Neuropsychology of the 20th and 21st Century

How North America, Spain, and Russia have led us astray in the development of neuropsychology

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- Presented on October 17, 1999 at the VI Congress of the Society for Latin American Neuropsychology at Varadero, Cuba

Overall Presentation

- Background
- Assumptions
- Russian Neuropsychology
- Spanish Neuropsychology
- North American Neuropsychology
- Common Variables
- Common Outcomes

Overall Presentation (continued)

- Proposal for a Universal Neuropsychology
- Case Studies
- Why Here?
- Why Now?
- Summary, Directions, Conclusions, & Questions

I. Background

- Intended Goals
- Anticipated Limitations
- Context
  - Decade of the brain
  - Beginning of the new century
  - My own training,, experiences, and interests

II. Assumptions

- Defining the Discipline
- General History
- Anticipated Trajectory

Assumptions: defining the discipline

- Defining by history
- Defining by purpose
- Defining by method & practice
- Defining by economics

III. Russian Neuropsychology

- General History
- Qualitative Approaches
- Quantitative Approaches

Russian neuropsychology: history

- Sechenov
- Pavlov
- Vygotsky
- Luria
- Bechterev

Russian neuropsychology: Luria's theory

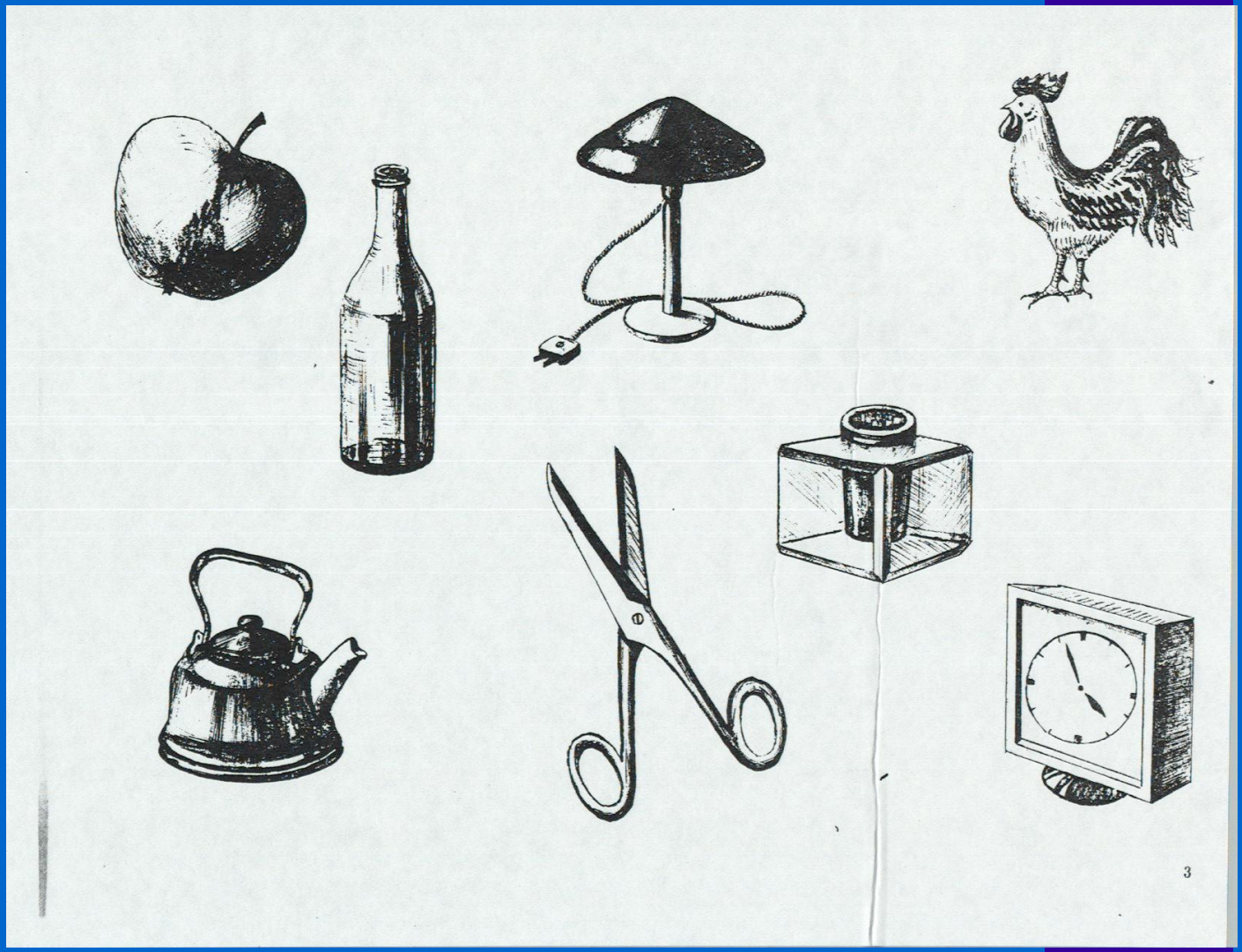
- Origins in cultural-historical context
- Systemic & dynamic localization of higher cortical functions
- Three (3) functional brain systems
- Syndrome analysis
- Romantic science

