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RECOGNITION OF COMPLEX PARTIAL SEIZURES IN A SIMULATED CASE
REPORT OF AN EPILEPTIC PSYCHOTIC BY RECENTLY TRAINED
PSYCHIATRISTS, NEUROLOGISTS, AND NEUROPSYCHOLOGISTS

City University of New York

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IN A SIMULATED CASE REPORT OF AN
EPILEPTIC PSYCHOTIC BY RECENTLY TRAINED
PSYCHIATRISTS, NEUROLOGISTS, AND NEUROPSYCHOLOGISTS

By:

Andrew W. Siegal, M.A., M. Phil.

A dissertation submitted to
The Graduate Faculty in partial fulfillment
of the requirements for the degree of
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1983

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This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Sept 18, 1983
date

Louis J. Gerstman
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ABSTRACT

Recognition of Complex Partial Seizures in a Psychotic Patient by Neurologists, Psychiatrists, and Neuropsychologists

Advisor: Prof. Louis J. Gerstman

Many writers representing the fields of neurology, psychiatry, and neuropsychology have noted the need for clinicians to be able to recognize the signs, symptoms, and antecedents of complex partial seizures (CPS) if incorrect functional diagnoses are to be avoided. The present study investigated the efficacy with which members of the three aforementioned disciplines recognized CPS in a psychotic patient on the basis of the same set of historical and clinical information. Seventeen neurologists, 17 psychiatrists, and 16 neuropsychologists were presented with two written, simulated case reports. One presented the case of a patient with a schizophrenia-like psychosis associated with CPS; the second case depicted paranoid schizophrenia of functional etiology. The neuropsychologists recognized CPS, when present, significantly more frequently than either of the two medically trained disciplines, both of whom showed a set toward functional diagnoses. The neuropsychologists assigned incorrect functional diagnoses to the paranoid schizophrenic more often than did either the neurologists or psychiatrists.

Differential use of various classes of information, e.g., medical history, examination of cognitive functions, was noted to exist

between the three professions. Item analyses, similarly identified profession specific cues which were utilized in the recognition of CPS. Implications for clinical practice and training for each discipline were discussed.

ACKNOWLEDGEMENTS

Completion of the present work would not have been possible without the contributions of many individuals ranging from my closest personal friends and revered mentors to a large group of well disposed strangers. Unfortunately, ethical concerns prohibit my fully crediting all of my valued collaborators in this work since the nature of the research was predicated upon the preservation of the anonymity of both the participants and of their training institutions. Special thanks go to the 51 psychiatrists, neurologists, and neuropsychologists who served as participants in the study. All gave generously of their time out of an amalgam of scientific curiosity, professional responsibility, and outright altruism when their own interests would have been more conveniently served by settling into the new homes and cities, to which many of them had just moved, studying for board exams, or devoting time to their own research or clinical practices. Similarly, the directors of residency training programs in psychiatry and neurology who helped me to locate their recent graduates and those members of The American Board of Clinical Neuropsychology who permitted me to contact their post-doctoral fellows are all offered both my warmest gratitude as well as my sincerest regrets that I cannot acknowledge them personally in print.

The six distinguished clinical researchers, who served as expert judges in verifying the criterion diagnoses on the cases of Charles and David, provided not only their formidable expertise but also encouragement and enthusiasm in the early stages of the research.

Professors Richard Masland, Ernst Rodin, David Bear, Gary Tucker, Louis Costa, and Manfred Meier are all offered both my sincerest gratitude and my hopes that the findings of this study further the goals of their clinical teaching and research.

My committee is to be lauded for carrying out a process analogous to that which dentists refer to as a "serial extraction." Louis J. Gerstman, famous for his ability to manage dissertation-resistant doctoral candidates functioned in every role from analyst, taskmaster, statistical consultant, literary critic, social philosopher, and friend. Elkhonon Goldberg's constant emphasis upon parsimony, pragmatism, and simplicity permitted the completion of this work prior to my 85th birthday. Marshall D. Schechter and Sidney P. Diamond through our clinical, didactic, and personal interactions fostered a sense of the aesthetic, logical, and uniquely human aspects of medicine when it is practiced as an art form. I will always cherish our clinical collaborations, theoretical discussions, and their wisdom which they chose to share with me.

The patience, technical virtuosity, and encouragement which was provided by Ms. Carol Shiroky resulted in the quality of the manuscript which follows. No thanks would be great enough.

Dr. Barbara C. Wilson was just always there and just always Barbara; for her friends and students, the impact of this statement is self-evident and needs no further elaboration.

Dr. Emerick Friedman, one of my closest personal friends and a long-standing source of inspiration on both personal and professional levels, served as an expert judge at the pilot stage of the

research and has my enduring thanks for his constant collaboration and friendship.

While spending two years in the Syracuse Tundra, I had the pleasure of working closely with Professor J. Clifford Kaspar. As my chief of service and clinical supervisor at The R.M. Hutchings Psychiatric Center and S.U.N.Y.-Upstate Medical College he actively encouraged my efforts to incorporate anamnestic and clinical data into the process of neuropsychological assessment. In his role as a decisive and enlightened administrator, he managed to always let me find a forum for my approach to the work. His awareness of the value of this approach, his encouragement, and his efforts to provide me with a clinical and teaching setting in which our concepts could be applied will always be deeply appreciated.

Clearly, no contribution to the present research was greater than that made by the patient to whom I refer as "David." His anguish over the crumbling away of the abilities essential to his existence as a highly respected member of his community, husband, father, and master of his own fate remain as vividly recalled as are his valiant efforts to maintain this existence. Both his suffering and heroism in the face of the uncanny experiences associated with complex partial seizures, personality changes, and losses of intellectual functions bring an immediacy and intensity to the meanings of the various symptoms upon which "objective" research is herein conducted. Both David's life and death point to the need for fuller exploration of the ability of the medical and mental health communities to meet the needs of such individuals and their families. If

this research furthers progress toward this goal, I shall be most pleased. In clarification of this goal, the present manuscript is dedicated to this brave man.

Andrew W. Siegal
New York, 1983

TABLE OF CONTENTS

	PAGE
ABSTRACT.....	iv
ACKNOWLEDGEMENTS.....	vi
CHAPTER	
I. STATEMENT OF THE PROBLEM.....	1
II. REVIEW OF RELEVANT LITERATURE.....	6
III. METHODS.....	48
Subjects.....	48
Instruments Administered.....	51
Procedure.....	68
IV. RESULTS.....	72
Derivation of Scores Used in Analysis.....	73
Statistical Analyses.....	74
V. DISCUSSION.....	118
Summary of Findings.....	118
Limitations of the Study.....	124
Clinical Implications.....	128
Epidemiologic Implications.....	132
Didactic and Curricular Implications.....	133
REFERENCE NOTES.....	136
BIBLIOGRAPHY.....	138
APPENDIX A: The CPS Case, the Case of David.....	148
APPENDIX B: The PASCHIZ case, the Case of Charles.....	169
APPENDIX C: Preliminary Instructions & Biographical Data Sheet...	189

TABLE OF CONTENTS (cont)

	PAGE
APPENDIX D: Contrasts Among Three Professions in Diagnostic Accuracy at Each Point of Inquiry on the CPS Case....	191
APPENDIX E: Contrasts Among Three Professions in Diagnostic Accuracy at Each Point of Inquiry on the PASCHIZ Case.....	192
APPENDIX F: Assessment of Changes in Diagnostic Accuracy Between Adjacent Points of Inquiry on the CPS Case for Each Profession.....	195
APPENDIX G: Assessment of Changes in Diagnostic Accuracy Between Adjacent Points of Inquiry on the PASCHIZ case for Each Profession.....	197

LIST OF TABLES

	PAGE
Table 1. Demographic Data for the Three Professions.....	49
Table 2. Number of Passages Contained in Each Section of the Cases of David and Charles.....	55
Table 3. Location and Description of Passages from the Case of David Selected by Expert Judges as Indicative of CPS....	57
Table 4. Taxonomy Used in Classifying Participants' Diagnostic Hypotheses.....	75
Table 5. Final Rank of Criterion Diagnosis (CPS) on CPS Case as a Function of Order of Presentation.....	81
Table 6. Final Rank of Criterion Diagnosis on CPS Case as a Function of Professional Specialization.....	83
Table 7. Frequency of Recognition of Complex-Partial Seizure Disorder by Neurologists, Psychiatrists, and Neuropsychologists.....	84
Table 8. Frequency of Occurrence of False-Positive CPS Misdiagnoses on the PASCHIZ Case by Members of Three Professions.....	87

LIST OF TABLES

	PAGE
Table 9. Final Rank of Criterion Diagnosis (PASCHIZ) on the PASCHIZ Case as a Function of Professional Specialization.....	88
Table 10. Items Selected Differentially by Members of Three Professions as Being indicative of CPS.....	98
Table 11. Distribution of Final First-Rank Diagnoses on the CPS Case Made by Three Professions.....	103
Table 12. Items Distinguishing Participants Selecting CPS vs PASCHIZ as their First-Rank Diagnosis.....	106
Table 13. Frequency of Selection of Hard-Signs of CPS by Participants Assigning CPS vs PASCHIZ as First-Rank Diagnosis on the CPS Case.....	114

LIST OF FIGURES

	PAGE
Figure 1 Mean Ranks of Criterial Diagnoses for CPS and PASCHIZ Cases for Three Professions at All Points of Inquiry.....	91

CHAPTER I

STATEMENT OF THE PROBLEM

One of the principal functions of differential diagnosis is to enhance the probability that patients will be assigned to those treatment modalities from which they can be expected to receive maximal therapeutic benefits (Redlich & Freedman, 1966). Currently a wide range of therapeutic modalities exist for the treatment of complex-partial seizures (CPS) and for their associated manifestations (Penry & Daly, 1975; Sands, 1982a; Wright, 1975). Seizure control can usually be achieved via the use of an array of currently available anticonvulsant medications, the efficacy of which have been documented and reviewed (Jovanovic, 1974; Tassinari & Roger, 1975; Parsonage, 1975; Woodbury, Penry, Pippenger, & Hessie, 1982). Medical treatment of a number of illnesses which are capable of precipitating seizures can also often achieve or contribute to seizure control (Gastaut & Broughton, 1972; Glaser, 1975). In cases which have proven refractory to anticonvulsant and other medical treatment, a variety of surgical procedures for the control of CPS and its associated psychopathology have been applied (Glaser, 1980; Lishman, 1978; Rasmussen, 1975; Taylor, 1972). In addition to these medical and surgical techniques a variety of highly specific psychotherapeutic and psychosocial treatments for both the control of CPS and for its associated psychopathology have been developed. Monroe (1970) and Sands (1982b) have elaborated guidelines for intensive, psychodynamically-oriented psychotherapy with CPS patients. Rodin (1975) has described a variety of techniques for in-patient ward

management of CPS patients with psychotic disturbances and for their out-patient follow-up. A variety of behavior therapy techniques for seizure control, including conditioning, biofeedback, and hypnotic treatments, have been reviewed by Williams (1982). In addition, brief problem-oriented counseling approaches have been developed to deal with issues pertaining to seizure control, psychosocial concomitants of seizures, and vocational issues (Fraser & Smith, 1982; Sands & Kraus, 1975). Social service resource and advocacy agencies have been established specifically for epileptic patients (Jacks & Toubbeh, 1975; Levinson, 1982) which provide a range of services geared to the difficulties of this population. Similarly, specific neuropsychologic assessment techniques have been developed for use with patients identified as epileptics (Dodrill, 1978, 1981, 1982; Dodrill, Batzel, Queisser, & Temkin, 1980; Rennick, 1975). The application of these procedures can result in active attempts at remediation of the cognitive deficits often seen in CPS patients and can also prove invaluable in treatment planning, monitoring the course of the illness, and in assessing response to treatment. Unfortunately the application of any of these specific treatment modalities is dependent upon the patient's receiving a diagnosis of epilepsy.

Both clinical experience and an extensive literature indicate that CPS patients are at risk for receiving incorrect functional psychiatric diagnoses and thereby having the etiologic role which seizures play in the genesis of their presenting symptomatology go unnoticed. The end result of this process is that those therapeutic modalities from which the CPS patient could be expected to receive

maximal benefit are not applied. The case of a 24 year old man whose CPS remained undiagnosed for five years, consequently resulting in 30 psychiatric admissions (Adebimpe, 1977), poignantly exemplifies the consequences of the misdiagnosis of this disorder.

Geschwind (1975) presented a position paper in which he analyzed the factors leading to the misdiagnosis of neurologic illnesses in general, and CPS in particular, as functional psychopathologic disorders. His analysis regarding the process by which CPS goes unrecognized, and incorrect, functional diagnoses are substituted for that of CPS can be reduced to three basic points:

(1) Geschwind speculated that neither psychiatrists, or the neurologists to whom they might refer, possess a sufficiently detailed and thorough knowledge of the signs, symptoms, or clinical courses of the presentations of focal, discharging lesions, of which CPS is one salient example. This lack of specific information was postulated as comprising the basic factor which results in the failure to recognize the presence of CPS. A corollary postulate was that the physician's lack of facility in using historical and clinical data to correctly diagnose CPS led to inappropriate referral to, and overemphasis of, special diagnostic procedures, especially the EEG and psychological test scores. He placed special emphasis upon the errors inherent in the evaluation of psychological test scores when this information is taken in isolation from historical and clinical data.

(2) A set toward functional diagnosis in both psychiatrists and neurologists was postulated to be fostered by premature psychodynamic interpretation of those signs and symptoms which had not

initially been recognized as being indicative of neurologic illness.

(3) The third factor in Geschwind's analysis implicated the collection, and/or analysis, of historical and clinical information by non-medically trained personnel as a factor which contributes to the failure to raise CPS as a diagnostic hypothesis in the initial stages of the patient's evaluation. In discussing this point, Dr. Geschwind did not, however, distinguish between the abilities of clinical neuropsychologists versus other non-medical personnel to recognize the presence of CPS.

This distinction seems worthy of consideration given the fact that the study of brain-behavior relations constitutes the raison d'etre of clinical neuropsychology. Their interest in this area may, indeed, facilitate the development of the level of familiarity with the historical and clinical manifestations of CPS which, in turn, may act to sensitize the neuropsychologist to the presence of CPS at levels commensurate with those of their medically-trained colleagues.

Geschwind's (1975) analysis of the factors leading to the misdiagnosis of CPS is by no means idiosyncratic and is, in the opinion of the present writer, representative of clear-thinking behavioral neurologists, biological psychiatrists, and clinical neuropsychologists, many of whose views are presented in the following review of the literature. Geschwind's position paper is unique only in that on the basis of his clinical observations and teaching experience, he analysed the sources of misdiagnosis of CPS which inhere in all three neurobehavioral disciplines, i.e., psychiatry, neurology and neuropsychology. These speculations provide the conceptual

framework upon which the hypotheses tested in the present investigation are based. The present study attempts to empirically assess the efficacy with which psychiatrists, neurologists, and neuropsychologists recognize CPS on the basis of historical and clinical information alone. Secondly, an attempt is made to identify the preferred information sources within these classes of data which are utilized by members of each discipline as cues in the recognition of CPS.

CHAPTER II

REVIEW OF RELEVANT LITERATURE

The inclusion of, at least, a brief caveat regarding the risk of misdiagnosing a patient with complex-partial seizures (CPS) as having one or another functional psychopathologic disorder is a routine phenomenon in introductions to and reviews of the epilepsies (Ervin, 1976; Glaser, 1975; Lishman, 1978; Walton, 1977). The false-negative diagnosis of CPS and the incorrect assignation of a functional diagnosis appears with alarming frequency in the histories of cases presented in the literature who have subsequently been correctly diagnosed as having CPS (Gladwell, Kaufman, & Driver, 1979; Jonas, 1965; Monroe, 1970; Pritchard, Lombroso, & McIntyre, 1980; Stevens, 1975). This situation is most likely to occur in those instances in which CPS patients present with psychopathologic symptoms or disturbances of behavior in the absence of generalized seizures (Blumer, 1975). These patients may have CPS raised as a diagnostic hypothesis at some point in their evaluation or by one member of a diagnostic team but, somewhere in the evaluation or treatment process, the investigation of the presence of CPS is truncated. In spite of referrals to various subspecialties within the neurobehavioral diagnostic network including, psychiatry, neurology, neuropsychology, electroencephalography (EEG), and others, the patient is assigned a functional diagnosis. Characteristically, the result is that symptomatic psychiatric treatment is carried out and vigorous attempts at CPS-specific treatment strategies are not pursued. The eventual attrition of some of these patients then serves to alleviate resid-

ual cognitive dissonance within the team regarding the diagnosis. Should the patient remain within the service delivery system he/she then runs the risk of not only carrying their functional diagnosis with them but then having the additional and pejorative epithet of "treatment resistant" being added to their original, incorrect functional diagnosis. Once this state of affairs is reached, staff may divert their attention to more promising patients and a decrement in the quality of care may ensue if the patient fails to attrit. If attrition does occur the patient may resurface on another service only to be misdiagnosed again and be subjected to the risk of additional tests and/or treatment side-effects.

It is difficult to assess the frequency with which CPS patients are misdiagnosed as having functional disorders. At least three factors could be cited as interacting to effect the probability that a given patient with CPS will be misdiagnosed as having a functional disorder. The first is the clinical acumen of the diagnostician to whom the patient presents and secondly, the adequacy of the information base which he can collect. The third factor involves the degree of ambiguity of the presentation of the signs and symptoms of the patient's seizure disorder, i.e., to the degree to which psychopathologic symptoms are present in a given patient the diagnosis becomes more difficult. Extensive epidemiologic studies of the prevalence of epilepsy have been reported and these studies indicate that approximately 1% of the general population have some type of epilepsy (Shamansky & Glaser, 1979; Kurland, Kurtzke & Goldberg, 1973). The cases which are included in these studies, however, are patients whose seizure disorders have been correctly diagnosed. It

is, therefore, illogical to extrapolate from these data, which reflect the outcome of effective diagnosis, to the outcome of the process of misdiagnosis. Nonetheless, CPS seems to be the single most prevalent form of epilepsy (Gastaut, 1953; Stevens, Milstein, & Goldstein, 1972). Bear (1979) noted that studies of the prevalence of psychosis in CPS patients has been reported to assume values of 2% to 81% depending upon the criteria of schizophrenia, psychosis, or whatever type of psychopathology which the investigator is attempting to correlate with epilepsy. Similarly, he notes that this variability reflects various investigators' definitions of epilepsy, per se, as a criterion variable. Critiques of both sampling and assessment techniques have been detailed (Stevens et al., 1972, 1975; Tizard, 1962) and have been implicated as also contributing to the striking lack of consensus among investigators regarding the prevalence of psychosis in CPS patients. It should be noted that even these studies also include only identified epileptics.

A more fruitful approach to estimating the magnitude of the problem of the rate of misdiagnosis of CPS in psychotic patients lies in the study of natural populations of psychiatric patients who have received diagnostic-research evaluations of sufficiently high caliber to identify CPS patients who have received functional psychiatric diagnoses.

Koranyi (1979) reported the findings of an intensive, medical-diagnostic screening study of 2,090 out-patients consecutively referred to a psychiatric clinic in Ottawa. Forty-three percent of the entire group of patients were found to have had some type of identifiable medical illness following an unusually thorough medical

evaluation at the clinic. Of this group, 250 patients were diagnosed as having central nervous system (CNS) illnesses, with the category including, but not specifically limited to, epilepsy. Half of this group of patients had not had their CNS illnesses diagnosed by the referral source prior to the clinic's special evaluation procedures. Hall, Gardner, Stickney, LeCann, and Popkin (1980) studied 100 consecutively-referred patients who were admitted to a research ward, which had been established in order to determine the rate of undiagnosed physical illness in a psychiatric in-patient population. Each patient was screened with physical, neurological, and psychiatric examinations. Medical and social histories were routinely collected on each patient as were standardized mental status examinations. Thirty-four panel blood chemistry analyses (SMA 34), complete blood count (CBC), electrocardiogram (EKG), and sleep-deprived EEGs were carried out routinely on all patients. The results were interpreted by board certified specialists in each relevant medical discipline regardless of whether or not historical and clinical data indicated the necessity for specialty examinations, diagnostic procedures, or consultations. A statistic remarkably close to Koranyi's (1979) finding of 43% was obtained in Hall et al.'s (1980) in-patient series. Forty-six percent of Hall et al.'s (1980) patient series were found to have undiagnosed physical illnesses. Within this group seven cases of epilepsy were found, four of which were diagnosed CPS. All of the epileptic patients, except one, in this series, had presenting symptomatology which met either DSM II or DSM III criteria for various functional psychiatric diagnoses had the presence of epilepsy not been established during the

study. These diagnoses included schizophrenia, borderline schizophrenia, acute psychotic reaction; one patient would have received a diagnosis of affective disorder, and only one would have been diagnosed as having an organic brain syndrome using standard DSM II and DSM III criteria.

Malamud (1975) reported neuropathologic findings on a series of CPS patients who had been admitted to psychiatric hospitals and were assigned functional diagnoses. His autopsy findings, when positive, revealed either atrophic or neoplastic lesions within the temporal lobes and adjacent limbic structures of these patients. Inadequate neurological evaluation was posited as constituting a major source of diagnostic error in the series of cases on which he reported. He also commented on two basic errors in clinical judgment in the assessment of these cases; the first, obviously, was the failure of the psychiatrists to recognize the presence of a seizure disorder. Secondly, he emphasized the fact that even when the presence of CPS was recognized, the psychiatrists often did not ascribe a causal relationship to the seizure disorder in the etiology of the patients' psychopathologic symptoms. Regarding the two processes as coincidental resulted in the maintenance of the diagnosis of schizophrenia and the progressive course of the illness was attributed to the "schizophrenia" rather than to progressive neoplastic disease of the limbic system. Malamud (1975) concluded that this type of diagnostic error reflected a basic lack of awareness of the types of psychopathologic symptomatology which lesions of the limbic system are capable of producing. Geschwind (1975), who emphasized this same point, went on to state that many practitioners would like to

believe that neurologic disorders presenting with psychopathologic symptomatology are relatively rare and that this group of patients therefore becomes inattended. His point is well taken that no matter how small this group might be, the mere fact that CPS is treatable renders inattention to the differential diagnosis of the disorder unjustifiable. Stevens et al. (1972) cited Gastaut's (1953) observation that whereas CPS was initially thought to be relatively rare it is now recognized as the most common form of epilepsy with estimates of its prevalence including about half of all patients with the diagnosis of epilepsy (Jovanovic, 1974).

Discussions of the misdiagnosis of CPS tend to invoke the concept of a "borderland," (Ervin, 1976; Geschwind, 1975; Koranyi, 1979; Sherwin, 1976). This term seems to connote not only the co-existence of psychopathologic ("psychiatric") symptoms and a neurologic etiology, but the term also seems to refer to role diffusion between the two disciplines with respect to acceptance of responsibility for the diagnosis and management of the disorder. Ervin (1976, p. 1139) describes the diagnosis and management of epileptic patients by physicians as "shocking" and analyzes the development of the "borderland" as being the result of American psychiatrists having relinquished responsibility for the management of epileptic patients to their colleagues in neurology. The result of this situation, in his opinion, is that psychiatrists have thereby relinquished their opportunity to gain additional knowledge of brain-behavior relationships from the extended observation of this patient population whose pathology historically served as the "via regia" in the study of brain-behavior relationships for such pioneers as

Jackson and Penfield. Ervin (1976) went on to state that the gap which causes the "borderland" is exacerbated by the fact that neurologists have tended to restrict their interest in the management of epileptic patients to the issue of seizure control via the prescription of anti-convulsant medications and that they have not taken a sufficient interest in the area of behavioral neurology. Geschwind (1975) also stated that "while it has become fashionable to acknowledge the existence of an area of overlap between neurology and psychiatry this common ground bears more resemblance to a no man's land than to an open border." He went on to state that while few members of either discipline have actually interested themselves in this borderland, mutual castigations regarding the diagnostic capabilities and theoretical orientations of the two disciplines have been exchanged. Geschwind, in discussing the diagnosis of CPS, stated that it is imperative for practitioners in both disciplines to have a working knowledge of the natural course and clinical manifestations of the illness as well as of those functional disorders from which it must be differentiated. He stated that neither mutual consultation or residency training experiences involving both psychiatry and neurology have seemed to achieve this goal. Strongly supporting Geschwind's position are the results of a study conducted by Depaulo and Folstein (1978) which called attention to high rates of undiagnosed psychopathologic and cognitive pathology in patients who were at the discharge stage on a neurologic ward. Their findings, although not exclusively limited to issues involving CPS, indicate the concerns expressed by the field of neurology regarding the sensitivity of its practitioners to psychopathologic and cogni-

tive disturbances in their patients.

Geschwind (1975) also emphasized the notion of a set toward functional misdiagnosis within psychiatry. He explained this phenomenon as occurring as a natural, but unfortunate, consequence of the psychiatrists' attempt to understand "the whole person." He emphasized that while this orientation is often productive, it hinders the recognition of focal and discharging lesions. Geschwind stated that the recognition of CPS is better facilitated by a set which emphasizes "the anatomy of behavior," i.e., specific knowledge of brain-behavior relationships. His point is underscored by Malamud's (1975) neuropathological study of 245 psychiatric patients. Twelve percent of this series demonstrated neoplasia within the limbic system and each of these 18 cases had received purely functional diagnoses.

