

P r o g r a m m e

ASI "Human Performance Theory", Trieste July 20-31

July 20

- 9.00 Opening
9.10 - 10.00 Single channel theory I (dr. Welford)
10.10 - 11.00 Single channel theory II (dr. Welford)
11.00 - 11.30 Coffee
11.30 - 12.20 Discussion in language groups
12.30 - 13.20 Reaction processes I (dr. Rabbitt)
17.00 - 17.50 Research paper (dr Sanders):
 Response preparation and single channel processing
18.00 - 18.50 Discussion in language groups

N.B. 16.00 - 17.00 Payment of grants

July 21

- 9.00 - 9.50 Reaction processes II (dr Rabbitt)
10.00 - 10.50 Reaction processes III (dr. Rabbitt)
10.50 - 11.20 Coffee
11.20 - 12.10 Single channel theory III (dr. Welford)
12.20 - 13.10 Discussion in language groups

Free afternoon

July 22

- 9.00 - 9.50 Single channel theory IV (dr. Welford)
10.00 - 10.50 Selective attention I (dr. Moray)
10.50 - 11.20 Coffee
11.20 - 12.10 Discussion in language groups
12.20 - 13.10 Selective attention II (dr. Moray)
17.00 - 17.50 Research paper (dr. Welford)
18.00 - 18.50 Discussion in language groups

July 23

- 9.00 - 9.50 Selective attention III (dr Moray)
10.00 - 10.50 Selective attention IV (dr. Moray)
10.50 - 11.20 Coffee
11.20 - 12.10 Discussion in language groups
12.20 - 13.10 Reaction processes IV (dr Rabbitt)

17.00 - 17.50 Research paper dr. Moray:
The psychophysics of attention
18.00 - 18.50 Discussion in language groups

July 24

- 9.00 - 9.50 Acquisition of skill I (dr Adams)
10.00 - 10.50 Acquisition of skill II (dr Adams)
10.50 - 11.20 Coffee
11.20 - 12.10 Discussion in language groups
12.20 - 13.10 Short term memory I (dr Sanders)

17.00 - 17.50 Research paper dr. Rabbitt
18.00 - 18.50 Discussion in language groups

July 25

- 9.00 - 9.50 Acquisition of skill III (dr. Adams)
10.00 - 10.50 Acquisition of skill IV (dr. Adams)
10.50 - 11.20 Coffee
11.20 - 12.10 Short term memory II (dr. Sanders)
12.20 - 13.10 Discussion in language groups

Free afternoon

July 26

No lectures

July 27

- 9.00 - 9.50 Short term memory III (dr Sanders)
10.00 - 10.50 Short term memory IV (dr Sanders)
10.50 - 11.20 Coffee
11.20 - 12.10 Discussion in language groups
12.20 - 13.10 Internal representations I (dr Michon)

July 27

- 17.00 - 17.50 Research paper dr. Adams:
On the closed loop theory of verbal learning and memory
- 18.00 - 18.50 Discussion in language groups

July 28

- 9.00 - 9.50 Internal representations II (dr Michon)
- 10.00 - 10.50 Internal representations III (dr. Michon)
- 10.50 - 11.20 Coffee
- 11.20 - 12.10 Visual search I (dr. Mackworth)
- 12.20 - 13.10 Discussion in language groups

Free afternoon

July 29

- 9.00 - 9.50 Vigilance I (dr. Haider)
- 10.00 - 10.50 Visual search II (dr. Mackworth)
- 10.50 - 11.20 Coffee
- 11.20 - 12.10 Discussion in language groups
- 12.20 - 13.10 Internal representations IV (dr Michon)
- 17.00 - 17.50 Research paper: dr Michon
- 18.00 - 18.50 Discussion in language groups

July 30

- 9.00 - 9.50 Vigilance II (dr Haider)
- 10.00 - 10.50 Vigilance III (dr Haider)
- 10.50 - 11.20 Coffee
- 11.20 - 12.10 Discussion in language groups
- 12.20 - 13.10 Visual search III (dr Mackworth)
- 17.00 - 17.50 Visual search IV (dr Mackworth)
- 18.00 - 18.50 Discussion in language groups