Russian neuropsychology: Luria's tests

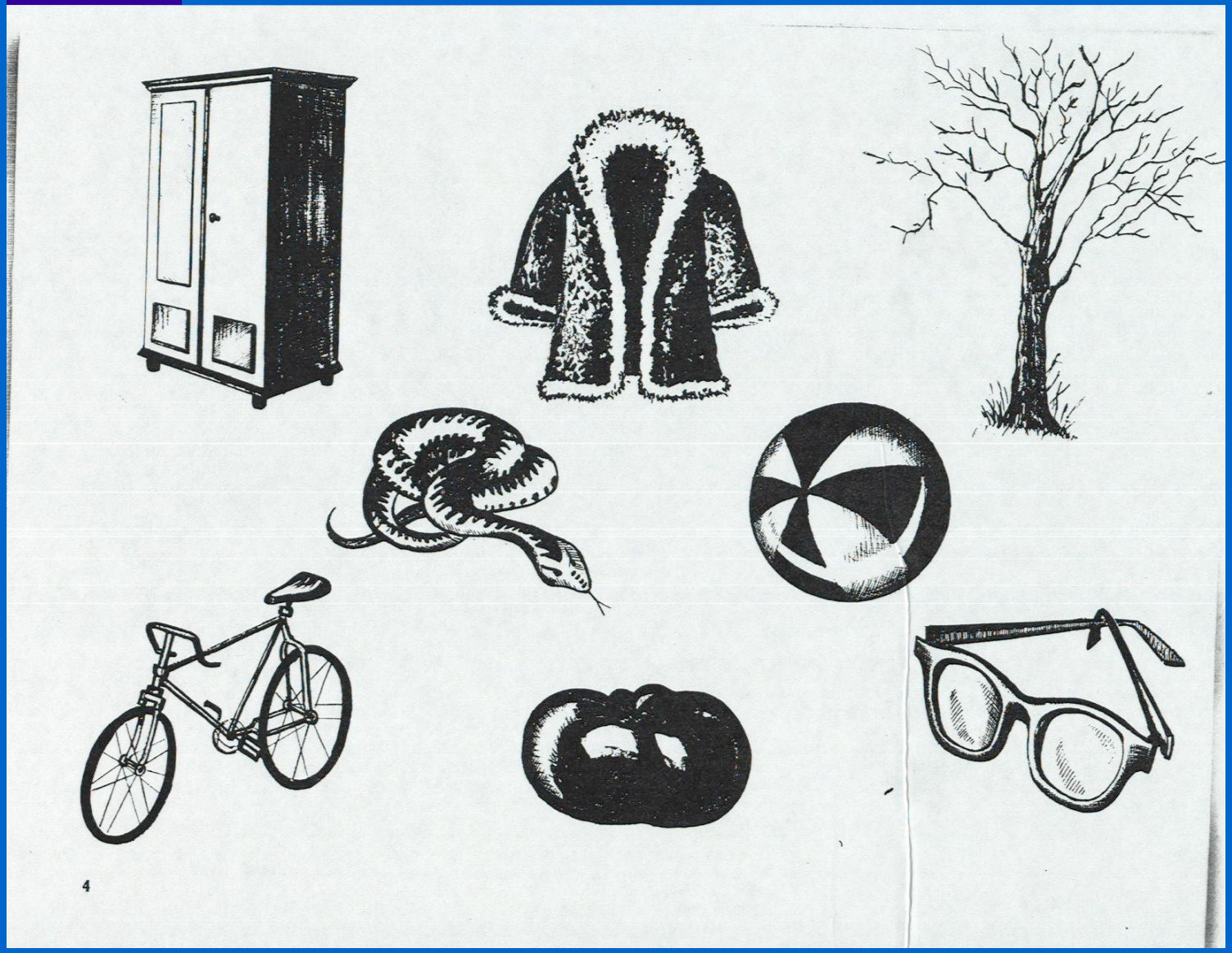
- Primarily qualitative
- Flexible and individual
- Samples of Luria's tests

