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ADVISORY GROUP FOR AERONAUTICAL RESEARCH & DEVELOPMENT

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AGARD REPORT No.763

Performance Assessment Register

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NORTH ATLANTIC TREATY ORGANIZATION



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NORTH ATLANTIC TREATY ORGANIZATION
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
(ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD)

AGARD Report No.763
PERFORMANCE ASSESSMENT REGISTER
Working Group 12 Preliminary Report

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According to its Charter, the mission of AGARD is to bring together the leading personalities of the NATO nations in the fields of science and technology relating to aerospace for the following purposes:

- Recommending effective ways for the member nations to use their research and development capabilities for the common benefit of the NATO community;
- Providing scientific and technical advice and assistance to the Military Committee in the field of aerospace research and development (with particular regard to its military application);
- Continuously stimulating advances in the aerospace sciences relevant to strengthening the common defence posture;
- Improving the co-operation among member nations in aerospace research and development;
- Exchange of scientific and technical information;
- Providing assistance to member nations for the purpose of increasing their scientific and technical potential;
- Rendering scientific and technical assistance, as requested, to other NATO bodies and to member nations in connection with research and development problems in the aerospace field.

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FOREWORD

The Advisory Group for Aerospace Research and Development (AGARD) is an agency created by NATO to promote communication and collaboration on aerospace-related topics. Working Group 12 of the AGARD Aerospace Medical Panel was formed at the beginning of 1987 to investigate methods of assessing human performance. Its major function is to evaluate the effects of environmental stressors; its activities, however, may also be of interest to those who wish to assess individual differences in information-processing capabilities. Although most members of the working group have professional interests in aviator performance, other military and civil applications will not be ignored.

Attempts to integrate findings from performance studies are frustrated by wide variations in testing methods. Partly because of its roots in the experimental rather than the psychometric tradition, performance assessment is perhaps the only area of mental testing in which standardisation is not a routine component of test construction. Paradoxically, there appears to be a fair degree of consensus regarding the types of task useful in performance studies. Tests of tracking, memory scanning, and verbal reasoning, for example, are frequently reported. But the differences in protocol between versions of these tasks represent a source of confounding that may be responsible for many of the apparent inconsistencies in the literature.

The major goal of Working Group 12 is to develop a standardised test battery, satisfying conventional psychometric criteria such as reliability, validity, and sensitivity, for which an extensive data base may be compiled. The intention is not to develop new tests, but to formalise the administrative protocol of tests that are already well-accepted. The data base for each standardised test, which will be made as freely accessible as possible to performance researchers, will serve the following functions:

1. Compare individual scores to test norms: This may be useful, for example, in personnel selection, or in experimental studies in which practical constraints preclude the inclusion of a suitable control group.
2. Investigate the pattern of effects of a particular stressor: The data base will reveal those cognitive functions most susceptible to disruption by a given stressor, and the effects of variation in stressor intensity.
3. Compare different stressor effects on performance of the same set of tests: The development of theory may be facilitated by comparison of stressor effects, currently rendered difficult by test variations.
4. Investigation of the effects of 'incidental' variables: Since it is envisaged that contributions to the data base will include elementary subject and procedural information, it will be possible to investigate the effects of variables, such as age, sex, or time of day, that are not addressed directly by individual studies.

Each member of the working group sent a simple questionnaire to researchers in his own country who are active in performance testing. The responses have been collated in the form of the present register which, it is hoped, will facilitate the communication between laboratories necessary for the success of the standardization programme. The progress made by the working group will be reported by means of an AGARD advisory publication and a lecture series.

The register was compiled at the Human Engineering Division of Wright Patterson Air Force Base, USA. We wish to express our gratitude to all who took the time to respond to our appeal for information, as well as Ms Melodie Morrow, who organised the entries, Mrs Iris Davis and Mr Sean Layne, who deciphered and edited the questionnaire responses, and Mr Ted Nieland, who was responsible for the final printing of the register.

Members of the Working Group:

Dr Guy Santucci, Chairman, France
Dr Louis Boer, The Netherlands
Dr Eric Farmer, Great Britain
Dr Klaus-Martin Goeters, Germany
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NOTE

All researcher teams listed in this Register will receive the Register. Such will not be the case, however, for the Final Report to be published by the Working Group in mid-1989; distribution of that document will be limited to normal distribution for AGARD documents. Those not receiving a copy of the Final Report should contact their national distribution centre, as listed on the back cover of this publication, if they wish to receive a copy.

AVANT-PROPOS

Le Groupe Consultatif pour la Recherche et les Réalisations Aérospatiales (AGARD) est une agence créée par l'OTAN afin de promouvoir la communication et la collaboration dans le domaine aérospatial. Le groupe de travail No. 12 du Panel de Médecine Aérospatiale de l'AGARD a été constitué au début de l'année 1987 afin d'examiner les méthodes employées pour l'évaluation des performances humaines. Sa mission principale est d'évaluer les effets des éléments stressants de l'environnement; toutefois, ses activités sont susceptibles d'intéresser tous ceux qui sont appelés à évaluer les différences qui existent au niveau de la capacité de l'individu de traiter de l'information. Bien que la majorité des membres du groupe de travail soit professionnellement intéressée par les questions relatives aux performances des aviateurs, d'autres applications civiles et militaires sont également étudiées.

Les efforts faits pour intégrer les résultats des études de performances se sont heurtés au problème de la diversité des méthodes de test employées; ceci tient en partie au fait que ces études trouvent leurs origines dans l'expérimentation pure plus que dans la psychométrie traditionnelle, l'évaluation des capacités intellectuelles dans laquelle la notion de la standardisation des tests psychologiques n'est pas systématiquement prise en compte lors de l'élaboration des méthodes de test.

Paradoxalement, il apparaît un consensus assez marqué en ce qui concerne les types de tâches qui seraient à inclure aux études de performances. Des tests ayant pour objet d'évaluer la capacité de suivre un objet, le balayage de la mémoire et le raisonnement verbal, par exemple, sont souvent signalés. Pourtant, les différences qui existent au niveau des protocoles des différentes versions de ces tâches représentent une source de confusion qui est peut-être à l'origine de bon nombre des divergences constatées dans la littérature.

L'objectif principal du groupe de travail No. 12 est de développer une batterie de tests normalisés, conformes aux critères psychométriques classiques, tels que la fiabilité, la validité et la sensibilité, pour laquelle une base de données importante pourrait être compilée. Le but n'est pas de développer de nouveaux tests, mais de formaliser le protocole administratif des tests, dont l'utilité n'est plus à démontrer. La base de données de chaque test normalisé sera accessible, dans la mesure du possible, aux chercheurs dans le domaine de la performance, et servira aux fonctions suivantes:

1. Comparaison entre les résultats individuels et les normes. Ces données pourront s'avérer intéressantes lors de la sélection du personnel, par exemple, ou dans le cadre d'études expérimentales où la prévision d'un groupe adéquat s'avère impossible pour des raisons d'ordre pratique.
2. Etude des effets d'un élément stressant bien défini. La base de données indique les facultés cognitives les plus sensibles aux effets perturbateurs d'un élément stressant donné et les effets des variations d'intensité de stress.
3. Comparaison des effets de différents éléments stressants au cours d'une même série de tests. Le développement de théories peut être facilité par la comparaison des effets stressants, actuellement difficile en raison de la diversité des tests employés.
4. Etude des effets de certaines variables fortuites. Etant donné qu'il est envisagé d'inclure certaines informations élémentaires concernant le sujet dans la base de données, ainsi que les données sur les procédures de test, il sera possible d'étudier les effets de certaines variables telles que l'âge et le sexe du sujet, voire même l'heure à laquelle le test a été réalisé, lesquels ne sont pas pris en compte directement par les études individuelles.

Chaque membre du groupe de travail a donné un questionnaire simplifié aux chercheurs de son pays travaillant dans ce domaine particulier. Les réponses ont été rassemblées dans le présent recueil, afin de faciliter les échanges d'informations qui sont nécessaires à la bonne marche du programme de normalisation entre les laboratoires. Les progrès réalisés par le groupe seront concrétisés sous forme d'un rapport consultatif de l'AGARD et d'un cycle de conférences.

Ce recueil a été compilé par la Division Ergonomie de la Base Aérienne de Wright-Patterson aux USA. Nous tenons à remercier tous ceux qui ont bien voulu répondre à notre demande de renseignements, ainsi que Ms Melodie Morrow, qui a collationné les données, Mrs Iris Davis et Mr Sean Layne, qui ont déchiffré et mis en forme les réponses des questionnaires et Mr Ted Nieland, responsable de l'édition définitive.

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Mr Randy Yates, Etats-Unis — Consultant

NOTA

Chaque équipe de recherche mentionnée dans ce Registre recevra un exemplaire du Registre. Tel ne sera pas le cas, pourtant, pour le Rapport Final, qui sera publié par le Groupe de Travail à la mi-1989; la diffusion de ce document sera celle d'un document AGARD normal. Les personnes souhaitant en recevoir un exemplaire devraient donc contacter leur centre de distribution national, tel qu'indiqué au dos de la couverture de la présente publication.

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Telephone Information

The listed telephone numbers are those supplied on the completed questionnaires. Country codes are provided in the parentheses preceding the telephone number. This information should enable you to contact someone from outside their country. However, telephoning from within the various countries involves unique procedures depending upon the country. We have provided below instructions for calling within several of the countries to help foreign visitors. The local operators can be consulted for further information and must be relied upon for countries not listed. The within country area code is typically the first group of numbers following the country code.

Canada

If you are making a call within the same city or its vicinity then just dial the seven digit number. If you are calling from within the same area code but to a different city, omit the area code, dial a 1 + the seven digit number. If you are calling from outside the area code you want to reach dial 1 + the area code and the seven digit number.

France

In Paris and its metropolitan area dial the 8 digits. From Paris to the rest of France dial 16 + 8 digits. To dial Paris from other areas in France dial 16 + 1 + 8 digits.

Germany

It is necessary only to add 0 to the beginning of the number.

The Netherlands

Dial 0 + the area code and wait for a high pitched tone. Then dial the rest of the number.

United Kingdom

Add a 0 to the beginning of the area code and dial the entire number. *If you are in the immediate vicinity of your call destination, it may be necessary to dial a local area code for which you must consult a local directory or inquire of the operator.*

United States

When calling within the same city and its surrounding area just dial the seven digit number. If you are calling a different city in the same area code, omit the area code, dial a 1 + the seven digit number. If you are calling from another area code then dial 1 + the area code and the seven digit number.

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Norman, Oklahoma 73019

University of Oklahoma
School of Industrial Engineering
Norman, Oklahoma 73019

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Brooks AFB, Texas 78235

USAF School of Aerospace Medicine
Crew Performance Laboratories
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Blacksburg, Virginia 24061

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Behavior Research Laboratory
at MBMHC

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Wright State University
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Dayton, Ohio 45435

WEST GERMANY

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German Army Aviation
Flugplatz
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DFVLR
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D-5000 Köln 90

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 Bruderstr. 53
 D-5060 Bergisch Gladbach 1

Forschungsinstitut für Anthropotechnik (FAT)
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 VI-Aviation Psychology-
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Institute for Test Development
 and Talent Research
 (Institut für Test-und Begabungsforschung)
 Koblenzer Strasse 77
 D-5300 Bonn 2

Institut für Psychologie
 RWTH Aachen
 Jägerstraße 17/19
 D-5100 Aachen

Johann Wolfgang Goethe-Universität
 Institut für Psychologie
 Abt. Arbeits-und Verkehrspsychologie
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Johannes Gutenberg-Universität
 Dept. of Psychology
 General Psychology, Psychophysiology
 and Human Factors
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 Dept. of Clinical Psychology
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Max-Planck Institute for Human Development
 and Education
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 Leitender Psychologe
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Psychologisches Institut
 Deutsche Sporthochschule (DSH) Köln
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 Hauptstraße 47-51
 D-6900 Heidelberg

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TuV Bayern e.V.
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 Institut für Psychologie I
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 Forschungsgruppe Psychophysiologie
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 5900 Siegen

Universität Göttingen
 Institut für Psychologie
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Universität Marburg
 FB Psychologie
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 AG Arbeits-u. Organisationspsychologie
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University of Hohenheim
 Institute 430
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Abele-Brehm, A.
Schröder, A.
Schmitt, A.

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Universität Erlangen-Nürnberg
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D-8520 Erlangen
West Germany

- **Performance Measures:** German standard tests such as Hamburg-Wechsler-Intelligence Test (Hawie & Hawik), Freiburger Persönlichkeitsinventar, Aufmerksamkeits-Belastungstest (d-2), projective techniques, etc. are used for therapy indication or counseling.
- **Normative Data Base:** Published test norms are used.
- **Test Validation:** Authors validated tests before publishing
- **Testing Protocol:** Individual testing according to test author's instructions
- **Test Equipment:** No information supplied
- **Theoretical Background:** Classical test theory (Galliksen)
- **Relevant Publications:** No publications supplied
- **Keywords:**

<i>Decision making</i>	<i>Task analysis</i>
<i>Divided attention</i>	<i>Performance</i>
<i>Personality factors</i>	<i>Risk taking</i>

Abel, S. (see Forshaw, page 31)

Algera, J.A.
Altink-van den Berg, W.M.M.
Born, M.P.

Telephone: (31)205485502

Free University
Dept. of Industrial and Organizational Psychology
De Boelelaan 1081
1081 HV Amsterdam
The Netherlands

- **Performance Measures:** A device is being constructed to measure personality styles regarding achievement -related work behavior in organizational settings for the purpose of selection, career development, and training.
- **Normative Data Base:** No
- **Test Validation:** Reliability and construct validations are in progress.
- **Testing Protocol:** Situation-response questionnaire with a precoded format
- **Test Equipment:** Paper & pencil S-R questionnaire
- **Theoretical Background:** S-R paradigm - Interactional Psychology where
S= Work situation characteristics based on Macgrimmon, Tylor, and Mintzberg's managerial roles.
R= Achieving styles (Lipman, Atkinson)
- **Relevant Publications:** -Altink, W. et.al., (1986) Preststiestrategieën in arbeidsorganisaties. Resultaten van experimentel vragenlijstafname en interviews met medewerkers. Intern rapport Vrije Universiteit.

- **Keywords:** *Individual Differences*
Personality Factors
Personnel Selection

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An der Questenhorst 13
D-3000 Hannover 1
West Germany

- **Performance Measures:** Measures of intellectual abilities, work behaviour, school, and common knowledge are used as predictors for professional qualification.
- **Normative Data Base:** Norms, ranging from 500 to 7000 samples, for different professions.
- **Test Validation:** Criteria: success in training and performance for different jobs; construct and content validity
- **Testing Protocol:** Paper-pencil; individual or in groups
- **Test Equipment:** No information supplied
- **Theoretical Background:** Classical test theory; Jäger's intelligence model
- **Relevant Publications:**
 - Jäger, A.O. (1960): Zum prognostischen Wert psychologischer Eignungsuntersuchungen, eine Bewährungsstudie. *Psych. Rundschau*, 11
 - Wolff, P. and Voullaire, C. (1968): Eignungsbegutachtung von Körperbehinderten für einen Verwaltungsberuf. *Diagnostica*, 14/3
 - DGP (Ed.) (1969): Differentieller Wissenstest (DWT). *Verlag für Psychologie*, Göttingen
 - Althoff, K. and Jäger, A.O. (1981): Zur Struktur des Wilde-Intelligenz-Tests (WIT) und zu seiner Stellung im Strukturmodell von Jäger 1967, *Diagnostica*, 27/3
 - Althoff, K. (1971): Die Voraussage des Berufserfolges von Regierungsspektoren und Revierförstern. *Diagnostica* 1971, 17/4
 - Jäger, A.O. and Althoff, K. (1983): Der Wilde-Intelligenz-Test (WIT)- ein Struktur-diagnostikum. Göttingen
 - Althoff, K. (1983): Zur prognostischen Validität von Intelligenz- und Leistungstests im Rahmen der Eignungsdiagnostik. *Ztschr. f. Arbeits- und Organisationspsychologie* 28
 - Kleinevoss, R. and Sonnenberg, H.G. (1987): Die prognostische Validität einer eignungsdiagnostischen Prozedur - dargestellt an einem konfiguralen Diskriminanzmodell. *Ztschr. f. Arbeits- und Organisationspsychologie*, 31
- **Keywords:** *Individual Differences*
Personnel Selection

Altink-van den Berg, W. (See Algera, page 1)

Amelang, M. Telephone number not supplied
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D-6900 Heidelberg
West Germany

- **Performance Measures:** Tests are used for research only
- **Normative Data Base:** Data has been collected on a large battery of personality scales (FPI, 16PF, Guilford Scales, etc.), using a sample of 424 subjects' responses on the individual items on computer.

- **Test Validation:** Sometimes the validation has been done by other authors; in other cases the validation of the tests is the concern of the study.
- **Testing Protocol:** Paper and pencil
- **Test Equipment:** No information supplied
- **Theoretical Background:** See relevant literature
- **Relevant Publications:**
 - Amelang, M. & Borkenau, P. (1982) Die faktorielle Struktur und externe Validität einiger Fragebogen-Skalen zur Erfassung von Dimensionen der Extraversion und emotionalen Labilität. *Zeitschrift für experimentelle und diagnostische Psychologie*, 3, 119-146
 - Amelang, M. *Psychologische Beiträge* 1985, 27, 318-331
 - Borkenau & Amelang (1985) *Journal of Research in Personality*, 19, 44-53
- **Keywords:**
 - Individual Differences*
 - Personality Factors*

Andriess, P. (See Rozeboom, page 86)

Angus, R. (See Heslegrave, page 49)

Aptel, M. (See Meyer, J.P., page 70)

Arbak, C.
 McDonnell Douglas Astronautics Co.
 Engineering Psychology Department
 Human Performance Laboratory
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 United States of America

Telephone: (1) 314-234-1096

- **Performance Measures:** Subjective Workload Assessment Test (SWAT)
- **Normative Data Base:** No
- **Test Validation:** Not locally
- **Testing Protocol:** Tests are used in conjunction with manned simulators.
- **Test Equipment:** None
- **Theoretical Background:** SWAT is based on mental effort, stress, and time pressure components of workload
- **Relevant Publications:** No publications supplied
- **Keywords:**
 - Workload*

Backs, R.W.

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- **Performance Measures:** Reaction time, eye movements, pupillary response, continuous EEG, steady-state evoked responses, modified rhyme test, and behavioral ratings are used to assess human performance
- **Normative Data Base:** No
- **Test Validation:** Yes, in varying degrees
- **Testing Protocol:** Speeded-response visual search tasks and intelligibility-testing in high background noise
- **Test Equipment:** Data General Eclipse and Nova 4/X with Fortran and the Interactive Laboratory System, AED smart graphics terminals, Apple II pluses for various laboratory control purposes. B & K and Peavey audio equipment
- **Theoretical Background:** Manual control theory, signal detection theory, and information processing models including Carroll, Wickens, and Posner
- **Relevant Publications:**
 - Bucks, R.W. (in press). Stimulus intensity and task complexity effects on late components of the event-related potential. In Johnson, R. et al. (Eds.), *Current research in event-related potentials*.
 - Bucks, R.W. & Walrath, L.C. (1986). Evoked pupillary responses during visual search. *Psychophysiology*, 23, 423.
 - Bucks, R.W. & Grings, W.W. (1985). Effects of UCS probability on the contingent negative variation and electrodermal response during long ISI conditioning. *Psychophysiology*, 22, 268-274.
- **Keywords:**

<i>Divided attention</i>	<i>Task competition</i>
<i>Focused attention</i>	<i>Theoretical models</i>
<i>Mental resources</i>	<i>Workload</i>
<i>Physio. Perform. Meas.</i>	
<i>Stressor effects</i>	

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- **Performance Measures:** Semantic processing test, logical reasoning test, free recall learning, Rivermead Behavioural Memory Test, & various memory span tasks are used for neurophysiological testing and for studying the effects of environmental stress on behavior.
- **Normative Data Base:** Logical reasoning / semantic processing: Data base being collected on sample of 200 (broad range of age and intelligence) Behavioral Memory Test: norms based on 100+ control subjects & 100+ brain damaged patients
- **Test Validation:** AB reasoning test: validated against standardised IQ tests. Semantic processing: validated against standard vocabulary tests & category generation. Behavioural Memory Test: validated against therapists' observations of everyday memory lapses etc
- **Testing Protocol:** Varies according to circumstances
- **Test Equipment:** Paper and pencil (others have used computerised versions of all tests except the Behavioural Memory Test, which has its own standardised material)
- **Theoretical Background:** Information processing theories of memory
- **Relevant Publications:**
 - Baddeley (1986), *Working Memory* (Oxford Univ. Press)
 - Wilson, Cockburn & Baddeley (1985), *Manual for the Rivermead Behavioural Memory Test* (Thames Valley Test Co)

- **Keywords:**
- | | |
|---------------------------------------|----------------------------|
| <i>Divided attention</i> | <i>Selective attention</i> |
| <i>Environmental stressors</i> | <i>Task analysis</i> |
| <i>Focused attention</i> | <i>Task competition</i> |
| <i>Individual differences</i> | <i>Theoretical models</i> |
| <i>Mental resources</i> | <i>Workload</i> |
| <i>Normative performance measures</i> | |

Baltes, P.B. (see Kliegl, page 59)

Battiste, V. (See Hart, page 43)

Beaumont, J.G. Telephone: (44) 792-205678
 University College of Swansea
 Dept. of Psychology
 Singleton park
 Swansea SA2 9LY
 United Kingdom

- **Performance Measures:** Standard cognitive/personality measures, eg. Raven's Matrices, EPQ, DAT, Mill-Hill vocabulary, Wisconsin card sorting, and Money road maps are used to assess neurological and psychiatric patients.
- **Normative Data Base:** Standard norms; data from more than 2500 test sessions on Apple II-based system (Pascal software)
- **Test Validation:** Investigation of reliability and validity using standard norms in sample of psychiatric patients (over 2500 test sessions)
- **Testing Protocol:** Not standard application - research into psychometric properties only
- **Test Equipment:** Apple II, New developments based on IBM PC (plus compatibles) under MS-DOS and applying expert systems technology
- **Theoretical Background:** Traditional Psychometrics and Classical mental test theory
- **Relevant Publications:**
 - Beaumont and French (in press), *Int. J. Man-Machine Studies*
 - French and Beaumont (in press), *Brit. J. Clin. Psychol.*
 - Beaumont, to appear in Irvine et al. (Eds) *Computer-Based Human Assessment* (Nijhoff)
- **Keywords:**
 - Individual differences*
 - Normative performance measures*
 - Personnel selection*
 - Task analysis*
 - Theoretical models*

Behbehani, K. (see Kondraske, page 60)

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 United States of America

- **Performance Measures:** Part and full simulations, flight tests, physiological measures, laboratory tests, workload
- **Normative Data Base:** No information supplied
- **Test Validation:** Yes- flight testing and pilot evaluations

- **Testing Protocol:** Flight simulations with mission scenarios
- **Test Equipment:** SEL computer and the McDonnell Douglas simulation facilities
- **Theoretical Background:** No information supplied
- **Relevant Publications:** Numerous Navy tech reports
- **Keywords:** *Performance*
Response competition
Task analysis
Task competition
Workload

Bennett, C. (see Hart, page 43)

Bercken, J. van den (See Bruyn, de, page 11)

Bhatti, J. (see Hindmarch, page 50)

Biferno, M.A.
Metaus, S.A.
Corwin, W.H.
Williams, K.N.

Telephone number not supplied

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Human Factors Engineering
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Long Beach, California 90846
United States of America

- **Performance Measures:** Primary task measures of aircraft operation are used, as well as secondary tasks, including radio communications, air traffic detection, and the Sternberg memory tests to provide objective guidance for aircraft design and serve as criteria for decision making.
- **Normative Data Base:** The norm is the control group.
- **Test Validation:** Graded levels of task demands are given to pilots (typically 12-15) and multiple performance measures are collected with parallel subjective measures. Construct validity is evaluated with ANOVA (sensitivity) and correlations is performed on the dependent variables to determine agreement (cross-validation).
- **Testing Protocol:** Controlled experimental comparisons are used, ranging from full-mission simulations to part-task simulations. Behavioral observation is also used.
- **Test Equipment:** PDP 11/23, amplifiers, Charles River data system with color monitor, various fixed- and motion-based simulators
- **Theoretical Background:** Interference single channel models of the human operator
- **Relevant Publications:** -Biferno, M.A. (1985) Relationship Between Event-related Potential Components and Ratings of Workload and Fatigue (report No. CR-177354). Moffett Field, California: NASA Ames Research Center. June
-Summers, L.G. et al. (1984) Flight Status Monitor Study, Phase I. System Concepts. DOT/FAA/PM-84/18. Federal Aviation Administration, Washington, D.C., July

• **Keywords:**

Focused Attention *Selective Attention*
Individual Differences *Task Analysis*
Performance *Theoretical Models*
Physio. Perform. Meas. *Workload*

Boelhouwer, A.J.W.

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Tilburg University
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 5000 LE
 The Netherlands

• **Performance Measures:**

Reaction time, brainstem reflexes, and heart rate are used to study motor preparation.

• **Normative Data Base:**

No information supplied

• **Test Validation:**

No information supplied

• **Testing Protocol:**

Brainstem reflexes are evoked during the foreperiod of a WS-RS paradigm to estimate the involvement of brain stem structures in motor preparation.

• **Test Equipment:**

Digital PDP 11/10 currently used. This will be updated with a PDP 11/73. A VAX 785 currently in use will be replaced with a VAX 8700. Standard physiological recording equipment is used.

• **Theoretical Background:**

The above paradigm is used in a series of experiments that study motor preparation at several levels of the central nervous system (cortical, brainstem, thoracic and lumbar).

• **Relevant Publications:**

-Boelhouwer, A.J.W. (1982) Blink Reflexes and Preparation. *Biological Psychology*, 14, 277-285.
 -Boelhouwer, A.J.W. et al. (1982) Habituation of the Human Blink Reflex: the Effect of Stimulus Frequency and the State of Arousal. *Physiological Psychology*, 10, 325-330.
 -Boelhouwer, A.J.W. et al. (1983) Changes of Human Blink Reflex Magnitude During a Three-Second Fixed Foreperiod. *International Journal of Neuroscience*, 18, 231-238.
 -Boelhouwer, A.J.W. et al. (in press) Blink Reflex Magnitude During the Foreperiod of a Warned Reaction Time Task: Effects of Priming. *Psychophysiology*
 -Brunia, C.H.M. and Boelhouwer, A.J.W. (in press) Reflexes as a tool: A window in the Central Nervous System. To be published in: P.K. Ackles, J.R. Jennings, & M.G.H. Coles (Eds.), *Advances in Psychophysiology*, Vol. 3, Greenwich CT, JAI Press

• **Keywords:**

Performance
Physio. Perform. Meas.

Boer, L.C.

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Wientjes, C.J.E.

TNO Institute for Perception
 Human Performance Research Group
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• **Performance Measures:**

Reaction time, error rate, physiological measures, manual control measures, and dual task methods are used to develop theory, assess workload, identify risk groups, study drug effects, and predict later job performance.

• **Normative Data Base:**

Yes, validations for three tasks in the "Taskoort" task battery are available with a subject base of 400.

• **Test Validation:**

Small-sample validation for predicting job success; assessment of reasonable test-retest stability of respiration-related parameters over a one-year interval

- **Testing Protocol:** After subjects are trained, measurements are taken.
- **Test Equipment:** IBM PC or XT for visual stimuli and RT; audio tape for auditory stimuli; PDP 11/34 for sampling and analyzing physiological data. Future plans include an IBM-AT.
- **Theoretical Background:** Additive factors method, resource theory
- **Relevant Publications:**
 - Boer, L.C. (1986), Attention Tasks and their Relation to Aging and Flight Experience. Soesterberg: TNO Institute for Perception
 - Jorna and Movaal, (September 1985) The use of simulation in predicting operational performance: A new means applied to old problems. NATO symposium on Transfer of Training.
 - Gaillard, A.W.K. et al. (1984) Application of lab tasks in military setting: Panel VIII. *Applied System Ergonomics*, vol. 1, C-77-C-83
- **Keywords:**

<i>Individual differences</i>	<i>Stressor Effects</i>
<i>Personnel selection</i>	<i>Theoretical models</i>
<i>Personality factors</i>	<i>Workload</i>
<i>Normative performance measures</i>	
<i>Physio. Perform. Meas.</i>	

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Stam, H.

Verbraak, A.F.M.

Versprille, A.

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 Pathophysiological lab., Dept. of pulmonary diseases
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 3000 DR Rotterdam
 The Netherlands

- **Performance Measures:** Cycle ergometry is used to help diagnose cardiopulmonary diseases
- **Normative Data Base:** Yes, based on Jones, et al. Clinical exercise testing. W.B. Saunders Cie. Philadelphia, 1975 and Oxygen Transport to Tissue VIII. Eds. Kreuzer, F. et al., Plenum Publishing Corporation, 409-417, 1985.
- **Test Validation:** Yes, medical validations have been done in literature and technological validations have been done through calibration procedures.
- **Testing Protocol:** Steady state sampling after stepwise increases of workload
- **Test Equipment:** Bicycle ergometer, inhalatory and expiratory gas analysis devices, pneumotachometer, blood pressure measurements, blood-gas analyses, ECG, off-line processing with Digital Equip. Corp. PDP 11/03.
- **Theoretical Background:** Physiological and medical background of ergometry as published in international journals and medical books
- **Relevant Publications:**
 - Bogaard, J.M. et al. (1986) Anaerobic Threshold as Detected from Ventilatory and Metabolic Exercise Responses in patients with mitochondrial respiratory chain defect. *Advances in Cardiology*, 35, 135-145.
 - Bogaard, J.M. et al. Metabolic and ventilatory Responses to Exercise in Patients with a Deficient O₂ Utilization by a mitochondrial myopathy. *Advances in Experimental Medicine and Biology*, 191.
- **Keywords:**

<i>Performance</i>
<i>Physio. Perform. Meas.</i>
<i>Workload</i>

Born, M. (See Algera, page 1)

Bortolussi, M. (See Hart, page 43)

Boschman, M. (See Roufs, page 86)

Bosma, H.A.

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(31)50-636309

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The Netherlands

- **Performance Measures:** Groningen Identity Development Scale is used to help assess adolescent identity development
 - **Normative Data Base:** No
 - **Test Validation:** Content and construct validity
 - **Testing Protocol:** Interview and multiple-choice questions
 - **Test Equipment:** Attempts are being made to refine procedures for clinical applications.
 - **Theoretical Background:** Erickson, E.H., (1968) *Identity, Youth, and Crises*, New York: Norton
Marcia, J.E., (1986) Identity in Adolescence in Adelson (Ed.), *Handbook of Adolescent Psychology*, New York: Wiley
 - **Relevant Publications:** -Bosma, H.A. (1985) Identity Development in adolescence: Coping with commitments. Groningen: State University, unpublished doctoral dissertation.
-Bosma, H.A. (1986) Identiteitsontwikkeling in de adolescentie. *Nederlands Tydschrift voor de Psychologie*, vol.41, 268-274
 - **Keywords:** *Personality Factors*
-

Bousquet, A. (See Meyer, J.J., page 70)

Bout, J. (See Dijkhuis, page 21)

Brand, N.