July 31

- 9.00 - 9.50 Research paper dr Mackworth
- 10.00 - 10.50 Vigilance IV (dr Haider)
- 10.50 - 11.20 Coffee
- 11.20 - 12.10 Research paper dr Haider
Neuropsychological studies on sensory-motor interactions
- 12.20 - 13.10 Discussion in language groups
- 13.15 - 13.25 Closing session

Free afternoon

A.F. SANDERS

Short term memory lecture 1

Broadbent, D.E. (1957), A mechanical model for human attention and immediate memory.
Psychol.rev. 64, 205-15

Norman, D. (1968), Towards a theory of memory and attention.
Psychol.rev. 65, 522-36

Blankenship, A.B. (1938), Memory span: A review of the literature.
Psychol.bull. 35, 1-25

Sanders, A.F., and J.W. van Borselen (1966), Continuing memory and information processing.
J.exp.psychol. 71, 844-48

Sperling, G. (1960), The information available in brief visual presentations.
Psychol. monograph, 74

Hebb, D.O. (1949), The organisation of behavior.
New York, Wiley

Wickelgren, W.A. (1969), Coding, retrieval and dynamics of multitrace associative memory.
Paper read at the Symposium on cognition, Carnegie University

Underwood, B.J. (1957), Interference and forgetting.
Psychol.rev. 64, 49-59

Postman, L. (1963), Does interference theory predicts too much forgetting?
J.verb.learn.verb.behav. 2, 40-48

Tulving, E., and Madigano (1970), Memory and verbal learning.
Annual rev.psychol. 21, 437-84

Atkinson, R.C., and R.M. Shiffrin (1969), Storage and retrieval processes in long term memory.
Psychol.rev. 76, 179-93

Tulving, E. (1968), Theoretical issues in free recall.
In: Dixon, T.R., and D.L. Horton (eds.), Verbal behavior and general behavior theory. London, Prentice-Hall

Lecture 2

Brown, J. (1958), Some tests of the decay theory of immediate memory.
Quart.j.exp.psychol. 10, 12-31

Peterson, L.R., and M.J. Peterson (1959), Short-term retention of individual verbal items.
J.exp.psychol. 58, 193-98

Broadbent, D.E. (1958), Perception and communication.
New York, Pergamon

- Melton, A.W. (1963), Implications of short term memory for a general theory of memory.
J.verb.learn.verb.behav. 2, 1-21
- Keppel, G., and B.J. Underwood (1962), Proactive inhibition in short term retention of single items.
J.verb.learn.verb.behav. 1, 153-61
- Wickens, D.D., et al (1963), Proactive inhibition and item similarity in short term memory.
J.verb.learn.verb.behav. 2, 440-45
- Loess, H. (1967), Short term memory, word class and sequence of items.
J.exp.psychol. 74, 556-61
- Wickens, D.D. (1970), Encoding categories of words: An empirical approach to meaning.
Psychol.rev. 77, 1-15
- Peterson, L.R., and A. Gentile (1965), Proactive interference as a function of time between tests.
J.exp.psychol. 70, 473-78
- Loess, H., and N. Waugh (1967), Short term memory and intertrial interval.
J.verb.learn.verb.behav. 6, 455-60
- Scott, K.G., et al (1967), A functional differentiation of STM and LTM.
Psychonom.sci. 7, 143-144
- Turvey, M.T., and J.F. Egan (1970), Release of proactive inhibition in STM as a function of change in visual and phonemic structure and retention interval.
Percept.psychophys. 7, 169-72
- Hebb, D.O. (1961), Distinctive features of learning in the higher animal.
In: J.F. Delafresraye (ed.), Brain mechanisms and learning. Oxford Univ.press, 37-46
- Sanders, A.F. (1961), Rehearsal and recall in immediate memory.
Ergonomics 4, 29-35
- Kothurkar, V.K. (1968), Effects of similarity of interpolated materials on short term recall.
Quart.j.exp.psychol. 20, 405-08
- Broadbent, D.E. (1963), Flow of information within the organism.
J.verb.learn.verb.behav. 2, 34-39
- Posner, M.I., and A.F. Konick (1966), On the role of interference in short term memory.
J.exp.psychol. 72, 221-31
- Waugh, N., and D.A. Norman (1965), Primary memory.
Psychol.rev. 72, 89-104
- Glanzer, M., and A.R. Cunitz (1966), Two storage mechanisms in free recall.
J.verb.learn.verb.behav. 5, 351-60
- Murdock, B.B. (1963), Short term retention of single paired associates.
J.exp.psychol. 65, 433-43

