

future will see rather the development of a modular approach, in which only a substantial but limited number of diagnostic modules are presented, offering some flexibility to researchers. The paper discusses some key methodological findings, reviews the pros and cons and attempts an outlook to the future.

S61. Computers in psychiatry

Chairmen: C Pull, I Marks

THE INFORMATION SUPERHIGHWAY AND PSYCHIATRY

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The Internet, a military creation, is a global network of computer systems. It stores, and is able to transfer, vast quantities of information. Over 30 million people currently access its information banks. The Internet has the potential to revolutionise many aspects of our lives such as; shopping, banking, education, entertainment and health.

The network presents health professionals with some important questions and challenges, such as. How can we ensure quality of stored information? How can we use the network for professional educational programs? Can patients be treated over the Internet? How will doctors adapt to patients who, through reading information on the network, know more about their condition than their doctor? What are the medico-legal implications?

This presentation will describe the mental health resources currently available on the Internet and discuss developments likely to occur in the near future.

INTERNET PERSPECTIVES FOR PSYCHIATRY

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Based on the growing general interest and discussion on how the Internet is changing our information behaviour, an idea might arise that an international-multimedia-network-future is starting right now for everyone — including psychiatry and psychiatrists. Though ICD-10 yields a “common language” for communication in psychiatry, there are still unsolved problems concerning searching and delivering psychiatric information on the net.

Among these are the structuring the information, rules about the kind of information to be made available, and for whom, the question of maintaining quality, the authorization of information and data, ethical issues and — last not least — costs and profits.

We will present some ideas and suggestions how these problems can be dealt with and how Internet can be utilized in the field of psychiatry for:

- Disseminating information from health-care organizations
- Research collaboration, exchange and collecting data and information
- Handling frequently asked questions (FAQs) in psychiatric problems
- Electronic journals and discussion forums
- Learning medicine in public education and computer assisted training
- Research in means of delivering health care and telemedicine potentials

We will present some plans in Internet for German psychiatry and the first experiences we gained when offering ICD-10 chapter V (F) as a HTML textbook on our internet server.

COMPUTERIZED AUDIT OF CLINICAL OUTCOME AND ITS COST: A EUROPEAN CLEARINGHOUSE IS NOW POSSIBLE

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Clinicians want to know how much their patients improve with treatment and the cost of obtaining that improvement, but rarely measure this in daily practice because of the time it takes. The measuring of improvement and the cost of treatment can be speeded up greatly by computerising it. Over the last 7 years computerized clinical audit systems have been developed. Experience with these is reported with 800 patients and 80 clinicians, first with a pilot system and then with its more efficient successor called CORM (*Clinical Outcome and Resource Measure*). CORM prints out ‘psychiatric temperature charts’ of clinical progress and the cost of getting that. Such charts allow clinicians to track outcome of individual patients at a glance and help them decide about further care. Data from individual patients can easily be aggregated in order to track outcome from particular diagnoses, treatments, clinics, age groups, gender, geographical areas etc. Such computerized data can be transmitted among clinics, regions and countries. This makes it feasible now to create a European Clearinghouse of Clinical Outcome and its Cost.

[1] Marks IM et al & McKenzie N et al (1995) *J Mental Health*, 1, 63–69 & 71–78

[2] Marks IM (1995) *Australian & NZ J Psychiatry*, 29, 1, 32–37.

S62. Perceptual processes in psychosis

Chairmen: A David, M Spitzer

FRONTOLIMBIC MECHANISMS FOR PERCEPTUAL AND RESPONSE CLASSIFICATION IN SCHIZOPHRENIA

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Prevailing theories of frontal lobe and hippocampal function in humans are based largely on a small number of unique cases sustaining massive injuries not limited to discrete anatomic loci. Lesion studies in non-human primates have shown many similarities between the cognitive consequences of frontal and hippocampal lesions, leading to suggestions that an integrated frontolimbic system is critically involved in a range of executive, “working” memory, and “explicit” memory functions; these functions in turn have been described as elaborations of more primitive classification operations in both sensory and effector domains. We report results from studies aimed at dissecting the respective contributions of frontal and limbic components to integrated frontolimbic functions, using modifications of methods validated in animals. Tests were developed to assess Delayed Matching to Sample with Trial Unique and Repeated Stimuli (DMSU/R), Conditional Discrimination Learning with Delays (CDLD), and Variable Interval Delayed Alternation (VIDA). Adaptive titration procedures assured that all subjects performed at equivalent levels of accuracy before introduction of delays. Samples included neuroleptic naive first-episode and stably treated

patients with schizophrenia, patients s/p unilateral anterior temporal lobectomy, patients s/p surgical excision of focal frontal tumors, and healthy controls. Results reveal that initial acquisition functions correlate as expected with illness severity parameters, but after titration on initial accuracy levels, delay effects are similar across groups. These findings suggest that after controlling for basic perceptual and response classification processes, differential frontal and mesiotemporal lesion effects are difficult to discern. The results support the hypothesis that both patients with schizophrenia and those with focal frontal or mesiotemporal lesions may show deficits reflecting integrated frontolimbic system dyscontrol, and severity of impairment in basic classification operations may mark this dysfunction.