When confronting the issue of the set favoring functional diagnosis, Koranyi (1979) emphasized that the manner in which symptoms are both experienced and expressed by the patient are often done within the psychosocial context in which they occur. He emphasized the need to disembed the report of the symptom from that of its sequelae if a premature set toward functional diagnosis is to be avoided. Although Koranyi's point is well taken, in developing his argument he refers to the patient's attempts at explanation of the presence, nature and sequelae of his "pure" symptoms as "irrelevancies." This position implicitly and artificially creates a distinction between a "pure symptom" and its personal meaning to the patient who experiences the symptom. Since the psychiatrist is the specialist who is most often called upon to manage the patient with

respect to exactly these types of issues, the psychiatrist's attempt to understand "the whole person" becomes more understandable when these parameters are implicitly or explicitly regarded as "irrelevancies" by other members of the medical diagnostic team. The complexity of the issue of the set in which one views the patient and the need for the simultaneous maintenance of a multiplicity of sets, and the awareness thereof, was emphasized as early in the history of psychiatry as 1923 by Karl Jaspers in his classic General Psychopathology, first published in English in 1963. The sets described by Jaspers ranged from "mechanistic, cause-effect, technological understanding" paralleling the "anatomy of behavior" approach advocated by Geschwind (1975), through, and including, the ability to enter into existential communication with the patient.

To the degree to which the psychiatrist views his role as being that of being a specialist in understanding and managing the patient's interaction with his psychosocial milieu, and in understanding the personal meaning of the patient's illness, he is at risk for a set toward functional diagnosis. Koranyi (1979) pointed out that since psychiatrists, in actuality, accept referrals from any source, they assume the responsibility of the primary care physician. This necessitates his carrying out sufficiently broad medical diagnostic evaluations to satisfy the requirements of that role.

Complicating the problem further is the manner in which referral sources utilize the services of the psychiatrist. Koranyi (1979) cited an earlier study by Johnson which found that referring physicians often failed to conduct physical examinations or take histories on the patients whom they referred for psychiatric consulta-

tion. In his own extensive series, Koranyi (1979) noted high rates of failure to diagnose physical illness in patients referred for psychiatric evaluation. Approximately one third of the patients who were referred by non-psychiatric physicians had undiagnosed physical illnesses. Psychiatrists referring patients to the clinic failed to diagnose existing physical illnesses in about half of the patients whom they referred. Almost all (87%) of those patients referred by social service agencies and social workers had undiagnosed physical illnesses.

Given the existence of a set toward functional diagnosis within psychiatrists as a group, the high rates of misdiagnosis among physicians and mental health workers referring to psychiatry, and the psychiatrists' tendency to misdiagnose the presentations of focal and/or discharging lesions of the limbic system, the utilization of routine neurologic consultation would seem to be one path toward obviating the misdiagnosis of CPS. Several pitfalls are inherent in this procedure, the first being that in CPS the neurological examination itself is of limited value since it is usually completely normal (Sherwin, 1976). Geschwind (1975) expressed pessimism regarding both the wisdom and utility of routine neurological consultation in the diagnosis of psychiatric patients since he felt that, at least at the time of his writing, too few neurologists were sufficiently well trained to recognize the psychiatric aspects of neurologic disorders. He also noted tremendous variability within neurologists as a group in their individual biases toward either functional or neurologic diagnoses. He also stated that routine referral is simply poor clinical practice. Koranyi (1979) reported

that referral to other services for ruling out organic etiologies in psychiatric patients carried the risk of poor follow-through and patient attrition and he similarly adopted the practice of using consultations but maintaining the psychiatrists' role as primary case manager. Like Geschwind (1975), he emphasized the need for the psychiatrist to simply become intimately familiar with the natural course and clinical presentations of those physical illnesses which must be ruled out or identified in psychiatric patients. Although this mandate seems eminently reasonable, the continuing misdiagnosis of CPS indicates that some difficulty must be present which prevents clinicians from achieving this goal.

Ervin (1976) emphasized that a tremendous number of clinical manifestations characterize the epilepsies in general, and a review of the breadth of the variety of negative, positive, and complex-positive phenomena which can occur during CPS ictal states (Daly, 1975; Dreifuss, 1975; Gastaut & Broughton, 1972; Jonas, 1974; Jovanovic, 1974) as well as during inter-ictal states (Bear, 1977, 1979; Monroe, 1970; Stevens, 1975; Waxman & Geschwind, 1974, 1975) illustrate the intellectual complexity involved in the acquisition of a working knowledge of all the illnesses' possible manifestations.

An intensive review of the clinical signs, symptoms, and antecedents of CPS is beyond the scope of the present work. The reader who wishes an introduction to the relevant historical and clinical phenomena is invited to examine the following reviews, reference texts, and selected journal articles and is thus provided with a bibliography. The signs and symptoms which may occur during the ictal phase, i.e., the seizure proper, of CPS have been classified

into six basic categories within the International Classification System for Seizures (Gastaut, 1970). These episodic, paroxysmal phenomena have been categorized as consisting of (1) impairments of consciousness alone i.e., clouding, diminution of awareness or enhancement of the "sense of" the clarity of one's own thoughts or perceptions. (2) Cognitive symptomatology within the International Classification (Gastaut, 1970) is further subdivided into two major subdivisions, (a.) dysmnestic disturbances which may include experiences of conscious amnesia, false recognition phenomena such as *déjà vu*, *jamais vu*, *déjà vecu*, and *jamais vecu*. (b.) The second major subcategory of cognitive symptoms includes ideational disturbances such as forced thoughts and dreamy states, as well as the experience of the absence of thoughts. (3) Affective symptomatology includes precipitously occurring and remitting episodes of fear, depression, rage, and, unfortunately, least frequently, ecstasy. All of these affective phenomena are often described as being marked by an uncanny quality. Interoceptive, visceral phenomena associated with any of these emotional states may occur as well. (4) Within the realm of "psychosensory" phenomena, episodic alterations in auditory, visual, somatosensory, proprioceptive, gustatory, and olfactory modalities may occur alone or in any combination(s). These episodic sensory and perceptual experiences can include loss or diminution of sensory-perceptual function, as well as illusions, or hallucinations in any of the aforementioned modalities. (5) "Psychomotor" symptomatology (signs) include automatisms, i.e., automatic movements involving any of the following: bucco-facial activity, mastication, posture, or gait. Other apparently inten-

tional activity ranging from "pill rolling" movements of the fingers to cursive attacks may similarly appear during the CPS ictus and complex, highly-skilled activities can be carried out during the ictus or post-ictal state. (6) The last category within the International Classification, "compound forms" of CPS simply indicates that phenomena which are included in the five aforementioned categories may occur in various combinations. Brief, introductory reviews of ictal, CPS signs and symptoms include chapters by Blumer (1975), Daly (1975), Dreifuss (1975) and Glaser (1975). Comprehensive presentations may be found in several texts (Gastaut & Broughton, 1972; Jovanovic, 1974; Penfield & Jasper, 1954).

Inter-ictal personality traits and psychopathologic states have been reviewed by many writers but the complexities involved in conceptualizing these disorders is sufficiently staggering that no accepted classification analagous to that of seizures has been accepted. Bruens (1974, 1980) presented a model for schematizing the myriad forms of psychoses seen in epileptic patients. This model included four basic dimensions along which these psychoses can be described and classified. These dimensions included (1) The actual clinical manifestations of the psychosis, e.g., paranoid, schizophreniform, or manic-depressive. Bruens' model also classified the epileptic psychoses with respect to (2) the temporal/sequential relationship of the psychotic phenomena to the ictus, (3) the duration of the psychosis, i.e., brief and transient versus episodes lasting for periods ranging from days to years, and lastly, (4) whether the psychosis occurred with or without clouding of consciousness. Bruens' (1974) chapter includes a thorough review of the early con-

tinental and British reports on epileptic psychoses as do Jovanovic (1974) and Monroe (1970). Excellent brief reviews of the epileptic psychoses were presented by Blumer (1975, 1982) and by Lishman (1978).

Inter-ictal personality traits/disorders have been reviewed (Bear, 1977, 1979; Blumer, 1975, 1982; Lishman, 1978; Monroe, 1970; Pond, 1974; Stevens, 1975; Waxman & Geschwind, 1974, 1975). Inter-ictal traits which are currently commonly held to be present in CPS patients include suspiciousness-paranoid trends, deepening of emotions, viscosity of thoughts and feeling states, as well as sexual changes especially hyposexuality and inordinate interest in philosophic and religious issues. Other cognitive changes include circumstantial thinking, pedantic stance, obsessional thinking, humorlessness, guilt and hypergraphia (Bear, 1977, 1979; Bear & Fedio, 1977; Waxman & Geschwind, 1974, 1975). Both the prevalence of these and other personality traits purported to be associated with epilepsy have been questioned (Stevens, 1975; Tizard, 1962) as well as their specificity to CPS (Mungass, 1982).

Inter-ictal signs and negative cognitive symptoms which have been studied in patients with structural lesions (traumatic, vascular, and surgical) of the temporal lobes have been reviewed in detail by Luria (1966) and Walsh (1978). These various dysmnesias, dysphasias, and agnosias need not be present in patients with epileptogenic lesions (structural or functional) within the temporal lobes (Kløve & Matthews, 1974), though they can often be observed or elicited. It is also critical to bear in mind that epileptogenic lesions outside of the temporal lobes may constitute the primary

epileptogenic focus involving the temporal lobe(s) via secondary generalization (Gastaut & Broughton, 1972; Penfield & Jasper, 1954) thereby making it possible for cognitive signs associated with foci in extra-temporal cortical regions to appear in a given CPS patient.

Historical inquiry requisite to the recognition of CPS extends beyond anamnestic study of the morphology, episodicity, stereotypy, and clinical course of both individual episodes and those of the course of the sequence of series episodes. This type of inquiry was artfully described in Penfield and Jasper (1954). Recognition of CPS may also be based upon elicitation of genetic predisposition to seizures via family history as reviewed by Falconer (1971) and by Metrakos and Metrakos (1961). A thorough review of encephalopathic events to which the individual is susceptible during gestational, pre-natal, peri-natal, and post-natal as well as childhood epochs are reviewed intensively by various writers in Black's (1981) monograph Brain Dysfunction in Children. Chapters are included on traumatic, infectious, and metabolic etiologies, as are reviews of nutritional factors and congenital malformation of the CNS. Falconer's (1974; Falconer, Serafetinides & Corsellis, 1964) observation of the clinicopathologic correlation between mesial-temporal sclerotic changes seen in adult CPS patients at autopsy and prolonged, high fevers during infancy deserves special emphasis in the role historical inquiry in the recognition of CPS. The various vascular, neoplastic, toxic, metabolic, and traumatic etiologies of seizure disorders likely to be sustained following the second decade of life are presented concisely in tabular form in Heilman, Watson and Greer (1977). These etiologic agents receive more detailed at-

tention in classical texts on epilepsy (Gastaut & Broughton, 1972; Penfield & Jasper, 1954).

Childhood presentations of CPS were reviewed and reported by various investigators (Aird, Venturini, & Spielman, 1967; Gamstorp, 1975; Glaser, 1967; Glaser & Dixon, 1956; Gold, 1974). Recognition of childhood ictal phenomena when presented by the patient or informants or when elicited by the examiner during anamnesis will facilitate the recognition of the presence of CPS in the adult patient. These ictal phenomena of childhood include episodic dysphasias, adventitious movements, autonomic signs such as flushing or pallor, alterations of consciousness, and perceptual changes. Nausea, vomiting and rising epigastric sensation are especially prominent in childhood forms of CPS (Glaser, 1967).

Other peri-ictal childhood phenomena stressed by these writers and others included nocturnal disorders of arousal such as enuresis, pavor nocturnus, sonambulism, and nightmares. Waking disorders of arousal, including hyperactivity and aggressiveness, were similarly noted by these writers with relative consistency. Similarly, academic difficulties, concentrational problems, and conduct disorders at school (Grunberg & Pond, 1957; Holdsworth & Whitmore, 1974; Ounsted, 1969; Pond, 1952) were variously noted in children with CPS. Lewis and Balla (1976), in a highly selected sample of court-referred CPS children, noted a striking concordance of paranoid symptoms and violent behavior in CPS. Cognizance of both the discussed genetic and other antecedent etiologic factors constitute vital cues in the recognition of CPS in adulthood when collecting and/or interpreting historical information from patients and/or cor-

roborating informants. Similarly, cognizance of signs and symptoms of childhood forms of CPS, and associated childhood inter-ictal phenomena, constitute cues capable of contributing to the recognition of CPS in adult patients who might, on the basis of their clinical presentation, appear to have functional psychoses.

In spite of the fact that an internationally accepted system for the classification of seizures exists (Gastaut, 1970), criterial judgments are still required regarding whether or not the observed signs, symptoms, and course of the illness to be diagnosed actually should be classified as seizures in the first place (Ervin, 1976; Jonas, 1974; Monroe, 1970; Schmidt & Wilder, 1968). The distinction of epileptic from non-epileptic conditions, i.e., its recognition, is the first step in the diagnosis and investigation of the disorder (Gibberd, 1953). This state of affairs probably led Ervin (1976, p. 1138) to state that "there are as many definitions of epilepsy as there are neurologists and as many types as there are patients." In light of this complexity and the sheer magnitude of the manifestations of CPS, it is natural to attempt to abstract, generalize, and seek more clearly defined rules upon which to make the decision as to whether or not CPS is present.

In the presence of such complexity of clinical presentations the applications of "rules of thumb" can, however, often be misleading (Detre & Jarecki, 1967; Geschwind, 1975). In the attempt to order the signs and symptoms of CPS into identifiable syndromes Geschwind (1975) noted the frequent error of failing to recognize inter-ictal behavior patterns which are indicative of the presence of CPS. Detre and Jarecki (1967) emphasized that even ictal signs, as basic

and trusted as amnesia for the episode, may be absent when the disorder is actually present.

The very complexity of the signs, symptoms, and historical antecedents of CPS, the absence of clear-cut criteria for determining which sets of phenomena actually constitute CPS syndromes, and the fallibility of "rules of thumb," combine with a set of factors which predispose the diagnostician toward incorrect functional diagnosis. Given this state of affairs a special diagnostic procedure which is "pathognomonic" of CPS would be most welcome and it is principally the EEG upon whose shoulders the clinician's wish is placed. EEG findings can contribute to the diagnosis of CPS (Gibbs & Gibbs, 1952; Jovanovic, 1974; Klass, 1975; Penfield & Jasper, 1954) but cannot replace clinical judgment (Detre & Jarecki, 1967).

Geschwind's (1975) position paper again expressed a cautionary note regarding the significance which can be accorded to EEG findings in ruling out epilepsy since a normal EEG, even when taken repeatedly, can be seen in CPS. Klass (1975) noted that the Gibbs' studies in the early 1950's found normal, inter-ictal, waking-EEG's in almost half of their series of CPS patients. Klass reviewed a group of EEG studies which demonstrated that the use of supplementary leads, activation techniques, and adjunctive procedures can lower the probability of obtaining a normal tracing in CPS to about 10%. Negative EEG's have also been reported during the CPS ictus in about 18% of the patients studied by Ajmone-Marson and Ralston (Klass, 1975). The phenomenon of "forced normalization" of the EEG, first reported by Landolt (1958), was observed to be dependent upon the clinical course of psychotic symptoms (Jovanovic, 1974). In other words, it

is precisely at the time at which a differential diagnosis between CPS and a functional psychosis would be called for that a subgroup of CPS patients could be expected to show normal EEGs. In keeping with Geschwind's (1975) emphasis upon the primacy of historical and clinical data, it must be kept in mind that the deployment of specialized electrode placements and activation techniques is usually contingent upon the clinician's initial suspicion of the presence of the disorder based upon his inferences based upon historical and clinical information.

Geschwind's (1975) caveat regarding the spurious diagnostic conclusions which can be reached on the basis of negative test findings must be expanded to include the fact that all too often even positive test findings do not ensure a change in diagnosis or treatment plan. In a study conducted in England, Thomas (1979) noted that while 73% of psychiatric in-patient admissions at the hospital which he studied had screening studies carried out, including biochemistry, liver function analyses, X-rays, thyroid function tests, electrolytes, and other tests, 61% of the 285 abnormal test findings led to no change in diagnosis, further study, or treatment planning. He also noted that the findings of this study essentially replicated those which had been carried out at an American mental hygiene clinic. One plausible explanation for the fact that clinicians did not follow through or fully utilize the results of these studies might have been the result of a failure to generate firm working hypotheses on the basis of historical and clinical data, thereby rendering the significance of the obtained test results obscure in the absence of a suitable conceptual framework into which to inte-

grate these findings. The failure to generate hypotheses at the stage of history and clinical examination was noted to be a significant factor leading to misdiagnosis by Platt and McNath (1979) in their process studies of the role of the clinical interview and history in internal medicine.

As noted, Geschwind's (1975) position paper cited the misuse of psychological test results by psychiatrists and neurologists in the diagnostic decision-making process as constituting one factor which is capable of contributing to the misdiagnosis of CPS. Sources of diagnostic error inherent in the misuses of psychological test results closely parallel some of the pitfalls which can arise in the use of medical laboratory tests and special diagnostic procedures. Consonant with the emphasis which Geschwind placed upon the primacy of historical and clinical information in the diagnosis of CPS is his concern that referrals for psychological testing for "organicity" are often used by physicians in order to compensate for the absence of clearly formulated and specific diagnostic hypotheses which the natural course and clinical presentation of the illness should suggest to the physician who is adequately versed in the clinicopathologic correlations seen in focal, irritative lesions of the temporal lobes and limbic system. Geschwind (1975) repeatedly emphasized that it is precisely this state of affairs which provides the breeding ground for the search for oversimplified "rules of thumb" and over-reliance upon the results of tests and special diagnostic procedures, in this case psychological test scores. His observation that CPS patients do not necessarily demonstrate impairment on psychological test scores adds weight to his contention that

while "psychological test results can be useful in the diagnosis of these disorders, their utility is greatest when they are incorporated into the results of the entire clinical picture." Negative psychological test results in the absence of a well formulated hypothesis regarding the presence of CPS could easily lend spurious support to a functional diagnostic hypothesis. Nonspecific referrals for testing to rule out "organicity" rather than for a formulated referral issue constitute the hallmark of such "casting about" in the absence of well-formulated hypotheses (McFie, 1975).

Each of the issues raised in Geschwind's (1975) position paper has been addressed from within the neuropsychological community which has both shared and been founded upon concerns such as those expressed by Geschwind. The issue of referral for neuropsychological testing in the absence of either a clear-cut referral issue or formulated diagnostic hypotheses has been pointed out by Barbara C. Wilson (Note 1). She observed the routine arrival of consultation request sheets at her service on which were written the patient's name, age, notation of negative examination findings, no diagnosis and a request for "urine, CBC, and psychometrics." Approximately two years of in-service training programs were needed to educate referring physicians that referrals must contain a referral issue and that provisional diagnostic hypotheses must be generated by the referring physician if the results of the neuropsychological consultation are to be effectively utilized. The logic which underlies the practice of requests for non-specific requests to "rule out organicity" received ample scrutiny in Aaron Smith's (1962) classic paper "Ambiguities in Concepts and Studies of Brain Damage and Or-

ganicity" in which he enumerated the many factors which determine the multiplicity of presentations of the effects of cerebral lesions upon cognitive test performances. He discussed the differential effects upon test scores caused by varying type, locus, mass, and velocity of lesion, as well as the age of onset of illness, and its duration. These concepts have been reiterated subsequently (Davison, 1974; Reitan, 1966; Smith, 1981; Walsh, 1978) and were expanded to include variables such as pre-existing personality and pre-existing brain damage (Lipowski, 1975). These critical papers serve to highlight the need for more detailed and specific hypothesis generation behavior and reference to specific clinicopathologic constructs as was implied in Geschwind's (1975) caveat.

Rourke (Note 1) has highlighted another type of problematic referral issue which, again, reflects a lack of appreciation of the complexity of factors which can effect psychological test performances and their interpretation. This class of error in referral issue occurs when the referring physician requests that a specific score be reported in lieu of requesting neuropsychological consultation regarding a specific, formulated referral issue involving specific diagnostic hypotheses.

Quite unfortunately, neuropsychologists have contributed to the physician's misunderstanding of the manner in which psychological test data maximally interdigitate with anamnestic and clinical data by having emphasized the predictive power of actuarial approaches to the neuropsychological diagnosis of cerebral lesions in patients who had not only been tested blind, but typically were done so by technicians. Studies using this methodology such as those reviewed by

Filskov & Goldstein, 1974 then went on to compare the hit rates of such neuropsychological summary indices to those obtained using other neurologic special diagnostic procedures. Clearly, these types of studies were a necessary part of the process of the empirical validation of standardized neuropsychological assessment techniques and served a necessary function of introducing these procedures to the scientific and clinical communities at large. It is the contention of the present author that two unfortunate consequences of the reporting of such studies have developed in terms of neuropsychology's having fostered misconceptions among referring physicians regarding the process of neuropsychological assessment, its utility, and its relationship to other diagnostic information sources. The actuarial nature of these validation studies implied that the locus of diagnostic precision in neuropsychologic assessment lies in the instrument, per se, and in the scores which it produces rather than in the skill or clinical judgment of the neuropsychologist. Similarly, the use of blind interpretation of anhistorical data bases in producing prodigious "hit rates" created a natural, yet elusive, conceptual haven for the physician whose observational, historical, and clinical data have not led him to a clear diagnostic hypothesis to be tested. Lastly, the comparison of "the tests'" diagnostic efficacy, expressed as "hit rates," when directly compared to those of medical tests, and neurologic special diagnostic procedures created the impression among physicians that "the tests" fall within the purview of laboratory procedures which they could order and for which they could assess a critical value much like a lithium level. This value then was hoped to be capable

of ruling out a wide range of neurologic illnesses in a manner analogous to the ruling out of lithium toxicity.

A host of factors have thus far been reviewed which operate to lead psychiatrists and neurologists astray in the diagnosis of CPS based upon consideration of its historical and clinical characteristics. Those factors which lead them to an overly optimistic expectation of the role which neuropsychological testing can play in easing this diagnostic dilemma seem especially salient in light of the assertion of Kløve and Matthews (1974) that there is no epilepsy-specific test profile. They go on to state that in CPS patients, particularly those in whom no demonstrable etiology is present, Halstead-Reitan test profiles are difficult if not impossible to distinguish from normals and that the principal function of such neuropsychological testing lies in the demonstration of focal brain disease (if, and when, it is present) but ...

"It is our firm conviction that specific attempts to rule epilepsy in or out on the basis of neuropsychological test data...are not likely to be successful. The test patterns reflect the underlying etiology....The diagnosis of epilepsy is most often a clinical diagnosis and the combination of electroencephalography and appropriate clinical skill are the primary requisites for making this diagnosis. Sometimes the diagnosis is easy to make; at other times it is very difficult to make. In either event, the neuropsychological test data are not likely to con-

tribute to the diagnosis of epilepsy as such."

(Kløve & Matthews, 1974, p. 254-255.)

As Reitan (1966) pointed out nearly twenty years ago, analysis of a patient's absolute or relative level of performance represents only one approach to the making of inferences regarding the presence of neurologic disease. The analysis of the configuration of scores reflecting various combinations of abilities and disabilities, consideration of the presence of qualitative signs of cognitive deficit highly associated with the presence of neurologic illness, and functional asymmetries in performances of the left and right extremities, all constitute complementary inferential techniques. As the Kløve and Matthews (1974) review concludes, CPS patients as a group tend to have neuropsychological test scores on the Halstead Battery which approximate the normal range, especially when a demonstrable etiology for the CPS is absent. Similarly, even on batteries of tests on which epileptics and/or patients with lesions of the temporal lobes are expected to perform poorly, CPS patients in whom etiologic factors cannot be demonstrated, often produce scores which approximate or even fall within the normal range (Dodrill, 1978; Mayeux, Brandt, Rosen, & Benson, 1980).

Studies of the configuration of test scores produced by patients with CPS of unknown etiology have shown a degree of inconsistency and subtlety in terms of the internal configuration of test protocols (Milberg, Greffenstein, Lewis, & Rourke, D., 1980; Stevens et al., 1972; Wanamaker & Matthews, 1976) which warrant caution when the findings of these group data are applied to the individual case. For ex-

ample, Fedio and Mirsky (1969) were able to demonstrate language and memory disturbances in children with CPS with material-specific deficits relating to side of lesion sufficient to separate the CPS children from those with generalized seizures. Their results paralleled those of many of the earlier studies of temporal lobectomized patients by Brenda Milner and her associates which they reviewed. Subtle differences within the configuration of test scores in nonlobectomized, CPS patients were noted in several studies (Mayeux, et al., 1980; Milberg, Greffenstein, Lewis, & Rourke, D., 1980). The potential subtlety of deviation from normal score ranges in psychometric performances is exacerbated by the conflicting results of varying investigators regarding the expected configuration of test scores in CPS patients. Striking, for example, are the relatively good performances of Mayeux, et al.'s (1980) CPS patients on a wide variety of tests of memory with impairment being noted principally only on one test, the Boston Naming Test. An earlier study of lobectomized patients failed to demonstrate visual confrontation naming difficulties but did demonstrate significant memory deficits (Cherlow & Serafetinedes, 1976); in short, the two studies demonstrated exactly opposite test score configurations.