EVALUATION OF VISUAL PERCEPTION /GNOSIS

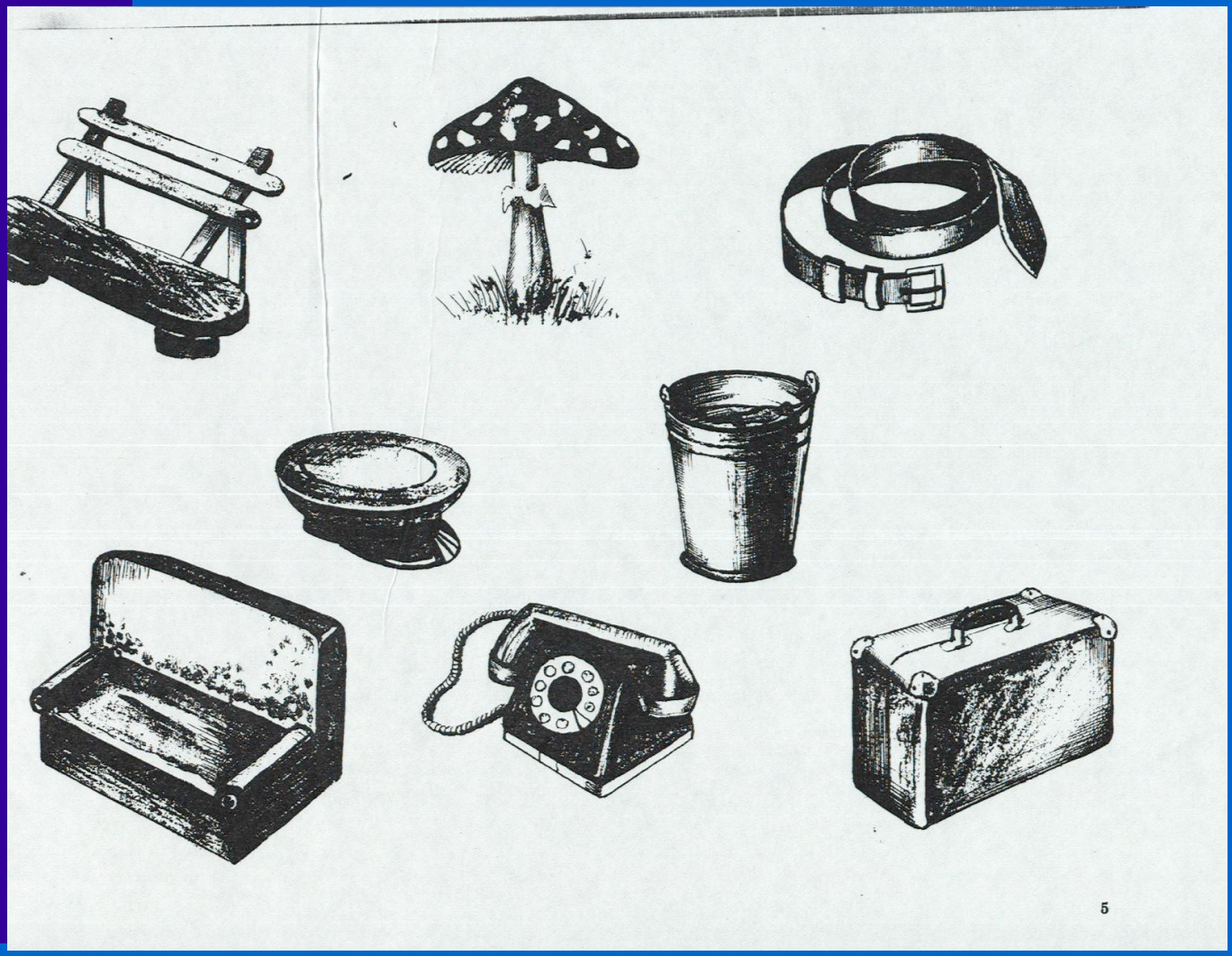
Recognition of real objects



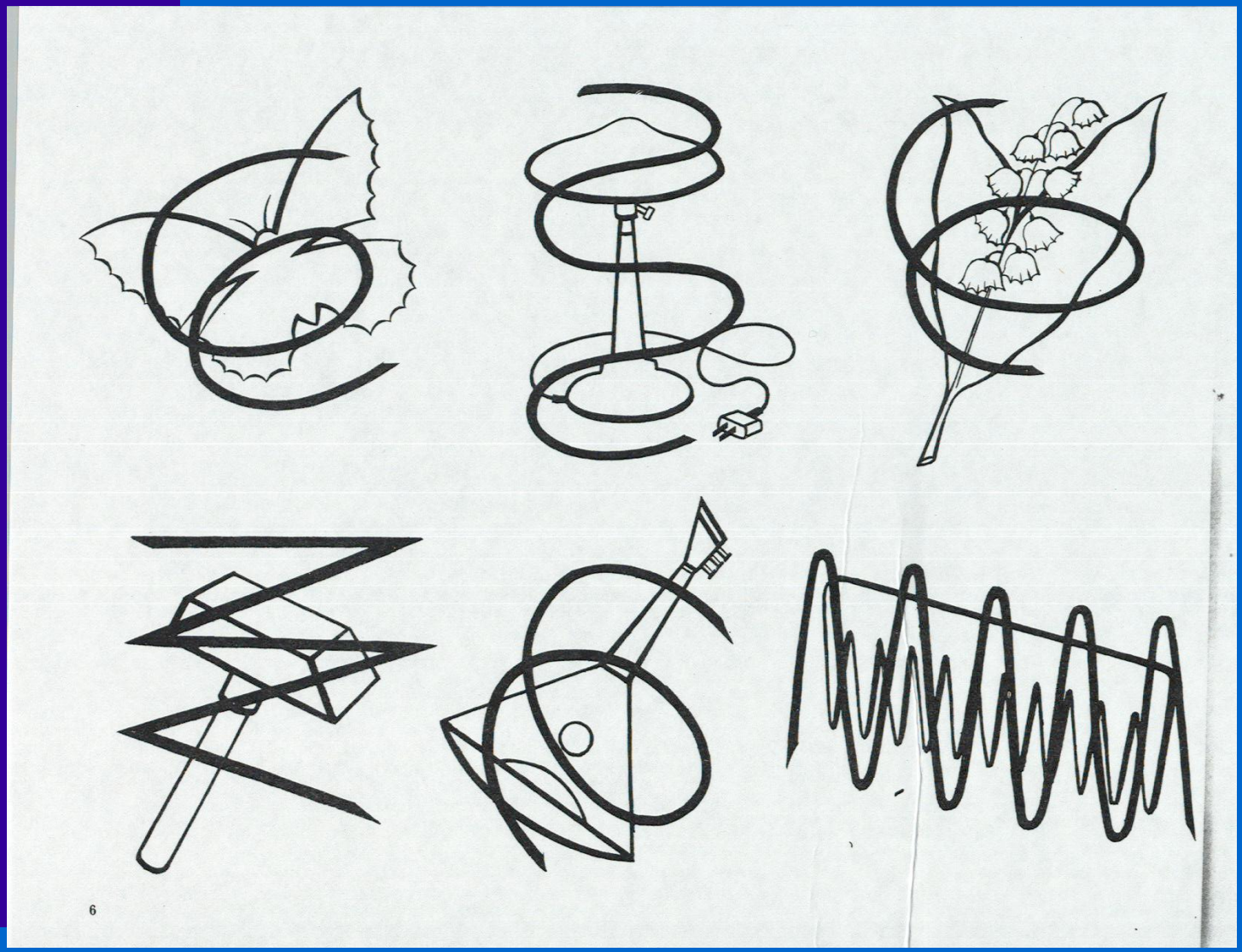
Recognition of realistic images



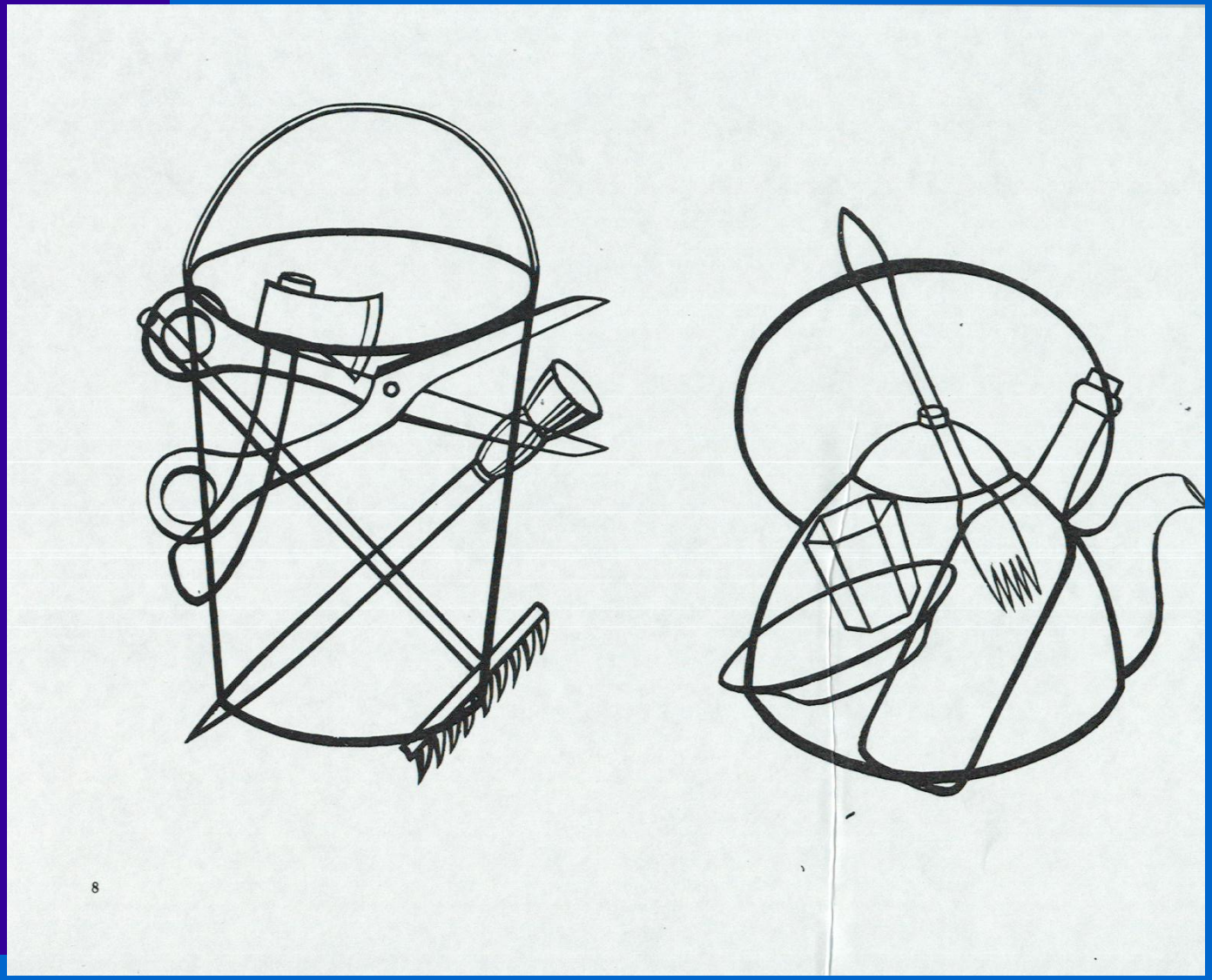