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Hýman, R.

State University Utrecht
Psychiatric University Clinic
Dept. of Cognitive Deficits and Neuropsychology
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3511 HG Utrecht
The Netherlands

- **Performance Measures:** Measurements are based on information processing theories adapted for clinical use. Psychometric tests for memory, language, and visuospatial functions, behavioral neurology for motor and planning behavior.
- **Normative Data Base:** Normative data is available on normal volunteers and different patient groups, but have not yet been entered into the computer.
- **Test Validation:** Information processing tests have been validated with other neuropsychological tests
- **Testing Protocol:** Stimuli presented on computer screen, by LEDs, or slide projector, paper and pencil tests, and copying motor and gestural behavior
- **Test Equipment:** Apple IIe with DOS 3.3 operating system: "NEUROPSYCH" custom test package

- **Theoretical Background:** Theory of information processing (Sternberg, 1969), long psychometric traditions. (Lezak, 1983), and neuropsychological insights (Luria, 1980, 1976, 1973)
- **Relevant Publications:**
 - Brand & Jolles (1985), *J. Gen. Psychology*, 112,201-210
 - Brand & Jolles, *Psychological Medicine*, in press
 - Brand & Jolles, in Maarsse et al. (Eds) *Computers in Psychology*, in press
 - Brand, N. (1987) Memory, Information Processing, and Depression. Dissertation in preparation.
- **Keywords:**
 - Decision making*
 - Performance*

Braune, R. (See Fadden, page 27)

Bressler, S. (See Gevins, page 35)

Broadbent, D.E.

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Department of Experimental Psychology
South Parks Road
Oxford OX1 3UD
United Kingdom

- **Performance Measures:** RT to syntactic, semantic, and non-verbal signals (most tests have strong attentional component) are used to determine environmental and psychological factors relevant to civil occupations, and to find personality measures to replace self-report questionnaires.
- **Normative Data Base:** No
- **Test Validation:** Stress: Comparison with operational records of accidents or production Personality: Correlations between questionnaires and with psychiatrists' ratings
- **Testing Protocol:** Short practice, test duration typically 30 min, but up to 6 hours. Typically between-Ss design with individual differences removed by common baseline: pure between and pure within designs also used
- **Test Equipment:** Research Machines 380Z, Sinclair Spectrum. May change to IBM PC compatibles
- **Theoretical Background:** See Broadbent, *Cognition*, 1981 and Broadbent, *Brit. J. Clin. Pharm.*, 1984
- **Relevant Publications:**
 - Brosan et al. (1986), *Psych. Medicine*
 - Stollery. (1986) *Brit. J. Indust. Med.*
 - Broadbent et al. (1986), *Brit. J. Clin. Psych.*
 - Smith (1985), *Acta Psychologica*
 - Smith (1985), *Brit. J. Psychol.*
- **Keywords:**
 - Environmental stressors* *Personality factors*
 - Focused attention* *Selective attention*
 - Individual differences* *Workload*

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9750 AB Haren
The Netherlands

- **Performance Measures:** Weaving (lateral position variability), Reaction time (false alarms and misses), Time to line-crossing, and digit symbol substitution tests are used to study driving performance
- **Normative Data Base:** No information supplied

- **Test Validation:** Yes- for the weaving parameter
- **Testing Protocol:** Data is collected on a highway test-vehicle, and in a lab with divided attention and vigilance tasks.
- **Test Equipment:** LSI-II system with an electronic line scanner, using MS-DOS operating system and private software
- **Theoretical Background:** Psychomotor functions may be impaired by Benzodiazepines due to its sedative effect on the extrapyramidal system
- **Relevant Publications:** -O'Hanlon et al., (1982)*Science*.
- **Keywords:**

<i>Divided attention</i>	<i>Physio. Perform. Meas.</i>
<i>Environmental stressors</i>	<i>Selective attention</i>
<i>Focused attention</i>	<i>Stressor effects</i>
<i>Performance</i>	

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Deelman, B.G.
Zomer, A.H. van
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 University Hospital
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 (31)50-612408

- **Performance Measures:** Reaction times, signal detection, attentional and memory parameters are used to study cognitive deficits in subjects with brain lesions.
- **Normative Data Base:** Healthy volunteers of all ages
- **Test Validation:** Yes- Predictive and concurrent validity
- **Testing Protocol:** Methods vary
- **Test Equipment:** No information supplied
- **Theoretical Background:** Information processing (Shiffrin and Schneider, 1977)
- **Relevant Publications:**
 - Brouwer, W.H., Limitations of Attention after Closed Head Injury.
 - Zomer, A.H. van., Reaction Time and Attention after Closed Head Injury.
- **Keywords:**

<i>Decision making</i>	<i>Response competition</i>
<i>Divided attention</i>	<i>Selective attention</i>
<i>Focused attention</i>	<i>Theoretical models</i>
<i>Individual differences</i>	<i>Workload</i>
<i>Physio. Perform. Meas.</i>	

Bruyn, E.E.J. de
Bercken, J.H.L. van den
Houtmans, M.J.M.
Grievink, E.
 Catholic University Nijmegen
 Instituut voor Orthopedagogiek
 (Department of Spec. Ed.:
 Psychodiagnostics Research Group)
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- **Performance Measures:** Choice of task difficulty level, choice time, completion time, error rate, and verification time are used to assess the effects of motivational factors on performance in cognitive tasks (anagrams)

- **Normative Data Base:** Not yet
- **Test Validation:** Yes- see Gjesme and Nygard's scale of achievement motivation. Also based on literature on tests of mental abilities
- **Testing Protocol:** Paper and pencil tests for motivational attitudes and cognitive abilities and a personal computer for presenting tasks and registering performance measures
- **Test Equipment:** Apple Macintosh Plus with special purpose software (Pascal programs)
- **Theoretical Background:** Achievement motivation theories, cognitive components theory, and models for response times and mental performance
- **Relevant Publications:** -Bercken, J.H.L. van den et al. (1986) *Achievement and Task Motivation*, Lisse-Swets, Netherlands
- **Keywords:**

<i>Decision making</i>	<i>Personality factors</i>
<i>Individual differences</i>	<i>Risk taking</i>
<i>Motiv. resources</i>	<i>Task analysis</i>
<i>Performance</i>	<i>Theoretical models</i>

Bugat, M. (See Hyacinthe, page 51)

- Burkard, F.** Telephone: (49) 69 7983786
 Johann Wolfgang Goethe-Universität
 Institut für Psychologie
 Abt. Arbeits- und Verkehrspsychologie
 Mertonstr. 17
 D-6000 Frankfurt 1
 West Germany
- **Performance Measures:** A test battery is used for personnel selection for driving, controlling and monitoring jobs.
 - **Normative Data Base:** A database of 70 students is available.
 - **Test Validation:** The battery consists of tests which have been validated by a paper-pencil version.
 - **Testing Protocol:** A visual display unit with a special keyboard is used.
 - **Test Equipment:** The hardware was developed on a basis of an EUROCOM computer; programs were developed in-house (ASSEMBLER)
 - **Theoretical Background:** Principles of the classical test theory for ability testing
 - **Relevant Publications:** Burkard, F., et al. (1982) Das Frankfurter Testsystem G25 zur psychologischen Untersuchung für Fahr-, Steuer-, und überwachungstätigkeiten nach den Berufsgenossenschaftlichen Grundsätzen für arbeitsmedizinische Vorsorgeuntersuchungen. Entwicklungsauftrag des Hauptverbandes der gewerblichen Berufsgenossenschaften. Frankfurt
 - **Keywords:** *Personnel Selection*

- Byrdorf, P.** Telephone number not supplied
 The Defense Centre for Leadership
 Christianshavns Voldgade 8
 1424 Copenhagen K Denmark
- **Performance Measures:** Information not supplied
 - **Normative Data Base:** Yes- it is stored on an Olivetti M 24 with MS-DOS operating system
 - **Test Validation:** Yes- by way of flying training and academics

- **Testing Protocol:** Group and individual psychological interviews and individual psychomotor tests
- **Test Equipment:** The Picard Analyzer will be used in the near future
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:**

<i>Decision making</i>	<i>Physio. Perform. Meas.</i>
<i>Divided attention</i>	<i>Response competition</i>
<i>Environmental stressors</i>	<i>Risk taking</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Task analysis</i>
<i>Norm. perform. measurement</i>	<i>Task competition</i>
<i>Performance</i>	<i>Theoretical models</i>
<i>Personality factors</i>	<i>Workload</i>
<i>Personnel selection</i>	

Cail, F. (See Floru, page 31)

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- **Performance Measures:** Memory tasks are used to study the relationship between mood and memory
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** Mood-enhancing films
- **Test Equipment:** Video equipment
- **Theoretical Background:** Mood-congruence hypothesis (Blaney, P.H., 1986) Affect and Memory: A Review, *Psychological Bulletin*, 99, 229-246. Also, Leventhal & Tomarken (1986). Emotion: Today's Problems. *Annual Review of Psychology*, 37, 565-610
- **Relevant Publications:** No earlier publications exist.
- **Keywords:**

<i>Individual differences</i>
<i>Performance</i>
<i>Personality factors</i>
<i>Selective attention</i>
<i>Theoretical models</i>

Casali, J.G. (See Snyder, page 95)

Charlton, S. (See Courtright, page 16)

Childs, J. (See Courtright, page 16)

Christensen, C. (See Courtright, page 16)

Chwialkowski, M. (see Kondraske, page 60)

Cohen, L.

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The Netherlands

- **Performance Measures:** Rorschach tests are used to assess personality.
 - **Normative Data Base:** Yes-Exner (in the U.S.)
 - **Test Validation:** Yes- J.E. Exner, Jr. (1986) *The Rorschach: A comprehensive system*, vol 1, Wiley, New York
 - **Testing Protocol:** Based on Exner's comprehensive system
 - **Test Equipment:** No information supplied
 - **Theoretical Background:** Personality theory
 - **Relevant Publications:** -Exner Jr., J.E.,(1986) *The Rorschach: A Comprehensive System*, Vol 1, Wiley, N.Y.
 - **Keywords:** *Individual differences*
-

Coleston, D.M.

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Human Psychopharmacology Research Unit
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- **Performance Measures:** Critical flicker fusion threshold, choice reaction time, and the Sternberg Memory Scanning with numbers and words are used to measure changes in cognitive function following application of cerebral stimulant.
- **Normative Data Base:** A data base is currently being collected for populations of young healthy adults, healthy elderly, and demented elderly.
- **Test Validation:** The tests are shown to be sensitive to changes in cognitive function and information processing application of drugs such as anti-histamines, minor tranquilizers, and anti-depressants.
- **Testing Protocol:** Practice until plateau is reached, then practice again at the start of each study day. Battery may be completed in 10 minutes and may be repeated a number of times during study day. Typical design: randomized double-blind crossover with each subject acting as his own control.
- **Test Equipment:** Leeds portable Psychomotor Tester and the Sternberg task: BBC
- **Theoretical Background:** Information processing and arousal theory and memory scanning model

- **Relevant Publications:**
 - Subhan and Hindmarch (1985) *European Journal of Clinical Pharmacology*
 - Parrott and Hindmarch (1982) *British Journal of Clinical Practice* (Symposium Supplement)
 - Subhan and Hindmarch (1984) *International Journal of Clinical and Pharmacological Research*
 - Subhan and Hindmarch (1985) *Drug Development Research*
- **Keywords:** *Normative Performance Measures*

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Tsang, P.

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- **Performance Measures:** Cognitive classification tasks. Criterion Task Set. Subjective Workload Assessment Technique, NASA bipolar scales, modified Cooper-Harper scale and specialized matching judgements are used to develop a measurement system to identify tests that measure comparable workload levels
- **Normative Data Base:** Yes- equivalences between at least 10 different cognitive tasks have been obtained.
- **Test Validation:** Yes- the procedure tests the axioms of a fundamental measurement theory
- **Testing Protocol:** Single and dual-tasks are being tested. Performance tradeoff curve usually with 5-6 levels are generated for each task pair
- **Test Equipment:** VIASYN S-100 buss systems with SCION graphics boards and Computalker CT-1 speech synthesizer, Commodore 64 computer
- **Theoretical Background:** Cognitive classification tests that tap short-term memory, different levels of cognitive processing, auditory vs. visual processing, and mathematical processing
- **Relevant Publications:**
 - Acton, W.H. & Colle, H.A. (1984). The effect of task type and stimulus pacing rate on subjective mental workload ratings. *Proceeding to the IEEE Aerospace & Electronic Conference*. 818-823.
 - Warr, D. et al. (1986). A comparative evaluation of two subjective workload measures: The subjective workload assessment technique and the modified Cooper-Harper Scale. *Proceeding of Psychology in the DOD conference*.
 - Amell, J.A. (1986). A comparison of two chord keyboards coding systems for alphanumeric data entry. Masters Thesis, Wright State University.
 - Colle, H.A. (1980, November). Extensive measurement of mental workload. Paper presented at the Psychonomics Society meeting, St. Louis.
 - Colle, H.A. & Ewry, M. (1987). Measurement of attentional capacity. In preparation.
- **Keywords:**
 - Divided attention*
 - Mental resources*
 - Normative performance measures*
 - Theoretical models*
 - Workload*

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Technical University Delft

Telephone number not supplied

- **Performance Measures:** Evaluating and combining expert opinion
- **Normative Data Base:** No
- **Test Validation:** In progress
- **Testing Protocol:** Calibration tests

- **Test Equipment:** No information supplied
- **Theoretical Background:** Subjective probability
- **Relevant Publications:** -Cooke, R., (September, 1985) Expert Resolution, *IFAC Proceedings*.
- **Keywords:** *Decision making*
Normative performance measures

Corwin, W.H. (see Biferno, page 6)

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 Taylor, B.H. Telephone: (1) 505-848-5240
 Charlton, S.G. Telephone: (1) 505-848-5122
 Childs, J. Telephone: (1) 505-848-0949
 Christensen, C. Telephone: (1) 505-844-8717
 The BDM Corporation
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 United States of America

- **Performance Measures:** Various objective and subjective measures to support operational test objectives
- **Normative Data Base:** Not really- literature data bases used. We have some data base information on specific subjective scales based on several applications to specific sub-populations.
- **Test Validation:** Where possible, tests are selected for performance assessment which have some validation reported in the literature.
- **Testing Protocol:** Tests administered with limited experimental controls. Must use correlational techniques and non-parametric inference where more powerful methods are inappropriate
- **Test Equipment:** Adaptive equipment used, including a recently developed microprocessor-hosted tool to administer and evaluate questionnaires, rating scales, etc. that are adaptive to pre-setting
- **Theoretical Background:** Eclectic and opportunistic approaches
- **Relevant Publications:** -*Proceedings of the Human Factors Society Thirtieth Annual Meeting*, Sept. 29-Oct. 3, 1986, Dayton, OH including:
 *Frazier, M.L. & Taylor, B.H. Integrating Human Factors in the Operational Test and Evaluation Process, p. 1146-1148
 *Acton, W.H. & Rokicki, S.M. Survey of SWAT Use in Operational test and Evaluation, p. 1221-1224
 *Courtright, J.F. et al. Scenario Analysis: A Tool for Planning Operational Test and Evaluation p. 1225-1228
 *Taylor, B.H. & Charlton, S.G. Adaptive Questionnaires for Operational Test and Evaluation p. 1229-1223
 *Rokicki, S.M. et al. The Independence of Ratings of Workload and Fatigue
- **Keywords:** *Performance*
Task competition
Workload

Cox, N. (See Hermaarden, page 47)

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- **Performance Measures:** Beta, d' , % correct, % hits, false alarms, and RT's from a wide range of tasks are used to evaluate cardiology diagnostic systems, determine vigilance levels and decrement, and determine time-of-day effects on performance.
- **Normative Data Base:** Only for CTS
- **Test Validation:** Diagnostic systems: validated against surgery/autopsy; Vigilance/time-of-day: validity not relevant
- **Testing Protocol:** Diagnostic systems: use experienced medical consultants; little practice given; all-day testing (with breaks); within-Ss design. Vigilance: mixed design; 40 min practice/60 min session. Time-of-day: within-Ss design; 15 min practice/ 1hr session
- **Test Equipment:** Apple II (Basic and Pascal software), Commodore 64 (CTS package)
- **Theoretical Background:** Multiple resources and Signal detection theory
- **Relevant Publications:**
 - Craig & Condon (1984), *Human Factors*
 - Craig (1981), *Human Factors*
 - Houston & Craig et al. (1985) *Proc. European Nuclear Medicine Congress*
- **Keywords:**
 - Decision Making*
 - Focused attention*
 - Workload*

Curtin, J. (See Walrath, page 107)

Dam-Baggen, C.M.J. Van
Kraaimaat, F.W.

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- **Performance Measures:** The Inventarisatielijst Omgaan met Anderen (IOA) is used for the assessment of social anxiety and assertiveness.
- **Normative Data Base:** Yes- there are four groups used: 172 non-assertive psychiatric patients, 62 psychiatric patients, 120 students (PABO) and 251 normal subjects. Seven-point scales with percentiles are used. Norm tables differentiate between men and women for sex-related subscales.
- **Test Validation:** Reliability and validity characteristics are determined by: factor analysis, test-retest, predictive validity, convergent and divergent validity, sensitivity for change, discriminative, and internal consistency.
- **Testing Protocol:** Paper and pencil format
- **Test Equipment:** MS-DOS operating system
- **Theoretical Background:** Behavioral therapy, learning theory, and test theory
- **Relevant Publications:**
 - Dam-Baggen, R. van & Kraaimaat, F.W. (1986) De betrouwbaarheid en validiteit van de Inventarisatielijst Omgaan met Anderen. *Gedragstherapie*, 19, (4), 229-248
 - Dam-Baggen, C.M.J. van & Kraaimaat, F.W. (1987). *Handleiding bij de Inventarisatielijst Omgaan met Anderen*. Swets & Zeitlinger bv, Lisse

- **Keywords:** *Individual differences*
Personality factors
Theoretical models

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 Los Angeles, CA. 90089-0021
 United States of America

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- **Performance Measures:** Correct and incorrect error scores and reaction times are used to study the effects of: practice, various stimulus-response modes on performance, exotic environment
- **Normative Data Base:** Most of the data supporting the use of the tasks we employ has been published in the open literature. There is no computer-based data base as such.
- **Test Validation:** Most tracking tasks have been validated as aircrew selection devices. A matrix test we are developing was originally used to demonstrate the existence of a visual short-term memory system. We have used the verbal suppression technique to demonstrate that the task is indeed spatial.
- **Testing Protocol:** Subjects receive repeated trials on a given task or a combination of tasks. Subjects always receive single- task training before performing dual-tasks. Otherwise, the protocol is dependent upon the specific tasks.
- **Test Equipment:** Micro PDP's with RT-11 operating system, IBM XT, VOTAN continuous recognition system, Micromint voice generation system, Measurement Inc. dual-axis control sticks, and a Tektronix 4107 color graphics terminal. A Tektronix 4128 3-D color graphics terminal will be added in the future.
- **Theoretical Background:** Wicken's Multiple Resources Model and Sternberg's memory search task
- **Relevant Publications:**
 - Damos, D.L. & Wickens, C.D. (1980). The identification and transfer of time-sharing skills. *Acta Psychologica*, 46, 15-39
 - Damos, D.L. & Lintern, G. (1981) A comparison of single- and dual-task measures to predict simulator performance of beginning student pilots. *Ergonomics*, 24, 673-684
 - Damos, D.L. et al. (1983) Individual differences in multiple-task performance as a function of response strategy. *Human Factors*, 25, 215-226
 - Damos, D.L. et al. (1984) Development of performance evaluation tests for environmental research (PETER): Critical tracking. *Perceptual and Motor Skills*, 58, 567-573
 - Damos, D.L. (1984) Individual differences in multiple-task performance and subjective estimates of workload. *Perceptual and Motor Skills*, 59, 567-580
- **Keywords:**

<i>Divided attention</i>	<i>Personnel selection</i>
<i>Individual differences</i>	<i>Response competition</i>
<i>Mental resources</i>	<i>Task competition</i>
<i>Performance</i>	<i>Workload</i>

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Jong, P. de
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 1081 HV Amsterdam
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- **Performance Measures:** Selective, sustained, & divided attention, flexibility of attention, distraction and impulsiveness are used to study attentional and impulsiveness problems among primary school children.
- **Normative Data Base:** Not yet
- **Test Validation:** Not yet
- **Testing Protocol:** Paper and pencil tests in class situation

- **Test Equipment:** Paper and pencil test is currently in development based on school-type tasks.
 - **Theoretical Background:** Various attentional theories
 - **Relevant Publications:** No publications supplied
 - **Keywords:** *Divided attention*
Focused attention
Individual differences
Selective attention
Workload
-

Debus, G. (see Sanders, page 87)

Deelman, B. (See Brouwer, page 11)

Dirkzwager, A. Telephone: (31)53-893563
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Faculty of Applied Educational Science
Postbox 217
7500 AE Enschede
The Netherlands

- **Performance Measures:** Log-scale of personal probabilities to measure knowledge and insight, realism score to measure if personal probabilities are reported realistically
 - **Normative Data Base:** No
 - **Test Validation:** No
 - **Testing Protocol:** Paper and pencil tests presented by an computer with on-line educating feedback
 - **Test Equipment:** Macintosh and Atari 1040 ST with own application software
 - **Theoretical Background:** Testing using personal probabilities
 - **Relevant Publications:** -Shuford, E. and Brown, F.A., (1975) Elicitation of Personal Probabilities and their Assessment, *Instr. Science*, 137-188
-Dirkzwager, A., (1975) Education for Knowledge Evaluation and Information Assessment, *Proceedings from the Second Int. Conference "Children in the Information Age"*.
 - **Keywords:** *Decision making*
Individual differences
Mental resources
Risk taking
Theoretical models
-

Dowd, P. (See Schifflett, page 90)

Droog, A. (See Willigers, page 111)

Dryden, R. (See Snyder, page 95)

Duhm, E. (See Lürer, page 66)

-
- d'Ydewalle, G.** Telephone number not supplied
 University of Leuven
 Dept. of Psychology
 B-3000 Leuven
 Belgium
- **Performance Measures:** Pupillometry & eye movement recordings are used for testing general models of information processing.
 - **Normative Data Base:** No information supplied
 - **Test Validation:** No information supplied
 - **Testing Protocol:** No information supplied
 - **Test Equipment:** Suns Workstations using Prolog, DEC PDP 11/40, 11/34, and Microvax II. Debic eye movement equipment
 - **Theoretical Background:** Information processing theories
 - **Relevant Publications:** See new book on eye movement by O'Rego and Levy-Schoer
 - **Keywords:** *Divided attention* *Theoretical models*
Focused Attention *Mental resources*
Physio. Perform. Meas.
Selective attention
-

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 University of Leeds
 Human Psychopharmacology Research Unit
 Leeds, West Yorkshire LS6 9JT
 United Kingdom
- **Performance Measures:** Critical flicker fusion is studied over menstrual cycles
 - **Normative Data Base:** 56 women over three months
 - **Test Validation:** Unspecified
 - **Testing Protocol:** 5 minutes of practice on CFRT, 5 minute test at same time of day at various stages of menstrual cycle repeated measures designed, in some cases, between subjects, eg. different gynaecological states.
 - **Test Equipment:** Leeds psychomotor tester
 - **Theoretical Background:** Cognitive information processing and/or arousal model
 - **Relevant Publications:** See Hindmarch publications
 - **Keywords:** *Environmental stressors*
Norm. performance Measures
-

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 Universiteit van Amsterdam
 Orthopedagogisch Instituut
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 1076 CV Amsterdam
 The Netherlands

- **Performance Measures:** *Lýst van Sociale Gedragingen (LSG)*, self-rating scale measuring social anxiety and avoidance behavior, the *Lýst Mogelyke Gebieden van Verandering (LMGV)* (assesses real and supposed conflicts), and the *Omgangssituatiedýst (OSL)* (assesses some conditional aspects of problem-solving behaviour).
- **Normative Data Base:** No
- **Test Validation:** Some tests have been validated with subscales from ASS (Brinkman and Hox), the 5 PFT (Akkerman), and trained judges; others are still in progress.
- **Testing Protocol:** Written tests, self-rating, and some self-administered tests are used.
- **Test Equipment:** Cyber, SPSS
- **Theoretical Background:**
 - Shriber, S.C. and Dýk, T.M. van (1981) *Gezinstherapie en Sociale Leertheorie*. Baexem, Gamma-publicaties
 - Dýk, T.M. van et al. (1982) *Meten van assertiviteit, angst daarvoor en vermijding*. Amsterdam, U.v.A. MLS- publicatie 16
 - Dam-Baggen, R. and Kraamaat, F. (1984) Een op zelfregulatie gebaseerde social-vaardigheidstherapie in groepen. *Evaluatie en Predicatie, Gedragstherapie*, 17(4)
 - Dýk, T.M. van and Shriber, S.C. (1984) *Ontwikkeling en Omgangssituatiedýst OSL*. Amsterdam, U.v.A. Vakgroep Gezinsleer
 - Weiss, R. et al. (1973) A framework for conceptualizing marital conflicts. In: Hamerlyne, L.A. *Behavior Change*. Champaign, Ill. Research Press
- **Relevant Publications:**
 - Dýk, T.M. van et al. (1983) *Wat moet anders? Ontwikkeling van de Lýst van Mogelyke Gebieden van Verandering*. Amsterdam: Vakgroep Gezinsleer, Universiteit van Amsterdam
 - Dýk, T.M. van Training in sociale vaardigheden binnen partner-relatietherapie. In: Dam-Baggen and Kraamaat *Sociale Angst*. Deventer, in druk
- **Keywords:**
 - Environmental Stressors*
 - Stressor Effects*
 - Theoretical Models*

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 Bout, J.V.D.
 Hoevenaais, J.
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 Son, M.J.M. van
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- **Performance Measures:** Two measures of several performances of the Pleasant Events Schedule (PES) and the Unpleasant Events Schedule (UES)
- **Normative Data Base:** See Hoevenaais, 1987
- **Test Validation:** The english version of the PES and the UES has shown some validity
- **Testing Protocol:** Paper and pencil test with instructions developed by Levinsohn et al. (1976,1983)
- **Test Equipment:** No information supplied
- **Theoretical Background:** Levinsohn's reinforcement theory of depression (See Hoevenaais, 1987)
- **Relevant Publications:**
 - Levinsohn, P.M. et al. (1983) *Manual for the Unpleasant Events Schedule*. Oregon, University of Oregon.
 - Macphillamy, D.J. & Levinsohn, P.M. (1976) *Manual for the Pleasant Events Schedule*. Oregon, University of Oregon

• **Keywords:**

Environmental stressors
Individual differences
Stressor effects
Theoretical models

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 Frauenfelder, U.
 Schreuder, R.

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 6525 XD Nijmegen
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- **Performance Measures:** Reaction time, intersensory facilitation; distinction of representation and integration
- **Normative Data Base:** No information supplied
- **Test Validation:** No information supplied
- **Testing Protocol:** Group experiment with visual and auditory presentation
- **Test Equipment:** DEC PDP 11/23 and special software package for crossmodal investigation
- **Theoretical Background:** Differentiation of crossmodal contacts at representational and decision/integration levels
- **Relevant Publications:** See publications by J. Miller
- **Keywords:** *Divided attention*

Egeraat, J. van (See Snijders, page 95)

Eiselt, W. (see Schoeffel, page 92)

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 West Germany

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- **Performance Measures:** SPM (Raven) Juveniles
- **Normative Data Base:** No
- **Test Validation:** Correlation with LPS and FPI
- **Testing Protocol:** Unlimited time
- **Test Equipment:** Honeywell-Bull; SPSS
- **Theoretical Background:** Performance of juveniles in environmental stressing situations
- **Relevant Publications:** Eisenhardt, T. (1977): *Die Wirkungen der kurzen Haft auf Jugendliche*. Frankfurt

- **Keywords:** *Environmental stressors*
Individual differences
Mental resources
Stressor effects

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- **Performance Measures:** Reaction-time tasks (Schneider & Shiffrin 1977), computerized Bourdon task, verbal & and nonverbal memory tasks are used to investigate the effects of "brain damage" (trauma and normal and pathological aging) on information processing; dissociation of memory systems.
- **Normative Data Base:** Approx. 140 healthy adults, 30-70 yrs. old
- **Test Validation:** The project is directed at studying the validity of attention and memory tasks as used in the literature.
- **Testing Protocol:** The tests are given individually and with the help of a P.C.
- **Test Equipment:** PC Apple Plus with locally developed software called A-Plex. New versions will soon be available for Olivetti PC's.
- **Theoretical Background:** The information processing model of Schneider & Shiffrin, 1977. *Psy. Review*, & the related semantic associative memory model of Raaymakers and Shiffrin
- **Relevant Publications:** Maarse, F., A-plex apparatus for Psycholinguistic experiments, *Proceedings of the second workshop "Computers in Psychology"*, Lisse & Swets, in preparation
- **Keywords:** *Divided attention* *Workload*
Focused attention *Individual differences*
Normative performance measures
Selective attention

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- **Performance Measures:** Verbal reasoning (Baddeley), digit span, visual search, and odd-even serial RT task are used to determine thermal and diving stress and fatigue.
- **Normative Data Base:** No
- **Test Validation:** No - but high reliability established
- **Testing Protocol:** Practice followed by testing before/during/ after stressor; typically within-Ss design
- **Test Equipment:** BBC Master/Winchester Hard Disk and In-House software
- **Theoretical Background:** General information-processing model
- **Relevant Publications:** -Ellis (1982), *Human Factors*
 -Ellis et al. (1985), *J. Aviation, Space & Env. Med.*
- **Keywords:** *Divided attention*
Environmental stressors
Focused attention
Mental resources
Workload

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Uytdehaage, B.**Orlebeke, J.F.**

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1081 HV Amsterdam
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- **Performance Measures:** The Neurobehavioral Evaluation System (NES), which has been developed to facilitate the evaluation of populations at risk for nervous system dysfunctions due to environmental agents
 - **Normative Data Base:** No
 - **Test Validation:** The tests included are modified from the validated Wechsler Adult Intelligence Scale (Wechsler, 1955).
 - **Testing Protocol:** A microcomputer is used to run the tests.
 - **Test Equipment:** Olivetti M24 computer with MS-DOS operating system
 - **Theoretical Background:** The NES is used to record symptoms, obtain exposure history, and characterize confounding variables. Standard tasks evaluating memory, visual/motor function, and mood are selected and adapted for computer presentation following the recommendations of the World Health Organization and National Institute for Occupational Safety and Health. Exposure to toxic substances would be expected to shift the distribution of test scores in groups of individuals with excessive exposure.
 - **Relevant Publications:** -Emmen, H.H. et al., (1987) Reliability of the Neurobehavioral Evaluation System. *Abstract for the First Meeting of the International Neurotoxicology Association* in Lunteren, The Netherlands.
 - **Keywords:** *Normative performance measures*
Performance
Physio. Perform. Meas.
-

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Bundesanstalt für Arbeit
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- **Performance Measures:** Ability tests, occupational interest inventories, vocational counseling of adolescents and adults, employment interviewing, and rehabilitation
- **Normative Data Base:** See "Publications"
- **Test Validation:** See "Publications"
- **Testing Protocol:** Paper-pencil tests are used.
- **Test Equipment:** Most cases are handled manually, but about one fourth of the cases use optical-electronic scanning, and computerized test interpretation. Siemens hardware and in-house software is used.
- **Theoretical Background:** Person-environment-fit

- **Relevant Publications:**
 - Engelbrecht, W. (1975) Validierung einer Berufseignungs-Test-batterie und Verwendung der Ergebnisse für eine computerunterstützte berufsbezogene Testbefundinterpretation. *Diagnostica*, 21, 3-24, 97-106
 - Engelbrecht, W. (1978) Weiterentwicklung der maschinellen Testbefundinterpretation zur EUB-Testbatterie. *Diagnostica*, 23, 39-49
 - Engelbrecht, W. (1980) Automated vocation-oriented test interpretation for the use of vocational guidance at the Bundesanstalt für Arbeit (Federal Employment Institute). *German Journal of Psychology*, 4, 74-82
- **Keywords:**
 - Individual Differences*
 - Mental Resources*
 - Personnel Selection*

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- **Performance Measures:** Unified tri-service PAB, physiological and work/exercise physiology measures to assess cognitive, fatigue, ECG, pulmonary and mood changes as a function of sustained work without sleep in thermo stress environments
- **Normative Data Base:** Not yet
- **Test Validation:** Yes, see Perez W. et al. (1987). Unified Tri-Service Cognitive Performance Assessment Battery: Review and Methodology AAMRL-TR-87-007. AAMRL, Dayton, Ohio
- **Testing Protocol:** Alternating sleep/sleep deprivation and work schedules are used.
- **Test Equipment:** Complete psychophysiology lab with MINC, Microvax, and Zenith 150 computers. Will add another treadmill, EEG, and peripheral equipment as money permits
- **Theoretical Background:** Perez, W. et al. (1987). Unified Tri-Service Cognitive Performance Assessment Battery: Review and Methodology. AAMRL-TR-87-007. AAMRL, Dayton, Ohio
- **Relevant Publications:**
 - Englund, C.E. (1978). The diurnal function of reading rate, comprehension, and efficiency. *Chronobiologica*, VI, 2, 1979, and in *Proceedings, XIV International Conference of the International Society for Chronobiology*, Hanover, Germany, 8-12 July 1979. (Navel Health Research Center TR 79-28; AD# A118-118)
 - Englund, C.E. et al. (1981). The effects of moderate physical work on chronopsychological variables during sustained operations. In E. Haus and H. Kabat (Eds.), *Chronobiology*, 1982-1983, (p. 192-199). Basel, Switzerland; New York: S. Karger
 - Naitoh, P. et al. (1983). Altered circadian periodicities in oral temperature and mood in men on an 18-hour work-rest cycle during a nuclear submarine patrol. *International Journal of Chronobiology* 8:149-172. (Navel Health Research Center TR 81-8; AD# A102-590)
 - Englund, C.E. et al. (1984). Cognitive performance during successive sustained operations. *Behavior Research Methods, Instruments, and Computers* 17(1), 75-85. (Naval Health Research Center Tr 84-31, AD# A148-061)
 - Ryman, D.H. et al. (1985) Decrements in logical reasoning performance under conditions of sleep loss and exercise: The factor of sentence complexity. *Journal of Perceptual Motor Skills*, 16, 1179-1188 (Naval Health Research Center Rep. No. TR 85-20, AD#)
- **Keywords:**
 - Normative performance measures*
 - Performance*
 - Physio. Perform. Meas.*
 - Stressor effects*
 - Workload*

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- **Performance Measures:** Car and truck driver behavior is studied through the use of different aspects of performance, including qualitative aspect, behavior in critical situations, and handling of conflicts.
- **Normative Data Base:** No
- **Test Validation:** There has been validation of traffic conflict techniques.
- **Testing Protocol:** No tests
- **Test Equipment:** No information supplied
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:** *Environmental stressors*
Performance
Response competition
Risk taking
Task analysis

Ertel, S. (See Lüer, page 66)

Extra, J.