- Baddeley, A.D. (1970), Estimating the short term component in free recall.
Brit.j.psychol. 61, 13-15
- Norman, D.A. (1966), Acquisition and retention in short term memory.
J.exp.psychol. 72, 369-81
- Tulving, E., and Z. Pearlstone, Availability versus accessibility of
information in memory for words.
J.verb.learn.verb.behav. 5, 381-91
- Norman, D.A., and N.C. Waugh (1968), Stimulus and response interference in
recognition memory experiments.
J.exp.psychol. 78, 551-59
- Shephard, R.N., and M. Teghtsoonian (1961), Retention of information under
conditions approaching a steady state.
J.exp.psychol. 62, 302-09
- Freund et al (1969), Recognition versus recall: Storage or retrieval differences?
Quart.j.exp.psychol. 21, 214-224
- Tulving, E. (1969), When is recall higher than recognition?
Psychon.sci. 10, 53-55

Lecture 3

- Murdock, B.B. (1968), Serial order effects in short term memory.
J.exp.psychol., 76, Monogr. 2
- Kassum, D.A. (1967)
Quoted in: A.T. Welford, Fundamentals of skill.
London, Methuen
- Michon, J.H. (1964), Temporal structure of letter groups and span of perception.
Quart.j.exp.psychol. 16, 232-40
- Ryan, J. (1969), Grouping and short term memory: different means and patterns
of grouping.
Quart.j.exp.psychol. 21, 137-47
- Ryan, J. (1969), Temporal grouping, rehearsal and short term memory.
Quart.j.exp.psychol. 21, 148-55
- Wickelgren, W.A. (1965), Short term memory for repeated and non-repeated items.
Quart.j.exp.psychol. 17, 14-25
- Sanders, A.F., and J.J.F. Schroots (1969), Cognitive categories and memory span.
III. The effect of similarity on recall.
Quart.j.exp.psychol. 21, 21-28
- Dale, H.C.A. (1967), Response availability and STM.
Psychon.sci. 6, 47-48
- Sanders, A.F. (1968), Short term memory for spatial positions.
Ned.t.psychol. 16, 1-15

- Tulving, E. (1962), Subjective organisation in free recall of "unrelated" words. Psychol.rev. 69, 344-54
- Katz, L. (1968), The limited capacity hypothesis: Effects of sequence length and instructions in free recall. J.verb.learn.verb.behav. 7, 577-583
- Crossman, E.R.F.W. (1961), Information and serial order in human immediate memory. In: C. Cherry (ed.), Information theory. London, Butterworth
- Baddeley, A.D. (1968), Delay and the digit probe. Psychonom.sci. 12, 147-48
- Crowder, R.G., and J. Morton, Precategorical acoustic storage (PAS). Percept.psychophys. 5, 365-73
- Waugh, N.C. (1969), The effects of recency and repetition on recall latencies. Acta psychol. 30, 115-26
- Sanders, A.F., and J.J.F. Schroots (1968), Cognitive categories and memory span. II. The effect of temporal vs categorical recall. Quart.j.exp.psychol. 20, 373-79
- Cohen, R.L. (1970), Primary memory and associative interference. Brit.j.psychol. 61, 171-77
- Murdock, B.B. (1963), Short term retention of paired associates. J.exp.psychol. 69, 237-40
- Murdock, B.B. (1964), P.I. in short-term memory. J.exp.psychol. 68, 184-89
- Murdock, B.B. (1965), A test of the "limited capacity" hypothesis. J.exp.psychol. 69, 237-40
- Crowder, R.G. (1968), The relation between interpolated task performance and P.I. in short term retention. J.verb.learn.verb.behav. 7, 577-83

Lecture 4

- Conrad, R., and A.J. Hull (1964), Information, acoustic confusion and memory span. Brit.j.psychol. 55, 429-43
- Wickelgren, W.A. (1966), Phonemic similarity and interference in short term memory for single letters. J.exp.psychol. 71, 396-404
- Baddeley, A.D. (1966), Short term memory for word sequences as a function of acoustic, semantic and formal similarity. Quart.j.exp.psychol. 18, 362-65
- Bruce, D., and B.B. Murdock (1968), Acoustic similarity effects on memory for paired associates. J.verb.learn.verb.behav. 7, 627-31
- Conrad, R., and A.J. Hull (1966), Rate of presentation and the acoustic similarity effect. Psychonom.sci. 5, 233-34