The Mayeux, et al. (1980) study is perhaps most significant in that it suggested the value of careful query of the patient's phenomenologic description of the nature of his deficit. Relatively good psychometric performances on memory tests contrasted strikingly with the patients' subjective descriptions of difficulties in "memory." The authors noted that although the patients described their cognitive deficits as "memory" problems, analysis of the conditions under which

the phenomenon emerged was usually encountered in attempts to recall the names of people, objects, etc. These phenomenologic analyses demonstrated the potential utility of phenomenologic data, such as would be noted in a carefully conducted history, review of systems, and mental status examination. The need for this type of investigation seems all the more compelling given the frequency of negative results which CPS patients can show upon neuropsychological testing. Even Dodrill (1978; 1981) who developed the first neuropsychological battery specifically designed to demonstrate the type of deficits seen in epileptics, and the first to be standardized specifically on epileptic populations, warned that the instrument is not to be applied to the differential diagnosis of epilepsy but to the measurement of its sequellae. Perhaps the most compelling point to be recognized is that the types of exceptionally detailed examination of memory and language functions of the types assessed in these research studies would probably not even be carried out in the routine clinical evaluation of a psychotic patient unless the presence of CPS had already been hypothesized on the basis of historical and/or clinical (including phenomenological) data. Secondly, it must be reiterated that even when such detailed studies are carried out the elicitation of psychometric evidence in documentation of the presence of CPS may not be obtained and the weight of evidence obtained from this data source, again as Geschwind (1975) suggested, must be evaluated within the context of the entire history and clinical presentation.

Historical information, phenomenological inquiry, and clinical observation have played relatively minor roles in the development of clinical neuropsychology as a professional discipline in relation to

the roles played by psychometric techniques and by the various techniques adopted from the domain of experimental psychology such as reaction time, tachistoscopic and dichotic listening studies. Although a complete analysis of the intellectual and sociopolitical milieu out of which clinical neuropsychology emerged is well beyond the scope of the present work, a few salient points may help to clarify the origins of the relative lack of emphasis which historical and clinical-observational and phenomenological information sources have received in the development of American clinical neuropsychology.

Traditionally, neuropsychologists working in medical settings were trained either as traditional clinical psychologists or essentially as experimental psychologists. Neither mode of training systematically taught the specific signs, symptoms, and clinical courses which are characteristic of the various types of neurologic illness. The curricula undertaken by these psychologists did not include systematic study of medical neurologic texts in which the clinicopathologic correlates of neurologic disorders were systematically presented. In short, any knowledge regarding historical or clinical features of neurologic illness beyond their traditional training in clinical or experimental psychology was unsystematic and self-synthesized (Costa & Siegal, Note 2; Meier, 1981a; A. Smith, 1981). When both the clinicians and experimentalists had the opportunity to study populations of neurologically ill patients, they did so within the context of collaborations with attending neurologists, psychiatrists, or neurosurgeons. These collaborations took place in hospital and clinical settings; situations in which the attending physician's ultimate authority over, and responsibility for, the patients whom he referred to

the psychologist was understood. These referred patients constituted, either or both, the psychologists' clinical case-load and/or pool of experimental subjects. The maintenance of effective, collegial interaction was essential, therefore to the psychologists' flow of patient referrals from the attending physician. The neuropsychologist, in turn, provided the physician with quantified data pertaining to the patient's current cognitive status which the physician could use as one of the few non-invasive special diagnostic procedures of that era and/or as research data. Essential to this maintenance of inter-professional cooperation was the establishment of an effective division of labor which emphasized the unique abilities of the disciplines involved and one which avoided replication of functions and services. Clearly, issues of both economy and professional protocol were of significance in effecting this division of labor. The asymmetrical power relationship between attending physician and psychologist within the medical setting no doubt created a tendency for somewhat greater accommodation in the process of role definition on the part of the psychologist.

In defining their methods of functioning complementary aspects of the two disciplines' training strongly effected the psychologists' modus operandi. As they attempted to fill roles within the service delivery system and/or research team which had not yet been adequately met, the psychologist attempted to avoid replication of services already provided by the physician. The elicitation and recording of the course of the patients' illness, the elicitation of antecedent events of potentially encephalopathic significance, as well as the elicitation of symptoms and signs of neurologic illness had traditionally

been the primary data base of the physician. The analysis of these data into syndromes and the recognition of the clinicopathologic significance of these syndromes, which had been learned by rote and clinical experience, constituted the natural and logical *modus operandi* of the physician in general (Walsh, 1978) and the epileptologist in particular (Penfield & Jasper, 1954). The history had traditionally been regarded as the core of this method of study and the skill of the individual clinician in generating sequential hypotheses to test on the basis of subjective judgment was regarded as the measure of excellence for the physician (Raskin, 1977). The psychologist, unlike his medical colleagues, was trained in a tradition in which the content of his curriculum systematically emphasized topics such as sensation, perception, and cognition. Their methodologic training emphasized concepts such as active manipulation of stimulus variables under maximally controlled conditions, and quantification of responses to the highest level of measurement attainable. When possible, the results of such manipulations were then to be repeated as many times as possible so as to permit the application of statistical decision-making rules in order to further ensure objectivity. In short, whereas the physician revered clinical acumen and the accuracy of his subjective judgements, the same concepts were anathema to the psychologist who revered objectivity and quantification.

The complementarity of methodologies employed by the disciplines of medicine and psychology in the 1940's and 1950's clearly paved the way for psychologists' emphasis upon the results of psychometric tests. The evolution of standardized testing procedures developed within this context. This "Zeitgeist" is clearly exemplified in re-

view articles by Yates (1954) and A. Smith (1975). Smith (1975) elaborated the contributions which the application of standardized neuropsychological tests made to the study of brain-behavior relations, the assessment of the efficacy of treatment techniques such as neurosurgical, pharmacologic, and electroconvulsive treatments, as well as to our knowledge of the effects and clinical courses of various neurologic illnesses upon cognition. It is clear that the division of labor based upon complementary methodologies contributed to the knowledge bases of both medicine and neuropsychology.

Concurrent with the professionalization of clinical neuropsychology as a discrete subspecialty, the methodology of the clinical neuropsychologist has begun to incorporate several of the basic tenets of the medical model. It is the contention of the present writer that this evolution in the neuropsychologist's data base and the methods of analysis to which these data are subjected interact to facilitate the neuropsychologist's recognition of the presence of CPS. Over the past several years, the use of historical, and clinical-observational data, and phenomenologic information has begun to find new emphases in clinical neuropsychology, although this trend appears to be in its formative stages at best. The publication of the English edition of A.R. Luria's (1966) Higher Cortical Functions introduced American neuropsychologists to two key concepts which embraced the underpinnings of the medical model. Luria (1966) emphasized "syndromal analysis," i.e., the elicitation and subsequent categorization of constellations of signs and symptoms which varied in terms of presence, absence, and severity. Luria's inclusion of symptomatologic inquiry was the first systematic inclusion of phenomenologic data into the process of neuro-

psychological assessment.

The active generation and empirical testing of hypotheses by the neuropsychological examiner regarding the nature of the fundamental deficits which interacted to produce the observed syndrome was also introduced as being an integral segment of the diagnostic process. Luria's (1966) work, in this respect, provided American neuropsychologists with a compendium of syndromes which, with sufficient study, could be recognized on the basis of both their historical and clinical presentations. The phenomena which comprised these syndromes were described in qualitative terms rather than in terms of constellations of quantitative test scores. The latter development had the effect of reuniting patient and neuropsychologist within the framework of a common language system. Once this step was achieved, it became possible for patient and neuropsychologist to engage in meaningful dialogue and consequently both interview and observational data acquired new significance for the neuropsychologist. Within this context phenomenologic information garnered in the interview was elevated to the status of data which was meaningful in and of itself.

A second major contribution of Luria's (1966) volume was that in presenting his description of his own clinical technique, he devoted an entire chapter to the technique of history-taking and to the interpretation of historical and clinical-observational data. Although his presentation of "The Preliminary Conversation" emphasized inquiry regarding the phenomenology of cognitive functions, also included were inquiries into negative, positive, and complex-positive sensory and somatosensory symptomatology. Similarly, queries regarding various episodic phenomena including alteration of awareness, recognition, and

familiarity were all included as were queries into visceral symptoms. Non-specific, episodic phenomena such as vertigo, dizziness, and headache were queried routinely as were personality changes. Luria specifically emphasized the need for careful inquiry into, and further study of these episodic phenomena in identifying the presence of partial seizure disorders and asserted that this type of inquiry should routinely precede neuropsychological testing.

Although self-report studies of the intellectual influences upon American neuropsychologists found that Luria was one of the two most influential writers (Costa & Siegal, Note 2; Costa, Siegal, & Gerstman, Note 3; Hartledge & Telzrow, 1980) the immediate impact of Luria's (1966) treatise on history taking did not appear to be overwhelming in terms of its influence on American neuropsychologists' clinical technique. In fact, Golden's (1981) popularization of Luria's clinical techniques as they had previously been presented in Higher Cortical Functions (1966) and later, in Christensen's (1975) exposition of Luria's methods, makes no mention whatsoever of historical data collection/analysis or clinical interviewing as having any role in the process of neuropsychological assessment whatsoever.

The next major thrust in the emergence of a greater emphasis upon historical, clinical observation, and phenomenologic data was presented in 1973 by the late Leonard Small when he presented a full chapter in his book Neuropsychodiagnosis in Psychotherapy (1973; 1980) on "neuropsychodiagnostic interview technique." Small's interview techniques emphasized historical events to a greater degree than Luria's. Small (1980) included routine queries for several classes of encephalopathic events, and emphasized a survey of pre-natal, peri-

natal, and post-natal development, as well as queries for many of the current-status phenomenologic and historic inquiries similar to those which had been included in Luria's (1966) "Preliminary Conversation."

The emphasis which Luria (1966) and Small (1973; 1980) both had placed upon historical inquiry, clinical observation, and phenomenologic inquiry stand in sharp contrast to several influential presentations of the technique of neuropsychological assessment examples of which include works by Reitan and Davison (1974), W.L. Smith and Phillips (1969), A. Smith (1975) and Walsh (1978). These presentations of clinical technique and reviews of the field of neuropsychologic assessment are characterized by not only conceptual excellence in their treatment of psychometric approaches, but also by their complete exclusion of any role played in the assessment process by historical interview data, patients' subjective descriptions of their pathology, or naturalistic observation of the patient. Some progress was made when Lezak's (1975) Neuropsychological Assessment advocated a brief interview of 15 to 20 minutes with the principal goal being that of creating rapport with the patient and explaining the psychometric testing situation. Walsh (1978) artfully presented the value of syndromal analysis as a diagnostic approach but then presented current cognitive status and psychometric data as the exclusive data bases upon which syndromal analyses were to be carried out in his chapter on assessment. McFie's (1975) text very briefly, but emphatically, directed the neuropsychologist to acquire the widest possible data base, including relevant history in the assessment process. Unfortunately, he did not include an exposition of what historical parameters he considered relevant and the clinical (current status) data which he does

discuss are, again, exclusively psychometric in nature. To the degree to which the neuropsychologist studies a patient utilizing the techniques advocated by these writers, the risk of failing to identify CPS, when present, would appear to be directly related to the probability that cognitive deficit is both present and is reflected in the psychometric measures selected for the patient's evaluation.

In spite of neuropsychology's emphasis upon psychometric, cognitive, and current status data, a trend toward the utilization of historical and other types of non-psychometric data has recently emerged and has finally received official recognition within the neuropsychological community. The Report of the Task Force on Education, Accreditation, and Credentialing of the International Neuropsychological Society (INS) (Note 4), in defining roles for practitioners in clinical neuropsychology, issued the following statement:

"A major function of the clinical neuropsychologist is to assess the current behavioral disturbances that are associated with central nervous system dysfunction. The first responsibility, whenever possible, is to develop an interdisciplinary data base of historical and current information to permit an accurate perspective of the present problem. These data frequently consist of developmental, academic, vocational and medical histories [author's italics] in addition to the specific findings of the psychological and neurological examinations, neuroradiologic and neuroelectrodiagnostic procedures, and laboratory tests. This in-

formation, when available, helps: (a) to determine the appropriateness of the referral and (b) to direct the course and content of the neuropsychological assessment. A definitive competency in neuropsychological assessment requires the ability to integrate medical, neurological, and behavioral interview data with neuropsychological findings for the purpose of relating behavior to neurologic status." [author's italics]

(Report of the Task Force on Education, Accreditation, and Credentialing of the INS, 1981, p. 5-6, Note 4)

At the same meeting of the INS at which the Task Force's recommendations were drafted the first intensive workshop to be devoted specifically and entirely to the topic of the theory and practice involved in the utilization of historical, clinical-observational, and phenomenologic data was presented to the membership of this society. An extensive and detailed format for the collection of these classes of data was presented along with a model for their synthesis in the diagnostic and management processes with a CPS case being used as a teaching case (Siegal, Costa, Diamond, Schechter, & B.C. Wilson, Note 5; Siegal, Diamond, Schechter, & Wilson, Note 6). The following year another full workshop was presented on historical information's role in the neuropsychological assessment of children by B.C. Wilson and Mattis, (Note 7). Dr. Wilson must be credited as being the principal proponent within the American neuropsychological

logical community to have consistently and actively advocated the primary role of historical information in neuropsychological assessment. Her lectures and workshops over the past 15 years have routinely included her distribution of history-taking forms which she developed. Unfortunately, much of her work in this area has not yet appeared in written form, but a formal text is on the horizon (Wilson, B.C., Wilson, J. & Davidowicz, Note 8). The appearance of a Handbook of Clinical Neuropsychology (Filskov & Boll, 1981) contained a chapter on the technique of assessment which included a brief segment on the contents of an historical inquiry which was recommended for routine development (Filskov & Leli, 1981). The same handbook contained descriptions of the modus operandi of several distinguished neuropsychologists and, significantly, Meier (1981b) described the collection of historical data as constituting an integral part of his service's clinical and didactic components. Jarvis and Barth (1979) described clear guidelines for history-taking procedures for neuropsychologists working in community mental health centers. In summary, it would appear that neuropsychological assessment technique is expanding to include historical inquiry, and clinical-observational and phenomenologic data as integral components of the diagnostic and assessment processes. The matter of the breadth and contents of these types of inquiry remains unsettled and unsystematized.

Of the history-taking systems described by neuropsychologists in the existing literature, those described by Luria (1966) and Small (1980) appear to encompass the greatest number of historical and clinical queries for those phenomena associated with the presence of

CPS. None of these published systems taken alone, however, seems comprehensive in scope given the variety of signs, symptoms, and historical antecedents of the illness.

Geschwind's (1975) analysis of the misdiagnosis of neurologic illnesses in general, and CPS in particular, cited the collection and analysis of the history by non-medical personnel, especially in psychiatric settings, as constituting one of the principal factors contributing to spurious functional diagnoses. He cited an instance in which a non-medical clinician, when taking the history of a patient presenting with depersonalization episodes, failed to inquire regarding the presence of olfactory hallucinations. The omission of this data point, in Geschwind's analysis, contributed directly to the misdiagnosis of the case and he attributed this error to the fact that the clinician in question was not medically trained. Although Geschwind (1975) clearly acknowledged that medical training does not ensure adequate historical data collection or interpretation, evidence exists which provides support for the basis of his contention that the use of histories obtained and/or interpreted by non-medical personnel constitutes a source of false-negative diagnosis when neurologic illness is present. The degree to which these studies apply to neuropsychologists has not been empirically studied, although some documentation of this phenomenon in clinical psychologists and social workers has been reported in the literature. Certainly Koranyi's (1979) observation that 87% of the patients referred to his clinic by social workers and social service agencies had undiagnosed physical illnesses provided compelling support for a cautionary note in having non-medical personnel screen psychiatric

patients. Similarly, Sbordone, Wingard, and Holmes (Note 9) demonstrated that one third of the certified clinical psychologists whom he surveyed reviewed vignettes of patients with neurologic disorders having psychopathologic presentations failed to recognize the neurologic basis of the patients' illness. Unfortunately, none of the cases utilized in Sbordone et al.'s study were epileptics, but rather had degenerative and vascular disorders (Sbordone et al., Note 9). In a 1978 national survey of 749 mental health administrators and mental health facilities 34% of the respondents indicated the need for specific information pertaining to the differential diagnosis of seizure disorders from functional psychopathologic disorders (Sands & Young, 1978, cited in Sands, 1982). These studies taken together clearly support concerns regarding the ability of non-medically trained personnel to recognize the presence of CPS based upon their review of historical and clinical information.

If the set of factors which Geschwind (1975) discussed as contributing to the failure by psychiatrists and neurologists to recognize the presentations of focal and discharging lesions, such as CPS, were restated positively, as pre-conditions for the recognition of CPS, they would correspond point for point with the recommendations for clinical practice which were articulated by the INS Task Force (Note 4). The Task Force stated that the goal of the neuropsychological consultation is that of "relating behavior to neurologic status." Thus, the first point of correspondence involves the notion of the clinician's set. The few neuropsychological treatises on the technique of history-taking and symptom elicitation and interpretation of information obtained thereby (Filskov & Leli, 1981;

Luria, 1966; Small, 1980) all make specific reference to particular historical and phenomenologic data which these writers clearly state should be used by the neuropsychologist to screen for seizure disorders as part of their routine interview. Secondly, both Geschwind and the Task Force advocated a primary role for historical data and interview data in the selection and interpretation of any subsequent specialty examinations and special diagnostic procedures. This concordance of approaches advocated for both psychiatrists and neurologists, as well as for neuropsychologists suggests that the latter, as a group, may have a greater likelihood of recognizing CPS than would other non-medically trained mental health personnel. It also suggests that neuropsychologists' sensitivity to the presence of this illness, and their levels of recognition of CPS may approach those of the two medically-trained groups.

The present study, thus, attempts to empirically assess the efficacy with which clinicians trained as psychiatrists, neurologists, and neuropsychologists recognize the presence of CPS, on the basis of historical and clinical information alone in a patient presenting with psychopathologic symptoms. These findings hopefully will serve to elucidate the degree to which the concerns expressed by members of the neurologic and psychiatric communities (Ervin, 1976; Geschwind, 1975; Koranyi, 1979) actually characterize the ability of professionals trained within these disciplines to recognize CPS. Similarly, the findings of the present study, hopefully, will provide documentation of the degree of facility which neuropsychologists have achieved in the use of non-psychometric, historical and interview data at the current stage of the incorporation of these

classes of data into neuropsychological practice.

Secondarily, the types of historical and clinical data which are utilized by each of the three professions are of interest for several reasons. As was the case with psychiatrists, neuropsychologists have begun to function in settings outside of hospital settings (Costa & Siegal, Note 2) and can, therefore, act in the role of primary care providers and case managers. Since patients can now come to the neuropsychologist self-referred, referred by non-medical mental health professionals, as well as the more traditional routes via the attending neurologist, psychiatrist, or neurosurgeon, the neuropsychologist functioning within this role must now accept responsibility for the identification of CPS in those patients for whom he/she acts as primary care provider. Competent assessment and management of these cases will require that the neuropsychologist be able to raise CPS as a diagnostic hypothesis and to initiate and manage referral to neurologic and/or psychiatric consultation at appropriate stages in the diagnostic and treatment processes. The diverse nature of signs and symptoms of CPS creates the possibility that a CPS patient could conceivably present, initially, to any of the three principal neurobehavioral specialties, psychiatry, neurology, or neuropsychology. An analysis of the types of historical and clinical data which constitute cues regarding the presence of CPS for each discipline should facilitate the creation of a meaningful division of labor between the three subspecialties which minimizes both informational redundancies and lacunae in the collection and interpretation of historical and clinical data. Clearly, data regarding differential patterns of information usage by the three dis-

ciplines in the recognition of CPS have the potential for clarifying avenues toward effecting the maximally efficient division of labor among neurology, psychiatry, and neuropsychology in the history collection and interpretation stages of the evaluation of CPS patients. These findings would be applicable both to the interaction of members of the three disciplines when working within the context of medical settings in which the neuropsychologist functions as a member of an integrated neurobehavioral team as well as in settings in which the neuropsychologist functions as the first-line diagnostician in the evaluation process.

CHAPTER III

METHODS

Subjects

The participants in the study included 17 neurologists, 17 psychiatrists, and 16 clinical neuropsychologists, all of whom participated on a voluntary basis. Since interprofessional comparisons were to be made, the participants' level of training and experience was controlled. This was accomplished by including only psychiatrists and neurologists who had completed their residency training within the past year. Similarly, neuropsychologists were included only if they had completed no more than two years of post-doctoral clinical work under the supervision of a member of the American Board of Clinical Neuropsychology.

No significant differences between the sexes, ages, or years of prior training outside of the current area of specialization were noted based upon self-report data derived from a biographical data sheet which each participant filled out at the time of the study. These demographic data are presented in Table 1.

The participation of the subjects was arranged in the following manner. The Directors of Residency Training in the departments of neurology and psychiatry at seven medical schools were informed regarding the purpose of the study and were asked to provide the present writer with the names, addresses, and telephone numbers of their most recent graduating classes. Of the seven schools contacted only one declined to release the names of its graduates. The remaining six schools' training directors agreed to provide the

Table 1

Demographic Data for the Three Professions

	Neurology	Psychiatry	Neuropsychology
Sex			
Men	15	12	9
Women	2	5	7
Age in Years			
Mean	31.29	30.71	33.56
S.D.	2.95	3.20	4.67
Years of Additional Training Outside of Participants' Areas of Specialization ^a			
Mean	1.18	1.24	0.56
S.D.	0.39	0.97	0.89

^a Internship year was not included in this statistic for either medically or psychologically trained groups.

lists and to not inform their graduates of the purpose of the study. The Directors were informed of both the confidentiality of their graduates' responses and were assured that their training programs would not be identified in the reporting of any results. The present writer then telephoned each graduate on the list and requested their participation in the study and informed each prospective participant of the following points:

- 1) The study was being conducted as a CUNY doctoral dissertation research project.
- 2) The specific focus of the study was to empirically investigate the manner in which psychiatrists, neurologists, and neuropsychologists utilize historical and clinical information in the processes of differential diagnosis and management planning. The words "epilepsy," "OBS," or "psychosis" were never mentioned in the explanation of the study.
- 3) It was explained that about one hour to an hour and a half's time would be required in order to complete the reading and subsequent fill-in type questions on two cases, and that this protocol would be mailed to the participants immediately, upon request.
- 4) The anonymity of the responses, identities, and training institutions of the participants was assured.

- 5) The present investigator explained to each participant that the cases which they would be reading had been previously reviewed by a group of expert judges and that the participants would be informed of the criterion diagnoses and management strategies suggested by the judges' blind review of the cases. Participants were also informed that they would receive summaries of the research findings upon completion of data collection and analysis.

With very few exceptions, the graduates agreed to participate. Of 29 psychiatrists who agreed to participate, 17 actually completed and returned protocols (59%); of 26 neurologists, 17 completed protocols (65%).

A similar procedure was used to recruit neuropsychologists via the directors of training of 12 post-doctoral training programs in clinical neuropsychology. Of 21 neuropsychologists who agreed to participate, 16 returned protocols (76% response rate).

Instruments Administered

Two written case studies were prepared for use in the study with the fictitious names "David" and "Charles" being given to the two simulated patients whose cases were presented. The Case of David depicted florid, paranoid psychotic symptomatology which had developed over a period of 18 months in a patient with a longstanding and un-

diagnosed complex-partial seizure disorder. The Case of Charles, in contrast, depicted florid paranoid psychotic symptomatology sufficient to meet all DSM III (American Psychiatric Association, 1980) criteria for a diagnosis of paranoid schizophrenia, but in whom no epileptic or any other neurologic signs or symptoms were present. In short, these two cases were prepared in such a fashion as to portray two patients in whom paranoid-psychotic psychopathology was manifest, but with the two cases differing with respect to etiology; David's psychosis being portrayed as occurring in association with a seizure disorder, and Charles' psychosis being portrayed as functional in etiology. This permitted the second case to serve as a "control condition," (i.e., paranoid psychosis without epilepsy) in relation to the "experimental" condition which consisted of the Case of David (paranoid psychosis with epilepsy). In the experimental condition, participants would, essentially, have to disembed information pertaining to the signs, symptoms, and antecedents of CPS from the matrix of coexisting paranoid psychotic psychopathology.

Both cases, "David" and "Charles," were based upon cases which had been seen conjointly in consultation by Prof. Marshall D. Schechter and the present investigator. Both identifying data and substantive aspects of the cases were significantly altered by the aforementioned examiners for purposes of the current study in order to achieve several goals.

Those alterations which were made on the "control case" ("Charles"), were effected in order to ensure that the case unequivocally met all DSM III (American Psychiatric Association, 1980)

criteria for the diagnosis of paranoid schizophrenia. Secondly, no phenomenon which could reasonably suggest an epileptic etiology for this psychosis (or any other neurologic etiology) was included. Thirdly, the case was constructed in such a fashion that both the amount and type of information which was presented to the participants regarding the patients was balanced over these two case presentations, as described below.

The content of the case reports included at least those data specified in Notes on Eliciting and Recording Clinical Information (The Department of Psychiatry Teaching Committee, The Institute of Psychiatry, London, 1973). The style of reporting information in the stimulus cases was consistent with the guidelines which were provided by the Committee (1973) as well. Additional information was supplied regarding the Examination of Cognitive Functions (Goldberg & Siegal, Note 11) and more detailed early developmental history was provided than is specified in the Committee's (1973) guidelines.