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 Vakgroep Sociale En Organisatie Psychologie
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 3584 CS Utrecht
 The Netherlands

- **Performance Measures:** Reaction time and writing ability are measured to ensure credibility of bogus feedback on own and other's performance scores to subjects. Investigation of how own and other's scores affect subject's performance and subject's ratings of other performance
- **Normative Data Base:** No information supplied
- **Test Validation:** No information supplied
- **Testing Protocol:** Fake tests are used.
- **Test Equipment:** No standard equipment is used
- **Theoretical Background:** Social comparison and judgement theories, level of aspiration theory
- **Relevant Publications:** -Extra, J. (1983). *Machtafstandreductie en Sociale vergelijking*. Dissertation, Utrecht University
 -Extra, J. & Huybregts, G. (1983). *Prestatieverandering door sociale vergelijking*. *Nederlands Tijdschrift voor de Psychologie*, 38, 445-451

- **Keywords:** *Performance*
Theoretical models

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- **Performance Measures:** Room for maneuver, regulation capacity, and steering capacity are used as indicators for quality of work and organization.
- **Normative Data Base:** No- absolute norms are neither appropriate nor possible.
- **Test Validation:** Yes- for Socio-Technical Task Analysis, where $N=445$
- **Testing Protocol:** Individual questionnaires, observation lists, and interview schemes are administered by way of the System Analysis (SA), Socio-Technical Process Analysis (STPA), and the Socio-Technical Task Analysis (STTA).
- **Test Equipment:** Currently, written questionnaires are being used. Future plans include automating the test administration
- **Theoretical Background:** Approach to Flexible Productive Systems (AFPS), AFPS design philosophy (allocation of system functions), and methodology= system thinking/theory of practice
- **Relevant Publications:**
 - Eynatten, F.M. van (1985) STTA, naar een nieuw werkstructureringsparadigma. Nijmegen: Katholieke Universiteit, druk: Nederlandse Philips Bedrijven, B.V., Eindhoven, proefschrift
 - Eynatten, F.M. van, & Otten, J.H.M., 1986, (in press) Contributions to automation processes from the perspective of a changing Work structuring Paradigm. *Proceedings of the Second West-European Conference on the Psychology of Work and Organization*, Aachen, West Germany
 - Hertog, J.F. den, & Eynatten, F.M. van, (1982). Practical paradigms for job design strategy. In: Kelly, J.E. & Clegg, C.W. (Eds.). *Autonomy and control at the work place: contexts for job redesign*. London: Croon Helm
 - Eynatten, F.M. van, et al. (1986). Grenzen voor productiecellen: ervaringen met het formeren van pseudo-autonome groepen in een truckeindassemblagefabriek. Nijmegen: KWO-Onderzoeks-en Adviesgroep. *Paper voor de konferentie Technologie, Arbeid en Economies te Maastricht*, 24 Oktober
 - Eynatten, F.M. van (1984). Flexibele Productie-Automatisering (FPA) en de gevolgen voor de kwaliteit van arbeid. In: *Computable*, Supplement, 7 December, pp. 7-8
- **Keywords:** *Decision making*
Task analysis
Theoretical models
Workload

Fadden, D.M.
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Wiedemann, J.
Kelly, B.D.

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- **Performance Measures:** The greatest reliance is placed on subjective measures, given in a structured environment with supporting performance or physiological measures. Tracking tasks are used if compatible with procedures. The purpose is to check validity of subjective measures

- **Normative Data Base:** Not usually. Tests are designed as comparative evaluations
- **Test Validation:** There have been many and various validations, due to the redundancy in the test data.
- **Testing Protocol:** Structured test design is used, including detailed data collection plan. Subject has controlled opportunity for free-form comments.
- **Test Equipment:** Airplane simulators or actual production airplanes
- **Theoretical Background:** Various backgrounds due to wide range of studies
- **Relevant Publications:** See various SAE and AIAA conference proceedings
- **Keywords:**
 - Individual differences* *Theoretical models*
 - Performance* *Workload*
 - Physio. Perform. Meas.*
 - Selective attention*
 - Task analysis*

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- **Performance Measures:** Number recognition (tracking paradigm individually adapted in speed) and mental arithmetic (under conditions of noise) are used for basic research in psychophysiological relationships, stress-strain processes, and personality research.
- **Normative Data Base:** No database is available.
- **Test Validation:** See "Publications"
- **Testing Protocol:** See "Publications"
- **Test Equipment:** PC Commodore Amiga 1000, laboratory computer HP 1000/85 specific software and software packages suited for beat-to-beat analyses of cardiovascular recordings
- **Theoretical Background:** Differential psychophysiology. Assessment of stimulus and individual specific response patterns. Laboratory field predictability and generalizability of individual differences in activation processes.
- **Relevant Publications:**
 - Fahrenberg, J. et al. (1979) Psychophysiologische Aktivierungsforschung. München: Minerva
 - Fahrenberg, J. et al. (1984) Psychophysiologische Aktivierungsforschung im Labor-Feld-Vergleich. München: Minerva
 - See also Psychophysiology
- **Keywords:**
 - Individual Differences*
 - Personality Factors*
 - Stressor Effects*

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- **Performance Measures:** Paper-pencil tests are used for assessment of intelligence, memory, concentration, & personality traits. Simulator-based tests are used for assessment of sensorymotor skills, coordination, & capacity for complex workload. Apparatus tests include: ERT (Entscheidungs Reaktions Test): decision making/reaction, VWT (Visueller Wahrnehmungs Test): visual memory, DTG (Determinationsgerät): concentration, and DLT (Dichotic Listening Test): division of attention
- **Normative Data Base:** Database consists of about 1000 aircrew personnel per year, and is stored on Tektronix and IBM with BASIC software.
- **Test Validation:** Long-term validation; data collection in progress. Various validation studies by HANSEN, 1986
- **Testing Protocol:** Paper-pencil tests are used and scored manually. Complex simulation tests use standardized and automated (audio cassettes) instructions, supervised training sessions, automated testphase, and computer-based scoring.
- **Test Equipment:** Tektronix computers, using BASIC are currently in use. High capacity sophisticated hardware may be used in future.
- **Theoretical Background:** Paper-pencil tests are self-explanatory. Simulator-based tests are simulations of cockpit-specific tasks and workload.
- **Relevant Publications:** No publications supplied
- **Keywords:**

<i>Decision Making</i>	<i>Performance</i>
<i>Divided Attention</i>	<i>Personnel Selection</i>
<i>Focused Attention</i>	<i>Risk Taking</i>
<i>Individual Differences</i>	<i>Selective Attention</i>
<i>Mental Resources</i>	<i>Stressor Effects</i>
<i>Norm. Perform. Meas.</i>	<i>Workload</i>

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- **Performance Measures:** Serial RT, verbal reasoning (Baddeley), manikin task, tracking (various), vigilance, addition, letter transformation, memory search, articulatory and spatial suppression, & peripheral detection are used to study the effects of environmental stressors and dual task performance.
- **Normative Data Base:** inc
- **Test Validation:** Some tests correlated with flying performance.
- **Testing Protocol:** Typically within-Ss design (with tests for possible asymmetric transfer effects); 1 practice session; battery of 3-5 tests (total duration 1-1.5 hrs)
- **Test Equipment:** Apple II, IBM PC (plus compatible), Basic/ Pascal/Assembler
- **Theoretical Background:** Working memory
- **Relevant Publications:**
 - Farmer and Bendix (1982), *Perceptual & Motor Skills*
 - Farmer, Hunter and Belyavin (1984), *Perceptual & Motor Skills*
 - Farmer & Green (1985), *Report of the 16th Conference of WEAAP*
 - Farmer, Berman & Fletcher (1986), *Quarterly Journal of Experimental Psychology*
- **Keywords:**

<i>Divided attention</i>	<i>Personality factors</i>
<i>Environmental stressors</i>	<i>Selective attention</i>
<i>Focused attention</i>	<i>Task competition</i>
<i>Individual differences</i>	<i>Theoretical models</i>
<i>Mental resources</i>	<i>Workload</i>

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- **Performance Measures:** UH-ID Simulator (screening). Various apparatus tests for pilot preselection, ATC controller selection, psychol. training (speed of perception, distribution of attention, psycho-motor performance); also, various paper-pencil tests (IST-70, CFT-3, LGT, WFT, KBT, labyrinth) for pilot preselection, ATC selection
- **Normative Data Base:** UH-ID: N = 300 app/paper-pencil tests: several thousand subjects (details BMVg PII4); no computer available
- **Test Validation:** Published by Federal Armed Forces Psychological Service (BMVg PII4)
- **Testing Protocol:** Individual testing by test assistant; UH-ID-Simulator: learning probe, one hour/day, four days, instruction and observation by instructor pilots
- **Test Equipment:** No information supplied
- **Theoretical Background:** No information supplied
- **Relevant Publications:** See list of annual publications by German MoD-PII4
- **Keywords:**

<i>Decision making</i>	<i>Personnel selection</i>
<i>Divided attention</i>	<i>Risk taking</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Environmental stressors</i>	<i>Stressor effects</i>
<i>Individual differences</i>	<i>Task analysis</i>
<i>Mental resources</i>	<i>Workload</i>
<i>Normative performance measures</i>	

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The Netherlands

- **Performance Measures:** Reaction times, total correct/error, detection rate and false alarms, & electrodermal responses are used for personnel selection
- **Normative Data Base:** Yes-data from more than 100 driver's function applicants is available at item level. For large groups total correct/ error is available. (in SAS)
- **Test Validation:** Validation of the DTG test has been done with performance data from engine-drivers in their real-life jobs
- **Testing Protocol:** Three tests are used: the DTG, a nine-alternative choice reaction time test, the VDA, a signal detection test, & the EDA, a habituation speed test
- **Test Equipment:** Apple IIe computers, ZAK I/O equipment, and Intertest programs
- **Theoretical Background:** Experimental psychology
- **Relevant Publications:**
 - Warm, J.S. (Ed.) (1984) *Sustained attention in human performance*. John Wiley & Sons., Cincinnati
 - Crider, A. & Augenbraun, C.B. (1975) Auditory Vigilance Correlates of Electrodermal Response Habituation Speed. *Psychophysiology*, 12.
- **Keywords:**

<i>Divided attention</i>	<i>Response competition</i>
<i>Focused attention</i>	<i>Workload</i>
<i>Individual differences</i>	
<i>Mental resources</i>	
<i>Personnel selection</i>	

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- **Performance Measures:** Speed and accuracy in data-entry tasks and vigilance tasks for assessing the workload of data-entry operators and measuring the effects of combined stressors on performance and physiological indices
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** Separate familiarization, training, and experimental sessions
- **Test Equipment:** HP 2647 A and HP9000
- **Theoretical Background:** Psychophysiological theories of activation
- **Relevant Publications:** -*Ergonomics*, 1985, 28, 1455-1468
- **Keywords:** *Environmental stressors*
Focused attention
Mental resource
Selective attention
Workload

Folgering, H. (See Hermaarden, page 47)

Forshaw, S.
Abel, S.

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- **Performance Measures:** Ability to understand speech in operational environments by individuals with various degrees of hearing disability
- **Normative Data Base:** A normative data base is generated as part of the study.
- **Test Validation:** Results are bench-marked against aircrew with operational experience.
- **Testing Protocol:** Psychoacoustic test, auditory memory recall, speech intelligibility tests, and hearing measurement scales
- **Test Equipment:** No information supplied
- **Theoretical Background:** Various acoustic, audiologic, and psychoacoustic literature
- **Relevant Publications:** See acoustic, audiologic and psychoacoustic literature
- **Keywords:** *Performance*

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- **Performance Measures:** Measures include perceptual, memory, and reaction time measures, as well as event-related potential, P300. These measures are used to uncover how certain stressors influence skilled performance so that theoretical models can be developed.
- **Normative Data Base:** No
- **Test Validation:** The experimental method constitutes the validation process.
- **Testing Protocol:** The stressor is compared to a control condition.
- **Test Equipment:** Masscomp 5600, LSI 11/73, PDP 11/04
- **Theoretical Background:** Information processing model of skilled performance
- **Relevant Publications:**
 - Fowler, B. & Ackles, K.N. (1975). The effect of hyperbaric air on long-term memory organization and recall. *Aviation Space and Environmental Medicine*, 46, 655-659
 - Fowler, B. et al. (1985). The effects of inert gas narcosis on behavior-a critical review. *Undersea Biomedical Research*, 12, 369-402
 - Fowler, B. et al. (in press). A direct estimate of the threshold for hypoxia effects on perceptual-motor performance. *Human Factors*
 - Fowler, B. et al. (1980). Narcotic effects of nitrous oxide and compressed air memory and auditory perception. *Undersea Biomedical Research*, 7, 35-46
 - Fowler, B. et al. (1982). The effects of hypoxia on serial response time. *Ergonomics*, 25, 189-201
- **Keywords:**
 - Environmental stressors*
 - Performance*
 - Stressor effects*
 - Theoretical models*
 - Workload*

Fracker, M.L. (See Wilson, page 112)

Frauenfelder, U. (See Dykstra, page 22)

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- **Performance Measures:** Reaction time and accuracy measures; investigation of controlled versus automatized display search under different load conditions (task speed, difficulty, secondary task) in order to assess (individual) capacity levels and allocations in attention and performance
- **Normative Data Base:** No

- **Test Validation:** Simulation of reading instruments on a console, as in complex man-machine systems and/or supervision tasks (Radar, Sonar); show face validity by way of display.
- **Testing Protocol:** Visual display, earphones; computerized task presentation and computerized storage of performance data
- **Test Equipment:** ELTEC EUROCOM II, combined with especially developed display and IBM XT (more information: see publications)
- **Theoretical Background:** Shiffrin & Schneider: two process theory of attention; Navon & Gopher: model of multiple resources
- **Relevant Publications:** -Zimmer, H., Vossel, G. & Frölich, W.D. (1986). Determinanten der Stabilität: Automatische Verarbeitungsprozesse und Aufmerksamkeitskapazität bei der Display-Absuche. *Wehrpsychologische Untersuchungen*, 21 (2), 73-152
- **Keywords:** *Divided attention Workload*
Focused attention
Individual differences
Performance
Physio. Perform. Meas.

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- **Performance Measures:** Computer simulated scenarios in which subjects can manipulate exogenous variables and see the effects of their interventions by endogenous variable states are used to measure the quality of system identification and system control.
- **Normative Data Base:** No
- **Test Validation:** In progress
- **Testing Protocol:** Systems are computer-displayed scenarios with which subjects can interact.
- **Test Equipment:** IBM-compatible PC; general program for data presentation and registration; list of scenarios is described in Funke et al., 1986
- **Theoretical Background:** Theories of decision making under uncertainty and of the development of "mental models" through learning by doing
- **Relevant Publications:** -Funke, J. (1985). Steuerung dynamischer Systeme durch Aufbau und Anwendung subjektiver Kausalmodelle. *Zeitschrift für Psychologie*, 193, 435-457.
 -Funke, J., Fahrenbrück, G. & Müller, H. (1986). Ein Computerprogramm zur Simulation dynamischer Systeme. *Berichte aus dem Psychologischen Institut der Universität Bonn*, Band 12, Heft 3.
- **Keywords:** *Decision making*
Task analysis
Theoretical models

Funke, U. (See Schuler, page 92)

Gabriel, R.F.
 Erickson, J.B.
 Stone, G.

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- **Performance Measures:** Time, errors, RMS tracking, tracking reversal, subjective scales, secondary tasks, and physiological measures (EEG, EKG, blood volume, etc.) are used for a wide variety of research.
- **Normative Data Base:** A data base is used for time, motion, and workload studies, as well as for anthropometry data, which is used for workplace layout.
- **Test Validation:** Some validation has been done by comparing simulator test data with actual flight performance data.
- **Testing Protocol:** A wide variety of protocols is used.
- **Test Equipment:** Basic psychological and physiological equipment is used. In addition, full-and part-task simulators are used.
- **Theoretical Background:** Limited channel capacity is used for workload, negative panic is used for passenger evacuation data, pin joints for anthropometry, and time required divided by time available is used for various tests.
- **Relevant Publications:**
 - Biferno, M.A. & Bigham, T.R. (1982) Speech- Related Potentials Elicited by Synthetic Speech Stimuli. *Psychophysiology*, 19, 306-307
 - Erickson, I.B. & Mas, G.E. (1980) Development and Evaluation of a Prototype Engine Monitoring and Display System. *D.C. Flight Approach*, 36, December
 - Summers, L.G. & Miller, J.I., (1983) Primary Flight Display: A Step Beyond EADI'S. SAE paper No. 831533, SAE Aerospace Congress and Exposition. Long Beach, California. October
- **Keywords:**

<i>Decision making</i> <i>Divided Attention</i> <i>Focused Attention</i> <i>Individual Differences</i> <i>Mental Resources</i> <i>Performance</i>	<i>Physio. Perform. Meas.</i> <i>Response Competition</i> <i>Selective Attention</i> <i>Stressor Effects</i> <i>Task Competition</i> <i>Workload</i>
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Gallard, A. (See Boer, page 7)

Galen, G. van (See Thomassen, page 102)

Gallhofer, I.N.

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- **Performance Measures:** Prediction of use of decision rules for the detection of political decisions
- **Normative Data Base:** 250 cases of political decisions in micro-computer, as well as the results of the validation study
- **Test Validation:** Validation of prediction of political decisions by a sample of the Dutch population via a fully automatic interview procedure
- **Testing Protocol:** Verbal protocols
- **Test Equipment:** Tele-interview system
- **Theoretical Background:** Decision theory as developed by psychologists and statisticians

- **Relevant Publications:** -Gallhofer, I.N., et al.(1986). The Empirical Decision Analysis Procedure. IN: Gallhofer, et al. (eds.) *Different Test Analysis Procedures for the Study of Decision making*. SRF
- **Keywords:** *Decision making*
Individual differences

Geer, C. (See Hebenstreit, page 44)

Genon, J. Telephone number not supplied

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- **Performance Measures:** Psycho-metric scores (coordination, divided attention, motor efficiency), & general aptitude scores (logical reasoning, memory, and practical reasoning)
- **Normative Data Base:** A data base is currently being collected.
- **Test Validation:** Yes- permanent validation through agreement with flight formation feedback
- **Testing Protocol:** Group questionnaires and individual tests of a psychomotor and projective nature and interviews
- **Test Equipment:** Precise Instrument Coordination Analyzer (PICARD) micro computer, Kontron PSI 80/ System KOS, Determination Gerat (DTG) micro computer ADDS/system Pakkett Picar
- **Theoretical Background:** Existential and dynamic psychology
- **Relevant Publications:** No publications supplied
- **Keywords:**

<i>Decision making</i>	<i>Personnel selection</i>
<i>Divided attention</i>	<i>Response competition</i>
<i>Environmental stressors</i>	<i>Risk taking</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Task analysis</i>
<i>Normative perform. measures</i>	<i>Task competition</i>
<i>Performance</i>	<i>Theoretical models</i>
<i>Personality factors</i>	<i>Workload</i>

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Greer, D.

Illes, J.

Bresler, S.L.

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- **Performance Measures:** EEG, MEG measures are used for predicting performance quality and for basic neuroanatomy.
- **Normative Data Base:** Normative data is collected on a UNIX operating system.
- **Test Validation:** Yes, with independent data replication and clinical neurological data
- **Testing Protocol:** Computer-controlled tasks developed in our lab

- **Test Equipment:** UNIX software
- **Theoretical Background:** The brain produces behavior. Details are too complex to describe here.
- **Relevant Publications:** -*Science*. 30 Jan 87. vol 235. 580-585
- **Keywords:**

<i>Decision making</i>	<i>Performance</i>
<i>Divided attention</i>	<i>Workload</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Task competition</i>
<i>Normative performance measures</i>	
<i>Physio. Perform. Meas.</i>	

Gier, J.J. (see O'Hanlon, page 78)

Gillard, M. (See Hyacinthe, page 51)

Gilliland, K. Telephone: (1) 405-325-4511
 University of Oklahoma
 Dept. of Psychology
 Human Performance Research Laboratory
 Norman, Oklahoma 73019
 United States of America

- **Performance Measures:** USAF Criterion Task Set (Single and dual task modes), brainstem and cortical evoked response, and Subjective Workload Assessment Techniques are used to explore basic human performance, as well as personality and individual differences effects. Drug and stressor effects on human performance are also studied.
- **Normative Data Base:** A normative data base is being completed and will be reported to the Air Force, where it will be made available.
- **Test Validation:** We are currently completing the standardization study for the CTS battery. Other measures we utilize have been shown to be valid by the open literature.
- **Testing Protocol:** Basic experimental paradigms with computer driven task battery (CTS)
- **Test Equipment:** Commodore 64 microcomputer system is used for CTS battery, but may be eventually replaced by an IBM-PC compatible system.
- **Theoretical Background:** CTS-Multiple Resource and Stage models of information processing. Brainstem Evoked Response- functional capacity of the auditory pathway, neural conduction capability, and reflection of arousal state
- **Relevant Publications:**
 - Gilliland, K. et al. (1980). Differences in EEG alpha index between extroverts and introverts. *Psychophysiology*. 18, 156. abstract
 - Bullock, W. et al. (1982). Effects of stimulus intensity and repetition rate on brainstem auditory evoked response and recovery rate of introverts and extroverts. *Psychophysiology*. 19, 552-553. abstract
 - Gilliland, K. et al. (1984). Effect of workload on the auditory evoked brainstem response. *Proceedings of the Human Factors Society*
 - Gilliland, K. et al. (1986). Individual differences in Criterion Task Set performance. *Proceedings of the Human Factors Society*
 - Schlegel, R. et al. (1986). Development of the Criterion Task Set performance data base. *Proceedings of the Human factors Society*
- **Keywords:**

<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Workload</i>
<i>Performance</i>	
<i>Personality factors</i>	
<i>Physio. Perform. Meas.</i>	

Giry, M. (See Hyacinthe, page 51)

Goeters, K.M.

Telephone: (49)-40-5130960

Lorenz, B.

Manzey, D.

DFVLR
Dep. of Aviation and Space Psychology
Sportallee 54
D-2000 Hamburg 63
West Germany

- **Performance Measures:** Knowledge tests (multiple choice), mental aptitude tests (paper-pencil), reaction & psychomotor coordination tests (apparatus) are used in the selection of pilots, ATC's and astronauts.
 - **Normative Data Base:** Contains hundreds to thousands of applicants per year; database on HP 1000, self-developed software
 - **Test Validation:** Validation by correlation analysis and system validity
 - **Testing Protocol:** Paper (partly computer readable), audio-visual (earphones, slides), displays and controls, computer presentation (PC Type)
 - **Test Equipment:** Currently self-developed data management on HP 1000; relational data base planned (HP 9300); additional: test presentation on IBM AT
 - **Theoretical Background:** Demand-oriented tests of aviation occupations
 - **Relevant Publications:**
 - Goeters K.M. (1981): Zur Taxonomie fehlerhaften Arbeitens in psychologischen Leistungstests. *Zeitschrift für Differentielle und Diagnostische Psychologie* 2, S. 237-251
 - Goeters K.M. (1983): Faktorielle Änderungen im Lernprozess: Das Fleishman-Paradigma als Artefaktbildner? *Zeitschrift für Differentielle und Diagnostische Psychologie*, 4, S. 301-318
 - **Keywords:**
 - Divided attention*
 - Focused attention*
 - Individual differences*
 - Personality factors*
 - Personnel selection*
-

Goud, A.

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Mellaard, M.

Postmes, J.

Veldt, R. van der

TNO Institute of Mechanical Engineering
P.O.Box 29, 2600 AA
Leeghwaterstraat 5, Delft
The Netherlands

- **Performance Measures:** Measures are derived from production goals and process characteristics as well as from human characteristics in order to achieve optimal use of process equipment, materials, energy, and human capacities in the process industry.
- **Normative Data Base:** Part of the measures of performance is derived from process characteristics and production goals. The human measures of performance are based on relevant literature, checklists, and experience of the investigators.
- **Test Validation:** Feedback on the validation of the research method is obtained by comments of principals on the results of contract-research.
- **Testing Protocol:** Semi-structured interviews and observations, task analysis, information analysis, process analysis, document studies, and statistical analysis of quantitative data
- **Test Equipment:** The development of an expert-system is being considered for the assistance in the design of man-machine systems (control rooms) in the process industry.

- **Theoretical Background:** General measurement and control theories, Ergonomics (Meister, McCormick, Sanders), Cognitive Psychology (Reynolds & Flagg), and Instructional / Learning Psychology (van Parreren)
- **Relevant Publications:**
 - Goud, A. & Jaspers, B. (1987). *Generating training specifications for a new marine simulator*. Marsim
 - Mellaard, M., et al. (1985) Methode voor Simulatorafweging. *PT Procestechiek*
 - Postmes, J. & Kop, A. (1986) Analyse van Informatiestromen. *PT Industriële Automatisering*
- **Keywords:**
 - Decision making*
 - Environmental stressors*
 - Stressor effects*
 - Task analysis*
 - Workload*

Greer, D. (See Gevins, page 35)

Greuter, M.A.M. Telephone number not supplied
 University of Amsterdam
 Dept. of Organizational and Industrial Psychology
 Psychologisch Laboratorium
 Weesperplein 8
 1018 XA Amsterdam
 The Netherlands

- **Performance Measures:** Behavioral observation scales are used to identify and operationalize criteria for personnel selection.
- **Normative Data Base:** Norms are available for psychiatric aides' jobs ("z" nursing) and are being prepared for social workers.
- **Test Validation:** Construct validation has been achieved with multimethod assessment.
- **Testing Protocol:** Self-administered questionnaires are taken by job incumbants, supervisors, and colleagues.
- **Test Equipment:** None
- **Theoretical Background:** Criteria development; developing predictive models for personnel selection; interactional psychology
- **Relevant Publications:** Several internal reports can be requested at this time. Journal articles are in preparation.
- **Keywords:**
 - Individual differences*
 - Performance*
 - Personnel Selection*
 - Theoretical Models*

Grievink, E. (See Bruyn, de, page 11)

Griffin, M. Telephone: (44) 703 559122
 Institute of Sound and Vibration Research
 Human Factors Research Unit
 The University, Highfield, Southampton SO9 5NH
 United Kingdom

- **Performance Measures:** The effects of vibrations on humans are studied using measures which include visual performance (reading accuracy, reading time, and contrast sensitivity), tracking performance (continuous and discrete with hand, head, and eye), and a cognitive performance battery of 7 tests.
- **Normative Data Base:** No

- **Test Validation:** Measures of inter- and intra- subject variability
- **Testing Protocol:** Design and procedure (including practice and test duration) vary greatly between studies
- **Test Equipment:** Various computers and internally developed software
- **Theoretical Background:** Not applicable
- **Relevant Publications:**
 - Griffin, et al. (1986), ISVR Technical Report number 132
 - Moseley and Griffin (1986) *Ergonomics*
 - Lewis and Griffin (1978) *Journal of Sound and Vibration*
- **Keywords:**
 - Decision Making*
 - Environmental Stressors*
 - Individual Differences*

Grind, W.A. van de
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Neuroinformatics Group, Medical Physics
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The Netherlands

Telephone: (31)20-5665277

- **Performance Measures:** Perceptual abilities
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** Psychophysical methods
- **Test Equipment:** PDP 11, IBM PC's, Apples, VAX graphic terminals, optical equipment
- **Theoretical Background:** Physiological and psychophysical theories of perception (mainly vision)
- **Relevant Publications:**
 - Grind, W.A. van de, et al; (1986) *Vision Res.* 26 (5), 797-810.
 - Krol & Grind, W.A. van de; (1986) *Vision Res.* 26 (8), 1289-1298.
- **Keywords:**
 - Performance*

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- **Performance Measures:** Psychological tests for figural-spatial abilities and cognitive styles are used for fundamental research.
- **Normative Data Base:** Yes, in relevant test manuals
- **Test Validation:** This type of test is frequently used in applied settings, especially for selection of technicians and pilots.
- **Testing Protocol:** Paper, pencil, and video
- **Test Equipment:** Eye movement recording apparatus, video system, and a computer system
- **Theoretical Background:** Intelligence and cognitive style theories, in particular, field dependence and independence.