Recognition of realistic images



Recognition of superimposed images

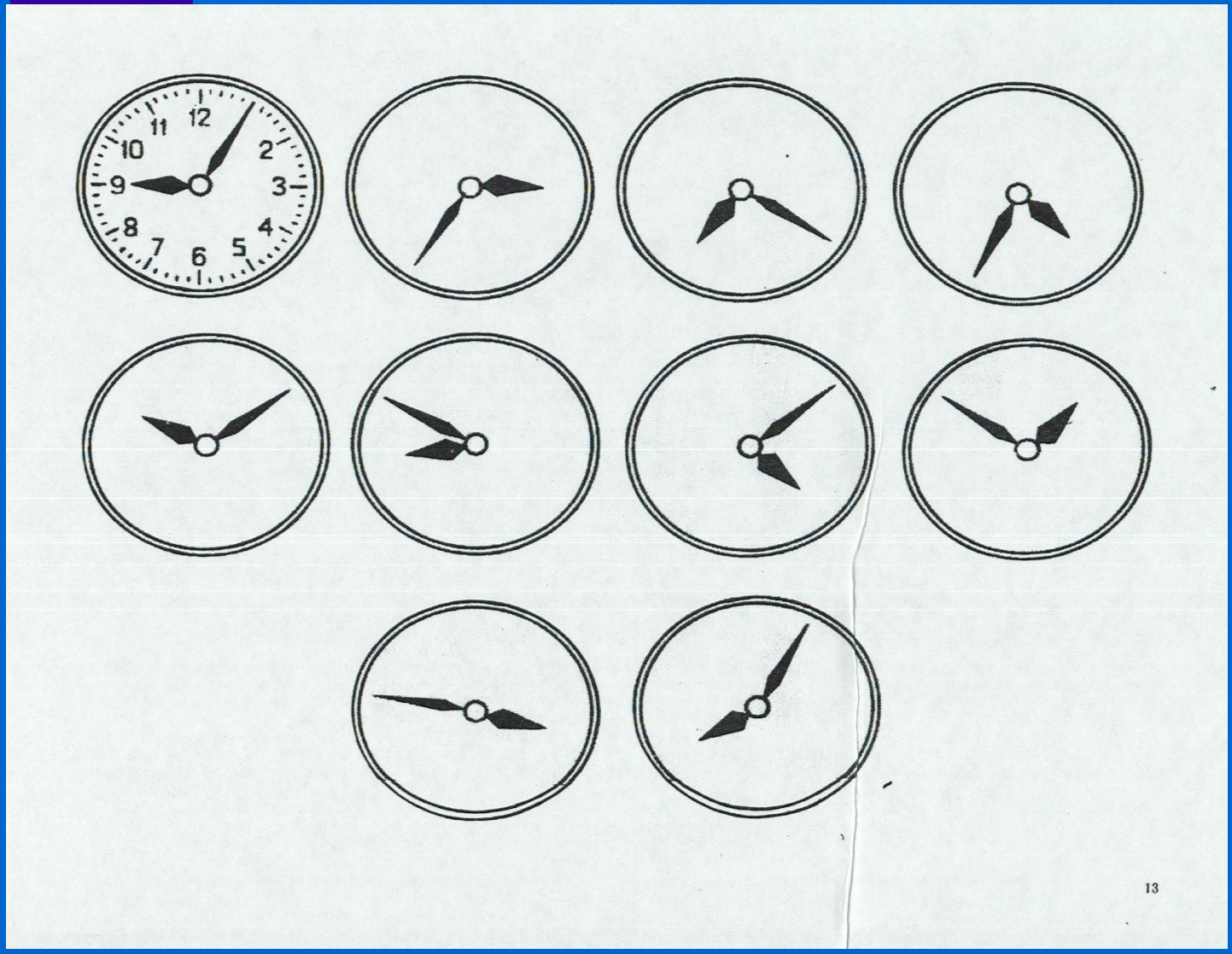


Recognition of Poppelreuter's figures



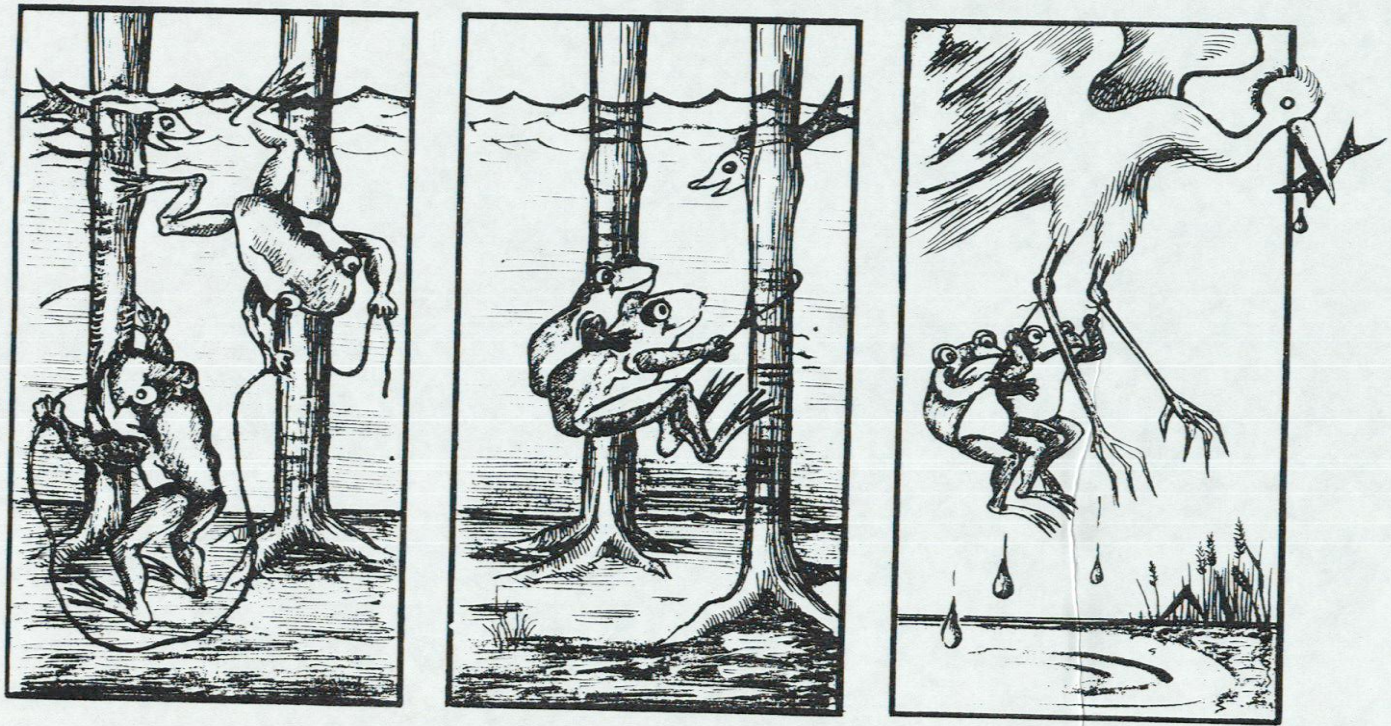
Optic-spatial perception / gnosis