Both cases contained 105 passages of equal length, and an equal number of passages were contained in each section of the case reports. The section headings utilized in the case reports were those which appear in The Neurobehavioral Assessment Format (Siegal, Diamond, Schechter, and Wilson, Note 6) since it was felt that these headings would be less likely to bias the participants in favor of functional diagnoses, e.g., "The Psychiatric Examination (Mental State)" was replaced with the section titles "Observations of the Patient, Review of Systems, and Examination of Cognitive Func-

tions." Table 2 presents the section headings into which the reports were divided and the number of passages which were contained in each section.

Verification of the criterion diagnoses was established empirically by submitting both case reports to six internationally recognized authorities on the differential diagnosis of complex-partial seizure disorders. This group of judges consisted of two neurologists, two psychiatrists, and two neuropsychologists, each of whom was asked to rank order their diagnostic hypotheses at the end of each section of the report as well as at the end of the entire report. The judges reviewed both cases independently and were blind with respect to knowledge of the intended criterion diagnoses. By the end of their reading of the Case of David, five of the six expert judges listed CPS as their first-rank diagnosis and the sixth judge listed CPS as his second-rank diagnosis, but included an unsolicited note explaining that he had selected paranoid schizophrenia as his choice for the "most likely diagnosis" on essentially probabilistic grounds rather than on the basis of any lack of evidence which would suggest CPS in the case's substantive content. The criterion diagnosis of CPS for the Case of David was thus considered verified unanimously. Following the judges' listing of their ranked diagnostic hypotheses, they were asked to reread the CPS Case and to place check marks in the spaces next to any of the 105 items which they felt supported their diagnosis of choice, and to place a double check next to any item which strongly supported that diagnosis. Fortunately, the one judge who listed CPS as his

Table 2
Number of Passages Contained in Each Section
of the Cases of David and Charles

Section of Report	Number of Passages per Section for Each Case
Identifying Data	4
Referral Issue	5
Presenting Complaint	3
History of the Present Illness	21
Medical History	9
Developmental History	22
Social History	5
Observations of the Patient and Review of Systems	18
Examination of Cognitive Functions	<u>18</u>
	105 Passages Per Case

second rather than first-rank diagnosis spontaneously and without solitication placed one set of checks next to those items which he regarded as supporting the CPS diagnosis in addition to those which supported his first-rank diagnosis, each in separate colors.

Those items which were selected by a majority of judges were used to operationally define the information within the Case of David which would constitute the array of criterion items signifying the presence of CPS. This set of items was then used to assess the performance and information-processing strategies of the participants. Of the 105 items which comprised the Case of David, hereafter referred to as "The CPS Case," 51 items were not selected by any more than one judge as signifying the presence of CPS. Thirty-five items were selected by either two or three judges as signifying the presence of CPS. Only 14 items out of the entire array were selected by a majority of judges, i.e., four or more. The latter set of items will be referred to as "hard-signs" of CPS, while those selected by only either two or three judges will, for purposes of convenience, be referred to as "soft-signs" of CPS. The 51 items which were selected by only one or no judges will be designated "distractor items." Table 3 presents a summarization of the contents of the passages which constitute softand hard-signs.

It should be noted that marked individual differences characterized the number of items selected by the six judges (range = 15-48) and that their weighting of items as one check vs two also showed individual differences which were so great that the application of more sophisticated scaling procedures would have been spur-

Table 3

Location and Description of Passages from
The Case of David Selected by Expert
Judges as Indicative of CPS

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
		Section: Identifying Data
1-4	_____	
		Section: Referral Issue
5	_____	
6	soft	referral to social worker precipitated by vitriolic arguments
7	soft	Pt reprimanding neighbors regarding their religious transgressions
8-9		

Table 3 (cont.)

Passage Number	Weight ^a	Description of Passages' Contents ^b
Section: Presenting Complaint		
10	soft	paranoid delusion, hyper-religiosity, greater destiny (Chosen as Prophet)
11	soft	fixed, systematized, persecutory delusions
12	soft	delusional jealousy
Section: History of the Present Illness		
13-15	_____	
16	soft	irritable and labile mood, decompensation following job promotion
17	soft	decompensation from obsessive compulsive to paranoid defenses
18	soft	hyper-religiosity, hypermoralism, pedantry
19	hard	hyposexuality, hypermoralism, hyper-religiosity

Table 3 (cont.)

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
20	soft	hyposexuality, paranoid projections, paranoid rage
21	soft	hyper-religiosity
22	_____	
23	soft	obsessive ruminations and viscuous affect, rage attacks precipitated by minimal alcohol use
24	soft	delusional jealousy
25-31	_____	
32	soft	sudden mystical experience while watching spinning lathe wheel
33	soft	acting out religious delusions, hyper-moralism, all above over 18 months

Table 3 (cont.)

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
Section: Medical History		
34	_____	
35	soft	febrile convulsions before age 2, fever in excess of 105°
36-37	_____	
38	soft	recurrent, serous otitis media, ages 3-7
39-42	_____	
Section: Developmental History		
43-46	_____	
47	soft	delayed expressive language development: spoke at 2; sentences at 4
48-49	_____	
50	soft	nocturnal enuresis, pavor nocturnus, sonambulism, until age 11

Table 3 (cont.)

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
51	hard	poor school grades even with studying
52	soft	teachers' report of difficulty in following verbal instructions
53	_____	
54	soft	school avoidance, stomach-aches on school mornings
55	_____	
56	soft	sudden, noticeable change in behavior at age 11 noted by family
57	hard	partial seizures age 11: always in PM, precipitated by stress. Symptoms include: blanching, holding stomach, staring blankly 15-30 seconds; vomiting, and unresponsive
58	hard	episodes occurred 5 times per month

Table 3 (cont.)

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
59-60	_____	
61	hard	temper outbursts at school, killed hamster in biology class
62-64	_____	
		Section: Social History
65-69	_____	
		Section: Observations of the Patient & Review of Systems
70-73	_____	
74	soft	well groomed and dressed, but wearing a great deal of religious jewelry
75	soft	possible diminution of awareness 1 minute; apologies for losing control of anger

Table 3 (cont.)

Passage	Weight ^a	Description of Passages' Contents ^b
Number		
76	soft	depressive affect, self-blame, paranoid ideation
77	soft	grandiose delusions, sense of greater destiny, hyper-religiosity, jealous delusions
78	soft	reacts to interviewer angrily
79	soft	viscosity of cognition and affect
80	hard	intense "moments" of uncanny feelings reported by Pt, believes them of divine origin
81	soft	expresses fears of losing control of rage
82		
83	soft	sense of greater destiny, grandiose delusions, hyper-religiousity
84	soft	paranoid ideation, hypermoralism, hyper-religiousity

Table 3 (cont.)

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
85	soft	paranoid ideation, hypermoralism, hyper-religiosity
86	hard	Pt reports CPS episode: following sleep loss and mounting tension episodes visually induced by watching spinning lathe wheel and glinting of metal which he is polishing. Episode begins with depersonalization and macropsia, precipitous terror and rising epigastric sensation. Phosphenes bilaterally and mystical divine union. Distortion in the experience of time, entire episode is followed by exhaustion and sleep
87	soft	visceral symptoms depression: early AM awakening, weight loss, hyposexuality

Table 3 (cont.)

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
		Section: Examination of Cognitive Functions
88-92	_____	
93	soft	sinistrality
94	_____	
95	hard	sentence repetition failed, apparently due to memory difficulty
96	hard	anomia (objects)
97	hard	semantic paraphasia
98	hard	perplexed at memory and language difficulties
99	soft	spelling errors
100	_____	
101	hard	unable to recall paragraph just read, verbal memory difficulty

Table 3 (cont.)

Passage		
Number	Weight ^a	Description of Passages' Contents ^b
102	hard	loses place on serial-sevens, apparently due to dysmnnesia
103	soft	proverb interpreted with grandiose and religious theme
104	_____	
105	hard	ommissions and confabulations in story recall

^a weights: line indicates distractor item; i.e., no judges or one
judge selected the item as indicative of CPS

soft-signs: 2-3 judges selected item as indicative of CPS
hard-signs: 4-6 judges selected item as indicative of CPS

^b These passage abstracts contain the writer's perceptions of the
diagnostic significance of each item. The actual narratives seen
by the judges and participants are found in Appendix A.

ious and artifactual. Although with sample sizes this small, formal correlations would not have been appropriate, it is interesting to observe that the judge who selected the smallest number of items as signs and symptoms of CPS, also used the fewest number of double checks. The converse was true for the judges who selected the greatest number of items. Since the objective of this preliminary item analysis was to ascertain those phenomena which independent, expert judges considered indicative of the presence of CPS, and not that of studying individual differences between judges in their response styles, the number of judges selecting an item was used as the index of the item's salience rather than the number of checks which any given item received.

The Case of David (CPS) is included in its entirety in Appendix A in the identical form in which it was read by both judges and participants.

The same six judges upon blind and independent review of the Case of Charles, unanimously assigned the case a diagnosis of paranoid schizophrenia. No judge raised any hypothesis regarding the presence of CPS during their review of the case. The criterion diagnosis was thus considered verified for the Case of Charles, hereafter referred to as the Paranoid Schizophrenia Case (PASCHIZ). The PASCHIZ Case is included in its entirety in Appendix B.

Both the CPS and PASCHIZ cases were converted to workbook form by attaching a one page cover sheet which contained instructions for reading and responding to the case. The actual 17 page, double-spaced, typed reports had instructions which queried participants

regarding their preliminary diagnostic hypotheses. Five lines were drawn at the point of query upon which the participant was asked to list his provisional diagnostic hypotheses.

These queries were inserted into the report following each of the sections detailed in Table 2. The five-item queries, in other words, followed the sections entitled Identifying Data, Presenting Complaint, History of the Present Illness, Medical History, Developmental History, Social History, Observations of the Patient and Review of Systems. The query which followed the last section of the report, Examination of Cognitive Functions, contained spaces for as many as 10 fill-in diagnostic hypothesis responses.

The 105 passages which comprised each of the two cases were placed under their appropriate section headings as illustrated in Table 2 and a short line was drawn next to the passage number. This space was provided in order to accommodate the check marks which would be placed next to items by the participants following their diagnosis on the CPS Case. Similar markings and spacings were placed on the PASCHIZ Case although, in actuality, no marks would be made on the PASCHIZ Case in excess of the diagnostic hypothesis queries at the end of each section of the report.

Procedure

A protocol was mailed out to each participant on the day of their giving their consent to participate during telephone call(s) from the present writer. Neurologists (Ns), psychiatrists (Ps), and neuropsychologists (NPs) were all mailed the same protocols. Each

protocol contained (a) a preliminary instruction sheet, (b) a biographical data sheet, (c) the CPS Case and (d) the PASCHIZ Case (see Appendix C). The two cases were counter-balanced in the workbooks, so that odd-numbered participants got the CPS Case first, while even-numbered participants got the PASCHIZ Case first.

The preliminary instruction sheet reiterated the confidentiality of the responses of the participants as well as assuring them of their anonymity and that of their training institutions. The preliminary instruction sheet explained, as had the preceding telephone conversation, that the study was an investigation of the diagnostic process. This set of instructions also specified the order in which the cases were to be read and answered. Participants were requested to complete one entire case per sitting and to refrain from engaging in consultations with colleagues or utilizing reference texts during the study.

The contents of the biographical data sheet are described in the Subjects section of this report.

Both the CPS and PASCHIZ cases had a cover sheet stapled to the first page of the workbook which informed the participants that they would be queried throughout their reading of the case material regarding their provisional diagnostic hypotheses based upon all of the information which they had read up to the point of inquiry. The instructions, which were affixed to each of the cases, emphasized that the participants should feel free to change their minds about hypotheses as they proceeded through the cases, but that they should never go back to change their previously written hypotheses.

At the end of each section of the case reports, the following written instructions appeared: "After reading the report thus far, do you have any diagnostic hypotheses? If so, please list them with the most likely diagnosis first (rank 1) and rank others accordingly." Ranks one through five had been typed next to lines which were provided for the participants' fill-in responses. Eight of these queries were made during each of the two cases which the participants read, (i.e., after Identifying Data through Observations of the Patient and Review of Systems) (see Table 2).

At the end of each case report, the participants were presented with the following written instructions: "Please list those diagnoses which seem most probable on the basis of all of the information which you have read thus far in this case report." The ninth, and final query on each of the two cases, was followed by 10 lines which were clearly labelled 1-10, on which the participants placed their fill-in responses.

On the CPS Case, but not on the PASCHIZ Case, an additional and post-facto task was required of the participants after they had listed their final set of diagnostic hypotheses. The participants were informed, in written instructions, that the investigator was interested in determining what features of the case led to the participant's first-rank diagnosis. In order to answer the question, the participants were instructed to go back to the beginning of the case and to place a check mark next to the number of any passage which the participant felt, in his opinion, supported the first-rank diagnosis. The instructions further specified that two check marks

should be placed next to the number of any passage "which, in your opinion, lends particularly strong support to your diagnosis."

Following the final query for diagnostic hypotheses, the participants were instructed to complete two pages of questions pertaining to their management strategies for each case. These data, pertaining to case management, are not reported in the present study, since it focuses exclusively upon the process of diagnosis.

Following completion of the entire protocol, the participants placed the biographical data sheet and both completed case workbooks into a pre-addressed, stamped, manila envelope and mailed these to the residence of the present writer.

CHAPTER IV

RESULTS

The principal foci of the data analyses involved the study of the efficacy and manner in which various classes of historical and clinical information were utilized by clinicians who had been trained in three different disciplines as they confronted the task of identifying CPS in a psychotic patient. Post-facto analyses were carried out in order to attempt to isolate the specific signs and symptoms which were (a) utilized differentially by members of the three different disciplines, and (b) by clinicians with varying levels of awareness of the presence of CPS in the case which they had reviewed, irrespective of their type of training.

The raw data were analyzed in such a fashion as to permit quantitative description of the participants' assessments of the cases using two basically complementary approaches. The first approach involved the description of the patterning and internal consistency of the participants' judgments regarding the cases' diagnoses. The second approach focused upon the degree of congruence between the judgments made by the participants and those which had been made by expert judges. Although these two approaches converge, the analysis of the development of the participants' diagnostic hypotheses, over time, as they were presented with progressively greater amounts and differing types of information, constituted the basic parameters which describe their performance. The congruence of participants' judgments with those of the expert judges is assessed principally, yet not exclusively, at the level of actual item analysis. Item

analyses were conducted on both a priori and a posteriori bases. In the former case, the significance which participants accorded items that had been adjudged distractors, soft- and hard-signs of CPS, was assessed. In the latter case, those items which empirically differentiated the performances of both (a) the three disciplines, and (b) clinicians who differed in the accuracy of their diagnoses on the CPS Case were identified.

Derivation of Scores Used in Analysis

The number of diagnostic hypotheses which were generated by each participant upon inquiry following each section of each of the case reports was tabulated. This variable could assume values ranging from zero through five depending upon the number of hypotheses generated. A value of zero would thus indicate that the participant listed no diagnostic hypotheses in response to the query; a value of five indicated that five hypotheses had been listed. This value was computed separately for the CPS and PASCHIZ cases for the inquiries following each of the first eight sections on each of the two cases. The ninth, and final, inquiry for diagnostic responses which appeared at the end of the cases was scored for the number of hypotheses which had been generated on that inquiry on each of the two cases taken separately. Since 10 fill-in spaces had been provided at the final inquiry, this variable could assume values of zero through 10, thereby directly depicting the number of hypotheses generated at the end of each case.

The total number of hypotheses generated for each case was simply calculated as the sum of the number of hypotheses which had

been generated over all of the nine inquiries which were made during each case. It should be noted that no attempt was made to eliminate redundancy of hypotheses across queries in the computation of the total number of hypotheses per case. This method of calculation was utilized in order to permit later comparisons of the ordinal position of the criterion diagnosis within these self-generated arrays. If a given participant listed "manic-depressive illness" on his list of hypotheses on six different queries, those six hypotheses would contribute six points, not one, toward the computation of the total number of hypotheses per case. The total number of hypotheses generated on the CPS Case and on the PASCHIZ Case was calculated for each of the 50 participants.

Each of the participants' diagnostic hypotheses was classified in a nominal categorization. Since the instructions did not specify that participants adhere to any specific taxonomic system or nomenclature, it was necessary to employ a coding system in order to describe their responses in a consistent manner. The classification system for recording the participants' diagnostic hypotheses is presented in Table 4.

In order to avoid biasing the results in favor of any of the three disciplines, the category breadth of the two criterion diagnoses was intentionally created to be broad enough to accommodate the responses of participants who might have had a basic grasp of the disease process with which they were confronted and yet still be unfamiliar with the intricacies of diagnosis within the taxonomic system of a discipline outside of their specialty area. For example, the reader will note that any type of epilepsy or temporal

Table 4

Taxonomy Used in Classifying
Participants' Diagnostic Hypotheses

Diagnostic Categories	Hypotheses Included in Categories
No DX	No diagnostic hypothesis given. Diagnostic categorization not possible, e.g., "why is patient unemployed?" Space is simply left empty.
CPS	Complex-partial seizures, temporal lobe epilepsy, epilepsy, petit-mal epilepsy, temporal lobe lesion (any etiology included), inter-ictal behavior disorder, OBS secondary to seizure disorder.
Other OBS	Organic Brain Syndrome (OBS) with no etiology specified, OBS with any etiology other than epilepsy specified, e.g., degenerative, Wilson's Disease, frontal tumor, porphyria.

Table 4 (cont)

Diagnostic Categories	Hypotheses Included in Categories
Paranoid Schizophrenia (PASCHIZ)	Schizophrenia of <u>any</u> of the major subtypes, e.g. paranoid schizophrenia, simple, undifferentiated. This category also includes brief psychoses, acute psychoses, and schizophreniform psychoses. This category excludes paranoia and schizotypal, schizoid, and paranoid personality disorders.
Paranoia	Category excludes paranoid schizophrenia, paranoid personality. Included are paranoia and paranoid psychosis.
Affective Disorder	Category includes any affective disorder, e.g., major affective disorder, mania, depression, bipolar, etc. Schizoaffective psychosis is included in this category. Neurotic depression is excluded from this category.
Cognitive Deficit	Category includes any specified cognitive deficit, e.g., aphasia, dyslexia, etc. "MBD," pervasive developmental disability, and learning disability are included in this category as well.

Table 4 (cont)

Diagnostic	
Categories	Hypotheses Included in Categories
Character Disorder	Category includes any character or personality disorder, e.g., schizotypal, schizoid, impulsive, borderline, narcissistic, and obsessive-compulsive personalities.
Neurosis	Category includes any neurosis, including "depressive neurosis" when specified. "Obsessive-compulsive" is included unless "obsessive-compulsive personality" is specified in which case the hypothesis is categorized under character disorders. Hypochondriasis is included in this category.
Situational Disturbance	Any diagnosis which neither specifies or implies OBS of any etiology; any psychosis, schizophrenia or paranoia, any affective disorder, or neurosis, character disorder or cognitive deficit. This category includes only diagnostic hypotheses which include the words "adjustment reaction" or "situational disturbance." Also included in this category are statements which specify only a stressor without specifying any illness, e.g., "conflicts with father."

Table 4 (cont)

Diagnostic

Categories

Hypotheses Included in Categories

Psychophysio- Category includes any psychophysiologic disorder,
logic Disorder e.g., "functional bowel."

lobe disease was accepted as being equivalent to the criterion diagnosis of CPS. Similarly, any type of schizophrenia was considered an acceptable response and equivalent to PASCHIZ. This category breadth does roughly equal injustice to the International Classification of Seizure Disorders (Gastaut, 1970) as it does to DSM III (American Psychiatric Association, 1980).

All of the participants' diagnostic hypotheses were classified in accordance with the criteria specified in Table 4 by the present writer. It should be noted that the identities and group membership of the participants were known to the writer at the time of the scoring of the protocols since blind review of the 50 participants' protocols was impossible due to financial limitations.

Once each of the participants' diagnostic hypotheses had been classified according to the criteria specified in Table 4, the ordinal position, or rank, of CPS was computed for each participant on each of the nine inquiries on both the CPS and the PASCHIZ cases. The former measure was calculated as a dependent variable serving as an index of diagnostic accuracy on the CPS Case and as an index of response bias when CPS occasionally occurred on the PASCHIZ Case. In parallel fashion, ordinal position of PASCHIZ as a diagnosis was recorded as the index of diagnostic accuracy on the PASCHIZ Case within the arrays of hypotheses which were generated at each of the cases' nine inquiries.

Each of the 105 passages, hereafter referred to as "items," was assigned a score of 0, 1, or 2 depending upon the number of check marks which each participant placed next to the item. This value was tabulated for every item on each participants' CPS Case. No

analogous measure was computed for the PASCHIZ Case.

Statistical Analyses

In order to rule out the hypothesis that diagnostic accuracy on the CPS Case was effected by the order of case presentation, the rank of the criterion diagnosis upon final inquiry was computed for each participant who received the CPS Case first as well as for those participants who received the case second. The frequency of occurrence of ranks under these two conditions of order are presented in Table 5.

It should be noted that whenever CPS occurred as a diagnostic hypothesis, it appeared only in ranks one through four. For computational purposes, a rank of six was assigned to any participant who failed to include the CPS diagnosis in his list of diagnostic hypotheses since this represents the minimal quantitative value which was capable of describing failure to list the criterion diagnosis on a five-choice query.

A Mann-Whitney U-Test yielded essentially identical mean ranks for the two orders of presentation and yielded a non-significant z score for the statistical contrast ($z = 0.67$). Thus, the order of presentation of the cases was not considered to have exerted an effect upon diagnostic accuracy on the CPS Case.

With order effect now refuted as the most parsimonious explanation of any inter-professional differences in diagnostic accuracy on the CPS Case, it was then possible to assess the principal hypothesis of the study, i.e., that the clinicians' professional training exerted an effect on diagnostic accuracy on the CPS Case. The

Table 5

Final Rank of Criterion Diagnosis (CPS) on CPS
Case as a Function of Order of Case Presentation

Rank of CPS Dx	Order of Presentation	
	CPS Case First	CPS Case Second
1	11	11
2	6	1
3	-	2
4	1	-
Criterion Dx Absent "6"	<u>11</u>	<u>7</u>
	29	21

CPS First vs. CPS Second $z = 0.67$

Note: Mann-Whitney U-Tests corrected for tied ranks and expressed as normal deviates.

final ranks of the criterion diagnosis as it occurred in the self-generated arrays of diagnostic hypotheses of the neurologists, psychiatrists and neuropsychologists are presented in Table 6.

Strikingly, only two neuropsychologists (13%) failed to include the criterion diagnosis, CPS, in their list of diagnostic hypotheses, whereas seven neurologists (41%) and nine psychiatrists (53%) failed to even raise the hypothesis that CPS was present after their review of the entire case. Mann-Whitney U-Tests yielded z score values which failed to differentiate the performance of psychiatrists and neurologists. Similarly, comparisons between the performances of the neurologists and neuropsychologists failed to achieve significance. Statistically significant differences in the rank of the criterion diagnosis occurred only upon comparison of the performance of the psychiatrically-trained group versus the neuropsychologically-trained group (see Table 6). Type of professional training, i.e., professional specialization was, on this basis, found to exert a significant effect upon the clinicians' inclusion and ranking of CPS as a diagnostic hypothesis.

In order to fully appreciate the depiction of the ranks in which the participants placed CPS, it should be recalled that five of the six expert judges, independently offered CPS as their first-rank diagnosis, and the sixth judge included CPS, equivocating only with respect to whether it should be assigned first or second rank. Any deviation from the first two ordinal positions was therefore considered to be discrepant from expert judgment.

Table 7 presents the frequency with which members of each of the three professions failed to include CPS on their lists of provi-

Table 6

Final Rank of Criterion Diagnosis on CPS Case
as a Function of Professional Specialization

Rank of CPS Dx	Specialization		
	Neurology	Psychiatry	Neuropsychology
1	9	5	8
2	1	1	5
3	-	2	-
4	-	-	1
CPS Dx Absent	<u>7</u>	<u>9</u>	<u>2</u>
	17	17	16

Neurology vs. Psychiatry $z = 1.10$

Neurology vs. Neuropsychology $z = .61$

Psychiatry vs. Neuropsychology $z = 2.11^*$

Note: Mann-Whitney U-Tests corrected for tied ranks and expressed as normal deviates.

* $p < 0.05$, two-tailed

Table 7

Frequency of Recognition of Complex-Partial
Seizure Disorder by Neurologists,
Psychiatrists, and Neuropsychologists ^a

	Profession		
	Neurology	Psychiatry	Neuropsychology
	N=17	N=17	N=16
Recognized CPS	10	8	14
Failed to Recognize CPS	7	9	2

Neuropsychology vs Neurology	F.E.T., p = .041*
Neuropsychology vs Psychiatry	$\chi^2 = 4.38^*$
Psychiatry vs Neurology	$\chi^2 = \text{NS}$

^a Recognition of CPS is defined by the participants' inclusion of any type of epilepsy or temporal-lobe disease of any etiology upon final inquiry for diagnostic hypotheses at the end of the CPS Case.

* = p<0.05

F.E.T. = Fisher's Exact Test

sional diagnostic hypotheses upon final inquiry. When inclusion of the criterion diagnosis versus failure to do so was used as the index of diagnostic accuracy, the performance of the neuropsychologists significantly surpassed that of both the psychiatrists and neurologists ($\chi^2 = 4.38^*$, and F.E.T., $p = 0.041^*$). It should be noted that the use of Fisher's Exact Test was necessitated in assessing the contrast between the neurologists' and neuropsychologists' diagnostic accuracy since the frequencies-expected values for this contrast were not sufficient to utilize the Chi-Square technique (Siegel, 1956).