- **Keywords:**

<i>Divided attention</i>	<i>Selective attention</i>
<i>Focused attention</i>	<i>Task analysis</i>
<i>Individual differences</i>	
<i>Mental resources</i>	
<i>Personality factors</i>	

Groot, G. de (See Ingen Schenau, van, page 52)

Gros, E.
Mehnert, P.
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D-4000 Düsseldorf 1
West Germany

Telephone: (49) 211 3114721

- | | |
|----------------------------------|--|
| • Performance Measures: | 4- and 5-choice reaction time tests, fatigue, concentration, and compensation |
| • Normative Data Base: | In preparation |
| • Test Validation: | Construct validity, surface validity, comparing performance measures with physiological measures |
| • Testing Protocol: | Analog / digital recording of reaction time and errors |
| • Test Equipment: | Determinationsgerät Fa. ZAK DTG, PC, BMDP, SPSS, SAS |
| • Theoretical Background: | Reaction time test performance as indicator for vigilance, fatigue, subjective stress resistance depending on endogenously and exogenously controlled rhythmicity |
| • Relevant Publications: | -Gros, E. & Mehnert, P. (1986). Methodical problems in research of performance changes as after-effects of noise. In: Schick, A., Hoge, H. & Lazarus, G. (Eds), <i>Contributions to Psychological Acoustics</i> . Oldenburg: BIS (Bibliotheks und Informationssystem der Universität Oldenburg), 122-137 |
| • Keywords: | <i>Environmental stressors Theoretical models</i>
<i>Individual differences</i>
<i>Performance</i>
<i>Personality factors</i>
<i>Stressor effects</i> |

Guillermain, H. (See Neboit, page 76)

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University of Southern California
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Dept. of Safety Science and Human Factors
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United States of America

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- Performance Measures:** Measurements of time estimation, reaction time, and error rate are used to assess primary task workload.

- **Normative Data Base:** Yes, there is a research data base using PC software and hard and soft disk storage.
- **Test Validation:** Yes, NASA TLX and SWAT validations. Time estimation and reaction time measurements are common.
- **Testing Protocol:** Computer-based tests and Subjective Workload Assessment
- **Test Equipment:** IBM PC XT 20 MB hard disk & peripherals are currently in use. Use of an IBM PC AT with 80 MB hard disk is planned.
- **Theoretical Background:** Stress/performance theory, also, theories from Yerkes/Dodson (1908), Hockey/Coles/ Gaillard (1986), and from Hancock/Chignell(1985)
- **Relevant Publications:** See NASA contractor listings
- **Keywords:**

<i>Decision making</i>	<i>Personality factors</i>
<i>Divided attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Performance</i>	<i>Workload</i>
<i>Normative performance measures</i>	
<i>Theoretical models</i>	
<i>Physio. Perform. Meas.</i>	

Hansen, H.D. (see Falckenberg, page 28)

Hansen, I. Telephone: 02.40.30.30.
 The Norwegian Armed Forces
 Psychological and Pilot Selection Educational Centre
 Oslo Mil/akershus
 0015 Oslo 1
 Norway

- **Performance Measures:** Results from various tests are used in pilot selection. These tests include: general ability level tests, Ravens progressive matrices advanced form, number series tests, technical comprehension and space orientation, surface development tests, figure pattern tests, figure form tests, block tests, simultaneous capacity tests, sorting tests, reversal tests, number identification tests, instrument comprehension tests, transfer of principals-confusion of direction tests, mirror tracing tests, time estimation variability and blocks, flying information tests, and defense mechanism tests.
- **Normative Data Base:** Not yet
- **Test Validation:** Contact J.L. Syversen at 1460 Norway
- **Testing Protocol:** No information supplied
- **Test Equipment:** ACSWG is validating the PORTA-BAT system (computer based test system) for use in national test batteries, based on a Fleishman task analysis
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:**

<i>Personality factors</i>
<i>Personnel selection</i>
<i>Task analysis</i>

Harris Sr., R.L.
 Pope, A.T.

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 Flight Management Division
 Human Engineering Methods Group
 Mail Stop 152 E
 Hampton, VA 23665-5225
 United States of America

- **Performance Measures:** Scan behavior, pupil diameter, auditory evoked potentials, heart rate, heart rate variability, eye blink responses, embedded auditory secondary tasks. SWAT, and NASA TLX are used to measure the strain response of test subjects to the stress imposed by a particular flight task. These measures will be used to infer what mental states (strain) the pilots are responding with to the flight tasks.
- **Normative Data Base:** Not yet
- **Test Validation:** Several comparisons have been made to SWAT rating scores.
- **Testing Protocol:** No information supplied
- **Test Equipment:** Fixed-base and motion flight simulators; Data is collected with DEC MINC and AT- based LABMASTER system.
- **Theoretical Background:** No information supplied
- **Relevant Publications:** -NASA TP 2525 (July 1986) Analytical Techniques of Pilot Scanning Behavior and their application.
- **Keywords:** *Mental resources*
Physio. Perform. Meas.
Workload

Harsveld, M.

Royal Dutch Air Force

Royal Dutch AF
 Behavioral Sciences Department
 Koninklijke Luchtmacht
 Afd. Gedragswetenschappen/DPKLU
 Binckhorstlaan 135 KR 2 K 12
 2500 ES Gravenhage
 The Netherlands

- **Performance Measures:** Intelligence tests, spatial ability tests, apparatus tests (hand - eye - feet coordination), and reaction time/attention tests (DTG) are used for selection purposes.
- **Normative Data Base:** Selection data of approximately 4000 stored on a Siemens main frame with IBM TSO operating system and SPSS
- **Test Validation:** Not much. Only for pilots against single pass/fail criteria.
- **Testing Protocol:** Paper, pencils, and other apparatus
- **Test Equipment:** Obsolete apparatus is currently being used. New developments will include digitalized flight simulators and computer based tests.
- **Theoretical Background:** Background is practical (selection), using psychological tests.
- **Relevant Publications:** No publications supplied
- **Keywords:** *Divided attention*
Personality factors
Personnel selection
Selective attention

Hartman, B.O.

Telephone: 512-536-2811

USAF School of Aerospace Medicine
Brooks AFB, Texas 78235
United States of America

- **Performance Measures:** Goal is to target the superior fighter pilot, through use of an Intentional Tutor Training system and Situational Awareness Training, which uses target detection, motion discrimination, recognition, and identification as measures of performance.
- **Normative Data Base:** Not yet
- **Test Validation:** Not yet
- **Testing Protocol:** No information supplied
- **Test Equipment:** AI Enhanced intelligent trainer, PC environment, software is advancing from Basic to Pascal to ADA
- **Theoretical Background:** No information supplied
- **Relevant Publications:** Currently in preparation
- **Keywords:**

<i>Divided attention</i>	<i>Risk taking</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Theoretical models</i>
<i>Performance</i>	<i>Workload</i>
<i>Decision making</i>	
<i>Physio. Perform. Meas.</i>	

Hart, S.G.
Bennett, C.T.
Shively, R.J.
Battiste, V.
Johnson, W.
Bortolussi, M.

Telephone number not supplied

NASA-Ames Research Center
MS-239-3
Moffett Field, CA 94035
United States of America

- **Performance Measures:** % correct, # correct, points scored, RMS tracking error, and response times are used for laboratory research. Control reversals, SD, RMS control activity, error response time, number discreet actions, errors, communications rate, and content are used for simulated and inflight research.
- **Normative Data Base:** No
- **Test Validation:** Results are compared to previous similar research results, theoretical predictions, subjective workload ratings, and physiological measures.
- **Testing Protocol:** It varies with the experiment
- **Test Equipment:** APPLE II, IBM AT, DEC PRO 350, COMMODORE, DEC 11/70, E&S PS-II, VAX, IRIS Graphic systems, DEC 11/44, DEC 11/34, (with RSX operating systems), Analog recorders, and telemetered data
- **Theoretical Background:** This is dependent on the type of study. Some theories used include: Fitt's Law, Hick's Law, Multiple Resource Theory, Automaticity Theory, Production Models, Markov Models, and Optimal Control Models.
- **Relevant Publications:** Relevant information can be found in NASA Technical Reports, *Human Factors Journal*, *AGARDographs*, *Applied Ergonomics*, *Ergonomics*, SAE Technical Publications, *Aviation Space and Environmental Medicine*, and various *Proceedings from Human Factors Annual Manual*, *Aviation Psychology*, *SAE*, and *IEEE*.

- **Keywords:**
- | | |
|-------------------------------|----------------------------|
| <i>Divided attention</i> | <i>Selective attention</i> |
| <i>Individual differences</i> | <i>Task analysis</i> |
| <i>Mental resources</i> | <i>Theoretical models</i> |
| <i>Physio. Perform. Meas.</i> | <i>Workload</i> |
| <i>Response competition</i> | |

Haußer (see Roth, page 85)

Hauke, G.

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21054203

TU München
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D-8000 München 2
West Germany

- **Performance Measures:** Measures are used to assess perception of risks, especially in field settings and related judgemental tasks. The general subject is perception and judgement of risks in man-machine-systems
- **Normative Data Base:** No information supplied
- **Test Validation:** Construct-validation, criterion-validation
- **Testing Protocol:** Answer sheets with scales are used for structured interviews. Additional answers of free interview are tape-recorded.
- **Test Equipment:** No information supplied
- **Theoretical Background:** Descriptive models from the psychological theory of judgement and decision making.
- **Relevant Publications:**
 - Vlek & Stallen (1981)
 - Slovic et al. (1984)
- **Keywords:**
 - Decision Making*
 - Risk taking*
 - Task Analysis*

Hebenstreit, W.J.

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Geer, C.W.

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Boeing Aerospace Co.
Man/Machine Systems Technology
P.O. Box 3999, M/S 2K-58
Seattle, Washington 98124
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- **Performance Measures:** Time and errors are being predicted (for analysis and human performance requirements) and measured (for test and evaluation for validation of the design) in accordance with MIL-H-46855, AFAMRL-TR-81-35, and new DOD-HDBK
- **Normative Data Base:** There are a few for time, e.g., AIR Data Store (see DOD-HDBK), but only one we would consider using for errors. It is a Boeing internal document. Other data is extremely suspect.
- **Test Validation:** Yes-see AFAMRL-TR-81-35, section 3.9.6
- **Testing Protocol:** In accordance with AFAMRL-TR-81-35, section 3.9.6 "Test and Evaluation"
- **Test Equipment:** The most cost-effective techniques for time and error evaluation are direct continuous observation, interviews, questionnaires, video tapes, and online interactive simulation.

- **Theoretical Background:** See AFAMRL-TR
- **Relevant Publications:** -AFAMRL-TR-81-35-DOD HDBK
- **Keywords:**
 - Decision making*
 - Performance*
 - Personnel selection*
 - Task analysis*
 - Workload*

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 Dept. of Psychology, Psychophysiology Div.
 De Boelelaan 1115
 1081 HV Amsterdam
 The Netherlands

- **Performance Measures:** Pupillometry, cardiovascular tests, evoked cortical potentials, as well as speed, processing, and accuracy
- **Normative Data Base:** No
- **Test Validation:** Construct validation in the context of the efficiency model (Heemstra, '84, '85, '86)
- **Testing Protocol:** Computer-controlled and presented visual and auditory lab tests
- **Test Equipment:** DEC LSI 11/23, OLIVETTI, TULIP AT, Whittaker Eye View Monitor
- **Theoretical Background:** Efficiency Model (Heemstra, 1986)
- **Relevant Publications:** -Heemstra, M.L. 1986. An Efficiency Model of Information Processing. In: Hochen, Gaillard, Coles: *Energetics and Human Information Processing*. (NATO-ASI)
- **Keywords:**

<i>Divided attention</i>	<i>Physio.</i>	<i>Perform.</i>	<i>Meas.</i>
<i>Environmental stressors</i>	<i>Theoretical models</i>		
<i>Focused attention</i>	<i>Workload</i>		
<i>Individual differences</i>			

Hella, F (See Noholt, page 76)

Hendriks, A.J.P. Telephone: (31)13-662390
 Tilburg University
 Post Box 90153
 5000 LE Tilburg
 The Netherlands

- **Performance Measures:** Reaction and movement times, accuracy
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** computer-controlled displays
- **Test Equipment:** DEC PDP and VAX
- **Theoretical Background:** Human performance theory, human Information processing, and chronometric analysis

- **Relevant Publications:** -Hendrikx, A.J.P. (1986) Compatibility of precueing and of S-R mapping in choice reactions. *Acta Psychologica*, 62, 1, 59-88
 -Hendrikx, A.J.P. (1986) Short-term Proactive Interference Revisited. *Bulletin of Psychonomic Society*, 24, 5, 358-360
- **Keywords:** *Divided attention* *Stressor effects*
Focused attention *Theoretical models*
Mental resources *Workload*
Performance
Selective attention

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 DCIEM
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 Canada

Telephone number not supplied

- **Performance Measures:** Network modeling - workload prediction. Subjective ratings (SWAT, NASA Bipolar)- workload measurement
- **Normative Data Base:** No
- **Test Validation:** A large part of our program is aimed at validating these techniques. The subjective rating scales have been extensively validated.
- **Testing Protocol:** Subjective ratings are in accordance with detailed instructions from originators of SWAT and NASA Bipolar scales.
- **Test Equipment:** Network modeling-IBM PC (compatible) with MicroSaint. Subjective ratings use IBM PC (compatible) with Pascal, Fortran, and C
- **Theoretical Background:** Time line analysis, attentional demand, magnitude estimation and multiple resources
- **Relevant Publications:** No publications supplied
- **Keywords:** *Task analysis*
Workload

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 TÜV Rheinland
 Prüfstelle für Medikamenteneinflüsse
 auf Verkehrs- und Arbeitssicherheit (PMVA)
 Postfach 10 17 50
 D-5000 Köln 1
 West Germany

Telephone: (49)-221-83932053

- **Performance Measures:** The Influence of medical drugs on traffic and work safety is evaluated in terms of:
 - visual orientation
 - concentration performance
 - stress tolerance in reaction tasks
 - eye-hand coordination
 - vigilance
 - reaction time to acoustic stimulus
 - response time in choice reaction task
- **Normative Data Base:** Results of 200 placebo studies; data base continually supplemented
- **Test Validation:** Either by test authors or reported in literature
- **Testing Protocol:** Two test rooms, each with two test cubicles; tests are computer administered and monitored by an experimenter; tests are scheduled to exploit the psychodynamic characteristics of a test substance in multiple doses with special attention to initial effects during the first day of treatment; composition of subject samples reflects the driving or working population.

- **Test Equipment:** Based on the equipment used by the Dr. Schuhfried Company in Austria (Vienna Test System), Z80 BASIC PSI. and CP/M
- **Theoretical Background:** Test philosophy based on the fact that many accidents are attributable to the use of medical drugs which impair driving or work performance; test battery is constructed from well established tests, reflecting important components of work and driving
- **Relevant Publications:**
 - Kisser, R. and Wenninger, U. (1983): Computerunterstütztes Testen im Rahmen der Fahreignungsdiagnostik. Arbeiten aus dem Verkehrspsychologischen Institut des Kuratoriums für Verkehrssicherheit, Wien
 - Schuhfried, G. (1981): Signal-Detection, Handanweisung, Mödling
 - Kisser, R. and Krafack, A. (1984): Test für Entscheidungs- und Reaktionszeitmessung in: *Kuratorium für Verkehrssicherheit* (Ed.): Die Verkehrspsychologischen Verfahren im Rahmen der Fahreignungsdiagnostik, Kleine Fachbuchreihe, Bd.21, Wien
 - Klebensberg, D. (1960): Zwei neue Testgeräte - Beck-Apparat/Wiener Determinationsgerät. *Diagnostik*, 6, (4), 164-166.
 - Kuratorium für Verkehrssicherheit (Ed.): Programmübersicht für ACT & REACT Testsystem ART-90 und Wiener Testsystem WTS-90.
 - Schneider, W. : Die Erstellung medizinisch-psychologischer Gutachten im TÜV-Rheinland.
 - Erdmann, G. and Janke, W. (1979): MKSL. (ak-7s-136i-20k). Psychologisches Institut der Universität Düsseldorf. unveröffentlichtes Manuskript. Düsseldorf
- **Keywords:**

<i>Decision Making</i> <i>Divided Attention</i> <i>Focused Attention</i> <i>Individual Differences</i> <i>Performance</i> <i>Personality Factors</i>	<i>Physio. Perform. Meas.</i> <i>Response Competition</i> <i>Risk Taking</i> <i>Selective Attention</i> <i>Stressor Effects</i>
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Folgering, H.

Cox, N.

Catholic University of Nijmegen
 Dept. of Pulmonology
 Dr. Spunjekliniet
 Nijmeegse laan 31
 6564 CA H. Landstichting
 The Netherlands

- **Performance Measures:** Exercise performance of COPD patients
- **Normative Data Base:** No
- **Test Validation:** Yes, in the international scientific literature under exercise testing in COPD
- **Testing Protocol:** With a bicycle ergometer
- **Test Equipment:** Bicycle ergometer, blood-gas analyzer, and a system to analyze expired air
- **Theoretical Background:** The exercise performance of COPD patients is limited by their pulmonary problems in contrast to normals, where exercise limitation comes from the cardio-vascular system.
- **Relevant Publications:** No publications supplied
- **Keywords:**
 - Performance*
 - Personnel selection*
 - Physio. Perform. Meas.*
 - Workload*

Hermans, P.H.
Veen, J.A.F. van der
Meijers, A.R.

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(31)20-5202397

Marine Keurings-en Selectiecentrum (MARKEURSEL)
Afdeling Bijzonder Psychologisch Onderzoek (BPO)
Kattenburgerstraat 7
1018 JA Amsterdam
The Netherlands

- **Performance Measures:** Gopher selective attention task, pursuit rotor tracking task, divided attention and signal detection, reaction time to signals from various sources, performance under time pressure and ambiguity, speed and accuracy in a monotonous task environment, and the Taskomat are used for personnel selection.
- **Normative Data Base:** No information supplied
- **Test Validation:** Norms are based on samples varying in size from n=100 to n=200, and are stored on an IBM mainframe with SPSS. Validations are currently underway using pass-fail criteria.
- **Testing Protocol:** The tests are given by computer, paper and pencil, or applied with apparatus.
- **Test Equipment:** Hardware-oriented test-apparatus. An IBM PC will be used in the future for implementing job-sample tests
- **Theoretical Background:** Information processing and stress research
- **Relevant Publications:** Internal military reports
- **Keywords:**

<i>Divided attention</i>	<i>Personality factors</i>
<i>Environmental stressors</i>	<i>Personnel selection</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Task competition</i>
<i>Performance</i>	<i>Workload</i>

Herpt, L.W.A. van
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Institute of Phonetic Sciences
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The Netherlands

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- **Performance Measures:** Perceptual measures of voice and pronunciation quality are used to develop and validate a maximally reliable and efficient instrument for the description of voice and pronunciation quality.
- **Normative Data Base:** No information supplied
- **Test Validation:** Not currently- this is part of the project
- **Testing Protocol:** Perceptual judgements on 7-point scales, semantic differential
- **Test Equipment:** No information supplied
- **Theoretical Background:** Relating acoustic and perceptual measurements
- **Relevant Publications:** *Proceedings of the Institute of Phonetic Sciences*, Amsterdam (ISSN) including:
 - Fagel, W. et al. (1983) Analysis of the perceptual qualities of Dutch speakers' voice and pronunciation. *Speech Communication*, 2, 315-326
 - Velde, J.C. van de. (1981) Transitional relations between personality cues and judgements. Dissertation, Groningen
- **Keywords:**
 - Individual differences*
 - Performance*

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 Angus, R.G.
 Pigeau, R.
 DCIEM
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 Canada

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 Autovon: 8274101 x2043

- **Performance Measures:** Cognitive tasks and subjective ratings, as well as physiological measures are used to assess changes in cognitive abilities as a function of fatigue, sleep loss, & stress.
- **Normative Data Base:** Yes. The data samples military/civilian, male/female, young/old subjects across a number of laboratory experiments. Most data is computerized on DIGITAL systems.
- **Test Validation:** Yes. All the tasks undergo internal validation testing in fixed protocol experiments and are validated by results from other labs. Primarily, the validation is a measure of sensitivity to the stressor of interest.
- **Testing Protocol:** Subjects continuously perform mental work for 2-3 days and 10-20 different tasks are repeatedly administered.
- **Test Equipment:** VAX 785
- **Theoretical Background:** Limited capacity models, Arousal and activation models, and Stress and coping models
- **Relevant Publications:**
 - Heslegrave & Angus, (1985) *Behavior Research Methods, Instruments, & Computers*, 17:592-603
 - Angus & Heslegrave, (1985) *Behavior Research Methods, Instruments, & Computers*, 17:55-67
- **Keywords:**

<i>Environmental stressors</i>	<i>Performance</i>
<i>Focused attention</i>	<i>Response competition</i>
<i>Individual differences</i>	<i>Selective attention</i>
<i>Mental resources</i>	<i>Theoretical models</i>
<i>Normative performance measures</i>	
<i>Workload</i>	

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 Dept. of Educational Sciences
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 The Netherlands

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 (31)71-273401
 (31)71-273399

- **Performance Measures:** Process and performance measures are taken from children in primary math, spelling, and reading comprehension in order to advise teachers about children with learning problems and curriculum effectiveness.
- **Normative Data Base:** A data base is in development, consisting of 250 cases on an IBM PC, using Reflex software.
- **Test Validation:** Yes, with other instruments in primary mathematics, spelling, and reading, and with the schoolnotes of the pupils
- **Testing Protocol:** Individual testing with retrospection questions, and behavior observation
- **Test Equipment:** Reflex software for report generation. An expert system may be added in the next two years.
- **Theoretical Background:** Activity psychology

- **Relevant Publications:**
 - Heijden, M.K. van der (1986). Aanpak, kennis en reflectie in het optellen en aftrekken van tweede klas lagere schoolleerlingen. In: S. Dijkstra & P. Span (Red.), *Leerprocessen en instructie*. Lisse: Swets & Zeitlinger.
 - Heijden, M.K. van der & Beishuizen, J.M. (1986). Diagnostisering van individuele verschillen in het optellen en aftrekken van basisschoolleerlingen. V.J.N.:A. Reints, P. Span (red.), *Differentiatie in het Onderwijs* in Lisse: Swets & Zeitlinger.
 - Heijden, M.K. van der (in press) Diagnostics of learning strategies from an activity-psychological point of view. Primary mathematics as an example (Verschijnt eind 1986 in de *Proceedings van het 1. Internationale Kongress Zur Tätigkeitstheorie*, Berlijn.)
- **Keywords:**
 - Focused attention*
 - Individual differences*
 - Personality factors*

Hjman, R. (See Brand, page 9)

Hindmarch, I.
Bhatti, J.

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Human Psychopharmacology Research Unit
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United Kingdom

- **Performance Measures:** Critical flicker fusion threshold; Sternberg memory scanning task; word recognition; choice reaction time; Stroop tasks; continuous attention tasks; questionnaires; and driving simulators with on-board computer systems are used to measure drug effects.
- **Normative Data Base:** Approximately 100 studies have provided placebo data.
- **Test Validation:** There has been some validation of critical flicker fusion.
- **Testing Protocol:** Within-subject, double-blind, balanced crossover with placebo and verum controls; baseline performance taken prior to drug then typically at 1, 3, and 5 hour or 1 and 10 hours with 20 minute training/5 minute test for each assessment.
- **Test Equipment:** Leeds psychomotor tester and BBC; an IBM compatible will be used in the future.
- **Theoretical Background:** Sternberg memory scanning model; Atkinson and Schiffrin information processing models; and Hick's law. See also Hindmarch 1980.
- **Relevant Publications:** No publications supplied.
- **Keywords:**
 - Mental Resource*
 - Response competition*
 - Selective Attention*
 - Task Competition*

Hoevenaais, J. (See Dijkhuis, page 21)

Hoffmann, J. (See Veron, page 105)

Hoh, G. (See Vries, de, page 106)

Hollander, A. (See Eugen Schenari, van, page 52)

-
- Hooisma, J.** Telephone: (31) 15-138777
 TNO Medical Biological Laboratory
 P.O. Box 45, Lange Kleiweg 137
 2280 AA Rijswijk
 The Netherlands
- **Performance Measures:** Neurobehavioral Evaluation System, which is used for screening central nervous system effects of neurotoxic agents in occupational health
 - **Normative Data Base:** Not yet
 - **Test Validation:** Test validations are in progress.
 - **Testing Protocol:** Tests are automated and given via an IBM-PC system.
 - **Test Equipment:** IBM-PC, IBM-XT, or compaq portable computers. Software is available to those belonging to the NES users group
 - **Theoretical Background:** The choice of tests was based on the experience with a large number of traditional tests in neurotoxicology. Sensitive tests were chosen and adapted for computer. Many of the tests can also be found in the World Health Organization test battery for neurotoxicology.
 - **Relevant Publications:** No publications supplied
 - **Keywords:** *Environmental stressors*
Performance
Stressor effects
-

Houtmans, M. (See Bruyn, de, page 11)

Hulstijn, W. (See Thomassen, page 102)

- Hyacinthe, M.C.** Telephone: (33) 94.02.03.75.
Giry, M.C.
Gillard, M.C.
Bugat, M.C.
 EASSM/CERB
 H.I.A. Ste Anne
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 83800 Toulon Naval
 France
- **Performance Measures:** Reaction time, CFF, & cognitive tests (such as mental calculation, memory test, code test) are used to estimate learning and memory under hyperbaric conditions.
 - **Normative Data Base:** No
 - **Test Validation:** No
 - **Testing Protocol:** Paper-pencil tests are given individually, but all subjects work at the same time on the same test.
 - **Test Equipment:** Micro ordinateur MICRAL 9050 & self made software
 - **Theoretical Background:** Variation memory and learning under hyperbaric conditions - variation vigilance level with breathing gas

- **Relevant Publications:**
 - Bugat, R. (1984) Etude psychologique experimentale des plongeurs au cours de la plongee. Entex III. Rapport CERB/6-N1/2 84-22-1984
 - Bugat, R. (1985) Variation des processus psycho-sensoriels et cognitifs en plongee. *Travaux scientifiques SSA-N1/2 6-1985*, pp. 128
 - Bugat, R. (1986) Suivi psychologique d'une quipie de plongeurs au cours d'une plongee profonde en hydrogene. *Travaux scientifiques SSA-N1/2 7-1986*
- **Keywords:**
 - Environmental stressors*
 - Individual differences*
 - Mental resource*
 - Performance*
 - Personality factors*

Illes, J. (See Gevins, page 35)

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Groot, G. De
Hollander, A.P.