Reading time from a watch & schematic watch



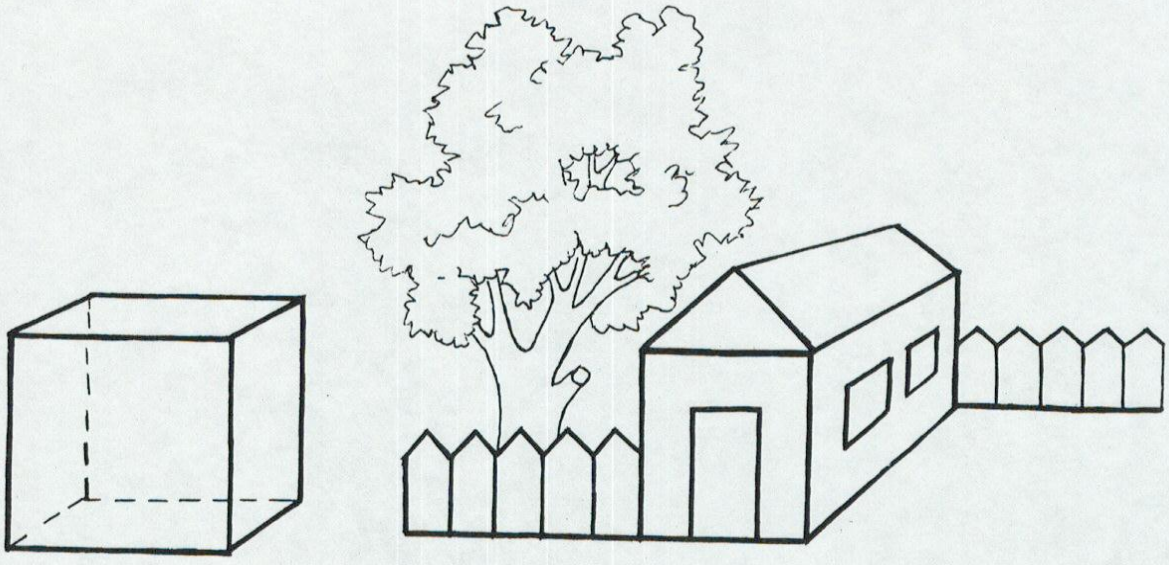
EVALUATION OF INTELLECTUAL PROCESSES AND SPONTANEOUS SPEECH:

a story told from a series of pictures

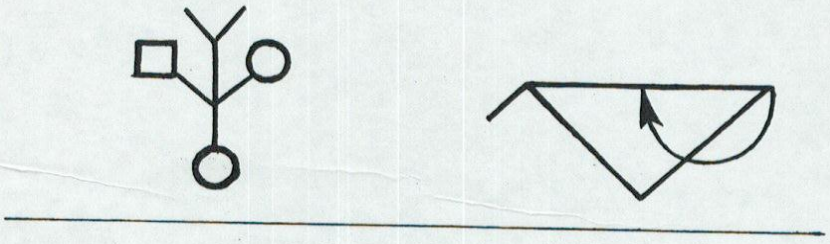


CONSTRUCTIONAL PRAXIS :