- Laughery, K.R., and A.L. Pinkus (1966), STM: effects of acoustic similarity, presentation rate and presentation mode. *Psychonom.sci.* 6, 285-86
- Adams, J.A., H.I. Thorsheim and J.S. McIntyre, Item length, acoustic similarity and natural language mediation as variables in STM. *J.exp.psychol.* 80, 39-46
- Baddeley, A.D., and H.C.A. Dale (1966), The effect of semantic similarity on retroactive interference in long and short term memory. *J.verb.learn.verb.behav.* 5, 417-20
- Gruneberg, M., and R.N. Sykes (1969), Acoustic confusion in long term memory. *Acta psychol.* 31, 293-96
- Baddeley, A.D. (1968), How does acoustic similarity influence short term memory? *Quart.j.exp.psychol.* 20, 249-64
- Conrad, R. (1967), Interference or decay over short term retention intervals. *J.verb.learn.verb.behav.* 6, 49-54
- Sperling, G. (1960), The information available in brief visual presentation. *Psychol. monogr.*, 74
- Mackworth, J.F. (1963), The relation between the visual image and post-perceptual immediate memory. *J.verb.learn.verb.behav.* 2, 75-85
- Mackworth, J.F. (1962), The effect of display time upon the recall of digits. *Canad.j.psychol.* 16, 49-55
- Von Wright, J.M. (1970), On selection in visual immediate memory. *Acta psychol.* 33, 280-93
- Morton, J. (1970), The role of memory in the attention process. *Acta psychol.* 33, 271-79
- Murray, D.J. (1966), Vocalisation at presentation and immediate recall with varying recall-methods. *Quart.j.exp.psychol.* 18, 9-18
- Murray, D.J. (1967), The role of speech responses in short term memory. *Canad.j.psychol.* 21, 263-76
- Conrad, R., and A. Hull (1968), Input modality and the serial position curve in STM. *Psychonom.sci.* 10, 135-36
- Corballis, M.C. (1966), Rehearsal and decay in immediate recall of visually and auditory presented items. *Can.j.psychol.* 20, 43-51
- Cooley, R.K., and J.A. McNulty (1967), Recall of individual CCC trigrams over short intervals of time as a function of mode of presentation. *Psychonom.sci.* 9, 543-44
- Murdock, B.B. (1967), Auditory and visual stores in short term memory. *Acta psychol.* 27, 316-25
- Murdock, B.B., and K.D. Walker (1969), Modality effects in free recall. *J.verb.learn.verb.behav.* 8, 665-77
- Murdock, B.B. (1967), The effect of noise and delayed auditory feedback on short term memory. *J.verb.learn.verb.behav.* 6, 737-43

- Basic Texts. (1) Broadbent, D., Perception & Communication. Pergamon, 1958.
 (2) Moray, M. Attention: Selective Processes in Vision and Hearing. Hutchinson. 1970.