Initially, the PASCHIZ Case was included in the protocol only in order to assess the degree to which a positive-response bias toward the diagnosis of CPS might be present. If present, it was thought the phenomenon would emerge when the participants were confronted with a case of psychosis without epilepsy, e.g., PASCHIZ. The data which describe the performances of the three groups on this case go well beyond ruling out response bias as a plausible explanation for the inter-professional differences in diagnostic accuracy on the CPS Case. These serendipitous findings appear to point to actual inter-professional differences in diagnostic accuracy when dealing with a functional psychosis, i.e., paranoid schizophrenia.

With respect to the issue of response-bias, it should be noted that none of the participants, irrespective of group membership, listed CPS as their final diagnosis or included it within their lists of diagnostic hypotheses at the final inquiry. The number of times which CPS was cited as a diagnostic hypothesis en route to the final query was quite small as well. The number of times which the

CPS diagnosis was made by members of each discipline, en route to the final inquiry, is presented in Table 8.

The infrequency with which CPS was listed as a false-positive diagnosis on the PASCHIZ Case argues against the hypothesis that the observed inter-professional differences in accuracy in the recognition of CPS on the CPS Case occurred as a function of positive response-bias favoring that diagnosis.

Table 9 presents data which indicate the presence of two interesting phenomena. First, both medically-trained groups significantly surpassed the diagnostic accuracy of the neuropsychologists on the PASCHIZ Case. All but one psychiatrist and one neurologist listed the criterion diagnosis as their first-rank diagnosis; the remaining member of each group listed it second. In contrast, fully 25% of the neuropsychologists failed to include the criterion diagnosis on their lists of diagnostic hypotheses. Interestingly, none of these four neuropsychologists assigned a neurologic diagnosis to the PASCHIZ Case but listed incorrect functional diagnoses as their first-rank diagnosis even given the rather generous category breadth permitted by the experimenter in defining the criterion diagnosis. Their first-rank diagnoses included "atypical paranoid psychosis," "schizotypal personality disorder," "paranoia," and "obsessive-compulsive neurosis." Since two of the neuropsychologists included paranoid schizophrenia, the criterion diagnosis, on their lists of diagnostic hypotheses, but relegated the criterion diagnosis to other than first-rank status it would appear that these misdiagnoses reflect at least two types of errors. One type of diagnostic error appears to reflect a basic lack of comprehension of the principles

Table 8

Frequency of Occurrence of False-Positive CPS

Misdiagnoses on the PASCHIZ Case by

Members of Three Professions

Professional Specialization

Section of Report	Neurology	Psychiatry	Neuropsychology
Identifying Data	0	0	1 (4)
Referral Issue	0	0	1 (2)
Presenting Complaint	0	1	0
History of the Present Illness	0	0	2 (3, 5)
Medical History	0	0	1 (3)
Developmental History	0	0	0
Social History	0	1 (2)	0
Observations of Patient			
& Review of Systems	0	1 (4)	0
Examination of Cognitive Functions	0	1 (4)	0

Note: Cell entries indicate the number of times that CPS was raised as a diagnostic hypothesis at each of the nine points of inquiry on the PASCHIZ Case by members of each profession. Numbers contained within parentheses report the rank assigned to the CPS hypothesis by the participant(s) at that point of inquiry.

Table 9

Final Rank of Criterion Diagnosis (PASCHIZ) on the
PASCHIZ Case as a Function of Professional Specialization

Rank of PASCHIZ Dx	Specialization		
	Neurology	Psychiatry	Neuropsychology
1	16	16	10
2	1	1	2
PASCHIZ Dx Absent	<u>-</u>	<u>-</u>	<u>4</u>
	17	17	16

Neurology vs. Psychiatry $z = 0.0$

Neurology vs. Neuropsychology $z = 2.27^*$

Psychiatry vs. Neuropsychology $z = 2.27^*$

Note: Mann-Whitney U-Tests corrected for tied ranks and expressed
as normal deviates.

* $p < 0.05$, two-tailed

of functional psychiatric diagnosis. The other type of diagnostic error may simply reflect a lack of familiarity with the DSM III taxonomy.

Also noteworthy is the fact that the neurologists' diagnostic accuracy on the PASCHIZ Case was identical to that of the psychiatrically-trained group, and surpassed that of the neuropsychologists.

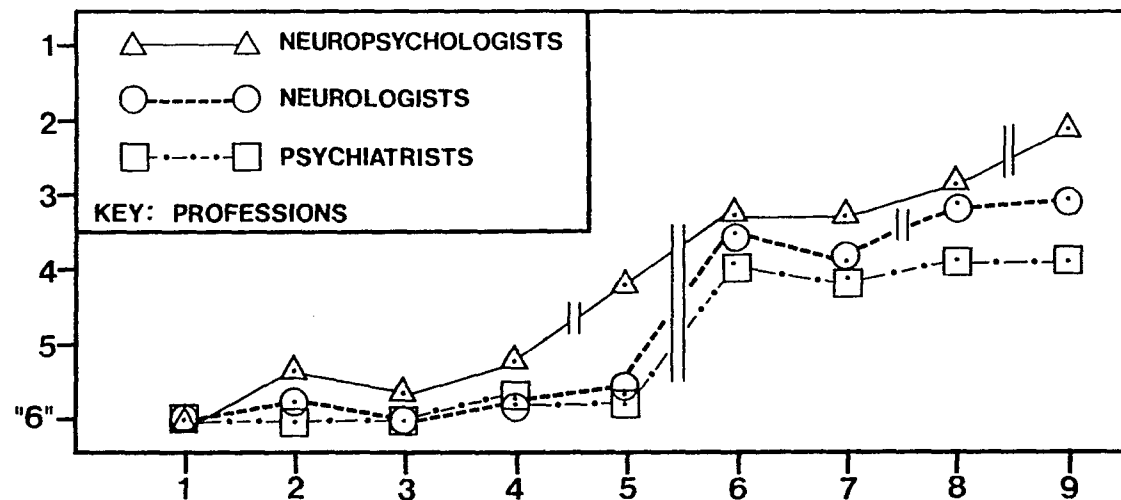
With the aforementioned inter-group differences in diagnostic accuracy on the CPS Case noted and the subsequent failure to demonstrate evidence to support a significant role for either order-effects or response-bias as being capable of explaining these inter-group differences, it is now reasonable to hypothesize that the three professions' diagnostic accuracy on the CPS Case varied as the result of the effect of the historical and clinical data with which the participants were presented. In order to test the hypothesis that different classes of information, i.e., sections of the case report (see Table 2), differentially effected the diagnostic accuracy of the three professions, the following comparisons were made. Again, a score of six was assigned to any participant who failed to list CPS in his list of diagnostic hypotheses. Differences in the rank of the criterion diagnosis following the inquiry which followed each of the nine sections of the case were tested using the Wilcoxon Signed-Rank Test. For convenience of illustration, the mean rank of the criterion diagnosis on the CPS Case is plotted on the ordinate in Figure 1 for each of the three professions at each point of inquiry. Points of inquiry are indicated along the abscissa. Double, vertical bars are set between adjacent points at which statistically-significant differences in the position of the criterion

FIGURE CAPTIONS

Figure 1 Mean Ranks of Criterial Diagnoses for CPS and PASCHIZ
Cases for Three Professions at All Points of Inquiry.

The mean rank of the criterion diagnosis on the CPS and PASCHIZ Cases are plotted on the ordinate for each of the three professions at each point of inquiry. Points of inquiry are indicated along the abscissa. Double vertical bars are set between adjacent points at which statistically significant differences in the position of the criterion diagnoses occurred as assessed by the Wilcoxon Test.

CPS CASE



PASCHIZ CASE

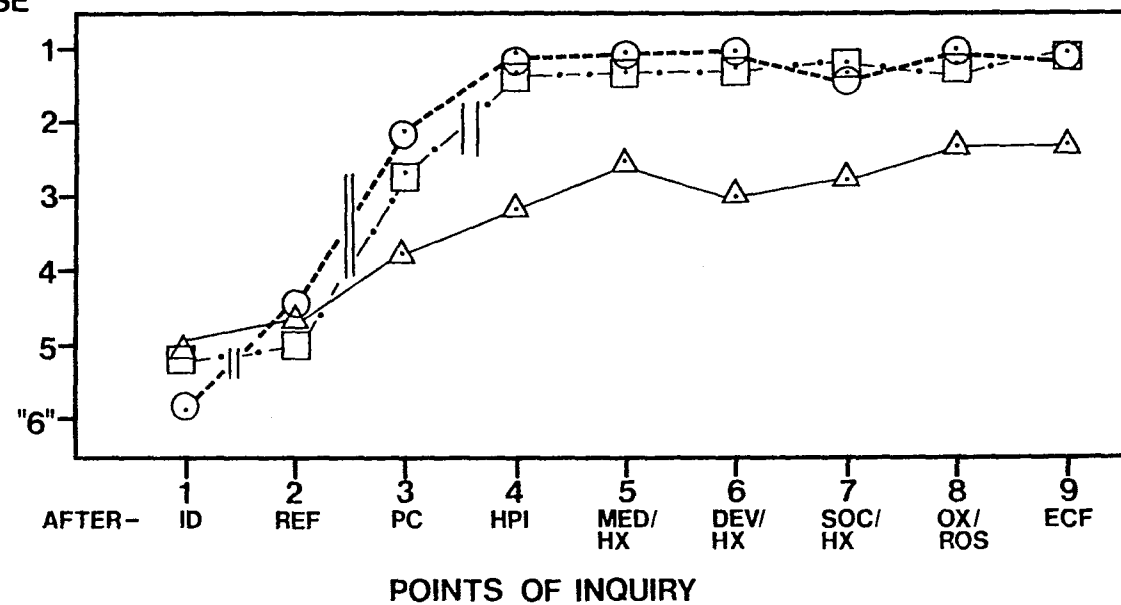


FIG. 1

diagnoses occurred as assessed by the Wilcoxon Test.

Significant increments in diagnostic accuracy, as measured by decreases in the ordinal position of the criterion diagnosis occurred at three different points for the neuropsychologists. The first significant change occurred following their reading of the Medical History. This section of the report contained two soft-signs (a) a history of repeated febrile convulsions prior to age two, and (b) recurrent serous otitis-media in childhood.

Reading of the Medical History (even in conjunction with the preceding sections) did not result in a significant change in the diagnostic hypothesis generation of either of the two medically-trained disciplines.

The neuropsychologists then showed a significant increment in diagnostic accuracy after reading the Developmental History (see Table 3 for a synopsis of the contents of this section).

A parallel increment in the accuracy of the psychiatrists and neurologists following their reading of the Developmental History was noted as well.

The neuropsychologists' third statistically discriminable increment in diagnostic accuracy occurred following their reading of the Examination of Cognitive Functions (see Table 3) which contained an array of items which described various aphasic and mnestic deficits. Neither neurologists or psychiatrists demonstrated a significant change in diagnostic accuracy following their reading of this section.

The neurologists showed a significant increment following their reading of the section Observations of the Patient and Review of

Systems. Contained within this section of the report was the patient's actual description of his seizures. It is most noteworthy that neurology alone demonstrated an increment following their reading of this section. The only other significant increment which preceded this for the neurologists occurred following the Developmental History.

The psychiatrists' only discriminable increment occurred following their reading of the Developmental History prior to reaching asymptote at that point. Neither the Observations of the Patient/Review of Systems or the Examination of Cognitive Functions effected any further significant increments in diagnostic accuracy for this group on the CPS Case.

In order to assess the question of the degree to which the aforementioned differences in each profession's utilization of information resulted in discriminable differences between professions in their diagnostic accuracy as they proceeded through the case, Mann-Whitney U-Tests were computed to contrast each pair of professions at each point of inquiry. The results of these tests are presented in Appendix D.

It is noteworthy that psychiatry and neurology are not statistically different with respect to the rank of the criterion diagnosis at any point as the two groups proceed through the case, in spite of the increment which the neurologists accrue as they complete their reading of the Observations of the Patient and Review of Systems. The relative superiority in diagnostic accuracy on the CPS Case which the neuropsychologists showed respective to the other two groups are demonstrated by the statistically significant dif-

ferences which emerge at the queries following Medical History ($z = 2.30$; $z = 2.50$) and following the Examination of Cognitive Functions ($z = 2.11$). The latter difference was noted only in the contrast with psychiatry

The patterning of information-usage on the PASCHIZ Case as well as the relative accuracy of the three groups varied almost as a mirror image to that seen on the CPS Case. Neurology and psychiatry were again statistically indistinguishable from one another on their diagnostic accuracy scores at all points of inquiry (See Figure 1 and Appendix E), and both groups' performance surpassed that of the neuropsychologists at the History of Presenting Illness ($z = 2.62^{**}$, $z = 2.04^{*}$). The relatively poor performance of the neuropsychologists on the PASCHIZ Case is paralleled by the absence of any discernable increments in their performance following the presentation of any single section of the case (see Appendix G).

The neurologists gained two significant increments in diagnostic accuracy as assessed by Wilcoxon-Signed Ranks Tests (see Appendix G). The first occurred following their reading of the Referral Issue ($z = 1.99$) and the second following the Presenting Complaint ($z = 2.93$).

The psychiatrists also made two discernable increments in diagnostic accuracy; these followed the sections Presenting Complaint ($z = 2.80$) and History of the Present Illness ($z = 2.67$). It is noteworthy that the differences in the relative levels of performance of the three groups on two different types of cases, i.e., psychosis with epilepsy vs. psychosis without epilepsy, were paralleled by differential impact of various sections of the reports upon the

performances of the participants. For example, all significant increments in diagnostic accuracy on the PASCHIZ Case occurred prior to Medical History's presentation, whereas on the CPS Case, significant increments were observed to occur throughout the duration of the entire case as relevant and/or competing information was introduced. In the PASCHIZ Case, all information implicated only paranoid schizophrenia and by the end of the History of the Present Illness, all historical and clinical data necessary to make the diagnosis had been presented. This fact is reflected directly in the results since no significant increments in diagnostic accuracy occurred after the inquiry which was made following History of the Present Illness. Noting the mirror image aspect of Figure 1 in which maximal acceleration occurs in the initial sections of the report on the PASCHIZ Case, whereas acceleration develops cumulatively, with more increments occurring toward the end of the report on the CPS Case dramatically highlights this point. This strongly supports the hypothesis that the observed intergroup differences in the recognition of epilepsy on the CPS Case were directly attributable to the effect of the actual contents of the passages.

Given the differences which were demonstrated to exist between the impact of various sections of the CPS Case upon the hypothesis generation behavior of the three groups, it would seem reasonable to surmise that specific items could be identified which constitute profession-specific, or at least profession-preferred cues in the recognition of CPS. In order to test the hypothesis that not all items would be selected by the three professions with equal frequency, the number of check marks placed next to each item was tal-

lied for each participant. It was found that the three groups did not vary significantly in either the total number of checks which they placed next to items ($F = 0.84$ NS) or with respect to the probability that members of any of the three groups would assign two checks to any item which they selected ($F = 1.33$ NS) as opposed to one check.

Similarly, the probability of the participants using the double check rating for any given item was found to be unrelated to the number of items selected ($r = 0.21$ NS). Nonetheless, the most striking characteristic was the extreme variability in the number of items selected by the participants (range 2-52) which paralleled the marked individual differences which had been shown by the judges in the overall number of items which they, as a group, selected as being indicative of CPS.

These wide individual differences in the number of items selected by both the judges and by each of the participants' groups along with the absence of any demonstrable explanation for these individual differences indicated that the most justifiable index of item selection was the number of participants who selected a given item. This approach seemed more conservative than attempting to weight or scale item values based upon the number of checks received by the item. Scaling of this type would have been more statistically powerful but would have detracted from the integrity of the actual meaning of the individual scores.

Eight items were found to have been selected with differential frequency when the items selected by the three professions were compared. Since all items selected were done so with reference to the

first-rank diagnosis by all participants, irrespective of the accuracy of the first-rank diagnosis, only those participants who listed CPS in first position could be included in this analysis. Therefore, 10 participants who included CPS as a diagnostic hypothesis upon final inquiry, but did not specify it as their first-rank diagnosis could not be included in this analysis (see Table 6). It should be noted that the number of neuropsychologists who were excluded in this operation was disproportionately high in relation to the other two groups, i.e., six out of the ten. Table 10 presents the eight items which received preferential selection when the three professions' sub-groups of participants who assigned CPS as their first-rank diagnosis (CPS 1), were compared.

Certainly the most striking finding is that all of the eight items which were utilized differentially were done so by neuropsychologists when compared with either or both of the other groups. Item use upon comparison of psychiatrists and neurologists could not be distinguished when compared with each other but only when compared with neuropsychologists.

A cluster of items pertaining to cognitive pathology was differentially selected by the neuropsychologists. Of the eight items preferentially selected by the neuropsychologists, two of the items (95, 101) were contained in the Examination of Cognitive Functions, as might be expected. On item 95, in which the patient's poor performance on sentence repetition was reported, all eight CPS 1 neuropsychologists checked the item, whereas about half of the neurologists and psychiatrists did so. On item 101, while six of the eight neuropsychologists checked the item which reported dys-

Table 10

Items Selected Differentially by Members of Three
Professions as Being Indicative of CPS ^a

Item Number & Synopsis of Contents	Professions . ^b			Comparison	F.E.T. ^c
	N	P	NP		p =
47					
delayed language	9	5	3	N vs NP	.009**
development	0	0	5	P vs NP	.043*
54					
school avoidance,	9	5	5	N vs NP	.083 ^s
stomach aches	0	0	5		
61					
temper outbursts,	7	3	2	N vs NP	.044*
cruelty to animals	2	2	6		
69					
normal social history,	9	5	5	N vs NP	.082 ^s
i.e. no psychosis	0	0	3		

TABLE 10 (cont)

75					
fears of losing	9	5	4	N vs NP	.029*
control of rage	0	0	4	P vs NP	.097 ^a
76					
depressive affect	5	1	6	P vs NP	.086 ^a
paranoid ideation	4	4	2		
95					
poor sentence	4	2	0	N vs NP	.053 ^a
repetition	5	3	8		
101					
dysmnnesia	6	4	2	P vs NP	.086 ^a
	3	1	6		

^a Only participants assigning CPS on their first-ranked diagnosis are included in this analysis.

^b Professions key

N = Neurology

P = Psychiatry

NP = Neuropsychology

^c F.E.T. = Fisher's Exact Test.

Table 10 (cont)

Note: For each item presented in the table, the lower row depicts the number of participants who selected the item, irrespective of their weighting of the item as a one or two check. The upper row depicts the number of participants who did not select the item as being indicative of CPS.

~ = $p < 0.10$

* = $p < 0.05$

** = $p < 0.01$

mnesic phenomena, only one of the CPS 1 psychiatrists checked the item. This trend toward differential sensitivity of neuropsychologists to cognitive phenomena in current status information becomes far more dramatic when cognitive deficit appeared in the history. On item 47, which reports delayed expressive language development, none of the nine CPS 1 neurologists, nor any of the five psychiatrists selected the item, whereas five of the eight CPS 1 neuropsychologists noted the phenomenon as being contributory to diagnosis (F.E.T., $p = 0.009^{**}$, F.E.T., $p = 0.043^{*}$ respectively). A trend also existed for the neuropsychologists to more frequently note the patient's avoidance of school than did the neurologists (F.E.T., $p = 0.083$).

Items reporting affective symptomatology seemed to be treated differently by the three professions' CPS 1 sub-groups as well. More startling, however, is the fact that different affective tones seemed to be used as preferred cues by different disciplines. Two items which reported rage-dyscontrol and fears of same, items 61 and 75, respectively, showed preferential selection by neuropsychologists when compared to both psychiatrists and neurologists. On item 76, where depressive affect in the presence of paranoid ideation was reported, four of the five psychiatrists cited the item as indicative of CPS while six of the eight neuropsychologists did not check the item.

The Social History, all elements of which were embodied in item 69, argued against a family history of schizophrenia. This absence of personal or family history of schizophrenia provides indirect evidence of an epileptic etiology for the patient's psychosis to the

degree to which the hypothesis of schizophrenia is not supported. No CPS 1 psychiatrist or neurologist checked this item, and only three of the eight neuropsychologists did. This difference produced statistical significance only when neuropsychologists were compared to neurologists (F.E.T., $p = 0.082$), and even then at a level which could only be described as a trend.

The results which have been presented thus far have principally addressed issues regarding the behavior of those participants who assigned the criterion diagnosis to the case and thereby successfully recognized the epileptic illness. The present section describes the first-rank diagnoses which were assigned to the case by the remainder of the sample. This focus is imperative if the question is to be asked, "If the clinician when looking at CPS in a psychotic patient failed to recognize the process as CPS, what diagnostic impressions occurred to him instead?"

Table 11 presents the distribution of first-rank diagnoses which members of each of the three professions offered after reading the CPS Case. Inspection of Table 11 indicates that the CPS Case was most frequently misdiagnosed as paranoid schizophrenia ($N=16$) and that this misdiagnosis occurred with almost equal frequency for each of the three professions.

Also striking is the fact that of the 28 participants who failed to list CPS as their first-rank diagnosis, only 3 assigned neurologic first-rank diagnoses to the case. One neurologist listed a degenerative etiology (Other OBS). "MBD" and "selective intellectual impairment of memory and language" were listed by a psychiatrist and neuropsychologist, respectively (Cognitive Deficit).

Table 11

Distribution of Final First-Rank Diagnoses on
the CPS Case Made by Three Professions

Hypothesis ^a	Professions		
	Neurology	Psychiatry	Neuropsychology
CPS	9	5	8
PASCHIZ	6	5	5
Other OBS	1	-	-
Paranoia	-	1	1
Affective Disorder	-	5	-
Cognitive Deficit	-	1	1
Character Disorder	1	-	-
Situational Disturbance	-	-	1

^a Definitional criteria for each category of diagnostic hypotheses are presented in Table 4.

Noteworthy is the fact that a group of five psychiatrists assigned a first-rank diagnosis of affective disorder to the case whereas affective disorder was not used as a first-rank diagnosis by any neurologists or neuropsychologists.

Unfortunately, the numbers of participants who assigned diagnoses other than either CPS or PASCHIZ to the case were too small to permit the application of statistical approaches to item analyses which might clarify the basis of the diagnoses which were selected. The frequency with which PASCHIZ was assigned as the first-rank diagnosis not only was sufficient to permit statistical comparisons, but, by virtue of the frequency of occurrence of this misdiagnosis it becomes a phenomenon worthy of study in and of itself. In an effort to clarify which specific historical and clinical phenomena were differentially evaluated by participants who diagnosed the case as CPS versus those who assigned the case a first-rank diagnosis of PASCHIZ, an item analysis was performed. It was hypothesized that the two groups would select arrays of items with differential frequency. In order to test this hypothesis, two groups were created by collapsing across professions and assigning all participants who specified CPS as their first-rank diagnosis to one group and those who assigned PASCHIZ first-rank to the other. The frequency with which members of both groups selected each item by placing a check next to the item was then tallied irrespective of whether one or two checks were assigned to the item by any given participant. Chi-Squares were computed in order to test differences in the frequency with which items were selected by the two groups; the set of items which differentiated the item selection of the two groups

is presented in Table 12.

A set of seven items were selected significantly more frequently by those participants who listed the criterion diagnosis as their first-rank diagnosis (CPS 1). Item 35 described reports of high fevers prior to age two which were accompanied by febrile convulsions. Slightly more than half the CPS 1's selected this item whereas only one participant who assigned PASCHIZ as the first-rank diagnosis (PASCHIZ 1) did so. It is important to recall that selection of an item, according to the instructions which the participants were given was made on the basis of the participants' citing items as evidence which supported their first-rank diagnosis. In other words, failure to select any given item does not necessarily indicate that the participant was unaware of the item, or of its possible diagnostic significance, but simply that the participant did not feel that the item lent support to his first-rank diagnosis. Given this interpretive caveat, it is surprising that even a single participant checked febrile convulsions as providing support for the PASCHIZ diagnosis.

Within the Developmental History two items were selected significantly more frequently by the CPS 1 group than by the PASCHIZ 1 group. Item 57 clearly presents the patient's mother's report of her observations of partial seizures during childhood. Her description of the episodes included blanching, staring and unresponsiveness, as well as arrest of speech, holding the stomach and vomiting. All but one CPS 1 checked this item as being indicative of CPS. Rather surprising was the fact that almost half of the PASCHIZ 1's selected the same item in support of their discrepant

Table 12

Items Distinguishing Participants Selecting CPS
vs PASCHIZ as their First-Rank Diagnosis ^a

Item & Section	Weight ^b	Contents ^c	First-Rank Diagnosis		χ^2
			CPS N=22	PASCHIZ N=16	
Presenting Complaint					
11	S	persecutory delusions	9 (40%)	14 (88%)	6.58*
12	S	delusional jealousy	6 (27%)	13 (81%)	8.74**
Hx Present Illness					
24	S	delusional jealousy	7 (32%)	13 (81%)	7.20**
25	D	job promotion precipitates paranoid thoughts	3 (14%)	10 (63%)	7.78**
32	S	mystical experience at lathe	11 (50%)	15 (94%)	6.31*

Table 12 (cont.)