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The Netherlands

- **Performance Measures:** Mechanical output / performance level / maximal volume oxygen/ conditional level
- **Normative Data Base:** Standards in physiology sources
- **Test Validation:** Standard physiology tests
- **Testing Protocol:** Bicycle and wheelchair ergometry, running, and using motor driven treadmills (speed and slope)
- **Test Equipment:** Motor-driven treadmills, bicycles, and wheelchairs. Bicycle and wheelchair ergometers, and a wheelchair simulator
- **Theoretical Background:** Power balance models
- **Relevant Publications:**
 - Groot, G. de, et al. (1983) *Int. Journal of Sports Medicine* 2, 132-134.
 - Hollander, A.P. et al. (1986) *Journal of Sports Sciences* 4, 21-30.
 - Woude, L.H.V. van der et al. (1986) *Ergonomics* 29, 1561-1573
- **Keywords:** *Physio. Perform. Meas.*

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- **Performance Measures:** Chronometric measures (response time and latency periods). These use a response-time decomposition method for an information processing analysis of test performance. So far, the method is exclusively applied to tests of visual organization and spatial orientation
- **Normative Data Base:** Not yet
- **Test Validation:** The tests that were designed so far were mainly prototypes. Internal validation has been accomplished through the Additive Factor methodology (Sternberg, 1969). Occasionally, external validation data has been obtained using psychometric factors as marker variables
- **Testing Protocol:** Computer-controlled slide presentation and response registration

- **Test Equipment:** Future projects involve the design of computer-based interactive testing environments, in which systems such as the Apple Macintosh and IBM PC/AT or compatibles will be considered
- **Theoretical Background:** Component-testing theory (Ippel, 1986a,b in press)
- **Relevant Publications:**
 - Ippel, M.J. (1981). Generalizability of performance scores on embedded figures material. *Educational and Psychological Measurement*, 41, 315-331
 - Ippel, M.J. (1986a). *Component-testing: A theory of cognitive aptitude measurement*. Amsterdam: Free University Press
 - Ippel, M.J. (1986b). Some principals for the design of componential measures. Paper presented at the AERA annual conference in San Francisco
 - Ippel, M.J. (1986c). An information processing approach towards a structural theory of item equivalence. In S.E. Newstead, S.H. Irvine, & P. Dunn (Eds.), *Human Assessment: Cognition and Motivation*. Dordrecht: Kluwer Academic Publishers
 - Ippel, M.J. & Beem, A.L. (1987). A theory of antagonistic strategies. In E. de Corte, H. Lodewyks, R. Parmentier, & P. Span (Eds.), *Learning and Instruction*. New York: Pergamon Press
 - Ippel, M.J. (in press). Component-testing of cognitive aptitudes. In P. Dunn & S.H. Irvine (Eds.), *Computer-based human assessment: Test use and construction*. Dordrecht: Kluwer Academic Publishers
- **Keywords:**
 - Individual differences*
 - Task analysis*
 - Theoretical models*
 - Workload*

Jackson, J. (See Mulder, G. page 74)

- Jacobs, I.** Telephone: (1) 416-635-2000
 Defense & Civil Institute of Environmental Medicine
 Exercise Physiology Group
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 Downsview, Ontario M3M 3B9
 Canada
- **Performance Measures:** Measures of Isokinetic, isoinertial, and isometric muscular strength, aerobic power, endurance capacity, maximal aerobic power, and lactate are used to quantify selective fuel used by skeletal muscle to perform work in various environments.
 - **Normative Data Base:** No information supplied
 - **Test Validation:** No information supplied
 - **Testing Protocol:** Cycle ergometers, treadmills, and other exercise systems
 - **Test Equipment:** Cardionics, Monark, & Collins cycles, Quinton treadmills, Yellow Springs automatic analyzer (for lactate), Arnet computerized exercise system, (for strength testing), Sensormedics Metabolic Carts for oxygen consumption
 - **Theoretical Background:** See publications
 - **Relevant Publications:**
 - Jacobs, I. (1986) Blood lactate: Implications for training & sports performance. *Sports Medicine*, 3, 10-25.
 - Jacobs, I. et al. (1987) Effects of hydraulic resistance circuit training on physical fitness components of potential relevance to +Gz tolerance. *Aviation and Space Environment Medicine*, in press
 - **Keywords:**
 - Environmental stressors*
 - Normative performance*
 - Performance*
 - Workload*

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 West Germany

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- **Performance Measures:** Motor tests (all kinds); vigilance tests, & Psychopharmacology
- **Normative Data Base:** No
- **Test Validation:** Construct and factorial validity
- **Testing Protocol:** Paper
- **Test Equipment:** Open
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:** *Environmental Stressors*
Physio. Perform. Meas.
Stressor Effects

Johnson, W. (See Hart, page 43)

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 The Netherlands

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- **Performance Measures:** Tests of foreign language listening comprehension at four levels of performance in English, French, German, Spanish, and Russian are used in graduation decisions.
- **Normative Data Base:** Test data is collected and analyzed each year, using Hewlett-Packard 3000 and BMDP. Norms are based on equating tests over the years.
- **Test Validation:** Yes- there has been validation of level differences and of context, using native speakers.
- **Testing Protocol:** Students listen to taped samples of speech and answer written questions.
- **Test Equipment:** Tape recorders, cassette players, paper and pencils, video recorders, and interactive video equipment.
- **Theoretical Background:** Performance of second or foreign language learning is evaluated against the performance of native speakers of comparable age and educational background. Tests are evaluated against: Rasch, G. (1960), Probabilistic Models for some Intelligence and Attainment Tests. Copenhagen Denmark Pedagogic Institute
- **Relevant Publications:** -Jong J.H.A.L. de, (1982). Testing Foreign Language Listening Comprehension. Paper presented at ISET 5, Stirling Scotland
 -Jong, J.H.A.L. de, (1983). Focusing in on a latent trait: An attempt at construct validation using the Rasch model. In: Weeren, J. van (Ed.), *Practice and Problems in Language Testing* 5, 11-35. CITO, Arnhem
 -Jong, J.H.A.L. de, (1984b). Listening: A single trait in first and second learning. *Toegepaste Taalwetenschap in Artikelen*, 20, 66-79
 -Jong, J.H.A.L. de, (1986b). Achievement tests and national standards. *Studies in Educational Evaluation*, 12, 295-305

- **Keywords:** *Decision making* *Theoretical models*
Focused attention
Individual differences
Normative perform. measures
Performance

Jong, P. de (See Das-Smaal, page 18)

Jong, R. de (See Dijkhuis, page 21)

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 RION
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 9701 BG Groningen
 The Netherlands

- **Performance Measures:** Test scores on electricity knowledge (the KE test) and electrical circuit problem solving (the POH test), as well as scores on an attitude scale.
- **Normative Data Base:** Yes- data from 409 students in three schools, analyzed with SPSS X
- **Test Validation:** There have been comparisons between KE, POH, field independence (GIFT) and an intelligence test (TIB)
- **Testing Protocol:** Whole-class instruction
- **Test Equipment:** Cyber 170/760 and SPSS V
- **Theoretical Background:** Problem solving theory, action theory, and the "Schema" theory.
- **Relevant Publications:**
 - Jong, R. de: (1981) Naar een model voor probleemoplossend handelen binnen Algemene Technieken. Een onderzoek naar operationalisering van Probleemoplossend Handelen in de L.B.O.-onderwijspraktijk. Eindrapport + bijlage. (S.V.O.-project 0490). Haren, RION.
 - Jong, R. de: (1982) Problemlosender Unterricht im Allgemeinen Technikunterricht. In: O. Lange und S. Lohmert (Hrsg.) *Problemlosender Unterricht und Selbständiges Arbeiten von Schülern*, p. 183-197. Zentrum für Pädagogische Berufspraxis, Universität von Oldenburg.
 - Jong, R. de: (1985) Denken en doen binnen het vakgebied Algemene Technieken. In: L.F.W. de Klerk en A.M.P. Knoers. (Red.). *Onderwijspsychologisch onderzoek. Bij dragen aan de Onderwijsresearchdagen 1984*. Lisse, Swets & Zeitlinger.
 - Jong, R. de: (1984) The influence of structuring the learning environment on technical problemsolving. In: E. Bol e.a. (Eds.), *Education for cognitive development: proceeding of the third international symposium on activity theory*. Den Haag, SVO, p. 204-223
 - Jong, R. de en Haanstra, F. : (1985) De invloed van sturing op probleemoplossend handelen, een onderzoek naar de effectiviteit van drie curricula voor Probleemoplossend Handelen binnen Algemene Technieken. Eindrapport III van SVO-project 0 490. Groningen, RION.
- **Keywords:** *Individual differences*
Performance

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- **Performance Measures:** Driver's license candidates who failed the exam and abnormal traffic behaviour are evaluated in terms of RAVEN progressive Matrices, Thurstone-HAWIE, IST, PSB horn, Rey, Meili, Rorschach, Zulliger, Wartegg, Four-Pictures, Giessen, Blake/Mouton, N29, and FLA.
- **Normative Data Base:** See testing protocol
- **Test Validation:** See testing protocol
- **Testing Protocol:** See the *Manual der Schweizerischen Verkehrspsychologischen Normaluntersuchung* by F. Gubser and S. Spörli, 1967, zuhanden ERFA-Gruppe Schweizerischer Verkehrspsychologen (not available)
- **Test Equipment:** ERFA group has decided to postpone the introduction of electronic systems
- **Theoretical Background:** See testing protocol
- **Relevant Publications:** See testing protocol and Spörli's literature, Siro: Seele auf Rädern und kritische theorie diagnostischer Praxis
- **Keywords:**

<i>Decision Making</i>	<i>Performance</i>
<i>Divided Attention</i>	<i>Personality Factors</i>
<i>Focused Attention</i>	<i>Personnel Selection</i>
<i>Environmental Stressors</i>	<i>Risk Taking</i>
<i>Individual Differences</i>	<i>Selective Attention</i>
<i>Mental Resource</i>	<i>Stressor Effects</i>

Jorna, P. (See Boer, page 7)

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- **Performance Measures:** Assorted secondary tasks with RT, d' and error rate, heart rate variance, & evoked potentials are used to measure attention and workload
- **Normative Data Base:** Yes, at Ames Research Center
- **Test Validation:** Test-retest for reliability, and some simulator work for validation
- **Testing Protocol:** Test one subject at a time under computer control
- **Test Equipment:** IBM AT with assorted peripherals, custom software in Microsoft C
- **Theoretical Background:** Kantowitz-Knight hybrid model of attention and capacity (*Acta Psychologica*, 1976)
- **Relevant Publications:** Kantowitz, B.H. & Casper, P.A. (1987, in press) Human workload in aviation. In E. Winer & D. Nagel (Eds.), *Human Factors in aviation*. Academic Press
- **Keywords:**

<i>Divided attention</i>	<i>Selective attention</i>
<i>Focused attention</i>	<i>Stressor effects</i>
<i>Mental Resources</i>	<i>Task analysis</i>
<i>Performance</i>	<i>Theoretical models</i>
<i>Physio. Perform. Meas.</i>	<i>Workload</i>
<i>Response competition</i>	

Keemink, C. (See Wildt, van der, page 110)

Kelly, B. (See Fadden, page 27)

Kemmerling Jr., P.T. (See Snyder, page 95)

Kennedy, R.S.

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Orlando, FLA 32803
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- **Performance Measures:** The Essex Automated Portable Test System (APTS) is a sensitive and reliable indicator of human performance suitable for use in remote operational settings
 - **Normative Data Base:** Not yet
 - **Test Validation:** Tests on the APTS have been validated using the paper and pencil form, the WAIS verbal and performance scores and the Wonderlic Personnel Test.
 - **Testing Protocol:** Tests are being given with a repeated measures design of ten replications
 - **Test Equipment:** NEC PC8201A microprocessor and Zenith ZF181 microprocessor
 - **Theoretical Background:** The purpose in the development of the APTS is to develop a repeated-measures test battery, effective in measuring human performance decrements over time, or in unusual work environments. Tests considered for inclusion in the APTS must show signs of: 1) sensitivity to disruptions in test performance due to an environmental stimulus; 2) concurrence in the scientific literature that the test measured an identifiable information processing of cognitive construct for which a theoretical basis was available; 3) ability to differentiate brain damaged individuals from normals on the basis of test results; 4) previous appearance in an established and/or factor analyzed battery; 5) inherent interest to the subject; 6) obvious face validity; and 7) availability, cost, and other practical considerations. Tests that meet these criteria are then stringently tested according to the following considerations: factor, domain, testing mode, time to stable means and standard deviations, time to differential stability, task definition, reliability efficiency, task sensitivity and ceiling.
 - **Relevant Publications:** No publications supplied
 - **Keywords:** *Individual differences*
Performance
Personnel selection
Stressor effects
Workload
-

Kerkhof, C.A.

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The Netherlands

- **Performance Measures:** Auditory detection performance, two-flash threshold, short-term memory, and reaction time
- **Normative Data Base:** No
- **Test Validation:** Cross validation
- **Testing Protocol:** Blocked test sessions of 45 minutes

- **Test Equipment:** PDP 11/03 processor, special "Miniboss" system, compatible with RSX-11m
- **Theoretical Background:** Theory of signal detectability and others
- **Relevant Publications:** -Kerkhof, G.A. & Verduin, C.J. (in press) In G. Hildebrandt (ed.), Peter Lang Verlag *Circadian rhythms in performance: neurophysiological and behavioral data for morning- and evening-type subjects.*
- **Keywords:** *Decision making*
Individual differences
Physio. Perform. Meas.

Kisser, R. (see Michalik, page 71)

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- **Performance Measures:** Basic research in working memory limits. Not for assessment testing purposes
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** Protocol according to AFHRL-TR-85-60
- **Test Equipment:** Software available from AFHRL at WPAFB
- **Theoretical Background:** AFHRL-TR-85-60
- **Relevant Publications:** -AFHRL-TR-85-60 Memory and processing limits in decision making
- **Keywords:** *Divided attention*
Mental resources

Klebel, E. (see Michalik, page 71)

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- **Performance Measures:** Effects of depressant and stimulant on arousal perception, cognitive work, continuous concentration remembering (short-term memory) fatigue, and psychomotor speed are measured via CFF, tapping tests, Poulit-test, recognition of digits, and reaction time
- **Normative Data Base:** Database exists on the computers listed under TEST EQUIPMENT

- **Test Validation:** The tests used have been validated through other research, including the work cited:
 -Arnold, W. (1975) *Der Poulis-Test*. Berlin
 -Baddeley, A.D. (1976) *The psychology of memory*. New York
 -Fleishman, E.A. (1972) Structure and measurement of psychomotor abilities. In: Singer, R.N. (Hg.) *The psychomotor domain*. Philadelphia
- **Testing Protocol:** Double-blind cross-over, latin square design before drug intake (baseline) and several times after (30 min to 6 hours) and 24 hours after, on human volunteers
- **Test Equipment:** MULTIPSY 801, BIO-DATA 6mbH, Bahnstrasse 9 D-63 STEINBACH RFA, microcomputer programmed tests on APPLE IIIC, Posturography
- **Theoretical Background:** The tests available cover the scope of sensor, sensorimotoricity, and psychomotoricity and cognitive functions like memory, classification, and problem solving
- **Relevant Publications:** -Croq et al., 1985, in Masson ed: 178-182
 -Klein et al., 1986, *Therapie*, 41, 299-304
 -Patat et al., 1986, *Therapie*, 41, 443-447
 -Patat et al., 1987, *European J. Clin. Pharmac.* (in press)
- **Keywords:** *Focused attention*
Performance

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- **Performance Measures:** Memory tests (word lists, number series) are used in the acquisition of expert memory (mnemonic skill) in young and old adults.
- **Normative Data Base:** There is no database.
- **Test Validation:** The tests were not validated.
- **Testing Protocol:** The tests are administered on PCs (presentation of material on screen, response collection on keyboard)
- **Test Equipment:** An Apple IIe computer with in-house software is currently being used. A Macintosh computer may be used in the future.
- **Theoretical Background:** Skilled memory theory; plasticity of cognitive functioning in old age; limits of plasticity; examination of cognitive reserve capacity
- **Relevant Publications:** Kliegl, R., et al. (1986) Testing the Limits, Expertise, and Memory in adulthood and old age IN: F. Klix & H. Hagendorf (Eds) *Human Memory and Capabilities*. North-Holland: Amsterdam
- **Keywords:** *Individual Differences*
Mental Resources
Performance
Task Analysis
Theoretical Models

Koenderink, J.J.

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 Dept. of Medical and Physiological Physics
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 3584 CC Utrecht
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- **Performance Measures:** Psychophysical measures of detection and discrimination thresholds used to study the structure of visual perception

- **Normative Data Base:** We collect the most diverse data on the visual perception of a few selected subjects for purposes of theoretical analysis. There is no normative data base on computer
- **Test Validation:** No
- **Testing Protocol:** Standard psychophysical methods, e.g., tracking thresholds, staircase method, forced-choice procedures, ROC-analysis
- **Test Equipment:** Optical, electro-optical, special purpose image (sequence) generators, standard image processors (de Anza). For software, see Watt & Andrews, (1981) Adaptive Probit Estimation, *Current Psychol. Rev.* 1, 205-214
- **Theoretical Background:** Signal detection theory, neural modeling
- **Relevant Publications:** Available upon request
- **Keywords:** *Focused attention*
Theoretical models

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Maltzahn, W. von
Chwialkowski, M.
Pape, E.

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- **Performance Measures:** More than 500 measures are used to understand relationships between basic measures and high level tasks; for applications in rehabilitation, personnel selection, and screening, among others; and for research related to the effects of various agents of performance.
- **Normative Data Base:** A database of 2600 records exists.
- **Test Validation:** Numerous reliability studies have been conducted. Validity is assessed via long-term experience with normal subjects and patient groups. Consensus validity studies have also been executed
- **Testing Protocol:** Tests are administered with a computerized human performance measurement system, which consists of a central minicomputer and individual test device modules. Various performance measures are obtained, such as: strength, speed, coordination, body stability, tremor, etc.,
- **Test Equipment:** The Human Performance Measurement System, developed at the University of Texas at Arlington, a DEC LSI 11/23, and in-house software are used.
- **Theoretical Background:** See Kondraske, G. (March,1987) Human Performance: Science or Art? *Thirteenth Northeast Bioengineering Conference*; Philadelphia, Penn., pp 44-47
- **Relevant Publications:** No publications supplied
- **Keywords:** *Mental Resource* *Physio. Perform. Meas.*
Normative Perform. Meas. *Task Analysis*
Performance *Theoretical Models*
Personnel Selection *Workload*

Kooreman, A.
Joint Medical Service
Bos en Lommerplantsoen 1
1055 AA Amsterdam
The Netherlands

Telephone: (31)20-872843

- **Performance Measures:** Mental ability tests, personality tests, interest inventories, Vocational Guidance, placement
- **Normative Data Base:** Yes, 560 subjects; SPSS software
- **Test Validation:** Not yet
- **Testing Protocol:** Class-room, paper and pencil tests
- **Test Equipment:** Introduction of the tests in the organization
- **Theoretical Background:** Trait theories, guidance models
- **Relevant Publications:**
 - Kooreman, A. & Sorb.J. (1986) MoRiNitoets. Zesde deelrapport. De constructie van het instrument. A. *Gemeenschappelyk Medische Dienst*, Feb. 1986
 - Kooreman, A. & Luteyn, F. (1987) Schriftelykeverkorte vorm van de Groninger Intelligentie Test, Swets en Zeitlinger (i.p.)
- **Keywords:**
 - Individual differences*
 - Mental resources*

Koot, J.M.

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Dept. of Developmental Psychology
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6500 HE Nijmegen
The Netherlands

- **Performance Measures:** Number of good and false solutions to computer-game with built-in barriers and a number of good and false solutions to Stroop Color-Word Interference Task. The purpose is to assess individual differences of performance of children aged 10-12 under stress
- **Normative Data Base:** No
- **Test Validation:** Related to IQ; personality factors; performance at age 7
- **Testing Protocol:** Using the Stroop test as a standard, the computer games are administered in an A-B-A design
- **Test Equipment:** Apple II computer, custom software in Pascal
- **Theoretical Background:** Coping theory (Lazarus) for the computer games, see relevant publications for the Stroop test
- **Relevant Publications:** No publications supplied
- **Keywords:**
 - Individual differences*
 - Performance*
 - Stressor effects*

Kraaimaat, F.W. (See Dam-Baggen, van, page 17)

Kramer, A.

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Dept. of Psychology
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Champaign, IL 61820
United States of America

- **Performance Measures:** Reaction time, accuracy, & psychophysiological measures (event related brain potentials) are used for workload assessment, skill acquisition, automaticity, and attention research
- **Normative Data Base:** No information supplied
- **Test Validation:** See Kramer et al. (1987) in Human Factors
- **Testing Protocol:** Protocol according to Kramer et al. (1987) in Human Factors
- **Test Equipment:** IBM XT and DEC PDP 11/73
- **Theoretical Background:** Electrophysiology, resource theory, and mental chronometry
- **Relevant Publications:** See Boeing & Douglas workload bibliography
- **Keywords:**

<i>Divided attention</i>	<i>Selective attention</i>
<i>Focused attention</i>	<i>Task analysis</i>
<i>Individual differences</i>	<i>Task competition</i>
<i>Mental resources</i>	<i>Theoretical models</i>
<i>Performance</i>	<i>Workload</i>
<i>Physio. Perform. Meas.</i>	

Kroemer, K. (See Snyder, page 95)

Leenders, I.H.R.

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Dept. of Development and Socialization
Developmental Psychology Section
Heidelberglaan 2
3584 CS Utrecht
The Netherlands

- **Performance Measures:** Behavioral style, habituation (visual) exploratory behavior, eye-hand coordination
- **Normative Data Base:** Approximately sixty 3-5 yr olds. For behavioral style questionnaires, there is approximately 100-130 children per question for Dutch normative data. SPSS is used to analyze data on CYBER systems
- **Test Validation:** There has been cross-validation for behavioral style and content validation for habituation, exploratory behavior, and eye-hand coordination with various IQ subtests
- **Testing Protocol:** Questionnaires on behavioral style for age groups 0-1, 1-3, and 3-7. Observational standardized procedures for habituation, exploratory behavior, and eye-hand coordination
- **Test Equipment:** No information supplied
- **Theoretical Background:** Parent-child interaction research, information processing theories, and early competence and effective development
- **Relevant Publications:** No publications supplied
- **Keywords:**

<i>Individual differences</i>
<i>Personality factors</i>
<i>Selective attention</i>
<i>Task analysis</i>

Leigh, T.

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Human psychopharmacology Research Unit
Leeds, West Yorkshire LS6 9JT
United Kingdom

- **Performance Measures:** Critical flicker fusion and choice reaction time are used to assess hangover effects of drugs and sleep.
- **Normative Data Base:** Baseline measures from studies over the last decade are used as data base.
- **Test Validation:** See Hindmarch references
- **Testing Protocol:** Practice: 20 CRT's and 6 CFF's. Additional practice before start of each test session (CRT only - 10 trials)
- **Test Equipment:** Leeds psychomotor tester
- **Theoretical Background:** Sleep - EEG/polygraph
- **Relevant Publications:** - Leigh, et al. (1987) *Human Psychopharmacology*
- **Keywords:** *Mental Resources*

Levison, W.H.

BBN Laboratories Inc.
10 Moulton St.
Cambridge, MASS 02238
United States of America

Telephone number not supplied

- **Performance Measures:** Measures of closed-loop man-machine system performance and operator response behavior are obtained to characterize system and operator effectiveness, and to develop and validate models of human performance. Closed-loop measures include means, variances, and amplitude density functions of important system variables, such as tracking error and operator-control response. Operator response measures include describing-function gain and phase shift, and power spectra of operator response partitioned into input-correlated and stochastic components.
- **Normative Data Base:** Published results of key laboratory experiments may serve as a normative experimental data base. The optimal control model for pilot/vehicle systems, parameterized according to the normative experimental data base, may serve as a theoretical normative data base.
- **Test Validation:** Yes
- **Testing Protocol:** A typical experiment involves a series of manual tracking tasks designed to explore the effects of two or more factors. These tests usually require the subject to null out errors produced by an external sum-of-sines forcing functions. Subjects are typically used as their own controls, with conditions presented in a balanced order during the training and data collection phases. The sum-of-sines analysis technique has recently been applied to the analysis of electrocortical visual evoked response at AAMRL.
- **Test Equipment:** Experimental studies are typically conducted by our clients. Theoretical studies using the optimal control model can be performed on a variety of digital computers. The model is currently implemented on an IBM PC and a VAX 8600.
- **Theoretical Background:** The optimal control model, based on modern control and estimation theory, provides a theoretical background for predicting the results of manual control experiments.

• **Relevant Publications:**

- Levison, W.H. (1971) "The Effects of Display Gain and Signal Bandwidth on Human Controller Remnant", AMRL-TR-70-93, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio.
- Levison, W.H. et al. (1971) "Studies of Multi-variate Manual Control Systems: A Model for Task Interference", NASA CR-1746.
- Levison, W.H. et al. (1985) "Descriptive Linear Modeling of Steady-State Visual Evoked Response", *Proceedings of the Twenty-First Annual Conference on Manual Control*, Ohio State University, Ohio, June 17-19.
- Kleinman, et al. (1971) "A Control Theoretic Approach to Manned-Vehicle Systems Analysis", *IEEE Transactions on Autonomous Control*, Vol. AC-16, pp.824-833, No. 6.
- Levison, W.H. (1982) "The Optimal Control Model for the Human Operator: Theory, Validation, and Application", in Frazier, M.L., and Cromble, R.B. (eds): *Proceedings of the Workshop on Flight Testing to Identify Pilot Workload and Pilot Dynamics*, AFFTC-TR-82-5, Air Force Flight Test Center, Edwards Air Force Base, CA.

• **Keywords:**

Divided attention
Normative performance measures
Performance
Task competition
Theoretical models
Workload

Lewis, N. (See Schiffett, page 90)

Liebrand, W.B.G.

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 (31)50-636340

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 Dept. of Personality Psychology
 Grote Marut 31/32
 9712 HU Groningen
 The Netherlands

• **Performance Measures:**

Intelligence and social values tests

• **Normative Data Base:**

Yes, programs are written in Turbo-Pascal for IBM-MSDOS systems

• **Test Validation:**

Currently in progress. See publications

• **Testing Protocol:**

Computerized assessment

• **Test Equipment:**

Computer system

• **Theoretical Background:**

Wiggins, J.S.: Personality prediction and assessment. Also, Addison-Wesley (1973)

• **Relevant Publications:**

- Liebrand, W.B.G., (1984) *European Journal of Social Psychology*, 14, 239-264
- Liebrand, W.B.G. et al., (1986) *Journal of Experimental Social Psychology*, 22, 203-215

• **Keywords:**

Decision making
Individual differences
Personality factors
Personnel selection

Logie, R.H.

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- **Performance Measures:** Secondary tasks are used as a means of task component analysis. Additionally, measures of cognitive performance, such as memory and attention are used. These measures help to determine diving stress & cognitive workload and changes in component skills with training
- **Normative Data Base:** No
- **Test Validation:** Some performance measures have had limited validation, such as correlation with IQ.
- **Testing Protocol:** Small numbers of subjects are used in within subjects designs.
Diving: Extensive practice effects during a dive;
testing before, during, and after the dive
Workload: Secondary tasks practiced to criterion,
then combined with primary task under
study: comparisons at different stages of
training for same or different individuals
- **Test Equipment:** PDP-11, Apple II, BBC, paper, and pencils
- **Theoretical Background:** Working memory (Baddeley)
- **Relevant Publications:** -Logie & Baddeley, (1985) *Ergonomics*
-Baddeley, et al. (1986) *Quarterly Journal of Experimental Psychology*
-Logie, et al. (in press) *Proceedings of European Workshop on Imagery & Cognition*
- **Keywords:** *Environmental Stressors*
Mental Resource
Task Analysis
Theoretical Models

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Wilson, F.W.

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London HCI Centre
UCL Ergonomics Unit
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England

- **Performance Measures:** Time, errors, and measures of user & customer acceptability are used to study human-computer interaction.
- **Normative Data Base:** No
- **Test Validation:** Validation may be integral component of some studies
- **Testing Protocol:** Expert/analytical/observational/ experimental approaches
- **Test Equipment:** VAX 11/780, GEC 4000 series, SUN, BBC, Apple, Torch
- **Theoretical Background:** Cognitive Science and Information Theory
- **Relevant Publications:** HCI Centre still in formative stage - publications will be notified in due time
- **Keywords:**

<i>Decision making</i>	<i>Selective attention</i>
<i>Divided attention</i>	<i>Task analysis</i>
<i>Environmental stressors</i>	<i>Task competition</i>
<i>Focused attention</i>	<i>Theoretical models</i>
<i>Mental resources</i>	<i>Workload</i>
<i>Response competition</i>	

Lorenz, B. (See Goeters, page 37)

Lourens, P.F.

State University Groningen
Traffic Research Centre
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- **Performance Measures:** Video recordings of car drivers in an instrumented vehicle to study patterns of error types
 - **Normative Data Base:** There is the data base of a normative drivers task analysis
 - **Test Validation:** Not yet
 - **Testing Protocol:** Post test analysis of video recordings and car characteristics including speed
 - **Test Equipment:** Instrumented vehicle with a three-camera video system and audio registrations
 - **Theoretical Background:** Theories of human performance and decision making
 - **Relevant Publications:** -Lourens, P.F., (1987) "The Psychogenesis of incorrect driving behavior". In: Lourens, P.F. (ed) *Annual Report 1986*. Traffic Research Centre. Haren.
 - **Keywords:** *Decision making*
Performance
Risk taking
Selective attention
Task analysis
-

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Ertel, S.

Duhm, E.

Institut für Psychologie
Universität Göttingen
Gosserstrasse 14
D-3400 Göttingen
West Germany

- **Performance Measures:** Standardized tests in clinical psychology
 - **Normative Data Base:** No information supplied
 - **Test Validation:** No information supplied
 - **Testing Protocol:** No information supplied
 - **Test Equipment:** No information supplied
 - **Theoretical Background:** No information supplied
 - **Relevant Publications:** No publications supplied
 - **Keywords:** *Task analysis*
Workload
-

Maarse, F. J.

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 HE 6500 Nijmegen
 The Netherlands

- **Performance Measures:** Tests for "ballistic" movements used for remedial teaching, fine motoric skill, and writing education.
- **Normative Data Base:** No information supplied.
- **Test Validation:** Validation is the goal of investigation.
- **Testing Protocol:** XY-tablet and computer
- **Test Equipment:** XY-tablet, PDP-11, and MSDOS system
- **Theoretical Background:** Psychomotoric insights (Ellis, Van Salen, Norgolin)
- **Relevant Publications:** -Maarse, F.J., Teulings, H.J. & Thomassen, A.W.J.W. (1987). Computational measures for ballistic handwriting (in prep).
- **Keywords:** *Individual difference*
Performance
Personnel Selection
Physio. Perform. Meas.
Task analysis

Maesen de Sombreff, P. van der (See Zaal, page 114)

Maltzahn, W. von (see Kondraske, page 60)

Manzey, D. (See Goeters, page 37)

Martin, E.

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 Williams AFB Arizona 85240-6457
 United States of America

- **Performance Measures:** Psychophysical techniques such as judgement matching, reaction time, and discrimination accuracy (for basic research, while pilot input, aircraft system states, output measures of mission, and training effectiveness are used for exploratory research.
- **Normative Data Base:** No information supplied.
- **Test Validation:** Yes, sensitivity to experience level differences, correlation to instructor ratings, operational (content) validity of the exploratory research.
- **Testing Protocol:** No information supplied.
- **Test Equipment:** For basic research, Maxwellian Viewing System, IBM XTs & ATs with enhanced graphics displays. For exploratory research, flight simulation of F-16A with dome color projection imagery.
- **Theoretical Background:** Visual/perceptual research since 1850 for basic research signal detection. Learning theories: cognition, attention, & workload
- **Relevant Publications:** No information supplied.

• **Keywords:**

Decision making *Workload*
Divided attention
Focused attention
Selective Attention
Task analysis

McKay, G.

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 United Kingdom

- **Performance Measures:** Critical flicker fusion, choice reaction time, Sternberg memory scanning task, tracking tasks, Stroop test, Leeds sleep evaluation questionnaire, analogue rating scales, and HPRU driving tests are used to study the psychopharmacological effects of drugs.
- **Normative Data Base:** Baseline measures from each study collected manually or automatically, depending on the tests used.
- **Test Validation:** See HPRU and general psychopharmacology publications.
- **Testing Protocol:** Repeated measures design. Practice on all tests for one day before start of the study. 2-4 test sessions, 1-2 hours apart.
- **Test Equipment:** Leeds psychomotor tester and BBC
- **Theoretical Background:** Sensory discrimination, cognitive function, and psychomotor reaction
- **Relevant Publications:** See HPRU library in care of B. Haig, secretary, University of Leeds
- **Keywords:** *Decision Making*
Divided Attention
Mental Resource
Selective Attention

Meere, J.J. van der

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 Instituut voor Experimentele Klinische Psychologie,
 Turfsingel 46,
 9712 KR Groningen
 The Netherlands

- **Performance Measures:** Reaction times and evoked potentials are used for investigating cognitive processes following mental chronometry, and for searching for differentiation in clinical groups in terms of cognitive processes.
- **Normative Data Base:** No information supplied.
- **Test Validation:** No information supplied.
- **Testing Protocol:** A single subject per morning session
- **Test Equipment:** PDP 11, stackpack computer.
- **Theoretical Background:** The Shiffrin and Schneider attention paradigm.
- **Relevant Publications:** -A divided attention experiment in pervasively hyperactive children, *Journal of Abnormal Child Psychology*, September 1987

• **Keywords:**

<i>Decision making</i>	<i>Performance</i>
<i>Divided Attention</i>	<i>Response competition</i>
<i>Focused Attention</i>	<i>Selective attention</i>
<i>Individual Differences</i>	<i>Theoretical models</i>
<i>Mental resource</i>	<i>Workload</i>
<i>Physio. Perform. Meas.</i>	

Mehnert, P. (See Gros, page 40)

Menu, J.P.

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de Medecine Aerospatiale
Psychophysiologie de la Perception Visuelle
5 bis, avenue de la Porte de Sevres
75731 Paris CEDEX 15
France

- **Performance Measures:** Reaction times, thresholds, SWAT, and CTS are used for ergonomic applications and aircraft cockpit designs.
- **Normative Data Base:** Not yet
- **Test Validation:** Confrontation of ophthalmological examination and CSF threshold.
- **Testing Protocol:** Psychophysiological methods are used.
- **Test Equipment:** IBM PC computers are used.
- **Theoretical Background:** Neurophysiology, color vision, and cognitive psychophysiology
- **Relevant Publications:** No publications supplied
- **Keywords:**

<i>Decision Making</i>	<i>Personnel Selection</i>
<i>Divided Attention</i>	<i>Response Competition</i>
<i>Environmental Stressors</i>	<i>Risk Taking</i>
<i>Focused Attention</i>	<i>Selective Attention</i>
<i>Individual Differences</i>	<i>Stressor Effects</i>
<i>Mental Resource</i>	<i>Task Analysis</i>
<i>Normative Perform. Meas.</i>	<i>Task Competition</i>
<i>Performance</i>	<i>Theoretical Models</i>
<i>Personality Factors</i>	<i>Workload</i>

Meijers, A. (See Hermans, page 48)

Mellaard, M. (See Goud, page 37)

Melter (see Roth, page 85)

Meltzer, P. (See Zaal, page 114)

Menlenbrock, R. (See Thomassen, page 102)

Metaus, S.A. (see Biferno, page 6)

Meyer, J.J.
Rey, P.
Bousquet, A.