OTHER MATERIAL

- (3) Bekey, G. Neal, C.B. Identification of sampling intervals in sampled-data models of human operators. IEEE Trans. on Man-Machine systems. MMS-9 (4) 138-143. 1968.
- (4) Cherry, C. Some experiments on listening to speech with one and with two ears. J. acoust. Soc.Amer., 25, 975-79, 1953.
- (5) Cherry, C. & Taylor, W. Some further experiments on listening to speech with one and with two ears. J. acoust.Soc.Amer. 26, 554-59., 1954.
- (6) Deutsch, J. & Deutsch, D. Attention: some theoretical considerations : Psychol. Rev. 70, 80-90, 1963.
- (7) Egan, J., Carterette, E., & Thwing, E. Some factors affecting multichannel listening. J. acoust. Soc.Amer. 26, 774-82, 1954.
- (8) Grindley, G., & Townsend, V. Voluntary attention in peripheral vision and its effects on acuity and differential thresholds. Quart. J. exp. Psychol. 20, 11-20, 1968.
- (9) Huggins, A.W. Distortion of the temporal pattern of speech: interruption and alternation. J. acoust. Soc.Amer. 36, 1055-64. 1967.
- (10) Kinchla, R. An attention operating characteristic. Attention and Performance III. 1970 (in Press).
- (11) Kristofferson, A. Attention and psychological time, Attention & Performance I, 93-101, 1967. North-Holland.
- (12) Levelt, W. Note on the distribution of dominance times in binocular rivalry. Brit. J.Psychol. 58. 143-47, 1967.
- (13) Lindsay, P. & Norman, D. Short-term retention during a simultaneous detection task. Perception & Psychophysics, 5 (4), 201-205, 1969.
- (14) Moray, N. Introductory experiments in auditory time-sharing: effect of stimulus duration. J. acoust.Soc. Amer. 1970 (in press)
- (15) Moray, N. Attention in dichotic listening: affective cues and the influence of instructions. Quart. J. Exp.Psychol. 9, 56-60, 1959.
- (16) Moray, N., Bates, A., & Barnett, T. Experiments on the 4-eared man. J.acoust. Soc.Amer. 38, 196-201. 1965.
- (17) Moray, N. & Jordon, A. Practice and compatibility in two channel short-term memory. Psychon. Sci. 4(12), 427, 1966.
- (18) Moray, N. & Reid, A. Two channel immediate memory span. Psychon.Sci. 8, (6), 249-50, 1967.
- (19) Moray, N. & O'Brien, T. Signal detection theory applied to selective listening. J.acoust.Soc.Amer. 42, 765-72, 1967.
- (20) Mowbray, G. Perception and retention of verbal material presented during auditory shadowing. J.acoust.Soc.Amer. 36, 1459-65. 1964. 6

- (21) Norman, D. Memory while shadowing, *Quart. J. Exp. Psychol.*, 21, 85-94, 1969.
- (22) Norman D. Attention and Memory, Wiley. 1969.
- (23) Poulton, E.C. Two channel listening. *J. Exp. Psychol.* 46, 91-96, 1953.
- (24) Shaffer, H. & Hardwyck, J. Monitoring simultaneous auditory messages. *Percept. & Psychophys.* 6 (6B). 401-404, 1969.
- (25) Shannon, C. & Weaver, W. The mathematical theory of communication. Univ. of Illinois Press. 1949.
- (26) Spieth, W. Curtis, J., & Webater, J. Responding to one of two simultaneous messages. *J. acoust. Soc. Amer.* 26, 391-96, 1954.
- (27) Sanders, A. The selective process in the functional visual field. ~~1967~~. Inst. for Percept. RVO-TNO. Netherlands, 1963.
- (28) Senders, J. On the distribution of attention in a dynamic environment. *Attention & Speech* (ed. Sanders) North Holland 349-55. 1967. (*Acta Psychol.* vol.27).
- (29) Treisman, A. Verbal cues, language, and meaning in selective attention. *Am. J. Psychol.* 77, 206-219, 1964.
- (30) Treisman, A. The effect of irrelevant material on the efficiency of selective listening. *Am. J. Psychol.* 77, 533-46, 1964.
- (31) Treisman, A. Selective attention in men. *Brit. Med. Bull.* 29, 12-16, 1964.
- (32) Treisman A. Strategies and models of selective attention. *Psychol. Rev.* 76, 282-299, 1969.
- (33) Treisman A. & Geffen, G. Selective attention: perception or response? *Quart. J. exp. Psychol.* 19, 1-18, 1967.
- (34) Treisman A. Contextual cues in selective listening. *Quart. J. exp. Psychol.* 12, 242-48, 1960.
- (35) Taylor, MM. & Lindsay, P. & Forbes, S. Quantification of shared capacity processing in auditory and visual discrimination. *Attention & Performance I*, 223-233. North Holland. 1967.
- (36) Trabasso, T. & Bower, G. Learning & Attention. Wiley. 1969.
- (37) Young, L. On adaptive manual control. *Ergonomics.* 12, 635-647. 1969.