Item & Section	Weight ^b	Contents ^c	First-Rank Diagnosis		χ^2
			CPS N=22	PASCHIZ N=16	
Medical Hx					
35	S	febrile convulsions before age 2, fevers over 105°	12 (55%)	1 (6%)	7.57**
Developmental Hx					
57	H	childhood episodes of blanching, staring, holding stomach and vomiting	21 (96%)	7 (44%)	FET, p = .007***
58	H	above episodes occur 5 times per month	15 (68%)	3 (19%)	7.20**

Table 12 (cont)

Item & Section	Weight ^b	Contents ^c	First Rank Diagnosis		χ^2
			CPS	PASCHIZ	
			N=22	N=16	
Observations of Patient and Review of Systems					
76	S	depressive affect, self-blame, paranoid ideation	10 (46%)	13 (82%)	3.58 ^v
77	S	grandiose delusions, greater destiny, hyper- religiosity, jealous delusions	2 (9%)	7 (44%)	8.74**
79	S	viscosity: cognition and affect	4 (18%)	8 (50%)	2.99 ^v
85	S	paranoid ideation, hypermoralism, hyper- religiosity	8 (36%)	15 (94%)	10.48**

Table 12 (cont.)

Item & Section	Weight ^b	Contents ^c	First Rank CPS N=22	Diagnosis PASCHIZ N=16	χ^2
Examination of Cognitive Functions					
95	H	poor sentence repetition (dysmnnesia)	16 (73%)	5 (31%)	4.88*
97	H	semantic paraphasia	14 (64%)	4 (25%)	4.11*
98	H	perplexed at memory and language errors	12 (55%)	3 (19%)	3.58 _s
105	H	omissions and confabu- lations on story recall	12 (55%)	3 (19%)	3.58 _s

Table 12 (cont)

^a Neurologists, Psychiatrists, and Neuropsychologists are included together in this analysis.

^b Item weight is defined by the number of expert judges selecting any given item:

0-1 Distractor	=	D
2-3 Soft	=	S
4-6 Hard	=	H

^c The synopses of the items' contents presented in this table represent the author's perception of their diagnostic significance. The actual contents of the items are presented in Appendix A.

∧ = $p < 0.10$

* = $p < 0.05$

** = $p < 0.01$

diagnosis. Since one of the frequencies-expected cell entries necessary to make this contrast was less than five, χ^2 could not be computed, and Fisher's Exact Test was employed to assess the probability of obtaining such an observed difference in the frequency of item selection between the groups. Using this technique statistical significance was demonstrated (F.E.T., $p = 0.007***$). Similarly, whereas 68% of the CPS 1's selected Item 58, in which it was reported that the aforementioned episodes occurred at a regular rate of five per month, only 3 PASCHIZ 1's selected the item yielding a significant difference ($\chi^2 = 7.20**$).

The last four items, all drawn from the Examination of Cognitive Functions, also differentiated the item selection at varying levels of statistical significance, (i.e., $p < 0.05$, $p < 0.10$). It is precisely the absence of more clear-cut differentiation between the CPS 1's and PASCHIZ 1's selection of these items which is so dramatic. Items 95, 97, 98, and 105 were all selected by at least four out of six expert judges as being indicative of the presence of CPS. Their contents portray a variety of memory and language deficits characteristic of dominant, temporal-lobe damage. The rates of selection of these items varies from 55% of the CPS 1 group to a high of 73%. Given these four items' status as hard-signs of CPS as defined by expert judgment, their rates of selection by the CPS 1 group are a bit low. What is somewhat more surprising is the frequency with which these hard-signs of CPS were selected by PASCHIZ 1's as being indicative of paranoid schizophrenia. These two trends converge to produce the rather slight separation between groups on these items.

On every item which the PASCHIZ 1's selected with significantly

greater frequency than the CPS 1's, it can be noted that the item was rated as a soft-sign, i.e., that it was selected by only two or three expert judges. The contents of each of these items involve some aspect of paranoid ideation, and each was selected with high frequency by the PASCHIZ 1 group, often surpassing 80%. It would appear that the process which occurred was one in which paranoid ideation was noted by the PASCHIZ 1's and was given sufficient weight to offset the competing information regarding either the presence of, or if presence was noted, the significance of CPS signs and symptoms contained elsewhere in the protocol. The end result appears as a "set" toward functional diagnosis.

Inspection of Table 12 indicates that those participants who successfully recognized CPS tended to base their diagnosis upon a more diverse base of historical and clinical data than did the PASCHIZ 1 group. Specifically, the CPS 1's selected an encephalopathic event from the Medical History; they noted not only the morphology but the episodicity and stereotypy in an informant's description of seizures occurring in childhood. Lastly, the CPS 1's noted selective intellectual impairment in current examination findings.

The results presented in Table 12 provide some insight into the question of identifying the actual phenomena which clinicians utilized as discriminanda in identifying CPS and those which they incorrectly evaluated as signs and symptoms of PASCHIZ. It is also of considerable interest to study the question of the degree of congruence of those items which were utilized by the participants with those selected by the expert judges. In other words, the question

becomes "Are the participants using the cues which the expert judges say they should be using?" As noted earlier, out of 105 items, 14 were selected by at least four of the six expert judges as being indicative of CPS; operationally defining a set of hard-signs. Table 13 presents these hard-signs and notes the frequency with which these signs were selected by the participants as being indicative of CPS and of PASCHIZ.

Noteworthy is the fact that of the 14 hard-signs, only six hard-sign items differentiated the item selection of CPS 1 and PASCHIZ 1 participants. In other words, the overall concordance of item selection of the judges and participants is relatively low. The patterning of item selection is also of interest. Those hard-signs which contributed most heavily to accurate recognition of CPS involved the recognition of the childhood partial seizure episodes, items 57 and 58, and current selective cognitive deficit as depicted in items 95, 97, 98, and 105. Of the hard-signs, those which failed to differentiate the item selection of accurate vs inaccurate participants (CPS 1 vs PASCHIZ 1) the item content often involved elements of "epileptic personality traits," i.e., items 19, 51, 61, and 80. This cluster of traits elicited consensus from the judges but not from the participants with regard to their value as indicators of the presence of CPS.

Most striking is the failure of item 86 to differentiate the item selection of the accurate vs inaccurate diagnosticians among the participants. Item 86 describes the Patient's experience of a CPS episode vividly. In spite of the fact that all but one of the CPS 1's selected the item as indicative of CPS, 88% of the partici-

Table 13

Frequency of Selection of Hard-Signs of CPS by Participants
 Assigning CPS vs PASCHIZ as First-Rank Diagnosis on the CPS Case

	CPS 1's	PASCHIZ 1's	χ^2
CPS Hard-Sign	N = 22	N = 16	
Item Number			
and Contents	f %	f %	
19			
hyper-religiosity, hyper-moralism, hyposexuality	6 (27)	8 (50)	NS
51			
poor school grades, even with studying	5 (23)	4 (25)	NS
57			
mother's description of partial seizure in childhood	21 (96)	7 (44)	FET, p = .007***
58			
above episodes occur five times per month	15 (68)	3 (19)	7.20**

Table 13 (cont.)

61				
temper outbursts; killed				
hamster at school	10	(46)	9	(56) NS
80				
intense moments of uncanny				
feelings believed by Pt to				
be of Divine origin	11	(50)	12	(75) NS
86				
CPS episode preceded by sleep				
loss, includes rising epigastric				
sensation, positive visual pheno-				
mena, etc., depersonalization,				
followed by sleep	21	(96)	14	(88) NS
95				
failure on sentence repetition				
due to dysmnesia	16	(73)	5	(31) 4.88*
96				
anomia (objects)	15	(28)	6	(38) NS
97				
semantic paraphasia	14	(64)	4	(25) 4.11*

Table 13 (cont.)

	CPS 1's		PASCHIZ 1's		χ^2
CPS Hard-Sign	N = 22		N = 16		
Item Number					
and Contents	f	%	f	%	
98					
perplexed at memory and language difficulties	12	(55)	3	(19)	3.58 ^{ns}
101					
poor paragraph recall after reading (dysmnnesia)	10	(46)	3	(19)	NS
102					
fails serial-sevens (dysmnnesia)	7	(32)	3	(19)	NS
105					
omission and confabula- tion on story recall	12	(55)	3	(19)	3.58 ^{ns}

^{ns} = p<0.10

* = p<0.05

** = p<0.01

*** = p<0.001

pants who diagnosed the case as paranoid schizophrenic used the same item to document the case for their misdiagnosis of the case.

Again, it would appear that once these participants had erected a set toward a functional diagnosis even the most clear-cut epileptic phenomena could be viewed as a functional phenomenon.

CHAPTER V

DISCUSSION

Summary of Findings

The present investigation was conducted in order to assess two basic questions. The first question essentially asks, "Do neurologists, psychiatrists, and neuropsychologists differ in their ability to recognize the presence of CPS in a patient who presents with psychotic symptoms?" The second question involves an assessment of the question of whether or not the recognition of CPS by members of these three professions is differentially effected by various classes of historical and clinical information.

In the present study no significant differences were found to exist between the frequency with which psychiatrists and neurologists raised CPS as a diagnostic hypothesis after reviewing the history and mental status examination findings in a simulated case of a patient with CPS who presented with psychotic symptoms. Neuropsychologists correctly raised CPS as a diagnostic hypothesis, after reviewing the same historical and clinical information, significantly more frequently than either neurologists or psychiatrists. Rates of correct recognition of CPS attained by the three professions were 59%, neurology; 47%, psychiatry, and 87%, neuropsychology, as defined by whether or not the clinicians included CPS, at all, on their lists of diagnostic hypotheses. When the rank of CPS within the arrays of diagnostic hypotheses generated by each group were compared, psychiatry and neurology, again, could not be distinguished from each other. Noteworthy is the fact that of those

neurologists who recognized CPS, all but one listed CPS as their first-rank diagnosis. The variance in ranks seen in the other two professions was greater and suggests that the neurologists were using a different hypothesis generation strategy. Neuropsychology assigned lower ranks to CPS than did psychiatry. This indicated an increased tendency to regard CPS as the most likely of the diagnoses which they were considering. On this measure, neuropsychology and neurology could not be statistically differentiated.

This pattern of the inter-professional differences in diagnostic accuracy was reversed when the three groups offered their diagnostic hypotheses after reading a simulated case of a paranoid schizophrenic patient in whom no neurologic illness was portrayed. On this case, the psychiatrists' and neurologists' performances again could not be statistically distinguished, with only one participant in each of these groups failing to list the criterion diagnosis, paranoid schizophrenia, as their first-rank diagnosis. Twenty-five percent of the neuropsychologists, however, failed to list paranoid schizophrenia as their first-rank diagnosis, substituting instead incorrect, functional diagnoses. On this functional case the levels of performance of neurology and psychiatry both significantly surpassed the neuropsychologists.

Since all three professions reviewed exactly the same case material but achieved different levels of diagnostic accuracy in recognizing CPS, it seemed especially important to identify what information affected the diagnostic accuracy of each group. This question was approached via two different methodologies. The first approach studied the increases in diagnostic accuracy over time as

the three groups of professionals read through the case report.

Significant gains in diagnostic accuracy were noted after the neuropsychologists read the Medical History, the Developmental History, and the Examination of Cognitive Functions. The neurologists' diagnostic accuracy showed significant gains after reading both the Developmental History and Observations of the Patient/Review of Systems. The psychiatrists' only significant increment in diagnostic accuracy followed their reading of the Developmental History. It would appear on the basis of these findings that the neuropsychologists were sensitive to a greater variety of signs, symptoms, and antecedents of CPS than were either of the two medically-trained disciplines. The neuropsychologists as a group made use of a wider variety of sources and types of historical and clinical information in their diagnostic decision-making processes. The differential impact of this variegated information set upon the neuropsychologists' diagnostic decision-making appears to account for their relative superiority in recognizing CPS in a psychotic patient.

These conclusions are supported by a second, and corollary, methodology which analyzed the individual items which members of the three professions selected after offering their final diagnostic hypotheses at the end of the case. With the exception of one item, the only items which showed differential selection by the three disciplines were those which were selected significantly more frequently by neuropsychologists. The content of these items depicted three basic types of signs and symptoms. One type of sign which was noted with significantly greater frequency by the neuropsychologists, not surprisingly, were signs of selective impairment of cur-

rent memory and language functions which appeared in the Examination of Cognitive Functions. The second cluster of items selected most frequently by the neuropsychologists presented the patient's history of learning disability and associated school adjustment and emotional difficulties. The third cluster of items portrayed the patient's episodic rage reactions and his fears of rage dyscontrol. The neuropsychologists' selection of the rage dyscontrol item is especially interesting since the group of psychiatrists who arrived at the correct diagnosis selected one item with significantly greater frequency than either of the other two professions. The one exception was an item selected by the psychiatrists which depicted depressive affect and ideation and a general deepening of emotions. Paralleling this observation is that of those participants who misdiagnosed the CPS case, all five who assigned the case a diagnosis of primary affective disorder were psychiatrists. This suggests that psychiatrists, as a group, may show an increased sensitivity to depressive symptoms and/or assign greater weight to this class of symptoms in their diagnostic decision-making process.

In summary, the neuropsychologists selected a sub-set of items from the report which, again, and using both a different task and method of analysis, differentiated their performance from those of the two medically-trained disciplines. This sub-set of items was drawn from several sections of the report and included affective and psychosocial data in addition to cognitive parameters. The neuropsychologists again demonstrated the use of a larger and more diverse information set than was used by the neurologists and psychiatrists in their decision-making processes. The findings derived

from post-facto item analysis paralleled those which were derived from analysis of the growth of diagnostic hypotheses over time as the participants worked their way through the case.

A final analysis was carried out in order to differentiate those clinicians, irrespective of type of professional training, who correctly assigned CPS as first-rank diagnosis on the CPS Case as opposed to those who diagnosed the case paranoid schizophrenia. A total of 16 items differentiated the groups' performances. Those clinicians who correctly diagnosed the case tended to document their diagnosis by checking those items which portrayed reports of actual seizure episodes. They noted seizures occurring before age two and at age 11 as were reported in Medical History and Developmental History sections. Another cluster of items which reported signs of selective impairment of memory and language, as reported in the Examination of Cognitive Functions section, were selected significantly more frequently by the accurate diagnosticians in documenting the basis of their diagnosis. These clinicians were able to identify the signs and symptoms of the ictal events irrespective of the data source, e.g., mother's observations, patient's phenomenologic reports. Similarly, they noted the correct significance of examination findings suggestive of focal cortical dysfunctions, thereby demonstrating the use of a third class of source-of-information.

Interesting findings emerged when items portraying personality traits which have been presented in the literature as being closely correlated with the presence of CPS, i.e., "epileptic personality traits" (Bear & Fedio, 1977). The expert judges often cited items depicting traits such as hyper-religiosity, hypermoralism, viscos-

ity, suspiciousness, and a sense of greater destiny, as factors in their arriving at the CPS diagnosis, but only one item depicting elements of that constellation ever received a full majority of votes by the expert judges. The same items were, however, often used by participants who incorrectly diagnosed the CPS Case as paranoid schizophrenic as documentation for their misdiagnosis of the case.

It would appear that those diagnosticians who successfully recognized CPS, like the expert judges, accorded less weight to personality characteristics and to inter-ictal psychopathologic symptoms. The successful diagnosticians seemed to give greater weight to phenomena which are more unequivocally associated with CPS and/or temporal-lobe disease. The principal phenomena utilized by this group included encephalopathic events, ictal phenomena, and signs of selective cognitive impairment. The participants who selected the most frequent misdiagnosis for the case selected items which indicated that they based their diagnosis most heavily upon inter-ictal personality and psychopathologic symptoms. Interestingly, once this group had fallen into a set toward the functional diagnosis they seemed to inattend some items which portrayed more unequivocal signs of CPS/temporal-lobe disease, especially the findings of impaired memory and language and early febrile convulsions. They used other items which were clearly indicative of CPS in order to document their functional diagnosis. Members of this group, once they had recorded their functional diagnosis actually re-read the patient's description of a full-blown complex-partial seizure and cited the items as supporting their diagnosis of paranoid schizophrenia. Ap-

parently, once members of this group had arrived at a set toward functional diagnosis based upon their early interpretations of the patient's inter-ictal personality traits, even the seizures themselves were interpreted as schizophrenic hallucinatory phenomena by about 88% of the participants who diagnosed the CPS Case as paranoid schizophrenia.

Limitations of the Study

In considering the significance of the findings of this study it is imperative to bear in mind that the diagnostic process in general (Raskin, 1977), and the differential diagnosis of CPS specifically (Detre & Jarecki, 1962; Glaser, 1975; Gastaut, 1970) includes a broader span of data bases and methods of hypothesis testing than those which were addressed in the present study. Specifically, the diagnostic process includes not only the clinician's collection and analysis of the history, observation of the patient and mental status examination findings. It is, however, at this point that provisional diagnostic hypotheses must be raised and are actively tested in specialty examinations such as the neurologic examination, neuropsychologic psychometric studies, and psychiatric consultation (Gastaut, 1970). Similarly, concurrent with or following these specialty examinations, special diagnostic procedures such as electrodiagnostic and radiologic tests are deployed as are laboratory studies. Lastly, response to treatment and observation of clinical course over time all constitute basic parameters of the diagnostic process in general (Raskin, 1977) and specifically of CPS (Detre & Jarecki, 1967; Ervin, 1967; Monroe, 1970).

The present study attempts to study only the generation of provisional diagnostic hypotheses at the stage of inquiry at which the clinician possesses the history and mental status findings alone. The findings of inter-professional differences in both the frequency with which CPS was raised as a diagnostic hypothesis, and the clinicians' perception of the likelihood of CPS's presence, pertain to the diagnostic process as a whole only to the degree to which referral for further studies and the interpretation of their results are actually affected by the working diagnostic hypotheses of the clinician following reading of history and mental status examination findings. It is the assumption of the present writer, however, that a clinician who early in the diagnostic process has formulated the correct provisional diagnostic hypothesis will be more likely to elicit and request contributory diagnostic information and will ask more correct and specific questions of that information than will the clinician who has started out with an incorrect provisional hypothesis. These explicit assumptions set the limits to which the findings of intergroup differences in the recognition of CPS on the basis of history and mental status pertain to the diagnostic process as a whole.

Similarly, since data pertaining to case management were collected, though not reported in the present study, no implications regarding differential abilities of the three professions in the processes of case management or treatment beyond the expressed opinion of the writer can be inferred on the basis of the present study's findings.

Apropos of management issues, it should be noted that the task

which the participants performed in the present study involved their listing and rank-ordering of the most likely diagnoses for this case. This task would seem to imply that a single correct diagnosis adequately describes the case. Both the opinion of the writer and the responses of the expert judges to questions pertaining to their management strategies for the case suggest that at least five specific diagnostic and assessment issues were necessary to facilitate proper management of this case. These issues involved (1) the determination of the presence of the seizure disorder itself, as well as (2) identifying the etiology of the seizures. Similarly, assessments of both the nature and severity of (3) the patient's psychosis and (4) selective intellectual impairment were deemed essential to the management process, as was (5) an assessment of family pathology.

It is evident that if the present study were to have emphasized the issue of completeness of diagnostic formulation rather than simply assessing the clinician's awareness of the presence of epilepsy, multi-axial findings pertaining to diagnostic accuracy would have carried wider implications for the management process. The present study takes as its exclusive focus the recognition of epilepsy and the identification of those information sources which lead clinicians of three types of professional training to the recognition of epilepsy's presence.

If one is to place the findings of the present study into the context of the entire domain of inquiry pertaining to studies of diagnostic accuracy, it is important to recall the distinctions which have been drawn between diagnostic errors which occur as the result of inadequate or incomplete information ("informational

errors") versus those which are attributable to the clinician's arriving at an incorrect diagnostic decision due to mis-evaluation of information which is present ("criterion errors") (Raskin, 1977; Spitzer, 1979). In the present study informational errors were controlled by presenting all three professions with the same historical and clinical data. The adequacy of the data base was assessed empirically in that it was found to be sufficient to elicit the same diagnosis from six expert judges. Although inter-professional differences were noted in the current study with respect both to diagnostic accuracy as well as with respect to the information sources which were used by the three professions, the results of this study carry no implications for assessing the completeness or relevance of the informational bases which would have been collected by the participants as they actually function, using their own *modus operandi*.

The selection of the participants in the current study limits the degree to which the study's findings can be generalized to psychiatrists, neurologists, and neuropsychologists as groups. First it should be noted that all of the participants' level of experience was limited since the inclusion criteria specified that they be recent graduates. The performance of more experienced clinicians may not be inferred from the findings of the present study but represents an issue worthy of future investigation. Secondly, it should be noted that although the participants' length of time in the practice of their respective fields was limited, all of the medically-trained participants were graduates of residency training programs in which distinguished faculty in the areas of behavioral neurology, biological psychiatry, and clinical neuropsychology hold chairs.

The neuropsychologists were all trained by highly respected practitioners in clinical neuropsychology. The participants, therefore, probably represent "the cream of the crop" with respect to the quality of their training. Their performances may not, therefore, be representative of the graduates of the other programs. Lastly, it must be noted that almost all of the participants in the two medically-trained groups took their residency training in the Northeastern United States and regional bias must be acknowledged as a limitation of the degree to which the findings of the present study can be generalized nationally.

The author also wishes to explicitly acknowledge that the observed inter-professional differences in both diagnostic accuracy and in information-utilization are specific to the recognition of complex-partial seizure disorders. The observed differences cannot be presumed to exist for all organic brain syndromes. The results of the study do suggest that the methodology which was employed represents a promising paradigm for use in the empirical study of other differential diagnoses, e.g., dementia vs depression, "MBD" vs character disorders, etc.

Clinical Implications

Given the nature of the psychopathology manifested in the CPS case used in the study it is most likely that his point of entry into the health care system would have been via psychiatry. The frequency with which CPS was raised as a diagnostic hypothesis by the psychiatrists as a group was low, with over half of the group failing to even raise the hypothesis at all. An additional subgroup

of psychiatrists raised the hypothesis but felt that a functional etiology was more likely after their review of the history and mental status. As the writer has speculated, this phenomenon would probably result in inappropriately low rates of referral for those special diagnostic procedures necessary to identify the presence of the CPS and/or its etiology.

Given the fact that the neurologists, as a group, did not differ significantly in their recognition of the CPS in this psychotic patient, and their failure to misdiagnose the psychosis as being functional in etiology significantly less frequently than did the psychiatrists, one would have to assume that the neurologists would also not pursue special diagnostic procedures vigorously, even had the patient been referred for neurologic consultation. It is difficult to imagine, however, the psychiatrists' not raising the CPS hypothesis but referring to neurology in spite of the functional provisional hypothesis. This being the case, clinical judgment on the basis of the history and mental status would not seem to represent an adequate basis for ensuring a sufficiently comprehensive neurological evaluation for the patient. The existence of this situation would seem to suggest that routine neurologic evaluation of psychotic patients, including the use of non-invasive special diagnostic procedures is indicated. This appears true even in cases in which the judgments of both the psychiatrist and neurologist have arrived at a functional etiology in their provisional diagnosis.

The cost effectiveness of this strategy can certainly be argued, but if this argument is made it should be noted that the procedures necessary to identify CPS and possibly its etiology as well are sen-

sitive to a wider spectrum of neurologic illnesses than CPS alone. The findings of the present study provide strong support for the position advocated by Hall, et al. (1980) in which a broad-banded, first-sweep study is made upon admission to psychiatric facilities. The fundamental tenet of the medical model which embraces the position of relying upon the psychiatrist's judgment, based upon history and mental status examination, in determining the need for neurologic consultation would appear to result in an excessive number of false-negative diagnoses. That model may be more suitable for more experienced clinicians, but the findings of the present study suggest the need for external supports for clinical judgement in the diagnostic process early in the careers of psychiatrists and neurologists.

It would appear that a neuropsychologically-trained clinician has a strong contribution to make in the recognition of CPS in psychiatric patients. Utilization of neuropsychological consultation only upon referral by neurologists or psychiatrists based upon their clinical judgement following review of historical and mental status data does not appear to be an effective strategy for ensuring neuropsychological consultation for CPS patients. The findings of the present study indicate that neuropsychological consultation at the intake stage, with the neuropsychologist reviewing the findings of the Medical History, Developmental History, and preliminary mental status data should yield significantly higher rates of true-positive CPS case identifications than in the situation in which the psychiatrist and/or neurologist examine this data base without presenting it to the neuropsychologist. Thus, the practice of referral for

"testing" rather than for consultation, appears wasteful. Similarly, waiting to refer to neuropsychology until equivocal results occur may be risking a falsenegative diagnosis unnecessarily, since the correct provisional hypothesis may not have been raised by either the psychiatrist or neurologist.

The results of the present study argue strongly for the utilization of a diagnostic team approach and one in which neuropsychological consultation is sought at the intake phase. These findings suggest that the neuropsychologists' provisional diagnostic hypotheses should constitute a major factor in the decision-making process regarding the need to rule out CPS.

The results of the present study have two clear-cut implications for neurologists when consulting on cases which present with psychotic symptoms. Firstly, it is imperative that the neurologist attempt to remain cognizant of a tendency toward false-negative diagnosis of CPS when the patient presents with psychotic symptoms and to proceed with his examination and possibly even with non-invasive special diagnostic procedures when possible, in spite of an initial, provisional, functional diagnostic hypothesis. Secondly, the results of the present study indicate that neither psychiatrists or neuropsychologists as groups derived as much diagnostic information from the Review of Systems as the neurologists. Consequently, conducting as detailed a review of systems as is possible, given the patient's ability to participate, will provide an information source to the data pool collected by the diagnostic team which might otherwise not have been given sufficient emphasis.