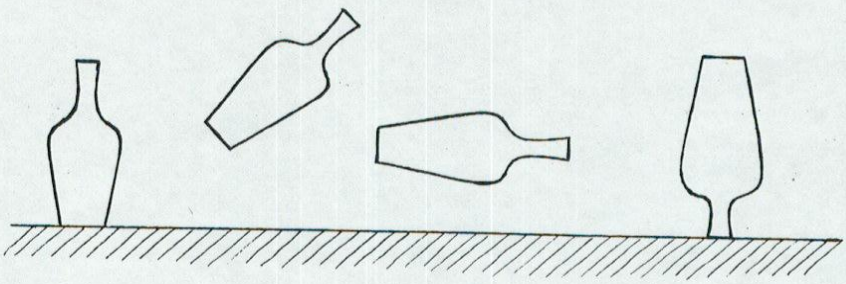
copying, drawing



turning over

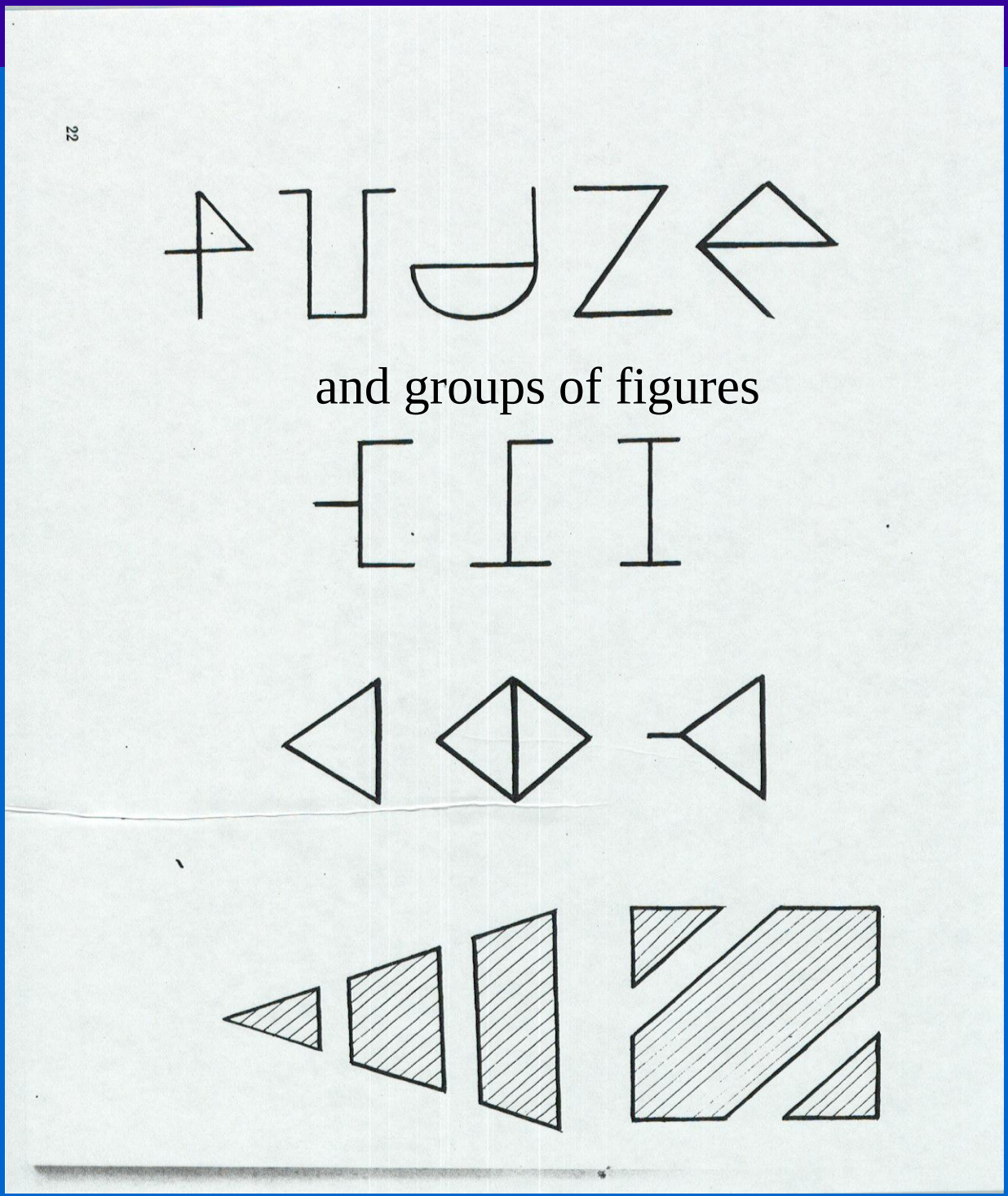


Test “A Bottle”