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IMSP Fac. Md. Univ.
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Switzerland

- **Performance Measures:** Visual thresholds, when changing luminances and contrast levels, temporal fluctuations, field characteristics, etc., and visual strain and sensitivity to glare are used in an ergophthalmological approach in the field of new technologies and transportation.
- **Normative Data Base:** In development.
- **Test Validation:** Yes, 2000 measures on several populations: a) both sexes from 18-70 years of age; b) professional groups such as VDT operators; and c) drivers. Our equipment was also tested in other laboratories.
- **Testing Protocol:** Self assessment of perceptual thresholds after adaptation to the luminous environment, together with questionnaires on visual strain and positive or negative feeling.
- **Test Equipment:** Prototypes developed in our laboratory.
- **Theoretical Background:** Visual psychophysics, ophthalmology, work physiology, and lighting.
- **Relevant Publications:**
 - Meyer, J. et al. (1980) L'analyse ergonomique des postes de travail avec cran visualisation - *Cah. ECOTRA*, A, juin
 - Meyer, J.J. (1981) L'évaluation de la charge visuelle et des risques pour la vue lors de l'utilisation intensive d'un microscope binoculaire - *Compte-rendu des Journées d'étude, Toulouse* 5-6 juin 1980. Publi par l'ANACT, pp. 22-49
 - Rey, P., Meyer, J.J. (1980) Visual impairments and their objective correlates. In: Grandjean, E., Vigliani, E. (eds) - *Ergonomic aspects of visual display terminals* - Londres. Taylor and Francis, pp. 77-83
 - Crespy, J., et al. (1980) La charge de travail des opérateurs dans les services informatiss - *Md. et Hyg.*, 38, 1365: 494-502.
 - Meyer, J.J. (1983) Test de dpistage et tes d'aptitude visuelle. L'apport de l'ergonomie l'ophthalmologie preventive. *L'opticien Suisse* n 1/2 10, 36-47
- **Keywords:**
 - Environmental stressors*
 - Individual differences*
 - Normative performance measures*
 - Personnel selection*

Meyer, J.P.
Aptel, M.

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Boîte Postale 27
54501 Vandœuvre Cedex
France

- **Performance Measures:**
 - a) Evaluation of Physical restraint and cardiac frequency through telemetry, the consumption of oxygen.
 - b) Spinal mobility
 - c) Detection of thresholds of finger sensitivity to hot or cold.
- **Normative Data Base:** It does not exist as standards applicable to the whole of a given population so much as it concerns the spinal mobility or that of digital thermal sensitivity.

- **Test Validation:** The spinal mobility has been utilized in youthful athlete populations. These studies show a correlation between changes in mobility and the predisposition to lumbago. The thermoelectrometer has been utilized in salaried personnel exposed to vibrations or attacks of Reynaud's Syndrome.
- **Testing Protocol:** Principles of terrain studies.
 - Physical workload based on ergometric bicycle.
 - Spinal mobility among 3 populations exposed to vibrations.
 - The thresholds of thermal sensitivity in salaried subjects exposed to artificial cold.
- **Test Equipment:** Rachimeter, compaq AT for acquisition and storage of the data
- **Theoretical Background:** Exposure to cold - recooling of hands - lowered thermal sensitivity - Reynaud's Syndrome.
- **Relevant Publications:** -Badelon et Coll. (1983) in *Lombalgie et Md. Education Masson*, Paris, 69-78
 -Hirosawa et Coll. (1984) *international Journal of Neuroscience*, 24, 281-288
 -Mito et Coll. (1981) *Medica KINKI University*, vol. 6, N2, 125-131
- **Keywords:** Workload

Meyman, T. (See Mulder, G., page 74)

Michalik, C.
 Klebei, E.
 Risser, R.
 Kissner, R.

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 Institute of Traffic Psychology
 Ölzeltgasse 3
 A-1030 Vienna
 Austria

- **Performance Measures:** Visual perception; structuring ability; peripheral vision; reactive capacity (speed and reliability of reactions, stress tolerance); concentrative capacity (resistance against monotony, flexibility of attention, vigilance); sensorimotor coordination (tracking, tapping, dual- and triple task tests); memory (short and long term); intelligence (non-verbal); and personality tests are used for driver aptitude tests and preselection of pilot applicants.
- **Normative Data Base:** Driver aptitude tests: 13000 (clients of the Institute of Traffic Psychology) pilot selection: 400 (clients of the Psychotechnic Institute Utrecht, Netherlands and Aerospace Medical Center Soesterberg, Netherlands)
- **Test Validation:** Driver aptitude tests have been validated with observed driving behavior as criterion; pilot selection tests have been validated with training results: (publications available at the end of 1987)
- **Testing Protocol:** Entirely computerized test procedure (computerized instruction, presentation, scoring, and normalization) using specialized computer test devices (ACT & REACT Testsystem ART-90)
- **Test Equipment:** ACT & REACT testsystem ART-90 and Viennese Test System WTS-90 by the Dr. G. Schuhfried Company, Hyrtlstr. 45, A-2340 Mödling, Austria (Z80A based microcomputer). Changes to IBM-Standard under development, partly available.
- **Theoretical Background:** Some publications in German and test manuals in German and English
- **Relevant Publications:** -Bukases, B. & Risser, R. (Eds.) (1985): *Die Verkehrspsychologischen Verfahren im Rahmen der Fahrignungsdiagnostik*. Vienna: Literas

• **Keywords:**

Divided Attention
Focused Attention
Individual Differences
Mental Resource
Performance

Personality Factors
Personnel Selection
Selective Attention
Workload

Millar, K.

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 Behavioural Sciences Group
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 Glasgow G12 8QQ
 United Kingdom

• **Performance Measures:**

Serial choice RT, discrete choice RT, CFF, simple RT, pursuit tracking with secondary task option, and tests of memory and vigilance are used in psychopharmacological studies.

• **Normative Data Base:**

No in-house normative data base, but most tests widely used and reported in literature

• **Test Validation:**

Most tests are sensitive to changes in cognitive/physiological state with performance profiles that change in a logical fashion according to treatment

• **Testing Protocol:**

No "typical" protocol is used. Ensure that practice curve reaches asymptote; lengthier tasks sensitive to small effects; when within-Ss designs used, consideration given to possible asymmetric transfer effects

• **Test Equipment:**

BBC 64k. Further expansion subject to University funding

• **Theoretical Background:**

Atheoretical - used purely as objective instruments to detect performance change

• **Relevant Publications:**

-Millar & Wilkinson (1981). *Eur. J. Clin. Pharmacol.*
 -Millar & Standen (1982). *Brit. J. Clin. Pharmacol.*
 -Millar (1983). *Psychol. Med.*
 -Millar et al. (1987). *Psychol. Med.*

• **Keywords:**

Environmental stressors
Individual differences
Personality factors

Miller, J. C.

Telephone number not supplied

Mummaw, D.

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 6520 Test Group/ENAH
 Edwards AFB, CA 93523-5000
 United States of America

• **Performance Measures:**

Airspeed, heading, and course deviation from aircraft instrumentation systems will be used as performance measures.

• **Normative Data Base:**

No

• **Test Validation:**

No. However, similar data have proven useful in road transportation and flight simulator investigation.

• **Testing Protocol:**

Semi-controlled inflight testing.

• **Test Equipment:**

1553 Instrumentation data bus; Masscomp Computer Systems (UNIX), MS-DOS based microcomputers.

• **Theoretical Background:**

Increased performance variability due to mental blocks or mental lapses (see Perelli, 1980, for review).

- **Relevant Publications:**
 - Perelli, L.P. (1980) Fatigue Stressors in Simulated Long-duration Flight: Effects on Performance, Information Processing, Subjective Fatigue, and Physiological Cost. USAFSAM-TR-80-49.
 - Morris, T.L. (1984) Electrooculographic Measurement, Fatigue, and Variability in Simulated Aircraft Flight. Dissertation, Texas A & M University.
 - Mackie, R.R. & Miller, J.C. (1978) Effects of Hour of Service, Regularity of Schedules, and Cargo Loading on Trade and Bus Driver Fatigue. Goleta CA: Human Factors Research, Inc. (HFR-TR-1976-F), 1978 (PB-290-957).
- **Keywords:**

<i>Divided attention</i>	<i>Response competition</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Task analysis</i>
<i>Performance</i>	<i>Task competition</i>
<i>Physio. Perform. Meas.</i>	<i>Workload</i>

Miller, J. T. Telephone number not supplied
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 P.O. Box 516
 St. Louis, MO 63166
 United States of America

- **Performance Measures:** Simulated time to complete task, resource utilization, error rate.
- **Normative Data Base:** No information supplied
- **Test Validation:** Limited
- **Testing Protocol:** Digital dynamic simulation of aircrew, command and control, engineering design, and manufacturing functions.
- **Test Equipment:** MicroVax II, SLAM simulation language.
- **Theoretical Background:** Information processing, perceptual, mental models.
- **Relevant Publications:** No information supplied.
- **Keywords:**

<i>Decision making</i>	<i>Workload</i>
<i>Mental resources</i>	
<i>Performance</i>	
<i>Task analysis</i>	
<i>Task competition</i>	

Moleman, P. (See Tulen, page 103)

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 Human Engineering Laboratory
 Aberdeen Proving Ground, Md. 21005-5001
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- **Performance Measures:** Recognition and recall are used to assess long and short term memory. Reaction time and detection are used to measure vigilance.
- **Normative Data Base:** No information supplied
- **Test Validation:** No information supplied
- **Testing Protocol:** Keeping track tasks, paired associate learning, and recall from text
- **Test Equipment:** No information supplied
- **Theoretical Background:** No information supplied

• **Relevant Publications:** No publications supplied

• **Keywords:** *Focused attention*
Performance
Selective attention
Workload

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- **Performance Measures:** Subjective scales including SWAT, NASA BIPOLAR, and our own Fuzzy Set Measures. Performance, including the JEN critical task, 0.4 Hz heart rate variability, and RMS error
- **Normative Data Base:** SEE USAF/NASA AMES/FAA workload bibliography
- **Test Validation:** Current validation in progress.
- **Testing Protocol:** Usually on-line realtime computer.
- **Test Equipment:** IBM, SON, and Apple.
- **Theoretical Background:** Mental resource theory, sampling theory, and cybernetics.
- **Relevant Publications:** Available late 1987.
- **Keywords:** *Decision making* *Theoretical models*
Divided attention *Workload*
Mental resources
Performance
Task competition

Morgan, N. (See Gevins, page 35)

Mulder, G. Telephone: (31)50-639111
Mulder, L.J.M.
Meyman, T.
Jackson, J.
Wijers, A.A.
Veldman, J.B.P.

State University Groningen
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9750 AA Haren
The Netherlands

- **Performance Measures:** Reaction and errors. The tasks are used to assess the effects of environmental stressors, aging, psychotropic drugs and of mental workload.
- **Normative Data Base:** Yes. Data from city busdrivers, driving examiners, Telephone and telegraph operators, are available on PDP-11/RSX-11M, Cyber of VAX/VMS

- **Test Validation:** Validation is done in three different ways:
 1) In laboratory studies the EEG is recorded and the effects of task variables on components of the Event Related (Electrical and Magnetic) Brain Potentials (ERP's and MEG's) are measured. The ultimate aim is to determine brain mechanisms involved in the performance of the tasks.
 2) In laboratory studies the effects of stressors (e.g. noise, sleep deprivation, time-on-task) and of aging have been investigated on performance, ERP and cardiovascular measures.
 3) In field studies the effects of preceding work have been studied on performance and cardiovascular measures.
- **Testing Protocol:** The tests are presented on personal or laboratory computer and performance measures (response latency and errors) are determined using the same systems.
- **Test Equipment:** The tests are implemented on PDP-11 and LSI-11 laboratory computers and some of them now run also on IBM-PC compatible Personal Computers. Also data acquisition and spectral analysis of heart rate (recorded simultaneously during task performance) can be done on these PCs.
- **Theoretical Background:** The tasks are based on the following theoretical models, eq. frameworks: The controlled-automatic and selective attention framework of Shiffrin and Schneider, Treisman and Gelade Posner e.o.; The continuous flow model of Eriksen and Shultz and Miller; the working memory model of Baddeley and Hitch and Carpenter and Just e.o.; performance-resource models.
- **Relevant Publications:**
 - Aasman, J., Mulder, G. and Mulder, L.J.M. (in press). Operator Effort and the Measurement of Heart Rate Variability. *Human Factors*, 1987 (in press)
 - Mulder, G. (1984). Stage Analysis of the Reaction Process using reaction and Brain Evoked Potentials. *Psychological Research*, 46, 15-32.
 - Okita, T., Hÿers, A.A., Mulder, G. and Mulder, L.J.M. Visual Search and Visual Spatial Attention. *Acta Psychologica*, 60, 263-292.
 - Mulder, G. & Mulder, L.J.M. Task-related Cardiovascular Stress. In: J. Long and A.D. Baddeley (Eds), *Attention and Performance*, Vol.9. Hillsdale, N.J.: Erlbaum
- **Keywords:**

<i>Workload</i>	<i>Normative performance</i>
<i>Task competition</i>	<i>Divided attention</i>
<i>Focused attention</i>	<i>Stressor effects</i>
<i>Response competition</i>	<i>Selective attention</i>
<i>Environmental stressors</i>	<i>Theoretical models</i>
<i>Individual differences</i>	<i>Task performance</i>
<i>Mental resource</i>	
<i>Physio. Perform. Meas.</i>	

Mulder, L. (See Mulder, G., page 74)

Mummaw, D. (See Miller, J.C., page 72)

Myrtek, M. (see Fahrenberg, page 28)

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 AG Arbeits- u. Organisationspsychologie
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- **Performance Measures:** Vigilance/(Laboratory)Research
- **Normative Data Base:** No
- **Test Validation:** No

- **Testing Protocol:** VDU
- **Test Equipment:** PDP 11, self-developed software
- **Theoretical Background:** Vigilance research
- **Relevant Publications:** -Eilers, K., Hanecke, K., Peper, J., and Nachreiner, F. (1987) *Time of day effects in vigilance performance*. In: Leonard, J.P. (ed.): *Vigilance: Methods, Models and Regulation*. Boston, Dordrecht: Martinus Nijhoff (i.p.)
- **Keywords:** *Workload*

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 Engineering Psychology Dept. E422
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- **Performance Measures:** Speeded and tachistoscopically presented clinical neuropsychological material, primarily Halstead-Reitan & Embedded Figures to obtain performance profiles for normal individuals.
- **Normative Data Base:** No. Work was dissertation/post-doctoral. Related investigation is currently not active.
- **Test Validation:** Profiles obtained appear to correlate positively with Shipley-Hartford IQ & stress resistance.
- **Testing Protocol:** Both individual testing and computer assisted protocols have been used. Computer assisted work was performed at USAF SAM, Brooks AFB, Texas.
- **Test Equipment:** No work in progress at this time.
- **Theoretical Background:** Laterality-Hemispheric Specialization.
- **Relevant Publications:** None, other than dissertation, most work was performed as a part of clinical evaluations of USAF officer at SAM.
- **Keywords:**

<i>Divided attention</i>	<i>Personality factors</i>
<i>Individual differences</i>	<i>Personnel selection</i>
<i>Mental resources</i>	<i>Stressor effects</i>
<i>Performance</i>	<i>Workload</i>

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Hella, F.
Guillermain, H.
 INRS - Institut National de Recherche et de Sécurité
 Service Ergonomie - Psychologie
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 France

- **Performance Measures:** Visual scanning (eye movements, line of regard). For research in evaluating perceptive load (in truck driving). In press control (picking up of information, information processing, and cognitive activity).
- **Normative Data Base:** No
- **Test Validation:** It is not really a test.
- **Testing Protocol:** Not tests "stricto sensu", but experimental paradigm.

- **Test Equipment:** NAC eye mark recorder (n 1/2 IV) from NAC incorporated (Japan). HENMS (Head-eye movement measurement system) Socié BOUIS Grachtweidel van 8, 1900 OVERYSE, BELGIUM. Simulated control command system (for supervising) (in project).
- **Theoretical Background:** Analysis of human reliability in information processing. Trade-off between perceptive and cognitive activity in incident diagnosis in complex systems. Time sharing and visual scanning.
- **Relevant Publications:** Only in project.
- **Keywords:** *Decision making*
Task analysis
Workload

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Rieke, K.

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Psychologisches Institut
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- **Performance Measures:** A manual compensatory tracking task is simulated, and different levels of mental workload (overload/underload) are induced; an emotional stressor (failure feedback) can be added under both conditions; induction of mental workload (high or low bandwidth of forcing function) is adaptive; data for performance (bandwidth of forcing function reached) and mental effort (grip measure on control element) are simultaneously registered over time and saved by computer (floppy disk)
- **Normative Data Base:** Preliminary Stanine norms from 90 sport students for measures of performance and effort
- **Test Validation:** Correlations with personality measures (paper-pencil) showed validity of the overload condition, underload is miscellaneous; emotional stress failed to proof validity
- **Testing Protocol:** Test presentation by Apple II on high-resolution monitor; reaction by control stick; own assembler software for task presentation and data saving; experimenter's role is restricted on primary explanation and program starting
- **Test Equipment:** Extended Apple-II compatible with own software; expansion of hardware planned but not yet specified
- **Theoretical Background:** Cognitive stress model, assuming a concept of stress vulnerability; individual differences in reaction to stress will show different relations of performance and effort over time
- **Relevant Publications:** Research report (grant no. 01HA091) to Bundesministerium für Forschung und Technologie (Department of Research and Technology)
- **Keywords:** *Individual Differences*
Mental Resources
Norm. Perform. Meas.
Performance
Personality Factors
Workload

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- **Performance Measures:** Reading time measures are used for developing models of reading behavior.
- **Normative Data Base:** No information supplied.

- **Test Validation:** Developments of tests are not the aim.
- **Testing Protocol:** Tests are displayed on a computer screen. Reading times (per word, clause or sentence) are measured.
- **Test Equipment:** Olivetti M24. Homemade software to control the experiments.
- **Theoretical Background:** Information processing in reading.
- **Relevant Publications:** No publications supplied.
- **Keywords:** *Mental resource*
Task analysis

Oatman, L.C.
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U.S. Army Laboratory Command
Human Engineering Laboratory
ATTN: SLCHE-BR (Dr. Oatman)
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Telephone number not supplied

- **Performance Measures:** Measures of performance include: reaction time, number of errors, subjective opinions, and physiological measures such as evoked potentials, P300, EEG, etc. and are used for workload assessment.
- **Normative Data Base:** Unknown
- **Test Validation:** Walter Reed validation: correlation of task performance, subjective opinion, and physio. measures
- **Testing Protocol:** Modified Walter Reed Performance Assessment battery given by computer
- **Test Equipment:** No information supplied
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:** *Performance*
Physio. Perform. Meas.
Workload

O'Hanlon, J.F.
Gler, J.J. de
Riedel, W.J.
Schoenmakers, E.
Robbe, H.W.

Telephone number not supplied

Institute for Drugs, Safety, and Behavior Ryksuniv. Lihmborg
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6211 L.H. Maastricht
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- **Performance Measures:** Vigilance, critical tracking, and the Stroop test are used to measure drug effects, while eye movements, lane tracking, and expert rating are used to measure driving performance.
- **Normative Data Base:** A data base, consisting of standard deviations of lateral positions, exists for driving performance.
- **Test Validation:** No information supplied
- **Testing Protocol:** All tests are on the MS-DOS operating system.

- **Test Equipment:** A DEC computer system, a Commodore 64, and the MS-DOS AT operating system with Burr-Brown data acquisition cards are used.
- **Theoretical Background:** Basic and advanced experimental psychology and neuro-psychopharmacology
- **Relevant Publications:** See O'Hanlon 1982-1987
- **Keywords:**

<i>Divided Attention</i>	<i>Risk Taking</i>
<i>Focused Attention</i>	<i>Selective Attention</i>
<i>Mental Resource</i>	<i>Stressor Effects</i>
<i>Performance</i>	<i>Workload</i>
<i>Physio. Perform. Meas.</i>	

Orlebeke, J. (See Emmen, page 24)

Otte (see Roth, page 85)

Padmos, P.
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376929 Soesterberg
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- **Performance Measures:** Maximum reading distance, eye movements & accommodation, detection, recognition, identification distances, and visual thresholds
- **Normative Data Base:** No
- **Test Validation:** There have been questionnaires for visual fatigue
- **Testing Protocol:** A variety of approaches is used
- **Test Equipment:** Video equipment, paper prints, EOG equipment, and a PDP 11/34 computer
- **Theoretical Background:** Visual physiology, physiological optics
- **Relevant Publications:** Various publications are relevant
- **Keywords:**

<i>Environmental stressors</i>
<i>Performance</i>
<i>Physio. Perform. Meas.</i>
<i>Workload</i>

Pape, E. (see Kondraske, page 60)

Patat, A. (See Klein, page 58)

Pawlik, K.
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- **Performance Measures:** Measures of cognitive functions, psychomotor aptitudes and behavioral activation are used for research applications
- **Normative Data Base:** No
- **Test Validation:** Mostly with respect to psychophysiological criteria
- **Testing Protocol:** Conventional as well as computer based test administration
- **Test Equipment:** A microcomputer-based behavior recorder developed at this institute is used as well as micro-computer and minicomputer installations (DEC)
- **Theoretical Background:** Theory of activation, multivariate structural theory of intelligence
- **Relevant Publications:** Research reports
- **Keywords:** *Individual Differences*
Personality Factors
Physio. Perform. Meas.
Theoretical Models

Pearson, W. (See Wilson, G., page 112)

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Plomp, T.J.
OCTO University Twente
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The Netherlands

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- **Performance Measures:** Mathematics and science tests are used to measure student achievement
- **Normative Data Base:** Yes, data from approx. 10000 students is stored on a VAX computer system
- **Test Validation:** Judgements by subject-matter experts
- **Testing Protocol:** Paper and pencil
- **Test Equipment:** No information supplied
- **Theoretical Background:** International comparative research and assessment of performance
- **Relevant Publications:** -Pelgrum, W.J. et al. (1983) Tweede Wiskunde Project. Beschrijving van Vitkomsten. Universiteit Twente
-Pelgrum, W.J. & Plomp, T.J. (1986) Second International Science Study: Beschrijving van Vitkomsten en analyse. Universiteit Twente: Toegepaste Onderwijskunde. ISBN 90-365-004-86
-Pelgrum, W.J. et al. (1978) The implemented and attained mathematics curriculum: A comparison of eighteen countries. University Twente. ISBN 90-365-004-78
- **Keywords:** *Performance*

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- **Performance Measures:** There are none at the moment: development of new methods: trend questionnaires, situation specific (e.g. UBV - Fragebogen zum Umgang mit belastenden Situationen im Verlauf. Reicherts & Perrez. 1986)
- **Normative Data Base:** See measures
- **Test Validation:** Yes
- **Testing Protocol:** According to manual
- **Test Equipment:** No information supplied
- **Theoretical Background:** See measures (e.g. Lazarus)
- **Relevant Publications:** No publications supplied
- **Keywords:** *Decision making Theoretical models*
Mental resources
Normative performance measures
Personality factors
Task competition

Perrig, W. (See Steiner, page 97)

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 McLean, VA 22102
 United States of America

- **Performance Measures:** Task speed and accuracy. Input to wargames/attrition models
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** Pre-post testing of army helicopter crews in helicopter simulator. Within-subjects counterbalanced design
- **Test Equipment:** This is not yet defined
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:** *Normative performance measures*
Performance
Stressor effects
Task analysis

Pfendler, C. (See Widdel, page 109)

Pigeau, R. (See Heslegrave, page 49)

Plaats, R. van der (See Thomassen, page 102)

Plomp, T. (See Pelgrum, page 80)

Pond, D.J.

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- **Performance Measures:** USAF Criterion Task Set & Walter Reed Army Institute for Research-Performance assessment Battery
 - **Normative Data Base:** See USAF/US army battery info
 - **Test Validation:** See USAF/US army battery info
 - **Testing Protocol:** Standard protocols for these batteries
 - **Test Equipment:** Addition of IBM compatible computer to Unified Tri-Services Cognitive Performance Assessment Battery
 - **Theoretical Background:** See USAF/US army battery info
 - **Relevant Publications:** See USAF/US army battery info
 - **Keywords:**

<i>Divided attention</i>	<i>Selective attention</i>
<i>Mental resources</i>	<i>Stressor effects</i>
<i>Performance</i>	<i>Theoretical models</i>
<i>Personality factors</i>	<i>Workload</i>
<i>Decision making</i>	
<i>Physio. Perform. Meas.</i>	
-

Pope, A. (See Harris, page 42)

Porlier, J. (See Fowler, page 32)

Postmes, J. (See Goud, page 37)

Pouw, E. (See Flier, van der, page 30)

Povel, D. (See Thomassen, page 102)

Price, D. (See Snyder, page 95)

Rameckers, F. (See Rozeboom, page 86)

Rey, P. (See Meyer, J.J., page 70)

Riedel, W.J. (see O'Hanlon, page 78)

Rieke, K. (see Nitsch, page 77)

Riel, M. van (See Snijders, page 95)

Risser, R. (see Michalik, page 71)

Rizzuto, A. Telephone number not supplied
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 Consolidated Space Operations Center
 Falcon Air Force Station, Colorado 80912-5000
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- **Performance Measures:** Decision times, error rates, response times, response series times. Questionnaire ratings of design features, environment, documentation, and operator software interface supporting human performance. Videotape of operator actions.
 - **Normative Data Base:** No. There are few criteria for human performance in space command and control systems. New ground is being broken.
 - **Test Validation:** Several dry runs at various satellite control facilities tested our data collection capabilities and analysis techniques. Questionnaires are in process of being validated.
 - **Testing Protocol:** During live operations, human performance measures are gathered from automated system recording capability. Questionnaires are administered on a computer based adaptive questionnaire package after each satellite support.
 - **Test Equipment:** AQ-Zenith 171 lap top micro-computer. VAX-data base. Zenith 248-analysis using SPSSPC+.
 - **Theoretical Background:** Relationship of human performance to system performance with subjective information as explanatory. Using multivariate regression to determine human performance predictors of mission success/failure is unprecedented.
 - **Relevant Publications:** No publications supplied.
 - **Keywords:**

<i>Divided attention</i>	<i>Selective attention</i>
<i>Focused attention</i>	<i>Stressor effects</i>
<i>Individual differences</i>	<i>Task analysis</i>
<i>Mental resources</i>	<i>Workload</i>
<i>Performance</i>	
-

Robbe, H.W. (see O'Hanlon, page 78)

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 The Netherlands

- **Performance Measures:** Visual acuity during pursuit and head movement, accuracy of fixation during head movement, and stability of stationary objects during head movement.
- **Normative Data Base:** No information supplied.

- **Test Validation:** No information supplied.
- **Testing Protocol:** No information supplied.
- **Test Equipment:** The contrast sensitivity for gratings is determined. A hydraulically- driven rotating chair is used for giving passive movement.
- **Theoretical Background:** The compensatory eye movements are not perfect, which results in a movement of the image on the retina. Can the visual performance be explained by this image movement or does a central process also play a role?
- **Relevant Publications:** -J.P. Flipse, G.J. van der Wildt, M. Rodenburg, C.J. Keemink and P.G.M. Knol. *Contrast sensitivity to oscillating sine wave gratings during ocular fixation and pursuit. Vision Res.* (submitted)
- **Keywords:** *Physio. Perform. Meas.*

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 Ven, A.H.G.D. van der
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 The Netherlands

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- **Performance Measures:** Choice response times and response probabilities (i.e. proportions errors).
- **Normative Data Base:** See handbook/guide to each of the tests. Our studies are relatively small samples & do not yield a normative data base.
- **Test Validation:** Yes, all tests investigated are existing pencil-and-paper tests for intelligence and concentration. But our work aims at discovering what exactly is measured by such tests, rather than by validation through correlations with external criteria.
- **Testing Protocol:** Computerized test administration, one test item at a time, with experimental variation of item difficulty, stress on speed vs. precision of responses, time limits for stimulus presentation duration, resting periods, etc.
- **Test Equipment:** PDP 11/45 and PDP 11/34. Software: programs written by ourselves and IMSL and SPSS routines for statistical analysis.
- **Theoretical Background:** (See test validation) Concentration tasks: visual discrimination of dot patterns, digit addition, etc. (Kraepelin, Bourdon, Hull, Eysenck). Intelligence tests: mental rotation (Thurstone, Shepard).
- **Relevant Publications:**
 - G. van Breukelen, E. Roskam, R. Jansen, A. van der Ven, & J.C. Smit (1987). Concentration, speed, and precision in simple mental tasks. In E.E. Roskam & R. Suck (Eds.), *Progress in Mathematical Psychology: Papers of the European Mathematical Psychology Group Meetings*. Amsterdam: North Holland
 - Roskam, Edw. E. (1987a). Toward a psychometric theory of intelligence. In E.E. Roskam & R. Suck (Eds.) *Progress In Mathematical Psychology: Papers of the European Mathematical Psychology Group Meetings*. Amsterdam: North Holland.
 - Ven, A.H.G.D. van der, Smit, J.C. & Jansen, R. Long term trend in speeded tests and Hull's concept of inhibition. Submitted to *Applied Psychological Measurement*.
 - Pieters, J.P.M. (1985). Reaction time analysis of simple mental tasks. *Acta Psychologica*, 59, 227-271.
- **Keywords:**
 - Individual differences*
 - Mental resource*
 - Performance*
 - Theoretical models*
 - Workload*

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- **Performance Measures:** Ability and knowledge tests, rating procedures in situational tests, essay tests, and sport exams are used for personnel selection.
 - **Normative Data Base:** A database exists of hundreds of military job and training candidates, 17-24 years old.
 - **Test Validation:** Concurrent validity, first results in the field of predictive validity (course of studies results as criterion); meta-analyses (in the future)
 - **Testing Protocol:** Paper-pencil, computer-assisted tests are used. Computerized adaptive testing will be used in the nineties.
 - **Test Equipment:** ZAK analyzer, Kaiser optical mark reader, paper-pencil workstation planned; computer workstation, computer assisted testing; IBM AT/03, PC standard software (eg. SPSS, WORDSTAR)
 - **Theoretical Background:** Theories of intelligence (Jäger, Pawlik), of personality (Murray, Cattell, Eysenck)
 - **Relevant Publications:** -Otte, R. (1987) Die Methodik zur Prüfung von Offizierbewerbern. In: Schuler, H., Stehle, W. (Hrsg.), *Assessment center als Methode der Personalentwicklung*. Verlag für angewandte Psychologie, Stuttgart, S. 78-98
 - **Keywords:** *Individual Differences Personnel Selection*
-

Rothengatter, J.A.