Epidemiologic Implications

Given the frequency with which CPS was not raised as a diagnostic hypothesis when the illness was, indeed, present, epidemiologic estimates of the prevalence of CPS must be questioned as being spuriously low. On the basis of the present study's findings it would appear that almost half of CPS cases which present with psychotic symptoms and in the absence of generalized convulsions are at risk for false-negative diagnosis. Secondly, given the initial failure to raise CPS as a diagnostic hypothesis, one could speculate that this phenomenon reduces the probability that these cases would be referred for those examination and special diagnostic procedures necessary to correct the initial error in clinical judgment. The resultant effect would be the case's failure to be included in epidemiologic researchers' studies of the prevalence of the disorder.

Assuming that spuriously low prevalence rates are reported in the literature, the consequences extend beyond the academic sphere. If clinicians assume a spuriously low prevalence rate for a given disorder, it would seem reasonable to speculate that they will be less likely to make that diagnosis even when the disorder is present. This would tend to perpetuate the tendency toward under-diagnosis of the disorder in question. Secondly, since one of the functions of differential diagnosis and epidemiologic studies is to determine the need for funding of specialized treatment facilities (Kurland, et al., 1973; Redlich & Freedman, 1966), spuriously low estimates of the prevalence of CPS should contribute to a disproportionately low fiscal allocation for the diagnosis and treatment of the disorder.

Didactic and Curricular Implications

The diversity of information sources which were utilized by the three professions in the manner in which they recognized the presence of CPS argues for a team-teaching approach and inter-disciplinary curriculum on epilepsy which integrates the approaches to diagnosis and management of all three fields. This course could be offered as part of either or both psychiatry and neurology residency training programs. Its contents should emphasize not only the clinical phenomena associated with ictal events, but should also emphasize interictal cognition and personality/psychopathologic characteristics as well. Developmental manifestations of seizure disorders and the differential diagnosis of epileptic phenomena and associated pathology from functional disorders should be emphasized.

The relatively poor performance by the neuropsychologists on the PASCHIZ Case strongly suggests the need for additional familiarity with functional psychiatric disorders. Neuropsychological training should probably be expanded to include contact with patients with functional disorders as well as those with organic brain syndromes. Similarly, specific training in the use of DSM III taxonomy is indicated.

Historically, the history and mental status examination, especially with respect to non-cognitive parameters, have received little attention in clinical neuropsychological training. Currently no thorough and systematic guide to the area of history taking or symptom elicitation has been published and formal course work in this area is virtually non-existent. The attention which has been given to trainees' competence in the administration and interpreta-

tion of psychometric tests has not been paralleled in training neuropsychologists in history taking, symptom elicitation, and the interpretation of these findings (Siegal, et al., Note 5). The present study demonstrated the ability of neuropsychologists to identify the presence of CPS based upon historical as well as cognitive data (and without psychometric indices) at levels which compared favorably with those of neurologists and which surpassed those of psychiatrists. These findings indicate a clear need within the health care delivery system for improved methods of detection of CPS cases and also indicate that neuropsychologists can make a solid contribution in this area. It would follow that the collection and utilization of historical data be formalized as course offerings within clinical neuropsychology training programs in order to ensure that the profession maintains these skills. In light of the International Neuropsychological Society's Task Force on Training and Accreditation's (1982) recommendation that the ability to collect and interpret historical information be identified as a core area of skills to be possessed by practitioners in the field, both formal course offerings and the development of a systematic technology, in the form of texts and manuals, for the teaching of these skills deserves development.

In conclusion, it should be emphasized that the issues raised in the present study regarding clinicians' abilities to recognize CPS in psychotic patients are principally of interest in enhancing our knowledge of the early stages of the process of differential diagnosis. The entire process of differential diagnosis is of value to the degree to which it facilitates the development and implementa-

tion of specific management and treatment techniques. Much of the discussion thus far of the significance of the relationship between clinicians' abilities to recognize CPS and the subsequent stages of the process of differential diagnosis, including the management of the patient through the diagnostic process, referral patterns utilized, information requested, and the prescription of a treatment plan, have been based upon the author's clinical experience and speculations based thereon. Each of these stages in management, as it is affected by the initial recognition of CPS, constitutes a critical area of study in and of itself and each stage and their interrelations require empirical study. Only in this manner can we, as clinicians, begin to fathom the often-puzzling logic of our own clinical decision-making processes and those of our colleagues. The need for both these studies as well as humility on our parts as we find ways of enhancing our interventions on behalf of this most fascinating and perplexing group of patients is implied.

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Appendix A

The CPS Case, The Case of David

CASE CONSULTATION REPORT

IDENTIFYING DATA

1. _____ David is a 34 year old, Jewish male.
2. _____ He currently is unemployed although he has worked as a jewelry designer in the past and holds a high-school degree in that field from a vocational high school in New York.
3. _____ Patient(Pt) lives in New York with his wife and three sons.
4. _____ He was referred for psychiatric consultation by Ms. Pauline Aronowitz, a social worker at Jewish Family Services(JFS).

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK THE OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

REFERRAL ISSUE

5. _____ Pt was referred for psychiatric consultation on an emergency basis by Ms. Aronowitz after Pt had been seen for an intake interview at Jewish Family Services.
6. _____ He had been brought to J.F.S. by his wife and rabbi, both of whom had expressed concerns about the patient and had finally coaxed him to come to J.F.S. to obtain an independent opinion regarding the necessity for psychiatric treatment after a vitriolic argument had developed between Pt and his next door neighbor
7. _____ whom Pt had approached to reprimand for failing to attend Sabbath services two weeks prior to their argument that morning.
8. _____ Both the rabbi and Pt's wife contended that they felt that Pt required immediate psychiatric attention in spite of Pt's protestations to the contrary.
9. _____ After weeks of discussion, Pt agreed to seek an independent opinion in the hope that his wife and rabbi would "take what I have to say seriously and stop telling me that I'm crazy."

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

PRESENTING COMPLAINT

10. _____ Pt complained that he felt misunderstood and betrayed by both his wife and by his rabbi, neither of whom would believe that he had been "chosen by G-d as a prophet to remind Jews of the Covenant which they had made with G-d and to help them to see their ways to a purer life and to live in accordance with Talmudic law."
11. _____ He stated that he felt that his rabbi "was against" Pt in his efforts to upgrade standards of religious observance and felt that the rabbi was colluding with Reformed Judaic organizations and was unduly influenced by Pt's father and his financial contributions to the synagogue.
12. _____ Pt explained that his wife's weak spirit and sexual promiscuity had made her "leave my side at the time that I needed her devotion more than ever and has turned my sons against their father."

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

HISTORY OF THE PRESENTING ILLNESS

13. _____ Prior to the intake interview at J.F.S. Pt's wife and Rabbi Gendleman had met with Ms. Aronowitz and provided historical information. Pt's wife had known Pt since the time they were 15 years old and the rabbi had known Pt and his family since several years prior to Pt's birth.
14. _____ Pt's wife reported that he had become increasingly irritable and short tempered about eighteen months ago after he had been promoted to a new position within his family's jewelry manufacturing business.
15. _____ Pt's father had presented Pt with an ultimatum that David, in order to remain in the family business, would have to assume a position which had become vacant after the retirement of his uncle who had been responsible for the majority of managerial and book-keeping functions within the firm. Since the promotion included a fifteen thousand dollar a year raise in salary, Pt's wife encouraged him to accept the position in spite of his protestations that he was happy working as a designer and did not wish additional responsibilities.
16. _____ She reported that within weeks of his accepting the new position, they argued frequently, he became more critical and short tempered with both her and with their children.
17. _____ Pt's wife explained that David had always been an "immaculate man, a beautiful dresser, and a perfectionist, but then he got 'crazy clean'...inspecting the dishes in the cabinets" making sure that meat and milk dishes were kept separate and that all requirements of the kosher kitchen had been met. Over the past year, he often accused his wife of "intentionally making mistakes" in observances of kosher.
18. _____ At that time, he began to consult the rabbi of the conservative congregation which they had joined several years after their marriage. Arguments developed between David and the rabbi, whom David felt was not sufficiently "observant, pious, or wise" and they rejoined the Orthodox congregation of which David and his family had been members during his childhood and adolescence.

19. _____ After joining this congregation, Pt insisted that he and his wife practice various sexual abstinence rules which were far more stringent than those which were dictated by Orthodoxy, often having sex less than once a month.
20. _____ When Pt's wife would approach Pt for sex, he would become enraged and berate her for her weakness and impurity. Finally, in desperation, she suggested that they together consult the rabbi for his opinion.
21. _____ After a month of discussion, Pt agreed to consult the rabbi who at that time explained that "David's piety was more than G-d ever wanted from any man" and that he "should enjoy his wife" and to "leave the law up to G-d."
22. _____ The rabbi continued to meet with Pt several times and then suggested that the couple seek professional assistance at J.F.S.
23. _____ Pt became irrate and several times during the following months became so furious that each time he recalled the conversation, he would try to calm down with a glass of wine. After sitting in his chair for almost an hour in what his wife described as a "slow burn," he would throw the glass against the wall, go to his bed, cry briefly and would then take a nap.
24. _____ Several months later, he began to angrily accuse his wife of having extra-marital affairs and would often become depressed for days, ruminating over these thoughts from which she could not dissuade him.
25. _____ Tensions between Pt and his father, who was serving as president of the firm, had developed within a month of his promotion. Pt felt that his father was constantly critical of Pt's work and eventually confided to his wife that he felt that his father promoted him in order to watch him fail.
26. _____ A year ago, after accusing his father of attempting to discredit him during a heated argument he resigned from the firm and severed all communications with him, forbidding his wife and sons from seeing the father as well.

27. _____ Following his resignation, he began the process of setting up a design studio in the basement of his home in which he could design and produce original jewelry pieces.
28. _____ His wife reported that Pt had never completed setting up the studio due to his inability to make final decisions regarding any equipment other than a lathe.
29. _____ He would often sit at the lathe for hours,
30. _____ polishing pieces which he had made several years earlier and rearranging the polished pieces in sample cases.
31. _____ He refused to go out of the house to sell his pieces which he simply rearranged in their cases.
32. _____ About eight months ago, Pt told his wife that while working at his lathe he had had a mystical religious experience in which G-d had come to him and told Pt that he had been "chosen" as a prophet and had been given a mission.
33. _____ Within several weeks Pt had begun the first of a series of visits to neighbors' homes advising them to seek atonement for their transgressions.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

MEDICAL HISTORY

34. _____ Medical history was provided by Pt's wife during a telephone interview which was held on the day preceding Pt's intake interview. Pt's wife had consulted Pt's family physician, who had treated Pt since childhood, in order to collect the requested information.
35. _____ Pt was hospitalized at Memgrial Hospital at age 15 months with a fever of 105° which was accompanied by a series of three febrile convulsions.
36. _____ Tonsilectomy was performed at age 5, also at Memorial Hospital.
37. _____ Clinically significant head trauma was denied and neurologic illness was reported to be absent from Pt's personal medical history.
38. _____ Serous otitis media recurred between the ages of three to seven several times.
39. _____ The "usual childhood diseases" were noted to have been present. Pt is reported to be allergic to penicillin.
40. _____ No neurologic consultations were reported.
41. _____ Pt's wife reported that he had seen a psychiatrist two years previously, whose advertisement for sex surrogate therapy was seen by Pt in the Village Voice newspaper while she was on vacation in Florida with her children.
42. _____ She explained that Pt had seen this psychiatrist for two office visits during which it was suggested to Pt that he and a surrogate attend an "on-premise swingers club" in order to get Pt "loosened up." Pt decided that this was not a good idea and discontinued treatment.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

DEVELOPMENTAL HISTORY

43. _____ Developmental history was elicited during a telephone interview with Pt's mother who was contacted through Pt's wife following the intake interview.
44. _____ Pt was a primipara; mother's age at the time of this pregnancy was 21 years with mother denying the use of any medications, tobacco or alcohol during the pregnancy. No illnesses, injuries or medical treatment other than prenatal monitoring by her obstetrician were reported.
45. _____ Pt was the product of a full term pregnancy, weighed 7 pounds and a normal delivery was reported to have followed labor which lasted about twelve hours. No Apgar rating was available but no cyanosis was noted nor was mechanical assistance in breathing required.
46. _____ Mother reported that Pt ate and slept well throughout the first year of life and was described as a "lovable, cuddly baby who was handsome from day one." Pt reportedly sat at 4 months, crawled at 9 months, and walked two days prior to his first birthday according to the mother's baby book.
47. _____ Pt did not speak until two and used full sentences by his fourth year.
48. _____ Throughout childhood Pt was of average height and weight and was described as a bright and active child who, although a bit shy, made friends easily.
49. _____ He loved to paint and draw and from the time he entered school he won the praise of his teachers for his artistic abilities. His favorite pasttime was making copies of pictures from books and magazines and the walls of his and his friends' rooms were typically covered with Pt's latest drawings of cars and baseball players.
50. _____ His mother stated that Pt was very embarrassed over nocturnal enuresis which persisted until his eleventh year and he would often walk in his sleep or awaken suddenly from sleep screaming. Consequently, Pt avoided sleeping over at friends' houses or having houseguests but otherwise got along well with his friends.

51. _____ Academic work was consistently difficult for Pt who was always a slow reader and seldom did well on tests even after studying for long periods of time which his father regulated.
52. _____ Pt's teachers had informed the mother that he often failed to follow instructions and turned in homework assignments which were only partially related to the assignment given.
53. _____ Following a series of parent conferences, Pt's father began to routinely check Pt's homework prior to its' being handed in. Frequent arguments developed between father and son over school. Pt complained that he hated school and enjoyed only art and shop classes.
54. _____ He often expressed his wish to stay at home and had frequent stomachaches on school mornings. He was gotten off to school only by his mother's reminding him that he would miss art classes and that his art teacher would be disappointed by his absence.
55. _____ After school Pt typically returned home, played ball with his friends, joined the family for dinner, drew for an hour and began his homework.
56. _____ Beginning in Pt's sixth grade year a noticeable change in his behavior occurred.
57. _____ Often, while having his homework critized in the late evening by his father, Pt would blanch, hold his stomach and stare blankly for periods of about fifteen to thirty seconds, he would then vomit which infuriated his father. Pt's father insisted that Pt was just trying to get out of correcting his work and would become even more infuriated when Pt sat motionless and stared refusing to talk with him after vomiting. At this point, father would lead Pt to his room by the hand and instructed him to remain there until he was ready to act like a man and talk with him.
58. _____ These episodes occurred as often as five times a month.

59. _____ Mother typically cried and pleaded with father to stop tormenting Pt and insisted that the child must be sick.
60. _____ She secretly took Pt to the family doctor and subsequently to a pediatrician, both of whom examined Pt and stated that his vomiting was "just nerves" and that Pt would "outgrow it."
61. _____ Temper outbursts at school were noted on several occasions and during an outburst Pt killed a hamster which was kept at school in the biology lab. Pt often tore up many of his drawings in the privacy of his room.
62. _____ Pt's behavior improved considerably upon his enrollment in the technical and vocational high school in which he excelled in graphic design, shop, and jewelry design.
63. _____ At age 15 he met the woman whom he subsequently married at 19 and he enjoyed taking her to school dances, proms, and social activities. As his grades improved, his relationship with his father did as well, although occasional disagreements arose over Pt's expressed wish to become a designer rather than a businessman.
64. _____ Only infrequently did these arguments precipitate noticeable reactions in Pt and his temper outbursts at school virtually disappeared.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

SOCIAL HISTORY

65. _____ Pt's father, a German Jew, who had lived in New York since his teens and was a successful jewelry manufacturer by his early twenties, was 37 at the time of Pt's birth. His current marriage was his second and followed the death of his first wife several years earlier. His current wife was, at the time of their marriage, the nineteen year old niece of a French Jew who had recently brought his entire family and niece to New York and was supporting them by working as a salesman in Pt's father's firm. Pt's mother was 21 at the time of Pt's birth and subsequently had two daughters.
66. _____ Pt has two younger sisters: Barbara is two years his junior and Evelyn is five years younger. Both attended New York University and were excellent students, studied piano and voice and subsequently moved to suburban communities in Westchester County after marrying attorneys within a year of graduation. Throughout their childhood and adolescence, they "adored" their older brother, according to the reports of Pt's mother, who stated that both girls probably still had every painting and piece of jewelry which Pt had ever made for them.
67. _____ Pt married his wife Else when they were both 19 years old.
68. _____ Pt had worked as a designer in his family business for two years following his graduation from Technical & Vocational High School prior to their marriage; she had majored in sociology at City College but discontinued her studies after becoming pregnant about a year following their marriage. She subsequently divided her time between caring for her three sons, aged 13, 11 and 10, and doing volunteer work.
69. _____ All three sons were doing well academically and got along well with both parents and each other until Pt began making heavy demands on them to take additional religious training and transferred them to the Orthodox school and congregation which had eventuated in their being separated from their friends at public school. Although they had complied with his wishes, they had begun to avoid their father and were both concerned about, and embarrassed by, his arguments, proselytizing and accusations.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY
DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH
THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK
OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

MENTAL STATUS: OBSERVATIONS & REVIEW OF SYSTEMS

70. _____ Appearance and General Description: Pt was led to the door of the examining room by his wife whose hand he caressed as he silently nodded to her in a gesture of reassurance and self-resignation as he entered the room and greeted the examiner with a soft spoken "Good afternoon, I am David _____," and walked slowly to the chair which had been indicated by the examiner.
71. _____ He sat silently for about fifteen seconds making eye contact with the examiner.
72. _____ He then said quietly, slowly and deliberately, "My wife and rabbi have brought me to you for you to tell me that I'm crazy."
73. _____ The examiner briefly reflected that Pt seemed to be carrying a very heavy burden and that the feeling of being betrayed by his wife and rabbi must have added to his pain at that moment. Pt then burst into tears and held his head in his hands, sobbed visibly, as he placed his elbows on his knees and faced the floor.
74. _____ Pt was dressed in well-ironed designer jeans and a matching, styled light denim shirt on top of which he wore a larger silver Star of David on a heavy ornamental silver chain in which was set several turquoise stones. His almost black hair was worn in a long stylish cut and his beard was trimmed impeccably. Several heavy silver and turquoise bracelets with various Hebrew inscriptions encircled both of his wrists.
75. _____ Mood: He looked up after about a minute and apologized for losing control.
76. _____ He stated that this was the saddest time of his life; "My wife whom I have always loved has turned against me, poisoned my sons' minds against me, and chosen to live a life of decadence and sin at the time when we could be living in G-d's light." He explained that he blamed only himself.

77. _____ "Once I knew that G-d had chosen me, I had no more choices, my destiny is chosen by Him. I left my wife and prayed that she would follow me but she couldn't possibly understand the forces that are at work now."
78. _____ Later in the interview, Pt reacted angrily to a query regarding how he could be sure that G-d had chosen him to be a prophet and why would G-d chose Pt for this role.
79. _____ He explained repeatedly and with heated anger which neither abated spontaneously nor with reassurances that his experience had been understood.
80. _____ He repeatedly asserted that the sheer intensity of "the moments" and their uncanny quality signified their divine origin.
81. _____ He again apologized for his anger and admitted that he was terrified of losing control in a moment of weakness.
82. _____ He described it as "a rage which only G-d could make a man feel."
83. _____ Thought Content: Pt explained that man was meant to study and to learn G-d's law and to not waste his time in search of money or meaningless beauty and pleasure as Pt had done for the better part of his life prior to his revelations. He repeatedly discussed the details of his various transgressions including an over-emphasis on "hollow sexual desire," moving away from religious observance, and producing "shallow art."
84. _____ He explained that he had withdrawn from his job in order to escape his father's wish to both deflect him from a life of righteousness and to punish him in G-d's behalf for his having done so. Pt stated that he wished to keep his own family safe from these influences and close to the life that G-d had intended for them to live.
85. _____ He repeatedly reiterated the evidence that he had amassed which proved that his wife had been having sexual relations with other men while he was at the synagogue in the morning and he stated that he felt that she and her lovers were ridiculing him for his piety, study, and wish to produce only religious art.

86. _____ Perceptual Experience: Pt described episodes, in response to a query regarding unusual visual experiences, in which he would sit at his lathe polishing a piece of jewelry, usually early in the morning after being so tense as to make him unable to sleep all night. During 'the moments', "The wheel seems to have always been there but I'm not there any more. Then the wheel suddenly looks huge and I get terrified and a sick feeling goes into my stomach and it feels like it (my stomach) is going to come up through my throat. I feel terrified, like I'm dead or going to die and when the feeling goes away, I know that G-d has come to me and he appears to me as small flickering flames all over the room. When it's over I feel like a hundred years have passed and I'm exhausted and go to sleep on the floor of my studio."
87. _____ Vegetative Systems: Pt stated that he awakens early in the morning, often unable to get back to sleep, lost twenty pounds over the last year, and has virtually stopped having sex for religious reasons.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

MENTAL STATUS EXAMINATION: EXAMINATION OF COGNITIVE FUNCTIONS

88. _____ Pt was alert and oriented in all three spheres with no alterations of consciousness noted.
89. _____ Perceptual functions were tested briefly in three modalities: tactile, auditory, and visual, with no extinction of double-simultaneous stimulation being noted in any modality. Pt was able to identify familiar objects and geometric shapes presented visually. Stereognosis and palmar graphognosis were within normal limits. Pt was able to identify familiar sounds such as whistling, humming, and coins jingling.
90. _____ Left-right orientation was within normal limits both on Pt's own body and in external space; no finger agnosia was elicited on either hand.
91. _____ Pt was able to recite the numbers 1-20 as well as the months of the year in both forward and backward sequences. He could spell W-O-R-L-D both forward and backward.
92. _____ Three-step commands were executed with no difficulty, e.g. "Fold the paper in half, put it in your pocket, and hand it back to me." Pt was able to imitate double-alternating hand movements with no difficulty.
93. _____ Pt was noted to be left-handed on all tasks, e.g. writing and drawing. He was able to draw a cross and cube from verbal instruction accurately and with no evidence of constructional dyspraxia.
94. _____ Pt was able to repeat single words and short sentences easily and with no dysarthria.
95. _____ Difficulty in recalling the entire sentence was encountered when Pt was asked to repeat longer sentences (e.g., "The airplane made a careful landing in the space which had been provided for it").
96. _____ Similarly, Pt showed some difficulty in naming objects,
97. _____ e.g. whereas he could name "glasses" upon visual confrontation naming, he called the glass frame "side pieces" and called the examiner's flashlight a "nightlight."

98. _____ He seemed somewhat perplexed and embarrassed during the time (about ten seconds) in which he tried to think of the objects' names.
99. _____ Pt's handwriting was artistic yet was punctuated with occasional spelling errors which were, nonetheless, phonetically reasonable.
100. _____ Pt showed no difficulty in understanding spoken language throughout the interview and followed instructions accurately.
101. _____ He was able to read a paragraph from The New York Times aloud, but had only partial recall of the paragraph.
102. _____ Pt was unable to complete serial sevens, subtracting accurately but losing his place at several points in the series requiring reminders from the examiner.
103. _____ Pt interpreted "People in glass houses shouldn't throw stones as "only the righteous shall judge."
104. _____ Pt recalled six digits forward and five backward and could recall three unrelated words, "rose," "battleship," teacup," after a five minute delay.
105. _____ Two omissions of highly relevant information were noted in Pt's attempt to recall a short story and one character's name was confabulated.

PLEASE LIST THOSE DIAGNOSES WHICH SEEM MOST PROBABLE ON THE BASIS OF ALL OF THE INFORMATION WHICH YOU HAVE READ SO FAR IN THIS CASE REPORT.

Diagnosis of Choice 1. _____ () 6. _____ ()
 2. _____ () 7. _____ ()
 3. _____ () 8. _____ ()
 4. _____ () 8. _____ ()
 5. _____ () 10. _____ ()

PLEASE RATE EACH DIAGNOSTIC HYPOTHESIS WHICH YOU LISTED IMMEDIATELY ABOVE FROM ONE TO THREE.

1 = I AM CERTAIN THAT THIS DIAGNOSIS IS CORRECT.

2 = THIS DIAGNOSIS IS PROBABLY CORRECT.

3 = THIS DIAGNOSIS MUST BE CONSIDERED BUT WOULD PROBABLY BE RULED OUT IN TIME.

 PLEASE TURN TO THE NEXT PAGE FOR FOLLOWING QUESTION

QUERY FOR CLINICIANS' OBSERVATIONS

On the previous question you arrived at a final diagnosis which you indicated was the most likely diagnosis for this case.

We are now interested in learning what features of the case led you to your final diagnosis.

Please go back to the beginning of the case consultation report and place a check mark (✓) next to the number of any passage which you feel supports the diagnosis which you selected as your first choice.

If any statements, in your opinion, lends particularly strong support to your diagnosis, please place two check marks (✓✓) next to the number of that passage.

ADDITIONAL DIAGNOSTIC INFORMATION REQUIRED:

AFTER HAVING REVIEWED THE MATERIAL IN THIS CASE REPORT, WHAT ADDITIONAL INFORMATION WOULD YOU EITHER REQUEST OR ATTEMPT TO ELICIT IN THE DIFFERENTIAL DIAGNOSIS AND CLINICAL ASSESSMENT OF THIS CASE?

PLEASE LIST THE INFORMATION WHICH YOU WOULD REQUIRE IN THE ORDER IN WHICH THE DATA SHOULD BE COLLECTED.

CASE MANAGEMENT

THE FOLLOWING QUESTIONS PERTAIN TO THE MANAGEMENT OF THE PATIENT
WHOSE CASE YOU JUST REVIEWED.

- 1) Should this case be referred to a clinical neuropsychologist?