Please take notice

- = Welcome to Trieste! We hope you have a pleasant and fruitful stay.
- = You are kindly requested to inform immediately Dr. Sanders, Information desk Milano Hotel about your arrival.
- = Tonight, Sunday July 19 at 20.00 hours, a "get to know eachother" party is held at the Restaurant "Da Otello" Via Carducci 12. Drinks and a cold buffet will be served free of charge for participants and their company.
- = Included in the information is a list of participants and Hotels where they stay. One of the important aims of a meeting like this, is to enable as much mutual exchange of contact and views between people of various countries. Please, contact eachother and promote the mutual discussion as much as possible.
- = Tomorrow, July 20, the programme will start at 9.00 hours sharp. Place: Main University building, ground-floor Aula M. Please be in time.

The organising committee

Prof. L. Houssiadas

Prof. F. Metelli

Dr. A.F. Sanders

Lecturers and Organising Committee

		<u>Hotel</u>
J.A. Adams	USA	Jolly
M. Haider	Austria	Regina
L. Houssiadas	Greece	Priests
N.H. Mackworth	USA	Jolly
F. Metelli	Italy	
J.A. Michon	the Netherlands	Milano
N. Moray	United Kingdom	Regina
P.M.A. Rabbitt	United Kingdom	Regina
A.F. Sanders	the Netherlands	Milano
A.T. Welford	Australia	Jolly

ParticipantsBelgium

J. Alegria	Jolly
K. David	Parenzo
J.R.C. Gaussin	Parenzo
Mrs. M. Radeau	Milano
Mrs. F. Tisseyre	Milano
P.C. Vervinckt	Priests

Greece

D. Fatouros	Posta
Miss I. Gordou	nuns
D. Natsopoulos	Priests
I. Paraskevopoulos	Priests
Miss E. Syncollitou	nuns
V. Vakalis	Milano

France

Mrs. A.E.L. Besrest	nuns
Mrs. M.M. Granjon	nuns
Mrs. F.J.J. Macar	nuns
G. Reynard	Obelisco

Italy

A. Beretta	Priests
P. Boscolo	Priests
P. Bozzi, Via delle Pulsatilla,	Opicina
L. Burigana	Priests
Miss D. Capozza	nuns
L. De Jorio	Priests
P. Legrenzi	*
Mrs. M. Legrenzi	*
R. Luccio	Priests
L. Meschieri	
Miss R. De Negri	nuns
M.L. Morra Pellegrino	nuns
* c/o P. Bozzi	

Germany

A. Albert	Priests
K. Kaiser	Corso
G.L. Neumann	Milano
Mrs. H. Radl-Koethe	Regina
A. Rasche	Priests
F. Rösler	Priests
V. Sarris	Corso
E. Scheerer	Milano

Miss S. Rossi	nuns	<u>United Kingdom</u>	
G. Di Stefano	Parenzo	M.F. Allnut	Jolly
Mrs. V. Di Stefano-D'Urso	Parenzo	A. Baker	Priests
G. Vicario		J.M. Bamford	Abbazia
		G.D. Cumming	Parenzo
<u>the Netherlands</u>		I.R.L. Davies	Corso
A.A. Bunt	Priests	K. Ellis	Jolly
H. van Hoogdaem	Corso	M.J. Fitter	Jolly
P.J.G. Keuss	Priests	M.M. Gruneberg	Parenzo
J. Moraal	Jolly	D.J. Guest	Milano
G. Mulder	Jolly	N.W.J. Harvey	Priests
A.M. Oostlander	Stella	G.J. Hitch	Priests
C. Opmeer	Priests	N.W.A. Marsh	Parenzo
C.L. Truijens	Milano	S.A. Monsell	Priests
A.M. Verschoor	Camping	T. O'Brien	Peru
A. Wiegiersma	Peru	Miss I.R. Roth	Priests
P.C.N. van Wieringen	Abbazia	Miss E. Saraga	Priests
		R.B. Stammers	Priests
<u>Turkey</u>		H.T. Smith	Priests
Miss F. Arda	nuns	R.N. Sykes	Peru
A. Arik	Parenzo	Miss C.E. Williams	Priests
Mrs. A. Arik	Parenzo	A.J. Marcel	Priests
N. Ayvalioglou	Priests	<u>U.S.A.</u>	
Miss O. Oktem	nuns	L.O. Harvey	Corso
Miss M. Ormanli	nuns	R.A. Schmidt	Parenzo
A. Turan	Priests		

Priests: Seminario Vescovile - Via Besenghi, 14

Nuns: Collegio della Beata Vergine - Via di Scercole, 7