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- **Performance Measures:** Reaction tasks, adaptive control tasks, simulated driving tasks, and real road driving tasks are used to identify factors that affect ability to perform driving and cycling tasks.
 - **Normative Data Base:** Limited, in particular related to elderly. Size: 120. Hardware: IBMPc or CDC. Software: SPSS
 - **Test Validation:** Yes, laboratory tasks against real road tasks, and real road tasks against accident involvement.
 - **Testing Protocol:** Tests are given under laboratory and real road conditions.
 - **Test Equipment:** LSI 11/73 for adaptive tracking control, and laboratory tests. LSI 11/23 for real road driving. Software: Owinn Fortran 77.
 - **Theoretical Background:** Risk compensation strategy.
 - **Relevant Publications:** -Wolfelaar, P.C. van, Rothengatter, J.A., Brouwer, W.H. (1987) Compensation strategies of elderly car drivers. *Contemporary Ergonomics*.
 - **Keywords:** *Individual differences
Personality factors
Risk taking
Task analysis*
-

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Boschman, M.C.

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 The Netherlands

- **Performance Measures:** Search velocity, identification, legibility and reading comfort of text on visual display units, contrast, contrast polarity, background level, Bandwidth, colour and character font being the parameters.
- **Normative Data Base:** Data are stored on VAX Systems.
- **Test Validation:** Yes, visual comfort has been scaled, saccadic length and fixation duration has been measured. The correlation coefficient is 0.9.
- **Testing Protocol:** Search of target symbol in nonsense text. Visual comfort is scaled. Eye movements are recorded (saccades and fixation duration registered), errors are measured and velocity is determined.
- **Test Equipment:** Gould DeAnza 8400 image processor. Micro VAX II, Conrac 2400. SRI-Eyetracker attached to P857.
- **Theoretical Background:** Reading theory, Information theory, Scaling theory, & Peripheral visual processing
- **Relevant Publications:**
 - Roufs, J.A.J.; Leermakers, M.A.M.; Boschman, M.C.; Knave, P.G.: "Criteria for the subjective quality of visual display units". *Work with display units '86*. Eds. B., Wideback. North Holland.
 - Roufs, J.A.J.; Boschman, M.C.; Leermakers, M.A.M. "Visual comfort as criterion for designing display units". *Human computer interaction: psychonomic aspects*. Eds., van der Veer/Mulder. Springer Verlag.
- **Keywords:**
 - Individual differences*
 - Normative performance measures*
 - Performance*
 - Physio. Perform. Meas.*
 - Theoretical models*

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Rameckers, F.**Andriess, P.S.**

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 Behavioral Sciences Department
 Divechrate RNLA/PERSONNEL
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 2500 ES The Hague
 The Netherlands

- **Performance Measures:** Intelligence, aptitude, and personality.
- **Normative Data Base:** A database of 4000 subjects exists on a Siemens main frame with SPSS software on IBM TSO operating system.
- **Test Validation:** Validation only for pilot-population against single pass-fail criteria..
- **Testing Protocol:** Paper and pencil, apparatus, and interview.
- **Test Equipment:** Implementation selection flight simulator computer assisted testing.
- **Theoretical Background:** Standard intelligence, aptitude, and personality tests, with the well-known theoretical background for Defense Mechanism Test, Perceptiveness and Psychoanalysis.
- **Relevant Publications:** No publications supplied.
- **Keywords:**
 - Focused attention*
 - Personality factors*
 - Personnel selection*
 - Selective attention*

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21, rue Becquerel
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France

- **Performance Measures:** Speed and accuracy in RT tasks. Errors in visual STM or Free recall task. & Speed and accuracy in mental Arithmetics are used to assess the effects of ambient Noise and Unattended Speech on Performances.
- **Normative Data Base:** No information supplied.
- **Test Validation:** All tests are common in the literature.
- **Testing Protocol:** Either independent groups or mixed groups.
- **Test Equipment:** Home-made micro-computerized tests. Ambient noises are produced by means of classical tape recorders. IBM AT compatible computer will eventually be used, possibly with GENSTAT V Software for statistics.
- **Theoretical Background:** Acoustic coding of visual information in immediate memory within the working memory framework.
- **Relevant Publications:** -Baddelay, A.D. (1974) The Psychology of Memory.
- **Keywords:** *Environmental stressors Workload*
Performance
Selective attention
Stressor effects
Theoretical models

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- **Performance Measures:** Basic and applied research is done on human information processing mechanisms in perceptual-motor performance.
- **Normative Data Base:** No database has been established.
- **Test Validation:** The tests have not been validated.
- **Testing Protocol:** No specific protocols are used since parameters are experimentally varied.
- **Test Equipment:** PDP 11-23 is used with tests of the functional visual field; Debie eye movement system; Fitts motor performance equipment; Taskomat
- **Theoretical Background:** Discrete processing stages, resource theory, manual control theory, stress theory
- **Relevant Publications:** -Sanders, A.F. (1983) Towards a model of stress and human performance. *Acta Psychologica*, 53, 60-91
- **Keywords:** *Divided Attention Risk Taking*
Environmental Stressors Selective Attention
Focused Attention Task Analysis
Mental Resources Task Competition
Performance Theoretical Models
Physio. Perform. Meas. Workload
Response Competition

Savelsbergh, G.J.P.

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1081 HV AMSTERDAM
The Netherlands

- **Performance Measures:** Eye and head movements are used to measure active search behavior.
 - **Normative Data Base:** No information supplied.
 - **Test Validation:** Measuring of spatial orientation.
 - **Testing Protocol:** Localization task.
 - **Test Equipment:** Apple IIe
 - **Theoretical Background:** The connection between acquired spatial information and human performance (motoric).
 - **Relevant Publications:** -Localizing Eye Movements in Children of Nine to Twelve Years. (submitted)
 - **Keywords:** *Divided attention*
Focused attention
Selective attention
-

Schaafstal, A

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TNO, Applied Research
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- **Performance Measures:** Protocol analysis, scaling techniques, and interviews are used to investigate the way people interact with complex devices.
 - **Normative Data Base:** No
 - **Test Validation:** No
 - **Testing Protocol:** No information supplied.
 - **Test Equipment:** No information supplied.
 - **Theoretical Background:** Cognitive Psychology-Computer Simulation: Expert-Novice differences; G.R. Anderson- H. Simon
 - **Relevant Publications:** In preparation
 - **Keywords:** *Decision making*
Individual differences
Task analysis
Theoretical models
-

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- **Performance Measures:** Sickness statistics/absenteeism, satisfaction, psychosomatic, and psychic complaints are used in looking for causes of absenteeism.
- **Normative Data Base:** No

- **Test Validation:** Not yet
- **Testing Protocol:** Questionnaires, registration systems (sickness statistics/absenteeism).
- **Test Equipment:** No information supplied.
- **Theoretical Background:** Michigan stress model.
- **Relevant Publications:** No publications supplied.
- **Keywords:** *Environmental stressors*
Personality factors
Stressor effects
Workload

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Telephone number not supplied

- **Performance Measures:** No information supplied
- **Normative Data Base:** No information supplied
- **Test Validation:** No information supplied
- **Testing Protocol:** No information supplied
- **Test Equipment:** No information supplied
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:** *Theoretical models*

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- **Performance Measures:** Human performance is one aspect of evaluation in addition to total (man plus machine) system performance, operator workload and acceptance. With studies in this context performance measures are typically not obtained from norm-based tests, but from specifically defined aspects of task competition, e.g. the deviation from a prescribed flight path.
- **Normative Data Base:** No information supplied
- **Test Validation:** No information supplied
- **Testing Protocol:** No information supplied
- **Test Equipment:** No information supplied

- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:** *Performance
Workload*

Schifflett, S.
Storm, W.
Lewis, N.
Dowd, P.

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Crew Performance Laboratories
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- **Performance Measures:** Drug and stressor effects are measured by the Performance Assessment Battery (PAB), performance evaluation tests: environmental research (PETER) (114 tasks), Criterion task set (11 tasks), Automated portable test system (APTS) (25 tasks), Eye blink, ECG, EP, flight measures (secondary tasks).
- **Normative Data Base:** Yes, reliability for the CTS on the Commodore, for the APTS on the NEC, and for the UTC-PAB on IBM and compatibles
- **Test Validation:** Yes; reliability for the CTS (University of Oklahoma), for the APTS (Essex Corp. Orlando, Fla.), and for PETER (Naval Bodydynamics Lab New Orleans, La.)
- **Testing Protocol:** Altitude, G-Forces (acceleration), Spatial disorientation, hypoxia, sustained operations double-blind, placebo controlled, repeated measures for testing chemical defence pretreatment drugs & sleep enhancers.
- **Test Equipment:** CTS - Commodore
APTS - NEC
UTC-PAB - IBM, compatible
- **Theoretical Background:** Too numerous
- **Relevant Publications:** -PETER- (1986) *Perceptual & Motor Skills*, 63, 683-708.
-APTS- (1986) Tech. Rept. # 86-4, Essex Corp., Orlando, Fla.
- **Keywords:** *Decision making Stressor effects
Divided attention Workload
Mental resources
Performance
Physio. Perform. Meas.*

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Norman, Okla. 73019
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- **Performance Measures:** The Criterion Task Set (CTS) is used for workload metric standardization and evaluation, as well as dual task evaluation. The Subjective workload assessment test (SWAT) is used to develop and evaluate subjective workload measures.
- **Normative Data Base:** Data on all CTS performance variables, accompanying SWAT and individual difference measures for training, baseline, sleep loss, noise and caffeine stress are stored on IBM 3081 with SAS data sets.
- **Test Validation:** There is a subject population of 150.
- **Testing Protocol:** Five-day training & baseline performance followed by stressor effects on performance.
- **Test Equipment:** Commodore 64

- **Theoretical Background:** See Shingledecker (1985) AMRL tech report.
- **Relevant Publications:**
 - Schlegel, R.E., et al. (1986) of the Criterion Task Set Performance Data Base. *Proceedings of the 30th Annual Human Factors Society Conference*. Dayton, Oh.
 - Gilliland, K. et al. (1986) Individual Differences in Criterion Task Set Performance. *Proceedings of the 30th Annual Human Factors Society Conference*. Dayton, Oh.
 - Schlegel, R.E. (1986) Development of an Optimal Testing Protocol for the USAF Criterion Task Set (CTS). Final Scientific Report, SC'EEE-84 RIP 47. Southeastern Center for Electrical Engineering Education, St. Cloud, Fla.
 - Gilliland, K. & Schlegel, R.E. (1986) Evaluation of the Criterion Task Set for Drug and stress Research. Final Report, SC'EEE-ARB/85-62, Southeastern Center for Electrical Engineering Education, St. Cloud, Fla. and Armstrong Aerospace Medical Research Laboratory, Wright-Patterson AFB, Oh.
 - Schlegel, R.E. & Shingledecker, C.A. (1985) Training Characteristics of the Criterion Task Set Workload Assessment Battery. *Proceedings of the 29th Annual Human Factors Society Conference*, Baltimore, Md.
 - Shingledecker, C.A. & Schlegel, R.E. (1985) A Resource Theoretical Task Battery for Workload and Human Performance Research. *Proceedings of the 9th Congress of the International Ergonomics Association*, Bournemouth, Eng.
- **Keywords:**
 - Individual differences* *Workload*
 - Mental resources*
 - Performance*
 - Personality factors*
 - Stressor effects*

Schmitt, A. (See Abele-Brehm, page 1)

Schneider, H. (See Perrez, page 80)

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- **Performance Measures:** Secondary tasks and subjective ratings.
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** By computer, using search and problem solving procedures.
- **Test Equipment:** IBM PC, using Micro Experimental Lab. by Psychology Software Tools, Pittsburg, PA
- **Theoretical Background:** Automatic/control processing theory Shiffrin & Schneider, 1977, Schneider 1985.
- **Relevant Publications:**
 - Fisk and Schneider 1984
 - Schneider and Fisk 1982, 1983, 1984
 - Schneider and Detweiler 1987
- **Keywords:**
 - Divided attention* *Workload*
 - Focused attention*
 - Mental resources*
 - Selective attention*
 - Theoretical models*

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- **Performance Measures:** Detection rate of radar (sonar) signals is used for estimation of vigilance
- **Normative Data Base:** No
- **Test Validation:** No
- **Testing Protocol:** Test is administered on a computer; registration of performance measurement follows "on line"
- **Test Equipment:** APPLE-II and simulated Radar(Sonar) monitor; in-house developed software
- **Theoretical Background:** Signal detection theory
- **Relevant Publications:**
 - Green,D.M. & Swets,J.A. (1966). *Signal Detection Theory and Psychophysics*. New York: Wiley.
 - Mackie,R.R. (Ed.)(1977). *Vigilance*. New York: Plenum Press.
 - Sanders,A.F. (1971). *Psychologie der Informations-verarbeitung*. Bern: Huber.
- **Keywords:**
 - Divided Attention*
 - Environmental Stressors*
 - Focused Attention*
 - Personality Factors*
 - Personnel Selection*
 - Selective Attention*

Schoenmakers, E. (see O'Hanlon, page 78)

Schomaker, L. (See Thomassen, page 102)

Schonman, W. (See Flier, van der, page 30)

Schreuder, R. (See Dijkstra, page 22)

Schroder, A. (See Abele-Brehm, page 1)

Schuler, H.
Funke, U.

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- **Performance Measures:** Cognitive ability tests and instruments for assessing complex problem solving abilities will be constructed and validated for the purpose of developing a selection battery for industrial research and development personnel.

- **Normative Data Base:** 500 researchers and engineers in 6 big German companies (R&D departments)
- **Test Validation:** Construction and validation of tests will take place in 1988.
- **Testing Protocol:** Paper-pencil as well as computer tests
- **Test Equipment:** IBM AT/03 with microCAT software for item presentation, ICL mainframe and SPSSX 2.1 for data analysis
- **Theoretical Background:** Cognitive psychology, intelligence, and creativity
- **Relevant Publications:** In preparation
- **Keywords:** *Individual differences*
Personality factors
Personnel selection
Task analysis

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- **Performance Measures:** Three tests are used: 1) motor tests 2) BLUMOD: subjective estimate of strain and 3) Test d-2
- **Normative Data Base:** Norms do exist for the motor tests, N=258 for BLUMOD rating scale, and test d-2 has age- and sex-specific norms.
- **Test Validation:** The motor tests have face validity. BLUMOD is used in situations with high information load. See manual (Brickenkamp, 1972) for test d-2.
- **Testing Protocol:** Motorische Prüfsérie nach Schoppe (MLS) Rocacci-Test, paper, and pencils.
- **Test Equipment:** No information supplied
- **Theoretical Background:** Compensation behaviour in stress situations and attention = ability to distinguish between (visual) similar details
- **Relevant Publications:** -Schoppe, K.J. (1974): Das MLS-Gerät. Ein neuer Testapparat zur Messung feinmotorischer Leistungen. *Diagnostica* 20, 43-46
-Brickenkamp, R. (1972): Test d2: Aufmerksamkeits-Belastungs-Test. Hogrefe: Göttingen
- **Keywords:** *Focused Attention*
Workload

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- **Performance Measures:** RT, response number, error percentage, psychomotor accuracy, evoked potentials, sleep EEG, heart rate, biochemical parameters, and subjective ratings are used to measure performance.
- **Normative Data Base:** Data base is small due to the small sample populations.

- **Test Validation:** In most cases, validation is part of the research.
- **Testing Protocol:** Simulation and field experiments; paper-pencil; and computer-based testing
- **Test Equipment:** Various simulation facilities are used, including sleep lab, altitude chamber, diving simulator, centrifuge, tilt table, rotating chair, and the LEMP-box are used, along with a MicroVAX, PDP-11, AT, COMMODORE 128, and ELTEC
- **Theoretical Background:** Measuring and minimizing environmental effects such as time shifts, irregular work, high pressure, drugs, etc. on health or job performance
- **Relevant Publications:**
 - Klein, K.E. & Wegmann, H.M. (1980) Significance of Circadian Rhythms in Aerospace Operations. *AGARDograph* No. 247. Neuilly-Sur-Seine: NATO-AGARD
 - Hordinsky, J.R. et al. (1982) Relative Efficacy of the Proposed Space Shuttle Antimotion Sickness Medications. *Acta Astronaut.* 9. (6-7): 375-383
 - Wegmann, et al. (1986) Sleep, Sleepiness, and Circadian Rhythmicity in Aircrews Operating on Transatlantic Routes. *Aviat. Space Environ. Med.* 57 (12 sup.): B53-B64
- **Keywords:**
 - Environmental Stressors*
 - Performance*
 - Physio. Perform. Meas.*
 - Stressor Effects*
 - Task Analysis*
 - Workload*

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- **Performance Measures:** Mainly career maturity inventories
- **Normative Data Base:** No information supplied
- **Test Validation:** No information supplied
- **Testing Protocol:** No information supplied
- **Test Equipment:** No information supplied
- **Theoretical Background:** No information supplied
- **Relevant Publications:** No publications supplied
- **Keywords:**
 - Decision making*
 - Individual differences*

Shively, R. (See Hart, page 43)

Snijders, C.J.
 Riel, M.P.J.M. van
 Egeraat, J.M. van

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- **Performance Measures:** Continuous measurements of spine movements in normal working situations over periods of eight hours or more. Analysis of muscle control and performance by means of biomechanical measurements, mathematical modeling and computer simulation.
- **Normative Data Base:** No
- **Test Validation:** Present research aims at validation of new methods for practical purposes.
- **Testing Protocol:** Location-dependent (Lab or field tests)
- **Test Equipment:** Kistler force plate, accelerometers, position/angle transducers, digital image analysis/processing, Medilog data recorders, PDP 11/73 + dedicated software/ PC + Asystant plus, Asyst, dedicated software.
- **Theoretical Background:** Theoretical background is developed in an interactive process of performance tests and computer simulation/modelling, combined with outstanding literature in the appropriate fields of research.
- **Relevant Publications:**
 - Snijders, C.J., van Riel, M.P.J.M. and Nordin, M. "Continuous measurements of spine movements in normal working situations over periods of 8 hours or more". In print.
 - van Egeraat, J.M. and C.J. Snijders: "The significance of the third time derivative of muscle length in muscle control-part II".
- **Keywords:**

<i>Individual differences</i>	<i>Task analysis</i>
<i>Performance</i>	<i>Workload</i>
<i>Personnel selection</i>	<i>Theoretical models</i>
<i>Normative performance measures</i>	
<i>Physio. Perform. Meas.</i>	

Snyder, H.L.
 Dryden, R.D.
 Kemmerling Jr., P.T.
 Kroemer, K.H.E.
 Price, D.L.
 Casali, J.G.
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- **Performance Measures:** Psychophysical, physiological, and psychological measures are used for research in rehabilitation engineering, vehicle analysis and simulation, auditory systems, human-computer interaction, safety, displays, and variables such as alcohol, heat, and cold.
- **Normative Data Base:** No
- **Test Validation:** Yes, simulator measures of driving have been validated by measures of actual driving
- **Testing Protocol:** Both laboratory and field testing is done, including some paper and pencil tests. Usually direct measures of performance, such as psychomotor skills, are taken under a variety of treatment conditions
- **Test Equipment:** Virginia Tech lab facilities
- **Theoretical Background:** The background includes various sources

• **Relevant Publications:**

- Casali, J.G. & Wierwille, W.W. (1983) A comparison of rating scale, secondary task, physiological, and primary task workload estimation techniques in a simulated flight task emphasizing communications load. *Human Factors*, 25, 623-641
- Kroemer, K.H.E. (1986) Engineering Anthropometry. Chapter in *Handbook of Human Factors/Ergonomics*. G. Salvendy (Ed.). New York, NY: Wiley
- Snyder, H.L. (1973) Image quality and operator performance. Chapter II in *Perception of displayed information*. L.M. Biberman (Ed.). New York: Plenum
- Wierwille, W.W., et al. (1985) Evaluation of the sensitivity and intrusion of mental workload evaluation techniques. In: *Advances in Man-Machine Systems Research, Volume II*. W.B. Rouse (Ed.). Greenwich, Connecticut: JAI Press, 51-127
- Willegas, R.C., et al. (1986) Software interface design. In: *Handbook of Human Factors*. G. Salvendy (Ed.). New York: Wiley

• **Keywords:**

<i>Decision making</i>	<i>Response competition</i>
<i>Divided attention</i>	<i>Risk taking</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Stressor effects</i>
<i>Mental resources</i>	<i>Task analysis</i>
<i>Normative perform. measure</i>	<i>Task competition</i>
<i>Personality factors</i>	<i>Workload</i>
<i>Physio. Perform. Meas.</i>	

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• **Performance Measures:**

Car drivers are examined by means of the psychological tests from the ACT a.REACT TESTSYSTEM - ART-90, including: attention under conditions of monotony (Q1); focal attention and flexibility of attention (FAT); choice reaction time split into central nervous processing and motoric reaction time (DR2); capacity to react under conditions of varying load (RST3); capacity to perform correct successions of reactions under the condition of free choice of working speed (SET3); visual perception: speed and accuracy when structuring simple visual tasks (LL5); traffic-specific perception: detailed perception of briefly presented complex traffic situations (TT15); peripheral perception while performing a simple central tracking task (PVT); complex tracking-conditions involving the capacity of eye-hand-foot coordination (CORT); visual memory: reproduction of abstract geometrical figures (GEMAT); ability to perceive and estimate the speed of moving objects (DEST); non-verbal intelligence (M30); risk-taking (FPF); personality factors (8 PF); traffic specific attitude (VIP) see also Bukasa, B./ Risser, R. (Ed.) Die verkehrspsychologischen Verfahren im Rahmen der Fahreignungsdiagnostik. Kleine Fachbuchreihe des KfV. Bd. 23. Literas-Verlag, Wien 1985

• **Normative Data Base:**

See Risser, K., Wenninger, U. (1983) Computergestütztes Testen im Rahmen der Fahreignungsdiagnostik (ACT.REACT-Test-system ART-90). Kleine Fachbuchreihe 20, Kuratorium für Verkehrssicherheit, Wien

• **Test Validation:**

See Risser et al. (1983) Verkehrspsychologische Testverfahren und Kriterien des Fahrverhaltens. Kuratorium für Verkehrssicherheit, Wien

• **Testing Protocol:**

The tests are given by a written instruction on a monitor.

• **Test Equipment:**

See "Normative Data Base"

• **Theoretical Background:**

"Test Validation" and "Normative Data Base".

• **Relevant Publications:**

See "Test Validation" and "Normative Data Base"

• **Keywords:**

Focused Attention Personnel Selection
Individual Differences Risk Taking
Normative Perform. Meas. Selective Attention
Performance

Sonnentag, S. (See Erke, page 26)

Sol., M. van (See Dijkhuis, page 21)

Spekreijse, H.

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- **Performance Measures:** Visual fatigue caused by prolonged use of visual display units.
 - **Normative Data Base:** Not yet
 - **Test Validation:** Yes, the amplitude of the evoked potential seems to change in time in relation to the prolongation of reaction time while keeping the performance level of the task constant.
 - **Testing Protocol:** Contrast evoked potentials.
 - **Test Equipment:** No information supplied.
 - **Theoretical Background:** It is well-known that the amplitude of the contrast EP reduces with disaccommodation and that variability in accommodation increase with overall fatigue. So, the amplitude reduction of the contrast EP might be used as a measure of fatigue.
 - **Relevant Publications:** No publications supplied.
 - **Keywords:** *Physio. Perform. Meas.*
Workload
-

Stam, H. (See Bogaard, page 8)

Steiner, G.

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- **Performance Measures:** Intelligence scales(cognitive capacities), imagery vividness and control (visual information processing), VVIQ, GTVIC
- **Normative Data Base:** No
- **Test Validation:** Yes, but not by ourselves
- **Testing Protocol:** Usual IQ-tests, imagery questionnaires
- **Test Equipment:** Data processing on PDP 11

- **Theoretical Background:** Cognitive psychology and human information processing
- **Relevant Publications:**
 - Fröschl, Th. (1985) Interferenzen von Vorstellungen und Wahrnehmungen. Dissertation Würzburg/Basel
 - Bischof, K. (1986) Individuelle Unterschiede beim visuellen Vorstellen. Dissertation Zurich/Basel
- **Keywords:**

<i>Divided attention</i>	<i>Task analysis</i>
<i>Focused attention</i>	<i>Task competition</i>
<i>Individual differences</i>	<i>Theoretical models</i>
<i>Physio. Perform. Meas.</i>	
<i>Selective attention</i>	

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- **Performance Measures:** Physiological measures such as: Electroencephalographic (evoked potential, etc.), Oculometric (Saccades, Blinks), and Heart (rate, variability) are used.
- **Normative Data Base:** No information supplied.
- **Test Validation:** There has been replication in other labs & simulation facilities.
- **Testing Protocol:** The protocol for the lab tasks include: the Sternberg Memory Task, Vigilance Tasks, and Visual Scanning Tasks. There is no formal protocol for simulations.
- **Test Equipment:** PDP 11/23+ VAX 750, MICROVAX Lab
- **Theoretical Background:** No information supplied.
- **Relevant Publications:**
 - Stern, J.A. and Skelly, J.J. The eye blink and workload consideration. In: *Proceedings of the Human Factors Society, 28th Annual Meeting*, 1984, Santa Monica, CA: Human Factors Society, pp. 942-44
 - Goldstein, R., Walrath, L.C., Stern, J.A. and Strock, B.D. Blink Activity in a Discrimination task as a function of stimulus modality and schedule of presentation. *Psychophysiology*, 1985, 22, 629-35
 - Bauer, L.O., Strock, B.D., Goldstein, R., Stern, J.A. and Walrath, L.C. (1985) Auditory discrimination and the eyeblink. *Psychophysiology*, 22, 636-41
 - B. L.J., Walrath, L.C., Gross, J., James, B., and Stern, J.A. (1986) A comparison of saccade evoked potentials recorded during reading and tracking tasks. *Physiology and Behavior*, 37, 527, 32
 - Lobb, M.L. and Stern, J.A. (1986) Pattern of eyelid motion predictive of decision errors during drowsiness: oculomotor indices of altered states. *International Journal of Neuroscience*, 30, 17-22
 - Bauer, L.O., Goldstein, R., and Stern, J.A. Effects of information processing demands on physiological response patterns. (in press, *Human Factors Journal*, 1987)
- **Keywords:**
 - Mental resources*
 - Physio. Perform. Meas.*
 - Selective attention*

Steyvers, F.

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- **Performance Measures:** Reaction time and performance assessment during sleep deprivation in choice reaction tasks. In the task, variables are manipulated, such as signal quality, S-R compatibility, time uncertainty and knowledge of results.
- **Normative Data Base:** No
- **Test Validation:** Not yet
- **Testing Protocol:** The experiments are given by means of a computer system.
- **Test Equipment:** DEC PDP 11/73, 11/23, Matrox QRGB-Graphics. VAX/VMS for data evaluation and statistics.
- **Theoretical Background:** A model of performance: Sanders, A.F. (1983) in *Acta Psychologica*.
- **Relevant Publications:** -Sanders, A.F. (many publications)
-Steyvers, F.J.J., The influence of sleep deprivation and knowledge of results on perceptual encoding. Submitted to *Acta Psychologica*
- **Keywords:** *Environmental stressor*
Mental resource
Performance
Stressor effects
Theoretical models

Stone, G. (see Gabriel, page 34)

Storm, W. (See Schiflett, page 90)

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- **Performance Measures:** Attention, simple, choice, and serial RT, tracking, memory, visual and memory search, verbal reasoning, mathematical processing, Stroop, pattern memory and comparison, two & six letter search (Folkard), and coding tasks are used to evaluate anti-emetic drugs and work/rest schedules.
- **Normative Data Base:** No
- **Test Validation:** No in-house validation
- **Testing Protocol:** Practice varies from 1-4 days (6-8.5 hr per day); typically 6 4-min tests: trial duration 2 days - 3 weeks, 3-8 testing sessions per day; within-Ss design
- **Test Equipment:** Corvus Constellation II network supporting Apple IIe, Stand-alone Apple IIe (Basic software)
- **Theoretical Background:** Atheoretical
- **Relevant Publications:** None
- **Keywords:** *Decision making*
Environmental stressors
Focused attention
Workload

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- **Performance Measures:** Temperament in young children is measured for research and practical purpose. (children's mental health, Well Baby clinics, Daycare centers)
- **Normative Data Base:** No
- **Test Validation:** Validation by F.A. Swets-Gronert (1986)
- **Testing Protocol:** Not for testing. Assessment.
- **Test Equipment:** No information supplied.
- **Theoretical Background:** Temperament theory in psycho-pathological orientation. Temperament, in particular difficult temperament, has been hypothesized to be important in individual differences in personality, children's effects on adult socialization agents, and the early origins of childhood behavioral problems.
- **Relevant Publications:** *Temperament, taal competentie en gedragsproblemen van jonge Kinderen* (Swets-Gronert, F.A., Lisse: Swets & Zeitlinger 1986)
- **Keywords:** *Individual differences*

Taylor, B. (See Courtright, page 16)

Teipel, D.
 Psychologisches Institut
 Deutsche Sporthochschule (DSH) Köln
 Carl-Diem-Weg 41
 D-5000 Köln 41
 West Germany

Telephone: (49) 221 4982550

- **Performance Measures:** Apparative test battery of fine and gross coordinative abilities are used for the diagnosis of specific coordinative abilities. Twenty-four frequency and time related measures of performance include right- and left-handed conduct of 6 fine and 6 gross coordinative tests (steadiness, tapping, aiming, tracing, hand dexterity, pursuit rotor)
- **Normative Data Base:** The database consists of 300 male and 60 female students of physical education: 150 persons in 8 age groups (10 to 83 years). A Cyber 76 computer with SPSS software is used.
- **Test Validation:** Content-analytic validation (tasks steadiness, tracing in rifle shooters and fencers). Construct validity: performance differences between different age groups; correlation between tasks of test battery and tasks of body coordination test (KTK) in pupils from 10 to 15 years
- **Testing Protocol:** Conduct of the fine and gross coordinative test battery as a single test: specified sequence of the 24 tasks; one experimenter; data registered by specific computer
- **Test Equipment:** Fine motor tests: 1 compact test apparatus; gross motor tests: 6 single apparatusive tests; data registration by specific program on Commodore Pet (BASIC)
- **Theoretical Background:** Analysis of movement regulation on the basis of standardized tests; analysis of the structure of coordinative abilities; study of the cross-sectional development of coordinative abilities; sport-related application of the coordinative test battery
- **Relevant Publications:** Teipel, D. (1986) Diagnostik koordinativer Fähigkeiten. Eine Studie zur Struktur und querschnittlich betrachteten Entwicklung fein und grobmotorischer Leistungen. Köln: DSHS (Unverö Habilitationsschrift).

