoc to provide a basis for item comparison between patient and informant sources so that factors could be compared quantitatively. Table B\textsuperscript{*} lists items entering each factor for the informant protocol and the corresponding items entering each factor for the ad hoc derived "new patient protocol."

The "new patient protocol" was an abridged patient protocol and, thus, was only utilized for quantitative comparisons between patient and informant sources. All diagnostic comparisons (eg, rankings and correlations) were between the original patient protocol and the informant protocol which represented the most complete interviews obtainable from each source.

**Classification**

Patients were divided into sub-groups based on their profile scores
following a classification scheme utilized by Gurland et al. Patients were assigned into sub-groups determined by their profile scores in three major areas of behavioral pathology: 1) mood disturbance — consisting of two factors, depression and retarded speech, usually associated with the clinical diagnosis of depression; 2) hypomania — a single factor which is often associated with a clinical diagnosis of schizophrenia as well as manic-depressive, manic; 3) conceptual or perceptual disorganization — consisting of ten factors usually associated with a clinical diagnosis of schizophrenia (e.g., non-social speech, auditory hallucinations). A patient could be assigned to one of eight relatively homogenous groups of patients, each having a characteristic pattern of high or low scores, since it is possible for a patient to score high or low in any of the three areas of mood disturbance, hypomania, and disorganization.

A standard score higher than 60 (i.e., higher than one SD above the mean) on any factor in one of these areas of behavior pathology was sufficient for classification in that area. Patients scoring high only on mood disturbance were called "moody." Patients scoring high only on disorganization were called "disorganized." Patients scoring high on both mood disturbance and disorganization were called "moody-disorganized." There were four varieties of patients who scored high on hypomania: 1) hypomania alone were referred to as "hypomanic"; 2) hypomania and disorganization were referred to as "hypomanic-disorganized"; 3) hypomania and mood disturbance were referred to as "hypomanic-moody"; 4) hypomanic, mood disturbance, and disorganization were referred to as "hypomanic-moody-disorganized." Finally, the last patient group, referred to as "mild," scored below 1 SD on all the scales. The seven factors which comprised the "miscellaneous area" of behavior pathology did not enter
into the sub-group classification.

A "combined" classification, based on information from both patient and informant sources, was adapted from Kendall (p 87). Kendall suggested that the best estimate of the "true" ranking of N objects is provided by the order of the sums of ranks of two or more similar rankings. Patients were ranked with respect to their average score across the factors comprising each of three symptom areas (i.e., mood disturbance, hypomania, and disorganization) separately for patient and informant interviews. The patient and informant rankings for each subject were summed for each of the three symptom areas to yield three combined scores for each subject. The mean combined score for all subjects on a given symptom area served as a cut-off point, to differentiate high from low scores. Each patient was then evaluated with respect to the mean to determine whether he was a "high" or "low" scorer on a given area of behavior pathology. The same classification into eight groups, as previously outlined, was then employed.

RESULTS

An initial analysis of the data consisted of determining the extent of agreement between the patient and informant interviews.

Table 1 lists, in the first column, the rank order correlations between the patient interview and the informant interview for each factor. The number of factors for which there was a significant correlation between the rankings of the two interviews exceeded chance occurrence (p < .05).

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Insert Table 1 about here
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Table 1
Rank Order Correlations Between Two Independent Patient Rankings for Each Factor

<table>
<thead>
<tr>
<th>Factors</th>
<th>Patient vs Informant</th>
<th>Patient vs Threshold</th>
<th>Informant vs Threshold</th>
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<tr>
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<tr>
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<td>.33</td>
<td>.18</td>
</tr>
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<tr>
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<td>.55§</td>
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<tr>
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<td>.23</td>
<td>.02</td>
</tr>
<tr>
<td>Obsessions</td>
<td>.60§</td>
<td>.34</td>
<td>.14</td>
</tr>
<tr>
<td>Lack of Insight</td>
<td>.22</td>
<td>.05</td>
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<td>Depersonalization—</td>
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<td>Derealization</td>
<td>.47</td>
<td>.33</td>
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<tr>
<td>Averaged Disorganization</td>
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<td>.22</td>
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Notes: 1. Rankings were ordered so that a positive correlation exists between high interview scores and low auditory sensitivity.
2. Correlations were not computed for disorientation because only one item entered that factor from the informant protocol.
3. Correlations (columns 1 and 2) were not computed for Non-Social Speech because all of the items in this factor obtained a zero rating in the patient interviews.