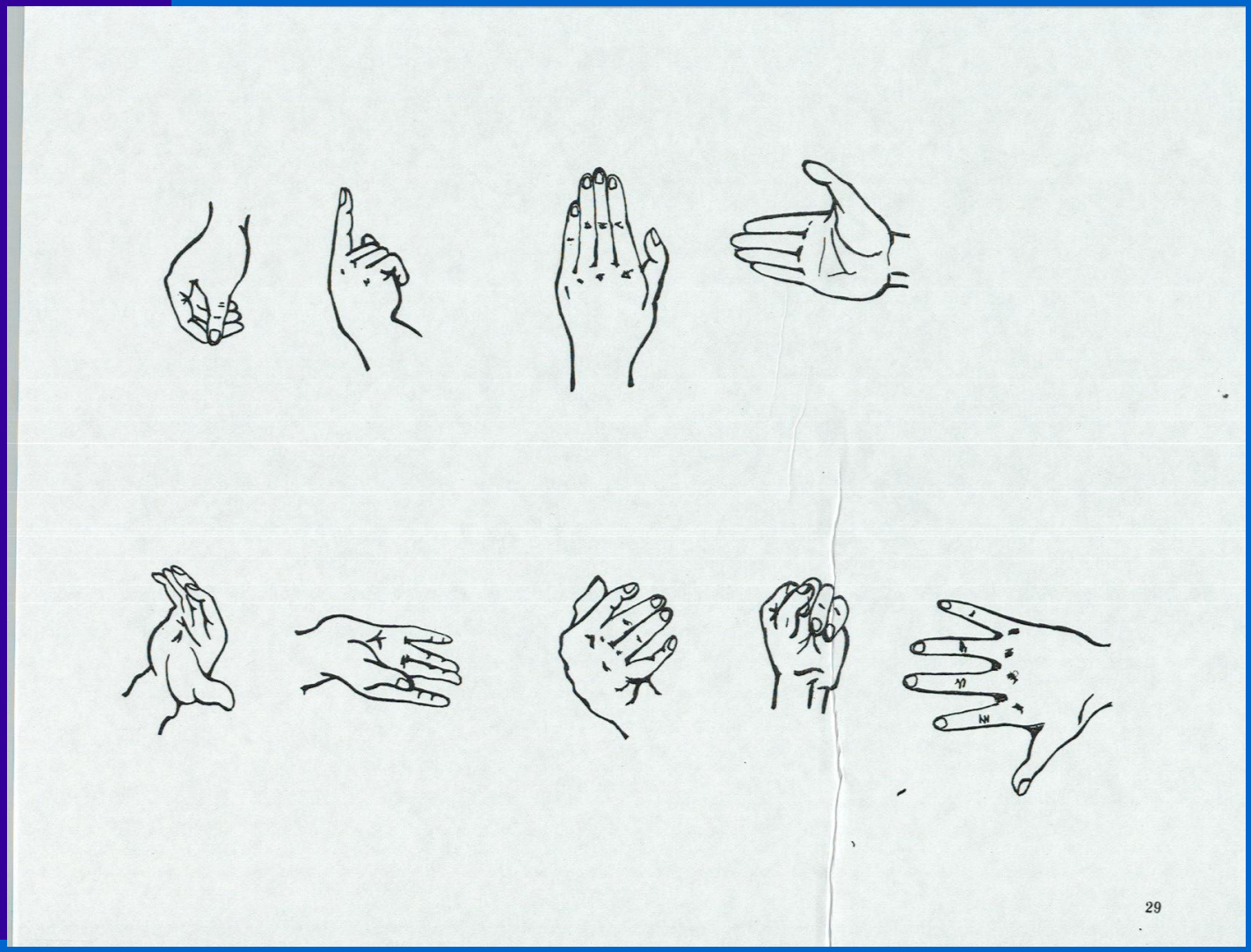
EVALUATION OF VISUAL MEMORY:

memorization of series of figures



and groups of figures

Left / right hand discrimination



EVALUATION OF THE SYSTEM OF COMPUTATION

1 2 3 4 6 7 8 9 17 71 1504 12007

VI V IV VII X XI IX 103 1402 017

2+3=

8-4=

9+5=

41-17=

63-27=

12+6-2=

34+17-9=

26+18-31=

10 2=8

10 2=20

10 2=12

10 2=5

Performance on simple computational operations

6	9	2	8	7	14	1	9	6	2	28
8	9	5	2	5	3	5	3	2	7	7
48	1	10	4	35	11	5	3	4	14	4

8	24	20	35	2	5	6	8	1	18	7
9	6	9	5	8	9	15	2	3	2	1
17	4	11	7	10	45	21	16	4	9	8

1	14	4	9	14	20	9	20	7	1	4
6	9	8	4	3	2	1	7	11	8	9
6	5	12	13	11	10	8	13	18	8	36

3	19	8	5	13	20	15	21	5	18	12
13	5	7	2	6	5	4	7	4	9	3
16	14	15	7	7	4	11	3	1	2	15

7	14	24	7	5	7	9	3	15	11	9
5	6	3	2	3	9	3	3	2	9	8
2	8	8	9	8	16	27	6	13	2	17

EVALUATION OF INTELLECTUAL PROCESSES

Selection of analogies

АНАЛОГИИ

ложка	вилка
каша	масло, нож, тарелка, мясо, посуда
лошадь	корова
жеребенок	пастбище, рога, молоко, теленок, бык
ухо	зубы
слышать	видеть, лечить, рот, щетка, жевать
нож	стол
сталь	вилка, дерево, стул, пища, скатерть
волк	птица
пасть	воздух, клюв, соловей, яйцо, пение
дождь	мороз
зонтик	палка, холод, сани, зима, шуба
яйцо	картофель
скорлупа	курица, огород, капуста, суп, шелуха
яблоня	капуста
сад	картошка, огород, цветы, кочан, борщ
хлеб	дерево
нож	вилка, пень, пила, лес, кора
собака	птица
лай	рычание, клюв, соловей, яйцо, пенис