- **Keywords:** *Individual Differences*
Normative Performance Measures
Performance
Personnel Selection

Tenbrigs, H. (See Thomassen, page 102)

Theunissen, T. Telephone: (31)85-521111
 CITO Central Institute for Educational Measurement
 P.O. Box 1034
 6801 MG Arnhem
 The Netherlands

- **Performance Measures:** Test scores and achievement measurements are used to help design automated optimal tests.
- **Normative Data Base:** No information supplied
- **Test Validation:** No information supplied
- **Testing Protocol:** No information supplied
- **Test Equipment:** Victor V206, operations research programs
- **Theoretical Background:** Item response theory, operations research
- **Relevant Publications:**
 - Theunissen (1985). *Psychometrika*. 50. 411-420
 - Theunissen (1986). *Appl. Psych. Measures*. 10
- **Keywords:** *Individual differences*
Theoretical models

Thiessen, M.S. Telephone number not supplied
 General Dynamics
 P.O. Box 748, MZ 1700
 Fort Worth, TX 76101
 United States of America

- **Performance Measures:** Eye blinks are used to measure visual demands in cockpit environments. Event-related potentials are used to assess pilot attention allocation in cockpit environments. Heart rate and variability are also measured.
- **Normative Data Base:** No
- **Test Validation:** Yes- there has been a Neuropsychological Workload Test Battery validation study as well as academic studies.
- **Testing Protocol:** The measures are recorded during performance of a mission scenario in which workload is manipulated within and across missions. The use of secondary tasks (unless imbedded) is kept to a minimum.
- **Test Equipment:** DEC PDP Micro-11 and Flex 68020-based parallel processor.
- **Theoretical Background:**
 - Event related potentials - amplitude and latency of the P300 component are sensitive to workload manipulations.
 - Heart rate variability - The 0.1 Hz Mulder signal diminishes with increasing workload.
 - Eye blink measures - Blinks are inhibited during high visual task workload.
- **Relevant Publications:**
 - Neuropsychological Workload Test Battery Validation Study Final Report.
 - AAMRL Technical Report # (not yet assigned)

- **Keywords:** *Divided attention*
Focused attention
Mental resources
Physio performance measures
Workload

Thomassen, A.J.W.M.
Galen, G.P. van
Povel, D.J.
Tenbrigs, H.
Menlenbrock, R.
Plaats, R. van der
Hulstÿn, W.

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Catholic University Nÿmegen
Dept of Experimental Psychology
P.O. Box 9104
6500 HE Nÿmegen
The Netherlands

- **Performance Measures:** Reaction-and movement-time measurements as well as motion parameters (trajectory, velocity, acceleration) in fine and gross motor skill.
- **Normative Data Base:** Not yet
- **Test Validation:** Validation is generally lacking.
- **Testing Protocol:** Predominantly in theory testing settings rather than individual assessment. The latter occurs in applied educational and rehabilitation settings.
- **Test Equipment:** Selspot, Digitizing tablet, RT apparatus Vector General Display, and a PDP 11/45, which will be replaced by a VAX 780 and micros/ minis
- **Theoretical Background:** Testing the presence of stages in the organization of motor behavior and its disturbance and testing parallel models of continuous tasks, such as hand-writing.
- **Relevant Publications:** List available upon request
- **Keywords:** *Performance* *Theoretical models*
Selective attention
Task analysis
Task competition
Normative performance measures

Tisserand, M. (See Nebcit, page 76)

Toemmler, K. (See Erke, page 26)

Trost, G.

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Institute for Test Development and Talent Research
(Institut für Test- und Begabungsforschung)
Koblenzer Strasse 77
D-5300 Bonn 2
West Germany

- **Performance Measures:** General and special scholastic aptitude tests; intelligence tests; specific ability tests (e.g. spatial perception, concentration, memory); biographical questionnaires; interviews; leaderless group discussions
- **Normative Data Base:** TMS: standardization on each test term (N=20,000 to 40,000 applicants)
- **Test Validation:** Primarily studies of predictive validity, also of current validity and, increasingly, of construct validity

- **Testing Protocol:** Mainly paper-pencil tests in group sessions
- **Test Equipment:** SIEMENS 7760, optical mark reader IBM 1288, (optical mark reader KAISER 40 planned); SPSS, FORTRAN-IV programs
- **Theoretical Background:** Classical test theory
- **Relevant Publications:**
 - Fey, E. (1986): Die Rolle der Psychodiagnostik bei der Zulassung zum Studium der Human-, Tier- und Zahnmedizin. *Psychologie und Praxis*, 30, S.68-76.
 - Trost, G. (1982): The Role of Aptitude Tests in Counseling. In: Valisno, M.D. (Ed.): *Broadening Opportunities Through Assessment in Education*. International Association for Educational Assessment. Princeton, N.J. S. 171-193.
 - Trost, G. (1985): Pädagogische Diagnostik beim Hochschulzugang, dargestellt am Beispiel der Zulassung zu den medizinischen Studiengängen. In: Jäger, R.S., Horn, R. & Ingenkamp, K. (Eds.): *Tests und Trends 4. Jahrbuch der Pädagogischen Diagnostik*. Weinheim, Beltz. S. 41-81
- **Keywords:**
 - Individual differences* *Task analysis*
 - Mental resources*
 - Normative performance measures*
 - Performance*
 - Personnel selection*

Tsang, P. J (See Colle, page 15)

Tulen, J.H.M.
Moleman, P.
 Erasmus University Rotterdam
 Academic Hospital Dijkzigt
 Department of Psychiatry
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 3015 GD Rotterdam
 The Netherlands

Telephone: (31)10-639222

- **Performance Measures:** A video-version of the Stroop Color-Word test is used to investigate sympathoadrenal activity during stress.
- **Normative Data Base:** No information supplied.
- **Test Validation:** There is no validation of the Stroop Test in this form. This test is used as a mental stressor and has proven to be effective as a stimulator of sympathoadrenal activity.
- **Testing Protocol:** The video version of the Stroop Test presents one stimulus word per (+/-) 1.5 sec. The word is a color adjective (red, blue, green or yellow), randomly written in one of these colors. The subject's task is to ignore the word and indicate the color with which the adjective is written on an answer sheet. The color words are also presented in random order on the answer sheet. A 20 min. and 5 min. version of this test is being used.
- **Test Equipment:** Video-recorder plus monitor. Computer version in preparation.
- **Theoretical Background:** The Stroop Test is used as a mental stressor. The relationship of psychophysiological to biochemical parameters during anxiety and stress is studied.
- **Relevant Publications:**
 - Akerstedt, T., et al. (1983) Comparison of urinary and plasma catecholamine responses to mental stress. *Acta Physio. Scand.* 117: 19-26.
 - Hiemdal, P. et al. (1984) Differentiated sympathetic activation during mental stress evoked by the Stroop Test. *Acta Physio. Scand.* Suppl. 527: 25-29.
- **Keywords:**
 - Performance*
 - Physio. Perform. Meas.*
 - Stressor effects*

Uytendaele, B. (See Emmen, page 24)

Vaitl, D.

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641-7025415

Justus-Liebig-University of Giessen
Department of Psychology
Clinical Psychology
Otto-Behagel-Strasse 10
D-6300 Giessen
West Germany

- **Performance Measures:** The Interactive Concentration Task (ICT) has been developed for cardiovascular stress testing in laboratory settings.
 - **Normative Data Base:** Consists of 140 subjects
 - **Test Validation:** ICT is applied to provoke prolonged increases in cardiovascular parameters (heart rate, blood pressure, blood flow) in normals and patients. It is already implemented in cardio diagnostic procedures of some medical centers.
 - **Testing Protocol:** Items were taken from the "Konzentrations-Verlaufs-Test" (Abels, 1965) and slightly changed for the computer version. Each time (slides presented automatically on a screen) consists of 36 two-digit numbers presented in a matrix of 6 rows and 6 columns. Ss are asked to detect as fast and as accurately as possible combinations of numbers: 43 only, 63 only, 43 and 63, neither 43 nor 63. After a certain number of correct responses the computer will speed up presentation time of slides. A series of incorrect responses results in slowing down presentation time again. Thus, the computer is tracing presentation times of slides around the actual performance level of individuals. This task may be administered as long as needed by protocol (e.g. 1 hour).
 - **Test Equipment:** No information supplied
 - **Theoretical Background:** No information supplied
 - **Relevant Publications:** No publications supplied
 - **Keywords:** *Physio. Perform. Meas.
Workload*
-

Valk, J.P.J. de

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BAZIS, Central Development & Support Group
Hospital Information System
C/O Leiden University Hospital, Bldg. 50
Rijnsburgerweg 10
2333 AA Leiden
The Netherlands

- **Performance Measures:** Human perception measures for the assessment diagnostic quality of medical images
- **Normative Data Base:** We are building one up of 512 x 512 pixel CT slices of the upper abdomen at Leiden University Hospital on VAX and Phillips computers.
- **Test Validation:** ROC-analysis based upon well-known literature and software available from the Univ. of Chicago (Prof. Metz/Doi)
- **Testing Protocol:** ROC analysis-compatible questionnaires
- **Test Equipment:** VAX with VMS operating system and Fortran 77. IBM-PC with MS-DOS operating system & Fortran 77 will be used in the future.
- **Theoretical Background:** Receiver operating characteristics & signal detection theory / Human Visual perception (Green/Swets; Swets/Pickett lit. ref.

• **Relevant Publications:**

- Valk, J.P.J. de et al. (1981). Detectability index, likelihood ratio and diagnostic output as psychophysical measures for evaluation of medical image processing. *Medical & Biological Engineering & Computing*. Vol. 19. 5. p. 597-604
- Valk, J.P.J. de. & Eykman, E.G.J. (1984) Analysis of eye fixations during the diagnostic interpretation of chest radiographs. *Medical & Biological Engineering & Computing*. Vol. 22. 4. p. 353-360
- Valk, J.P.J. et al. (1985). Color representative of biomedical data. *Medical & Biological Engineering & Computing*. Vol. 23. 4. p. 343-351
- Heringa, A. et al. (1986) The display of body surface maps. In: *Electrocardiographic Body Surface Mapping*. Dam, R.Th. van & Oosterom, A. van (Eds.) Nijhoff, p. 171-175

• **Keywords:**

Decision making *Selective attention*
Focused attention *Task analysis*
Individual differences *Theoretical models*
Normative performance measures *Performance*
Perform. Meas. *Workload Physio.*

Veen, J. van der (See Hermans, page 48)

Veldman, J. (See Mulder, G., page 74)

Veldt, R. van der (See Goud, page 37)

Ven, A. van der (See Roskam, page 84)

Verbraak, A. (See Bogaard, page 8)

Veron, G.

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Hoffmann, J.J.

Centre D'Etudes et de Recherches Psychologiques
 Selection. Formation, Suivi Personnel
 AIR-BA 272
 78210 ST CYR L'ECOLE
 France

• **Performance Measures:**

Tests - paper and pencil, psychomotor interview - personality group motivation

• **Normative Data Base:**

Yes - 10000 people by 500 variables.

• **Test Validation:**

Yes - correlations regression and discriminant analysis

• **Testing Protocol:**

Step by step: premed. selection includes paper and pencil - psychomotor tests. Medical selection includes group - sport - interview

• **Test Equipment:**

paper-pencil, simulator, computer

• **Theoretical Background:**

Intelligence factors, personality, and stress

• **Relevant Publications:**

No publications supplied

• **Keywords:**

Decision making *Personnel selection*
Divided attention *Stressor effects*
Environmental stressors
Individual differences
Personality factors

Versprille, A. (See Bogaard, page 8)

Vidulich, M. (See Wilson, G.F., page 112)

Vossel, G. (See Frölich, page 32)

Vries, H. de
Hoh, G.J.

Telephone: (31)43-888372

State University Himburg
Dept. of Health Education
Dutch Smoking Prevention Project
POB 616
6200 MD Maastricht
The Netherlands

- **Performance Measures:** Questionnaires are used to assess attitudes, social influences, personal efficacy expectations, social pressures, demographic variables concerning adolescent smoking behavior, and carbon monoxide assessment to validate the self reports about smoking.
 - **Normative Data Base:** No information supplied
 - **Test Validation:** Questionnaires are based on the Fishbein & Ajzes model.
 - **Testing Protocol:** The study is a smoking prevention project and utilizes an experimental and control group.
 - **Test Equipment:** Carbon-monoxide tests
 - **Theoretical Background:** The study is an application of the Fishbein and Ajzes model, but also utilizes additional predictive factors. One of the goals is to develop a better predictive model.
 - **Relevant Publications:** -Vries, H. de and Hoh, G. J. (1986) From Determinants of Smoking Behavior to the implications for a prevention program. *Health Education Research*, 1986, 1, 85-94
 - **Keywords:** *Individual differences*
Theoretical models
-

Wales, T.A.

Telephone number not supplied

McDonnell Douglas Astronautics Company
Engineering Psychology Department
P.O. Box 516
St. Louis, MO 63166
United States of America

- **Performance Measures:** Task completion time and error rate
- **Normative Data Base:** No
- **Test Validation:** Scheduled for late 1987
- **Testing Protocol:** Experimental design in field - Assessment of Workstation requirements for shop floor computer terminals.
- **Test Equipment:** Computer workstations located on factory. Floor comparison of advanced windowing workstations. Proprietary computer & software
- **Theoretical Background:** Task analysis

• **Relevant Publications:** McDonnell Douglas Corp. reports

• **Keywords:** *Individual differences*
Performance
Workload

Walrath, L.C.
Curtin, J.

Telephone: (1) 314-234-8682

McDonnell Douglas Astronautics Co.
Human Performance Laboratory
MDAC STL P.O. Box 516
St. Louis, MO 63166
United States of America

- **Performance Measures:** Contrast sensitivity, visual acuity, and stereo acuity are used for evaluation of life support/protection gear, flight path quality and target and threat detection, are used for flight simulation, and reaction time & errors, eye-movement, and EEG are used for workload evaluation & for control/display research.
- **Normative Data Base:** Recognized norms are available for vision tests.
- **Test Validation:** Generally repeated usage. For research methods, part of the goal is to establish validity and reliability of the techniques.
- **Testing Protocol:** Standard experimental designs for laboratory research in information processing paradigms (e.g. visual search, stimulus comparison). Similar designs with part mission scenarios (typically ground attack phases) in fixed based simulator with 40 ft. projection dome, typically F-18 or F-15 aircraft parameters.
- **Test Equipment:** Nicolet CS 2000, MDC Flight Simulation Facility, APPLE and Data General ECLIPSE Computers. Most software is special purpose and developed in-house.
- **Theoretical Background:** Reserve capacity model, Model of attentional processes based on R. Carroll's developmental model of information processes.
- **Relevant Publications:**
 - Stern, J.A. & Walrath, L.C. (1982) Eye movement indices of alertness (Final Report AFSAM/VNE, Contract # F33615-78-D-0617). St. Louis: Washington University Behavior Research Laboratory, 1982
 - Stern, J.A., Walrath, L.C., & Goldstein, R. (1984) The endogenous eye-blink. *Psychophysiology*, 21, 22-33.
 - Goldstein, R., Walrath, L.C., Stern, J.A., & Strock, B.D. (1985) Blink activity in a discrimination task as a function of stimulus modality and schedule of presentation. *Psychophysiology*, 22, 629, 635.
 - Hancock, G.A., Walrath, L.C., & Backs, R.W. Effects of update rate, practice, and display characteristics in critical event detection with digital displays. Paper presented at the 22nd Annual Conference on Manual Control, Dayton, OH, July 1986.
- **Keywords:**

<i>Divided attention</i>	<i>Response competition</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Mental resources</i>	<i>Workload</i>
<i>Performance</i>	
<i>Physio. Perform. Meas.</i>	

Wertheim, A.H.

Telephone: (31) 34-631444

TNO Institute for Perception
Performance, Perception and Human Factors Research
P.O. Box 23
3769 ZG Soesterberg
The Netherlands

- **Performance Measures:** Eye, head, and body movements, visual search, perceptual threshold for motion.
- **Normative Data Base:** No

- **Test Validation:** Subjects are not tested; their performance is measured in a laboratory in applied settings.
- **Testing Protocol:** Psychophysical laboratory experiments.
- **Test Equipment:** PC's, special purpose projection systems, Special purpose CRT's, optokinetic drum, and eye and head movement registration apparatus.
- **Theoretical Background:** Neurophysiological and Cognitive models
- **Relevant Publications:** Wertheim, A.H. & Bles, W. (1984-8). A re-evaluation of cancellation theory: Visual, vestibular, and oculomotor contribution to perceived object motion.
- **Keywords:** *Divided Attention Selective attention*
Environmental stressors Theoretical models
Focused attention
Performance
Physio. Perform. Meas.

Wetherell, A.
 Human Factors Unit
 Chemical Defence Establishment
 Porton Down
 Wilts. SP4 0JQ
 United Kingdom

Telephone: (44) 980-610211 Ext 411

- **Performance Measures:** USAF CTS battery, numerical and verbal ability, pursuit tracking, simple and serial RT, vigilance, and memory tasks are used to assess drug effects.
- **Normative Data Base:** No
- **Test Validation:** Measures were subjected to factor analysis and found to be factorially valid
- **Testing Protocol:** Typically within-Ss design
- **Test Equipment:** Apple II, BBC, Commodore 64. An IBM PC will be acquired in 1988.
- **Theoretical Background:** Multiple resources, Additive factors, and Factor analysis
- **Relevant Publications:** Wetherell (1980), *Brit. J. Clin. Pharm.*
- **Keywords:** *Decision making*
Divided attention
Environmental stressors
Mental resources
Stressor effects

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 Twente University of Technology
 P.O. Box 217
 7500 AE, Enschede
 The Netherlands

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 (31)53-892932

- **Performance Measures:** Time on task, subjective ratings, posture, and scores on relevant variables are used to investigate trend prediction, color blindness, query languages, and user friendliness of information presentation.
- **Normative Data Base:** No information supplied
- **Test Validation:** Validation on own experimental norm. No norm explicitly available in literature.
- **Testing Protocol:** Written instruction, isolated experiments, data logging, statistical verification, and structured rating interviews.

- **Test Equipment:** Ramtech graphics systems. ASEA semigraphics system. Apple II experiment computers. and a DEC' main frame. Software is mostly Pascal
- **Theoretical Background:** Contribution to development of Human Factors guidelines not available in literature, using theories and paradigms used in psychological and technical field.
- **Relevant Publications:** -White T.N. and Schaih, P. van (1987) Factors Influencing the Detection of Trend Deviations on VDT's In: *Man-computer interaction*. Springer Verlag. Eds. van der Veer & Mulder
- **Keywords:** *Decision making*
Individual differences
Performance
Task analysis
Theoretical models

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 Pfendler, C.
 Forschungsinstitut für Anthropotechnik (FAT)
 Neuenahr Strasse 20
 D-5307 Wachtberg-Werthofen
 West Germany

- **Performance Measures:** Reaction time, eye movement analysis, vigilance performance, tracking, human-computer-interaction
- **Normative Data Base:** Files of raw-data are stored on VAX 11/780 and MacIntosh
- **Test Validation:** No information supplied
- **Testing Protocol:** Isolated experimental tasks (no tests)
- **Test Equipment:** No information supplied
- **Theoretical Background:** No information supplied
- **Relevant Publications:** -Widdel, H. (1983). A method of measuring the visual lobe area. In Groner & Menz, D.F. Fisher & R.A. Monty (Eds.): *Eye movements and psychological functions: International views* (pp.73-83). Hills/037 dale, N.J.: Lawrence Erlbaum.
 -Widdel, H. (1983). Ergonomische und kognitive Determinanten der Steuerung eines simulierten Unterwasserfahrzeuges. *Zeitschrift für Arbeitswissenschaft*, 37, 92-97.
 -Pfendler, C. & Widdel, H. (1986). Vigilance performance when using colour on electronic displays. *Perceptual and Motor Skills*, 63, 92-97.
 -Widdel, H. & Kaster, J. (1986). Transparency of a dialogue through pictorial presentation of dialogue structure. In H.P. Willumeit (Ed.), *Human decision making and manual control* (pp. 135-143). Amsterdam: North-Holland.
 -Widdel, H. & Kaster, J. (1987). Wirkungen visuell präsentierter Dialog-Strukturen auf die Interaktion ungeübter Benutzer mit dem Rechner. In W. Schönplüg & M. Wittstock (Hrsg.), *Softwareergonomie '87 Nützens Informationssysteme dem Benutzer?* (s.329-339). Stuttgart: Teubner
- **Keywords:** *Environmental stressors*
Workload

Wiedemann, J. (See Fadden, page 27)

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Psychologisches Institut
 Fachgebiet Klinische Psychologie
 Knollstrasse 15
 D-4500 Osnabrück
 West Germany

- **Performance Measures:** Measures of intellectual functioning; prediction and evaluation of treatment effects; indication and planning of treatments
- **Normative Data Base:** N=200; age 7-8; normative data base was established for one study only
- **Test Validation:** Learning efficiency; rehabilitation outcome
- **Testing Protocol:** Standard procedures according to manuals and dynamic procedures (special software)
- **Test Equipment:** Raven Matrices Test; in future more neuropsychological tests: IBM-PC
- **Theoretical Background:** Theory of dynamic testing (learning tests, learning potential test, trainability testing, compensatory testing, etc)
- **Relevant Publications:**
 - Wiedl, K.H. & Carlson, J.S. (1985). The dynamic testing approach: Theoretical concepts and practical applications. In G. d'Ydewalle (Ed.), *Proceedings of the 29th International Congress of Psychology, Vol. 3, Cognition, Information Processing and Motivation* (pp. 681-690).
 - Wiedl, K.H., Schöttke, H. & Gediga, G. (1987). Reserven geistiger Leistungsfähigkeit bei geriatrischen Psychiatriepatienten und bei Altenheimbewohnern: Eine Studie zur dynamischen Testdiagnostik. *Zeitschrift für Klinische Psychologie*, 16(1), 1-14.
- **Keywords:**
 - Individual Differences*
 - Mental Resource*
 - Performance*

Wientjes, C. (See Boer, page 7)

Wierwille, W. (See Snyder, page 95)

Wyers, A. (See Mulder, G., page 74)

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 Keemink, C.T.
 Erasmus University Rotterdam
 Dept. Biomedical Physics and Technology
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 3000 Dr. Rotterdam
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 (31)10-635077

- **Performance Measures:** Contrast sensitivity of the visual system and eye movements are used to obtain a measure for the quality of vision during daily life.
- **Normative Data Base:** An interface is being developed so that the data can be measured and analyzed by IBM-compatible computers (PCs). The IR-System is already based on a Olivetti PC.
- **Test Validation:** Correlating results with other clinical tests is currently being tried
- **Testing Protocol:** Sinusoidal gratings on a TV-screen. The contrast sensitivity function is obtained by threshold measurements and different spatial frequencies. IR reflection is used from the front of the eye (developed by the VU-A'dan)
- **Test Equipment:** Custom equipment for automatic measurement of the C.S.F. The IR eye movement measuring system is developed by the Free University A'dan.

• **Theoretical Background:**

Campbell F.W. (1982). "Why do we measure contrast? Some thoughts." *Percept Brain Res.* 10, 87-97.

• **Relevant Publications:**

-Wildt, G.J. van der, Keemink C.J. and Brink G. van den. (1976). Gradient detection and contrast transfer by the human eye. *Vision Res.* 16, 1047-1053.
 -Ryśdyk, J.P., Kroon, J.N. and Wildt, G.J. van der. (1980). Contrast sensitivity as a function of position on the retina. *Vision Res.* 20, 235-241
 -Wildt, G.J. van der and Waarts, R.G. (1983). Contrast Detection and its dependence on the presence of edges and lines in the stimulus field. *Vision Res.*, 23, 821-830.
 -Wildt, G.J. van der (1984) Interchangeability of space and time in perception. In: *Limits in Perception*, van Doorn et al. (eds.), VNU Science Press 1984; 139-172.
 -Wildt, G.J. van der, Flipse J.P., Rodenburg M., and Keemink C.J. (1986). The effect of relative motion on the contrast sensitivity. In: *Eye Movements: from Physiology to Cognition*, 156-157. (Edited by: O'Regan J.K., Levy-Schoen A., Elsevier North Holland, Amsterdam).

• **Keywords:**

Performance

Willeges, R. (See Snyder, page 95)

Williams, K.N. (see Biferno, page 6)

Willigers, F.

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Droog, A.

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 Adviesbureau voor Personeel en Organisatievraagstukken
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 3512 BS Utrecht
 The Netherlands

• **Performance Measures:**

All kinds of intelligence measures (verbal, arithmetic, technical, spatial, reasoning, etc) and work samples are used for selection purposes. Measures of time-sharing performance are used for selection of pilots.

• **Normative Data Base:**

Collected data serves as normative data base, as well as the norms of the test publisher. The computer data base is on a Cyber computer, using SPSS and personal computer software.

• **Test Validation:**

All tests have been validated against the appropriate criteria: e.g., validation of time-sharing tasks against performance on flight-simulator and during actual flying.

• **Testing Protocol:**

Paper, pencil, and computer

• **Test Equipment:**

Precise Coordination Multiple Package, Kuratorium für Verkehrssicherheit, Vienna Continuous Memory Task and Taskomat battery (IZF.TNO, Soesterberg). Planning more computerized testing.

• **Theoretical Background:**

All relevant literature.

• **Relevant Publications:**

No publications supplied.

• **Keywords:**

<i>Decision making</i>	<i>Personality factors</i>
<i>Divided attention</i>	<i>Personnel selection</i>
<i>Focused attention</i>	<i>Selective attention</i>
<i>Individual differences</i>	<i>Task analysis</i>
<i>Mental resources</i>	<i>Workload</i>

Wilson, F. (See Long, page 65)

Wilson, G.F.
 Pearson, W.H.
 Reid, G.B.
 Vidulich, M.
 Fracker, M.L.

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AAMRL/HEG
 WPAFB, Oh. 45433-6573
 United States of America

- **Performance Measures:** Reaction times, error scores, accuracy, workload and performance assessment, evoked potentials, heart rate analysis, eye blinks, and subjective measures
- **Normative Data Base:** Yes- Criterion Task Set (CTS) studies at University of Oklahoma with approximately 250-300 subjects. The CTS runs on Commodore 65 and 128 using BASIC, and will also run on IBM PC's and clones.
- **Test Validation:** Physiological and subjective measures have been validated in simulators and aircraft flight.
- **Testing Protocol:** No information supplied
- **Test Equipment:** Performance measures (CTS) are run on a Commodore, which will be replaced with an IBM compatible. Physiological measures are taken with a Neuropsychological Workload Test Battery (NWTB) and a PDP 11/73 computer system, which will be updated in two years.
- **Theoretical Background:** Wickens Multiple Resource Model- Wickens, C.D., (1981). Processing Resources in Attention, Dual-Task Performance, and Workload Assessment. Technical Report EPL-81-3, Engineering Psych. Res. Laboratory, University of Delaware.
- **Relevant Publications:**
 - Shingledecker, C. (1984) A task battery for applied human performance assessment research. USAF Technical Report, AFAMRL-TR-84-071
 - Acton, W.H. and Crabtree, M.S. (1985) User's guide for the Criterion Task Set. USAF Technical Report AAMRL-TR-85-0341
 - Wilson, G.F. and O'Donnell, R.D. (in press) Physiological measures of mental workload. In:Hancock, P. and Meshkati (Eds.) *Human Mental Workload*, Amsterdam, The Netherlands, Elsevier
- **Keywords:**
 - Mental resources*
 - Normative performance measures*
 - Performance*
 - Physio. Perform. Meas.*
 - Workload*

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- **Performance Measures:** Verbal intelligence, memory, attention, visual neglect, visuo-spatial orientation & organization, perseveration, personality, and a small number of non-automated standard tests are used to assess adults with severe physical disabilities.
- **Normative Data Base:** No
- **Test Validation:** Standard tests: automated form validated against a standard
 New tests: validated against other behavioral aspects under investigation (repeated measures design with counterbalancing).
- **Testing Protocol:** Instruction/practice session of few minutes' duration; test duration 10-90 minutes; design depends upon whether subjects or the tests are under scrutiny
- **Test Equipment:** BBC, purpose-built response media, synthetic speech, and internally developed software

Theoretical Background:*Cognitive neuropsychology***• Relevant Publications:**

-Wilson, et al. (1982) *Int. Journal of Man-Machine Studies*
 -Wylie, et al. (1984) *Medical Engineering and Technology*
 -Wilson (1987) *Applied Psych. Ann. Int. Rev.*

• Keywords:

Decision Making
Individual Differences
Personality Factors

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• Performance Measures:

The Audiogram and Speech-Audiogram are used for hearing tests.

• Normative Data Base:

No information supplied.

• Test Validation:

No information supplied.

• Testing Protocol:

No information supplied.

• Test Equipment:

No information supplied.

• Theoretical Background:

No information supplied.

• Relevant Publications:

No publications supplied.

• Keywords:*Performance***Wittersheim, G.**

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• Performance Measures:

Free and ordered recall, reaction time for initiating and typing key responses, and detection rates are used to assess effects of environmental factors. These measures are mainly dual-task performance assessment combining a component of short-term memory for words or digits, and a component of elementary decisions on detected signal features.

• Normative Data Base:

No

• Test Validation:

These tests have not yet been validated on a group-psychometric basis. Only same separate task features have been evaluated (e.g. Posner, Sternberg).

• Testing Protocol:

Individual administration during exposure to environmental physical factors for sessions lasting at least one hour. Generally independent group of subjects with repeated measurements are used.

• Test Equipment:

Test procedures are mainly computerized. personal computers are linked to a main computer for extended data handling. In the future, compatible microcomputers will be more extensively used. Software is currently under development for specific tasks.

- **Theoretical Background:** The mental processes (mainly memory, attention, detection, and decision) are thought to be involved in a wide range of everyday life activities performed while people are exposed to either comfortable or adverse environmental factors (especially thermal and acoustical).
- **Relevant Publications:** Best list of relevant publications may be available in Bitter, A.C. et al (1986) Performance evaluation tests for environmental research (PETER): Evaluation of 114 measures. *Percept & Mot. Skill*, 63, 683, 708
- **Keywords:** *Divided attention*
Environmental stressors
Mental resources
Performance
Task competition

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- **Performance Measures:** Individual protocols of task performance are used for measuring metacognitive performance.
- **Normative Data Base:** Not yet
- **Test Validation:** Yes- Correlations between the metacognitive tests and between the metacognitive tests and IQ.
- **Testing Protocol:** Individual protocols of task performance
- **Test Equipment:** Simple material-like strips, token, tower figures, etc.
- **Theoretical Background:** A combination of activity theory and information processing theory.
- **Relevant Publications:** No publications supplied.
- **Keywords:** *Focused attention*
Performance

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 Maesen de Sombreff, P.E.A.M. van der
 Meltzer, P.H.
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 The Netherlands

- **Performance Measures:** Psychological tests and questionnaires, work samples, and specific assignments of mixed oral-written character
- **Normative Data Base:** Yes - applicants for vacancies in Dutch government make up various categories of 100-3000 subjects each. Burroughs 5900 & Phillips P3800 with lazervision video equipment are used with Cat Benelux software - RPD
- **Test Validation:** Yes, statistical and factor analysis
- **Testing Protocol:** Paper and pencil, videonetwork (CAT), and oral testing
- **Test Equipment:** Paper, pencils, optical markreader & computer equipment for scoring, videonetwork system, Phillips hardware, Turbodos operating system, E-active system language
- **Theoretical Background:** Multiple factor theories of intelligence, aptitude, and personality
- **Relevant Publications:** No publications supplied

• Keywords:

Individual differences
Normative performance measures
Personality factors
Personnel selection
Task analysis

Zielinski, W. (see Amelang, page 2)

Zomerén, A. van (See Brouwer, page 11)

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