§ A correlation of .48 is needed to obtain a P < .05
Additionally, it is evident that there were many factors for which correlations just fell short of significance. It therefore appears that the two interviews ranked patients similarly for many factors of behavior pathology, implying that information upon which these rankings were based, shared similar sources of variance.

Having assessed the relations between the patient and informant interviews, a study of the relation of these interviews to auditory threshold was undertaken. The forced-choice auditory thresholds obtained for all patients ranged from -76 dB to -58 dB attenuation. The mean threshold was -67.1 dB attenuation re 158 mV (acoustic [ie, click] output of the phones), SD = 5.4.

Rank order correlations between forced-choice auditory threshold and the patient and informant interview separately, are presented in columns 2 and 3 of Table 1. Inspection of these data revealed that although the general level of correlation between either interview and auditory threshold was rather low, a somewhat surprising pattern of differences between these rank order correlations emerged.

The factors of behavior pathology for which the patient interview showed the higher correlation with auditory threshold were retarded speech, reported belligerence, obsessions, paranoid delusions and incomprehensibility. This seems reasonable since all of these behaviors are directly observable during the interview. However, it was unexpected that the informant interview would show a higher correlation with auditory threshold on the factors of depression, somatic concern, lack of insight, grandiose delusions, control delusions, visual hallucinations and auditory hallucinations. These factors with the exception of depression and somatic concern are highly representative of the symptom area of disorganization.

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Rank order correlations, obtained for scores averaged across factors separately for the symptom areas of mood disturbance and disorganization, indicated that the patient interview correlated best with threshold for mood disturbance while the informant interview correlated best with threshold for disorganization. It appears that neither interview by itself is superior for the classification of patients in relation to auditory threshold performance.

Quantitative comparisons on each factor, (ie, t-tests between averaged patient and informant scores) revealed that significantly more behavior pathology was elicited for factors of depression, retarded speech, reported belligerence, and non-social speech when the source of such ratings was an informant. Figure 1 shows averaged profile distributions for patients on each protocol and, when appropriate, the level of significance for each factor. The number of factors showing a significant difference when the source of information was the informant rather than the patient, exceeded chance occurrence ($p < .05$). When factor scores within the important symptom areas of mood disturbance and disorganization were averaged for all patients and their informants, the same result was found, i.e., informants reported more behavior pathology than did patients ($p < .05$).

The utility of a uniquely determined classification schema from a patient and from an informant may also be compared for their ability to discriminate sub-groups of patients with respect to the patients' performance on a forced-choice auditory threshold task. Ultimately, however, the value of an informant interview as an adjunct research instrument to the traditional patient interview must be assessed in terms of the total

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Figure 1 - Comparison of mean standard score profiles obtained from the patient interviews and informant interviews.
information available for diagnostic classification from both interviews. Only then may it be determined whether both interviews are needed to achieve a better discrimination of patient sub-groups in relation to a psychophysical criterion than the patient interview alone.

Patients were therefore assigned into diagnostic sub-groups on the basis of a "combined" classification schema, as well as on the basis of patient interview classification and informant interview classification. One diagnostic sub-group, the moody-disorganized group, had the highest (least sensitive) mean auditory threshold based on patient (ie, \( \bar{X} = -65.3 \) dB, \( N = 6 \), \( SD = 6.5 \)) and informant (ie, \( \bar{X} = -66.2 \) dB, \( N = 8 \), \( SD = 4.9 \)) classification. However, the combined classification schema yielded still less sensitive average auditory thresholds for this sub-group (ie, \( \bar{X} = -63 \) dB, \( N = 3 \), \( SD = 2.6 \)). In addition, variability is also reduced.

A segregation of moody-disorganized patients from other patients, ordered with respect to their auditory threshold, is presented in Table 2 in the format of a Wald-Wolfowitz runs test.

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Insert Table 2 about here
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Although none of the three classifications produced a discrimination of patient groups which was significant at the .05 level, it is readily apparent that the combined classification came closer to significance than either the patient or informant classification alone. It appears likely that had we had a larger \( N \) available, significance would have been achieved within the combined classification.