Yes _____ No _____

If so, what referral issues should be addressed?

- 2) Should this case be referred to a neurologist? Yes _____ No _____

If so, what referral issues should the neurologist address?

- 3) Should this case be referred to a psychiatrist? Yes _____ No _____

If so, what referral issues should the psychiatrist address?

- 4) Should this case be referred to a social worker? Yes _____ No _____

If so, what referral issues should the social worker address?

Appendix B

The PASCHIZ Case, The Case of Charles

CASE CONSULTATION REPORT

IDENTIFYING DATA

1. _____ Charles is a 22 year old, Caucasian male.
2. _____ He is currently a senior at the University of Massachusetts.
3. _____ He was referred for psychiatric consultation by Dr. Feldman, Chief of Medicine at the University's Health Services Center.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY
DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH
THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK
OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

REFERRAL ISSUE

4. _____ The patient (Pt) was brought to Health Services during the early morning hours following an argument which occurred between Pt and campus security police.
5. _____ after the latter had denied the Pt access to the University Observatory.
6. _____ Security officers reported that after they had explained to Pt that his name was not on the list of students who had permission to use the observatory that evening.
7. _____ He became angry and belligerent, threatening to use violence, if necessary, to gain access to the observatory.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

PRESENTING COMPLAINT

8. _____ Pt explained that he was being prohibited from entering the observatory by the security police.
9. _____ He stated that the police were acting as "agents and pawns of a nepotistic, coercive, and perverted faculty coalition"
10. _____ whom he stated were "conspiring to thwart my endeavors to discover the energy secrets of the sun."

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

HISTORY OF THE PRESENTING ILLNESS

11. _____ Pt was unwilling to discuss any topics other than the current conspiracy although
12. _____ he did state that this conspiracy had been developing over the months preceding the night of his admission.
13. _____ Corroborating information was elicited from Mr. Greg Stevenson, who had known Pt for two academic years in his capacity as the Resident Assistant (R.A.) in the Pt's dormitory.
14. _____ Mr. Stevenson described his relationship with the Pt as "distant and strained" and stated that their few conversations had occurred at the R.A.'s request following difficulties which Pt had experienced with other students in Pt's dormitory.
15. _____ R.A. noted that when he returned from summer vacation Pt seemed to be dressing more eccentrically in that he almost always wore black clothing with the exception of his tennis shoes, which were navy blue.
16. _____ His appearance had become more unkempt since the beginning of the Fall semester and he spoke with almost none of the other students outside of the context of responding to the jibes of other students who often teased Pt regarding his dress, personal habits, and avoidance of his fellow students.
17. _____ Pt had avoided most social functions on campus and had attended only scientific lectures and chamber music recitals.
18. _____ He often criticized other students in the dormitory for smoking marijuana or using other drugs, occasionally reporting them to the R.A. and demanding that these "pollutant substances be removed from my environment." His complaints about campus drug abuse had begun approximately at the beginning of the previous Spring semester.
19. _____ The Pt had also at that time begun to lecture students, whom he knew or whom he suspected of smoking pot, about Eastern religions. He had enrolled in a course on T.M. which had been offered by a social worker at the University Counseling Center. Pt initially attempted to enlist other students to join the T.M. group, but shortly thereafter he stopped attending himself, following an argument with the group leader.

20. _____ He had decided to remain on campus through the summer to work in the laboratory of Dr. Mulhatra and to undertake independent studies in the area of astrophysics. Little else is known regarding the Pt's performance or living habits throughout the summer months.

At the beginning of the Fall semester, against the advice of the faculty advisor who had been assigned to Pt upon Dr. Mulhatra's departure for a sabbatical year, Pt enrolled for nine semester hours of independent study credits in astrophysics but was convinced to enroll in a literature course which would permit him to fulfill his requirements for graduation.

21. _____ Pt had petitioned the Dean of Students' office to permit him to maintain his current dormitory room and to have no roommate assigned to the room. At the beginning of the semester, an incoming freshman student was assigned to the room.

22. _____ He moved out after complaining about dirty laundry which Pt had simply piled under his bed.

23. _____ The roommate also complained that Pt usually stayed up until four or five in the morning reading and working at a drafting table that Pt had set up in the tiny dorm room.

24. _____ The roommate complained bitterly that Pt almost never showered and on those occasions on which he did, he typically did so at three o'clock in the morning and each time awakened the roommate in the process. By the end of October, the R.A. acceded to the requests of both Pt and the roommate to relocate the roommate in another room following two fist fights which broke out in the room.

25. _____ The first of these fights began after the roommate learned that Pt had reported him to campus security for smoking marijuana in the room. Later that week, in retaliation, the roommate took Pt's diary from the room and read passages from it to a girl whom Pt had followed around the campus for several weeks earlier in the semester.

26. _____ Although Pt was never known to have dated or to have shown any interest in doing so, he had begun a series of brief conversations with a girl in an adjacent dorm whom he had met in his literature course.

27. _____ In his diary, he had initially written that he had felt that a term paper which she had written about the Prometheus legend had been inspired by his brief conversations with her.
28. _____ Several weeks later he had become convinced that she felt sexually attracted to him and he would wait for her after class to shout insulting remarks at the girl.
29. _____ The roommate had shown the girl Pt's diary in the campus dining hall.
30. _____ When Pt learned of this incident, the second fight broke out. Subsequently, Pt dropped the literature course and began to take sandwiches to the observatory at meal time in lieu of going to the dining hall.
31. _____ Following the incident, Pt remained relatively quiet for the remainder of the semester and was seen very seldom on campus and had not come to the R.A.'s attention until he was called by the examining psychiatrist in connection with the present incident.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

MEDICAL HISTORY

- 32. _____ Medical History forms which had been filled out by Pt's family physician in Boston indicated that Pt had had the "usual childhood diseases," and had been hospitalized for a tonsilectomy at age seven and was allergic to penicillin.
- 33. _____ No other hospitalizations or surgical procedures had been noted, seizures and neurologic illnesses were reported by the family physician to be absent in both Pt's personal and family history, with the exception of
- 34. _____ Pt's paternal grandmother who had been hospitalized for "psychiatric problems" by the family physician.
- 35. _____ During his freshman year, Health Services records indicated that Pt had requested, on approximately seven separate occasions, that samples of his blood, and urine, be taken and that throat cultures be performed so that laboratory studies could be carried out in order to rule out any infections which he might have picked up by living in close proximity to people in the dorm, e.g. "sharing showers, and eating in the University dining commons."
- 36. _____ Dr. Feldman had noted that Pt requested the laboratory studies yet he refused to undergo physical examination except for examination of the head and neck.
- 37. _____ Pt was diagnosed as having a cold on his first visit to Health Services, but was asymptomatic on his subsequent visits.
- 38. _____ Laboratory studies were carried out following Pt's first three requests, but Pt was informed by Dr. Feldman that no further studies would be carried out unless the doctor felt that they were indicated on the basis of physical examination findings.
- 39. _____ Pt eventually stopped coming to Health Services until the Spring of his sophomore year when
- 40. _____ he badly strained his back when he had attempted to jog ten miles with no prior practice.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY
DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH
THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK
OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

DEVELOPMENTAL HISTORY

- 41. _____ Shortly after Pt was admitted to University Health Services, his parents were contacted at their home in Boston, and provided developmental history during an hour long telephone interview.
- 42. _____ Pt was the product of the mother's first pregnancy which occurred during her 30th year.
- 43. _____ She stated that she was followed regularly by her obstetrician throughout the pregnancy and that no illnesses, injuries or medications were present during the pregnancy.
- 44. _____ Pt's mother smoked cigarettes only occasionally during the pregnancy, usually only if she felt exceptionally nervous. She denied drinking.
- 45. _____ Pt was the product of a normal delivery which was performed under general anaesthesia; pregnancy was full term and the infant weighed 6.5 lbs. at birth. Labor was reportedly uneventful and no subsequent medical interventions were carried out between the birth and the time of discharge which was approximately three days following the delivery. The Apgar score could not be recalled, but Pt's mother felt sure that no cyanosis had been present at birth and that no mechanical assistance was required to facilitate the infant's respiration.
- 46. _____ Mother reported some difficulties in feeding the infant shortly after returning home
- 47. _____ and she required a brief hospitalization of approximately three and a half months for depression when the baby was two weeks of age. During this period, Pt was cared for by a maiden aunt, father's older sister, and mother felt that Pt was developing well upon her return home.

48. _____ At four months Pt was hospitalized briefly for diarrhea and weight loss. Pt was followed by the family's pediatrician for the remainder of that year, following his discharge. Pt was afebrile at the time of admission to hospital. Pt was discharged from hospital in one week and continued to gain weight steadily thereafter.
49. _____ Mother consulted the "baby book" which she had kept in her files and noted that Pt sat at four months, crawled at five months, and walked at 11 months. Pt spoke his first words at 14 months and used sentences just prior to his third birthday.
50. _____ Throughout childhood, Pt was described as being slightly shorter, younger looking, and thinner than other children of his age.
51. _____ Parents noted that he had never made any friends and tended to play alone, preferring to remain in his room reading and listening to the radio.
52. _____ He was described as an exceptionally well behaved child and seemed intellectually precocious.
53. _____ Upon entering school he proved to be a superior student. Both parents reported that they tolerated many of Pt's subsequent eccentricities, minimized them, and nicknamed Pt, "The Professor." At approximately the age of four, Pt began to develop several rituals which he continued until approximately the 8th year. Nightly he would carefully select his clothes which he was to wear to school the next day and lay them out in a very specific order. He would become furious if they were moved for any reason. He refused to go to bed unless kissed three times by both of his parents; mother first. He would then say his prayers three times before permitting the lights to be turned out.
54. _____ Often, at night, the parents would find him sitting up in bed and awake; apparently no nightmares or other unusual events had occurred to awaken Pt. At about five years, Pt would eat only "Spam" and this lasted for several months, but would be replaced by substitutions of other fad foods.

55. _____ Eventually vitriolic arguments between Pt and his mother developed over his peculiar food preferences. Father explained that in the course of these arguments, mother would typically accuse Pt of not trusting her and Pt would accuse her of trying to poison him. Arguments also typically broke out over issues such as visiting relatives, choice of clothes, and patient often became so enraged that when sent to his room,
56. _____ he would destroy possessions of his own but on several occasions, he was reported to have cut up various articles of his mother's clothing.
57. _____ Throughout later childhood and into adolescence he continued to be a superior student although his performance was somewhat erratic. He consistently excelled in math and science and by age 10, Pt had become a formidable chess player and had read everything about the subject that he could.
58. _____ His only voluntary contact with other boys his age centered around chess and he would often play chess against other boys at school with a vengeance and later call them at home to taunt them about their loss. His one relationship which lacked this vengeful quality, according to his parents, was a brief friendship with a boy who was two years older than Pt, from whom Pt wanted to learn more advanced chess strategies to "annihilate" his opponents.
59. _____ Pt showed no interest or prowess in athletics of any sort and refused to change his clothes in front of the other boys in his gym class. At age 15 Pt began to skip school frequently after being teased on the corner by his schoolmates while waiting for the bus.
60. _____ On days which he remained truant from school he went to the library and read math books which he claimed would permit him to graduate from college at nineteen and go on to win the Nobel Prize at 25 by inventing a solar powered machine which would enable people to live for three hundred years.
61. _____ His only interests outside of chess and science was reading monster magazines which he had piled in a cross indexed order in his room by the hundreds.

62. _____ Frequent arguments with his teachers and guidance counselors occurred regarding his truancy. It was only their threats that Pt would be expelled from school if he failed to comply with attendance requirements, and thereby be ineligible for college, which enlisted his cooperation in attendance.
63. _____ Pt at no time showed any interest in girls or in dating and never attended any school dances.
64. _____ His parents reported that he had stated that he was disgusted by the appearance of pubic hair and had repeatedly stated that he wished that he could have been "just a head."

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

SOCIAL HISTORY

65. _____ Patient's father was 26 at the time of Pt's birth and had just taken his first position as an assistant professor of chemistry at a small mid-western university.
66. _____ His wife, who was three years his senior, was working at the time as an accountant and shortly after Pt's 4th birthday, the family moved to the Boston area when the mother accepted a promotion at the firm's Boston office.
67. _____ The couple has two other children. Paul, who was described as being a "slow learner" and a shy, and well behaved boy, and is two years younger than Pt.
68. _____ Pt's relationship with Paul was openly hostile and Pt "bedeviled and tormented his brother with math games." Emily, the couple's youngest child, was born five years after Pt. Pt was most hostile to the youngest child. When Pt was seven his two year old sister entered his room while he was at school and disordered his monster comic books which resulted in Pt throwing the child down a flight of stairs. Parents reported that it was literally impossible to keep the two children in the same room without endangering the daughter.
69. _____ Although both his parents identify themselves as Jews, they stated that they are both agnostic and their small circle of friends are basically composed of couples with whom they work both at the father's university and at the mother's firm, whom they see either at work or occasionally at office parties.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

MENTAL STATUS: OBSERVATIONS & REVIEW OF SYSTEMS

70. Appearance and General Behavior: Pt entered the examining room angrily and initially refused to be seated, stating that he would rather stand. He was dressed completely in black with his sport shirt buttoned to the collar.
71. He appeared unkempt as though he had not washed or shaved for several days. He continuously stroked a scraggly Fu-Man Chu style moustache which he was attempting to grow in spite of rather sparse facial hair growth and he looked at the examiner in an angry and distrustful manner.
72. During the initial fifteen minutes of the interview all of the examiner's questions were answered with the shortest possible answers, sometimes monosyllabic or yes-no responses. All were, however, sarcastic in intonation.
73. Once the examiner explained to Pt that if Pt chose to refuse to actively participate in psychiatric evaluation, the University's response to Pt's actions would simply come under the jurisdiction of the Dean's office and that the reports of the security police, whom he had threatened, would constitute the sole testimony in his case, Pt seated himself and stated that he wished "to make my position known to as wide an audience as possible for my own protection in this situation."
74. Mood: Pt demonstrated little feeling as he spoke with the exception of an angry sarcastic tone. He denied feelings of fear, panic, sadness, and elation.
75. Pt started to become visibly angry when he felt that the examiner was attempting to coerce him into sitting down and talking, but he contained this reaction quickly and assumed an outwardly calm and aloof demeanor.
76. Thought Content: When questioned about his earlier assertion that the security police and professors were colluding against him,
77. he explained that his task was to complete the prototype for a solar powered machine within the next three years. This machine would permit a process of "energy stabilization, which if properly designed and applied to humans, would permit them to live for three hundred years."

78. _____ He explained that the professors at the University wished to thwart his research because his "winning the Nobel Prize for his accomplishment would constitute a humiliation for them and that they were attempting to steal his ideas."
79. _____ He stated that there were times that he could actually feel them "taking thoughts from my head."
80. _____ At two points in the conversation at which thought blocks were observed,
81. _____ Pt indicated, by pointing toward the door, that these were the doings of the professors as they attempted to steal his thoughts.
82. _____ The involvement of other students in this conspiracy occurred through their attempts to "distract" him from his research by "tormenting" him on campus and in the dormitory and that female students were attempting to "rob me of my mental energy by techniques of psychological seduction."
83. _____ He stated that the students wished to thwart his efforts since he had made his view on "moral and intellectual excellence quite clear" during his interactions with them over the past four years
84. _____ and that they feared that he would not "permit them to be treated by my machine" if he were permitted to perfect it.
85. _____ Hallucinations were categorically and angrily denied in all modalities, visual, auditory, tactile, gustatory and olfactory.
86. _____ Pt admitted to having difficulty falling asleep and often awakening to terrible dreams which have been getting worse. He has lost ten pounds in six months and has diarrhea when he eats full meals.

AFTER READING THE REPORT THUS FAR, DO YOU HAVE ANY DIAGNOSTIC HYPOTHESES? IF SO, PLEASE LIST THEM WITH THE MOST LIKELY DIAGNOSIS FIRST (RANK 1) AND RANK OTHERS ACCORDINGLY.

1. _____
2. _____
3. _____
4. _____
5. _____

MENTAL STATUS EXAMINATION: (EXAMINATION OF COGNITIVE FUNCTIONS)

87. _____ Pt was alert and oriented in all three spheres with no alternations of consciousness noted.
88. _____ Perceptual functions were tested briefly in three modalities: tactile, auditory, and visual, with no extinction of double-simultaneous stimulation being noted in any modality. Pt was able to identify familiar objects and geometric shapes presented visually. Stereognosis and palmar graphognosis were within normal limits. Pt was able to identify familiar sounds such as whistling, humming, and coins jingling.
89. _____ Left-right orientation was within normal limits both on Pt's own body surface and in external space; no finger agnosia was elicited on either hand.
90. _____ Pt was able to recite numbers 1-20 and months of the year both forward and backward. He could spell W-O-R-L-D backward with no difficulty.
91. _____ Three-step commands were executed with no difficulty, e.g., "fold the paper in half, put it in your pocket and hand it back to me." Pt was able to imitate double-alternating hand movements with no difficulty.
92. _____ Patient was noted to be left-handed on all tasks, e.g. writing and drawing.
93. _____ He was able to draw a cross and cube from verbal instructions accurately.
94. _____ Pt was able to repeat sentences and name objects, actions, body parts and colors flawlessly; writing and spelling were consonant with Pt's intelligence and education.
95. _____ No difficulties with comprehension of spoken language were noted during the interview and commands were followed accurately.
96. _____ Pt read from the Boston Globe effortlessly; comprehension and recall were complete.
97. _____ Pt performed mental calculations effortlessly and rapidly
98. _____ (serial sevens were continued into negative numbers

99. _____ and Pt stopped only after being asked twice by the examiner)
100. _____ and could perform long division in his head at astounding rates.
101. _____ Pt was able to interpret proverbs at abstract levels.
102. _____ For example, "People in glass houses shouldn't throw stones" was interpreted as "The guilty should refrain from accusation...an expert such as yourself, of course, knows why."
103. _____ Memory was within normal limits with nine digits forward and eight backward being recalled.
104. _____ Three unrelated words were recalled, ("rose," "battleship," "teacup") after a 15 minute delay,
105. _____ and a short story was recalled almost verbatim after a five minute delay

PLEASE LIST THOSE DIAGNOSES WHICH SEEM MOST PROBABLE ON THE BASIS OF ALL OF THE INFORMATION WHICH YOU HAVE READ THUS FAR IN THIS CASE REPORT.

Diagnosis of choice 1. _____ () 6. _____ ()
 2. _____ () 7. _____ ()
 3. _____ () 8. _____ ()
 4. _____ () 9. _____ ()
 5. _____ () 10. _____ ()

PLEASE RATE EACH DIAGNOSTIC HYPOTHESIS WHICH YOU LISTED IMMEDIATELY ABOVE FROM ONE TO THREE.

- 1 = I AM CERTAIN THAT THIS DIAGNOSIS IS CORRECT.
 2 = THIS DIAGNOSIS IS PROBABLY CORRECT.
 3 = THIS DIAGNOSIS MUST BE CONSIDERED BUT WOULD PROBABLY BE RULED OUT IN TIME.

 PLEASE TURN TO THE NEXT PAGE FOR FOLLOWING QUESTION

ADDITIONAL DIAGNOSTIC INFORMATION REQUIRED:

AFTER HAVING REVIEWED THE MATERIAL IN THIS CASE REPORT, WHAT ADDITIONAL INFORMATION WOULD YOU EITHER REQUEST OR ATTEMPT TO ELICIT IN THE DIFFERENTIAL DIAGNOSIS AND CLINICAL ASSESSMENT OF THIS CASE?

PLEASE LIST THE INFORMATION WHICH YOU WOULD REQUIRE IN THE ORDER IN WHICH THE DATA SHOULD BE COLLECTED.

CASE MANAGEMENT

THE FOLLOWING QUESTIONS PERTAIN TO THE MANAGEMENT OF THE PATIENT
WHOSE CASE YOU JUST REVIEWED.

- 1) Should this case be referred to a clinical neuropsychologist?

Yes _____ No _____

If so, what referral issues should be addressed?

- 2) Should this case be referred to a neurologist? Yes _____ No _____

If so, what referral issues should the neurologist address?

- 3) Should this case be referred to a psychiatrist? Yes _____ No _____

If so, what referral issues should the psychiatrist address?

- 4) Should this case be referred to a social worker? Yes _____ No _____

If so, what referral issues should the social worker address?

Appendix C

Preliminary Instructions and Biographical Data Sheet

RELEVANT BACKGROUND INFORMATION

1) Participant's Age: _____ 2) Participant's Sex M ____ F ____

3) Participant's Current Area of Professional Specialization _____

4) Participant's Educational History (please begin with Bachelors Degree

Degrees Awarded	School	Year of Degree	Area of Concentration or Specialization
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5) Postgraduate Training (please include post doctoral training, residencies, etc.)

School	Number of Years of Training	Area of Concentration or Specialization
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

6) Theoretical Orientation (e.g. psychoanalytic, biologic, eclectic, social community, eclectic, etc.) _____

7) What three writers have most influenced your professional development? _____

8) I wish to receive a summary report on the outcome of this research. Yes _____ No _____

Participant's name (optional) _____
address _____

PLEASE GO ON TO CASE #1

Appendix D

Contrasts Among Three Professions in Diagnostic Accuracy at Each Point of Inquiry on the CPS Case

Appendix D

Contrasts Among Three Professions in Diagnostic Accuracy at Each Point of Inquiry on The CPS Case ^a

	Neurologists vs Psychiatrists	Neurologists vs Neuropsychologists	Psychiatrists vs Neuropsychologists
Identifying Data	0.00	0.00	0.00
Referral Issue	1.44	1.84	0.61
Presenting Complaint	0.00	1.48	1.48
History Present Illness	0.53	0.69	1.08
Medical History	0.53	2.30*	2.50*
Developmental History	0.51	0.30	0.88
Social History	0.17	0.72	0.90
Observations of Patient & Review of Systems	1.21	0.36	1.58
Examination of Cognitive Functions	1.10	0.61	2.11*

^a Given in the body of the table are the results of Mann-Whitney U-Tests corrected for tied ranks and expressed as normal deviates

* $p < 0.05$, two-tailed

** $p < 0.01$, two-tailed

Appendix E

Contrasts Among Three Professions in Diagnostic Accuracy at Each Point of Inquiry on the PASCHIZ Case

Appendix E

Contrasts Among Three Professions in Diagnostic Accuracy at Each Point of Inquiry on The PASCHIZ Case ^a

	Neurologists vs Psychiatrists	Neurologists vs Neuropsychologists	Psychiatrists vs Neuropsychologists
Identifying Data	0.88	0.58	0.25
Referral Issue	0.60	0.21	0.73
Presenting Complaint	1.57	2.07*	0.98
History Present Illness	0.94	2.62**	2.04*
Medical History	1.08	2.30*	1.52
Developmental History	0.63	2.65**	2.28*
Social History	0.03	2.10*	2.21*
Observations of Patient & Review of Systems	1.43	2.74**	1.87
Examination of Cognitive Functions	0.00	2.27*	2.27*

^a Given in the body of the table are the results of Mann-Whitney U-Tests corrected for tied ranks and expressed as normal deviates

* p<0.05, two-tailed

** p<0.01, two-tailed

Appendix F

Assessment of Changes in Diagnostic Accuracy Between Adjacent Points of Inquiry on The CPS Case for Each Profession

Appendix F

Assessment of Changes in Diagnostic Accuracy Between Adjacent Points of Inquiry on The CPS Case for Each Profession

	Professional Specialization ^a		
	Neurologists	Psychiatrists	Neuropsychologists
Identifying Data vs Referral Issue	0.00	1.34	1.60
Referral Issue vs Presenting Complaint	0.00	1.34	0.55
Presenting Complaint vs History Present Illness	1.34	1.00	1.07
History Present Illness vs Medical History	0.00	0.00	2.02*
Medical History vs Developmental History	2.80**	2.67**	2.20*
Developmental History vs Social History	1.10	1.00	0.45
Social History vs Observations of Pt & Review of Systems	2.20*	0.25	1.83
Observations of Pt & Review of Systems vs Examination of Cognitive Functions	0.14	0.37	2.03*

^a Given in the body of the table are the results of Wilcoxon Matched Pairs Signed Ranks Tests, corrected for tied ranks and expressed as normal deviates

* $p < 0.05$, two-tailed

** $p < 0.01$, two-tailed

Appendix G

Assessment of Changes in Diagnostic Accuracy Between Adjacent Points of Inquiry on The PASCHIZ Case for Each Profession

Appendix G .

Assessment of Changes in Diagnostic Accuracy Between Adjacent Points of Inquiry on The PASCHIZ Case for Each Profession

	Professional Specialization ^a		
	Neurologists	Psychiatrists	Neuropsychologists
Identifying Data vs Referral Issue	1.99*	1.28	1.26
Referral Issue vs Presenting Complaint	2.93**	2.80**	1.46
Presenting Complaint vs History Present Illness	1.83	2.67**	1.05
History Present Illness vs Medical History	1.00	1.00	1.34
Medical History vs Developmental History	0.00	0.54	1.60
Developmental History vs Social History	1.00	0.00	1.00
Social History vs Observations of Pt & Review of Systems	1.34	0.45	1.60
Observations of Pt & Review of Systems vs Examination of Cognitive Functions	1.00	1.00	0.00

^a Given in the body of the table are the results of Wilcoxon Matched Pairs Signed Ranks Tests, corrected for tied ranks and expressed as normal deviates

* $p < 0.05$, two-tailed

** $p < 0.01$, two-tailed