SHAPE PERCEPTION IN SCHIZOPHRENIA: EEG ANALYSIS OF A CORTICAL ACTIVATION TASK

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Altered lateralization of brain function is currently under intensive discussion as a possible factor in the pathogenesis of schizophrenia. Numerous studies have demonstrated lateralized EEG patterns under activation. Right parietal cortical regions are well known to be pivotal for shape perception in normals.

We developed a shape perception task in which slowly changing elementary geometric forms (circle, triangle, rhombus) were displayed on a computer screen. Subjects were asked to press a reaction button when changing shapes were perceived as symmetric. Topographic cEEG and reaction times were measured during the task.

15 unmedicated sub-chronic (total duration of illness less than 2 years) patients with schizophrenia (ICD-10 F20.0, F20.3) were compared to 15 matched normal controls. Patients with major depression (ICD-10 F31.4, F32.2) were recruited as an additional control group.

EEG Analysis showed distinct patterns of lateralization in the examined groups. Implications are discussed in view of the ongoing debate on the pathogenesis of schizophrenia.

TOWARDS AN UNDERSTANDING OF THE COGNITIVE BASIS OF DELUSION FORMATION IN SCHIZOPHRENIA USING VISUAL SCAN PATHS

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Cognitive explanations for delusion formation have emphasised the role of distorted appreciation of complex stimuli. The study investigated information processing in deluded subjects (DS) using a novel, physiological marker of visual attention, the visual scan path — a map tracing the direction and duration of gaze when an individual views a stimulus. The aim was to demonstrate the presence of a specific deficit in processing meaningful stimuli (eg. human faces) in DS by relating this to abnormal viewing strategies. Visual scan paths were measured in DS ($n = 7$), non-deluded schizophrenics ($n = 7$) (≥ 3 and < 3 on SAPS, respectively) and age-matched normal controls ($n = 10$). Neuroleptic medication, SANS score and illness duration did not differ significantly between patient groups. The eye-tracking unit employed a pupil-diameter determination technique via infrared illumination. A fixation was defined as consecutive gaze positions within one degree for 200 milliseconds or more. DS employed abnormal strategies for viewing single faces and face pairs in a recognition task, staring at fewer points and fixating non-feature areas to a significantly greater extent than control groups ($p < 0.05$). Testing on a second occasion with DS demonstrating improvement in delusion ratings revealed a less-marked difference in viewing strategies across all three groups. The results indicate the presence of abnormal infor-

mation processing in DS: reliance on less-salient visual information for decision-making in the recognition task, which diminishes with resolution of delusions. This suggests a state-dependent processing abnormality in DS, and can be linked with theories of abnormal reasoning underlying delusion formation.

THE HISTORICAL BACKGROUND AND COGNITIVE NEUROSCIENCE OF PERCEPTUAL PROCESSES IN PSYCHOSIS

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In the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), hallucinations are defined as "a sensory perception that has the compelling sense of reality of a true perception but that occurs without external stimulation to the relevant sensory organ." (p. 767).

This definition dates back to Karl Jaspers, who not only established the clear-cut distinction between perception and imagery, presumably on "phenomenological" grounds, but also likened hallucinations to perception. This view has remained standard in clinical psychiatry up to the present although it was questioned whenever hallucinations were scrutinized in detail. In fact, the concept was explicitly stated to be of little use for clinical work (cf. Schröder 1915) as well as in research into the effects of hallucinogens (cf. Beringer 1927), sensory deprivation (cf. Shurley 1962, Vernon 1963), and electrical cortical stimulation (cf. Penfield & Perot 1963). Recent findings in the field of cognitive neuroscience, as summarized by Kosslyn (1994), further question the validity of the perception-imagery distinction and any concept based on it.

It is concluded that the history of the concept as well as recent findings from research into visual and imagery processes justify a conceptual change. Hallucinations should not be defined as "true sensory perceptions", but rather as experiences that are more or less perception-like. It is argued that although this definition appears to be less precise than the current definition, it in fact leaves more room for clinical description and does not force the clinician to making an arbitrary distinction.

VISUAL SCANNING STRATEGIES AND COGNITIVE DYSFUNCTIONS IN A VISUOMOTOR TRACKING TASK IN THE COURSE OF SCHIZOPHRENIA

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In the search for neurobiological determinants of cognitive dysfunctions in schizophrenics, objective and differentiated behavioral indicators of these dysfunctions are needed. In normals the analysis of visual scan path has proved to be a useful tool to study cognitive processes for years. Appropriate task conditions presupposed, scan path analysis may also help in a differentiation of cognitive dysfunctions in schizophrenia. Using eye movement recordings during the performance of the trail-making test (TMT) we have recently shown that acute schizophrenics have difficulties in parallel processing of visuomotor search and manomotor tracking, resulting in poorer TMT performance. Since these — timestable — dysfunctions occurred especially under test conditions requiring the subjects to alternate between two response categories (TMT-B) but not under conditions using only one response category (TMT-A), the present study should clarify the contribution of (1) pure manomotor tracking abilities and of (2) the ability to shift response categories to the TMT performance deficit. Therefore, the original TMT-A/B and experimental variations of the task (1) without the necessity of concurrent visuomotor