The value of an additional informant interview as deduced from the combined classification appears most clearly in the refinement of the Informant Interview/Yozawitz et al
<table>
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<th>Patient</th>
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<td>&lt; 5</td>
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Note: B represents patients classified as moody-disorganized
A represents all other patients
moody-disorganized group. Only half of the six patients classified as moody-disorganized by the patient interview retained this classification when the combined information was utilized. Figure 2 illustrates this point. The high ratings within the symptom area of disorganization which all six patients had acquired from the patient interview were only confirmed by the informant interview for half of these patients.

Insert Figure 2 about here

The three patients who comprised the new moody-disorganized group based on the combined interview had auditory thresholds which ranged from \(-66\) dB to \(-61\) dB. Eliminated from the moody-disorganized group were two patients with the most sensitive auditory thresholds (ie, \(-76\) dB, \(-69\) dB) and one patient with the least sensitive auditory threshold (ie, \(-58\) dB). The former two patients were reassigned to the moody sub-group; the latter patient was reassigned to the hypomanic-moody sub-group.

The combined classification additionally achieved resolution for averaged profile scores of the moody-disorganized group, as classified by the patient interview, for the major symptom areas of mood disturbance, hypomania, and disorganization. Figure 3 shows the average profile for these six patients.

Insert Figure 3 about here

The three profiles which are obtained for the same patients based on the combined classification are also shown. It can be seen that the three profiles based on the combined classification are not parallel, suggesting that their being averaged together as one group by the patient classification is confounding. The combined classification separates out the hypo-
COMBINED CLASSIFICATION

- N = 1 HYPOMANIC - MOODY
- N = 3 MOODY - DISORGANIZED
- N = 2 MOODY

PATIENT CLASSIFICATION

(● ■ △) N = 6 MOODY - DISORGANIZED

AUDITORY THRESHOLD (dB ATTENUATION)

Figure 2 - Auditory threshold of individual patients compared across two classifications, ie, patient classification vs "combined" classification.
Figure 3 - Comparison of group mean standard scores for major symptom areas between two classifications, i.e., patient classification vs "combined" classification.
manic-mood subject who has a clearly different profile as well as showing more mood disturbance and disorganization for the group now labeled as moody-disorganized.

No significant correlation was obtained between the psychophysical measure and either age, medication type, or dosage level.

DISCUSSION

The findings that informants reported more behavior pathology than did patients for the important symptom areas of mood disturbance and disorganization and that their ratings for the symptom area of disorganization were better correlated than patient ratings with the forced-choice auditory threshold, suggest that the usual classification, based solely upon patient information, may be inadequate. A combined classification appears to be effective (notwithstanding a small N) in producing greater homogeneity of sub-groups both with respect to behavior pathology and with respect to its relation to forced-choice auditory thresholds. Coupled with another report of differences between patient and informant disclosures for recent events\textsuperscript{15} as well as with reports of the reliability and validity of family ratings of psychiatric patients,\textsuperscript{12-14} the data presented in this study imply that, at least for research purposes, structured interviews of informants should be used as an adjunct to structured patient interviews.

All the interviews were given by the same E. Although each member of a patient-informant pair was questioned separately, their data were not collected blindly. A conscious effort was made to extend the information which had been obtained from the patient interview. Therefore, interviewer bias would have served to increase the information for those areas where there was a dearth of information from the patient. This factor dictates
that the present data must be interpreted with some caution. However, it should be noted that evidence exists, from other studies in which patient and informant data were not collected by the same interviewer, that informant report produced higher scores than patient disclosures on similar factors.

It was anticipated that factors of retarded speech, reported belligerence, and non-social speech would indicate that informants reported more behavior pathology than did patients in light of Zimmerman's report that "the symptom most clearly manifest, behaviorally, and the area in which family ratings appear most valid, is that of belligerence or social acting out. Next in order of overtness, and next in order of validity, are the two areas of anxious depression or withdrawal." Zimmerman also noted that the distinguishing factor in the affective group was "retarded depression." Nevertheless, in the present study, despite additional informant disclosure, rankings obtained from the patient interview correlated higher with auditory threshold for these factors.

The finding of the present study, however, that informants reported more behavior pathology than did patients within the symptom area of disorganization and that rankings obtained from the informant interview correlated higher with auditory threshold for these factors, was unexpected in light of Zimmerman's finding that family ratings were least adequate for the symptom area of conceptual disorganization. The factor contributing the most to the significance of greater informant report for the symptom area of disorganization was non-social speech. However, other factors in this symptom area (i.e., auditory and visual hallucinations, paranoid and control delusions, and lack of insight) yielded scores of

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behavioral pathology equivalent to (ie, not less than) scores obtained from the patient interview. This seems to indicate that reports obtained by the informant mental state interview in this study were not "least adequate" in detailing behavior pathology within the symptom area of disorganization as Zimmerman has suggested.

A possible explanation for greater informant disclosure within the symptom area of disorganization may be made with reference to a study by Kendell. Kendell reported that patients at Brooklyn State Hospital (the hospital in which the current study was done), who were compulsorily detained, tended to play down their symptoms in an attempt to secure their release. Lowy, Wintrob, Borwick, Garmaise and King reported that patients who were suspicious of the motivations of large public institutions, by which they felt frustrated and depersonalized, were not enthusiastic about giving detailed personal information for research projects, which to them were meaningless or suspect. Thus, it is possible that the patients in public institutions, constituting a sizeable proportion of all Ss of research in psychopathology, form a "special group" of patients for whom masking of their symptoms is especially reinforcing. A pragmatic method of circumventing the problem of limited disclosure by the patient and to supplement whatever information is communicated during the brief period of an interview is to "tap the reservoir of observations made of the patient by those people in daily contact with him, usually a relative or someone who has lived with the patient." (p 4)

The forced-choice auditory threshold task achieves a ranking of patients which may be compared with scores of behavior pathology, separately obtained from either patient or informant interviews. A discrimination of
these patients into sub-groups with the employment of a combined classification produced a greater homogeneity among these patients with respect to their performance on the forced-choice auditory threshold task than have been achieved by a classification without informant supplementation. Although the number of subjects was not sufficiently large and significant differences in threshold were not obtained for moody-disorganized patients, there were nevertheless clear trends (higher thresholds, smaller SDs despite a smaller N) which would suggest that a replication with a larger sample would be fruitful. Significantly higher forced-choice auditory thresholds, in comparison to a non-patient control group, were in fact achieved for a larger sample of patients, i.e., for the moody-disorganized group as determined by the patient interview alone.19

It has been reported2, 31 that "chronic schizophrenics" show decreased auditory sensitivity when compared to non-patient controls. The lack of precision in identifying sub-groups, however, attenuates the importance of their findings. Only a high degree of diagnostic resolution will aid in the formulation of meaningful etiological hypotheses in psychopathology. Additionally, the finding of objective measures which are uniquely characteristic for a particular sub-grouping can lead to practical diagnostic applications.32

Further research of the kind proposed by the next phase of the iterative method, (i.e., the selection of a sample of patients who display mood disturbance and disorganization to be tested on an auditory signal detection task) is now feasible. Further replication of these findings could also be attempted within an iterative design. The informant interview could be administered before the patient interview, to select a sub-group of patients possessing characteristic symptoms of mood disturbance.
and disorganization. One might then expect, in the light of data reported here, that a subsequent patient interview would reveal behavior pathology concordant with informant disclosure for most factors, specifically within the symptom area of mood disturbance and disorganization. This group would also be expected to produce higher forced-choice auditory thresholds than a non-patient control group\(^{19}\). Should this iterative design be adopted for a replication of these data, separate interviewers should administer patient and informant interviews to eliminate interviewer bias and to permit checks on interviewer reliability.
REFERENCES


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Footnotes

*Table A, listing the items contributing to each factor for the patient protocol, and Table B, listing the items contributing to each factor for the informant protocol and "abridged" patient protocol, are not presented here and have been deposited with the National Auxiliary Publication Service. Order Document No. _____ from National Auxiliary Publication Service of the American Society for Information Service, c/c CCM Information Sciences, Inc., 22 West 34th Street, New York, New York 10001. Remit in advance $_____ for photocopies or $_____ for microfilm and make checks payable to: Research and Microfilm Publications, Inc.