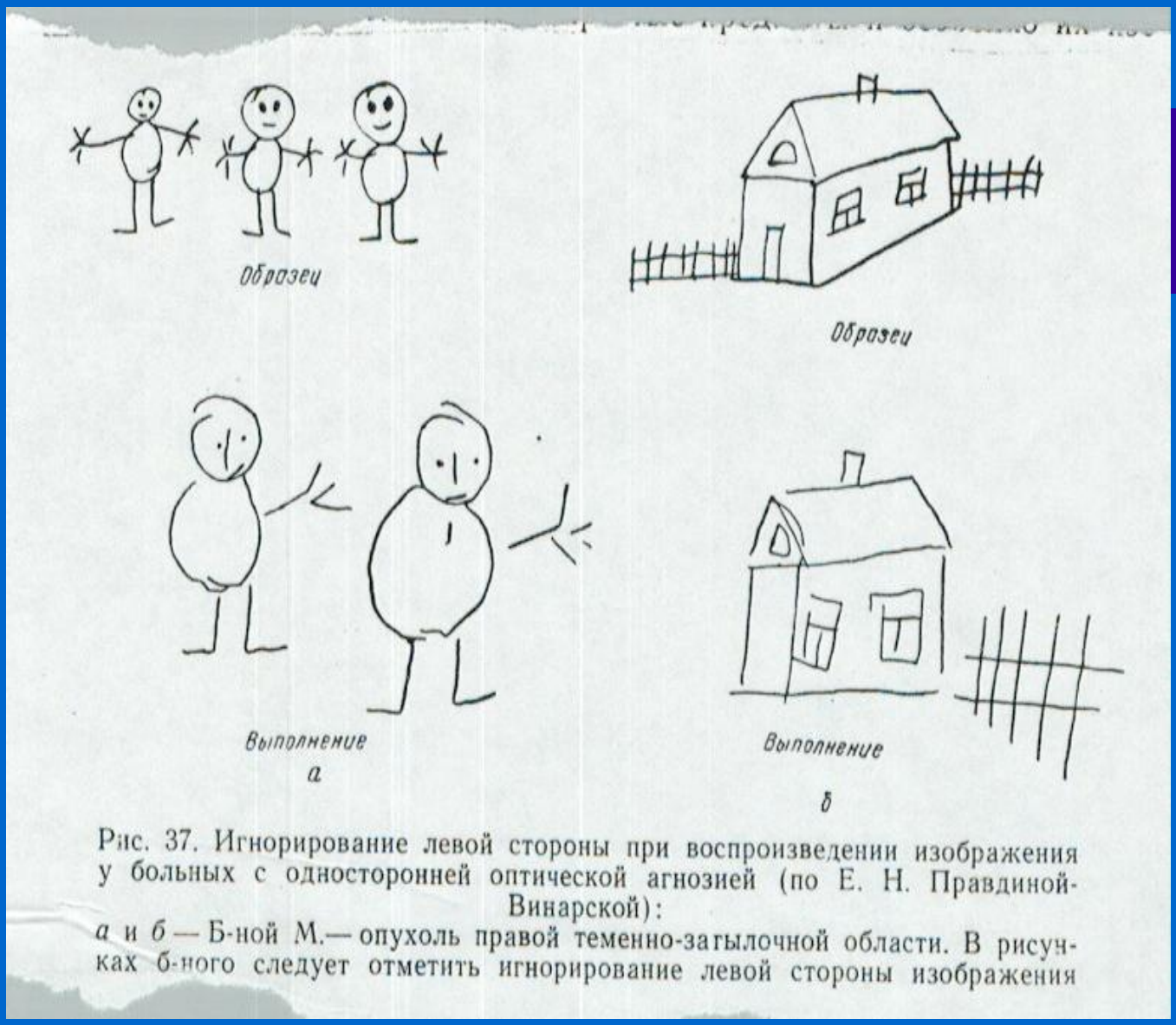
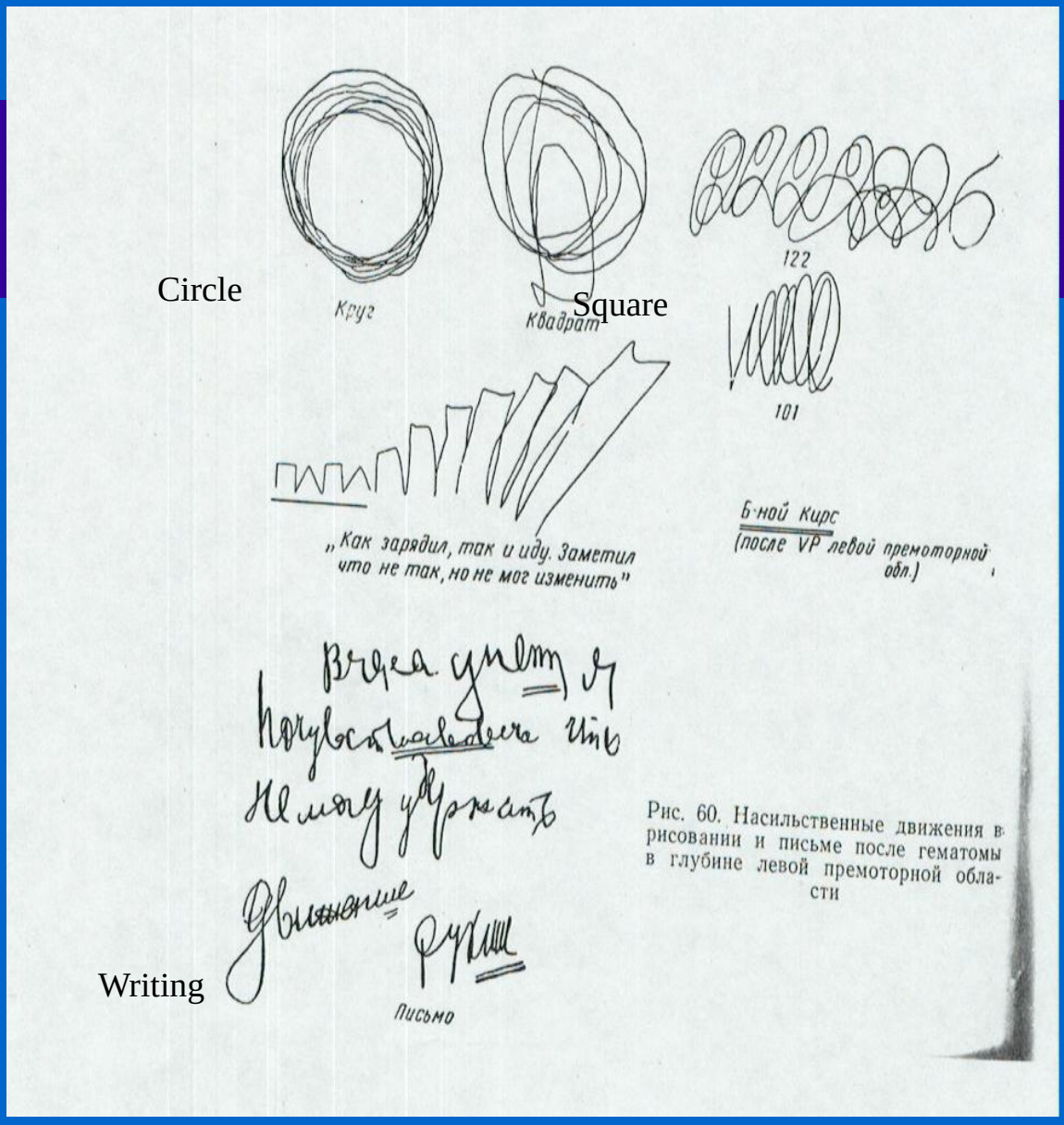


Рис. 37. Игнорирование левой стороны при воспроизведении изображения у больных с односторонней оптической агнозией (по Е. Н. Правдиной-Винарской):
а и *б* — Б-ной М.— опухоль правой теменно-затылочной области. В рисунках б-ного следует отметить игнорирование левой стороны изображения

Left-side ignoring during image recalling in patient with tumor of right parietal-occipital area.

Luria, A. R. (1962) Higher cortical functions in man and their disturbances in local brain lesions. Moscow University
Press, Russia, p. 118.

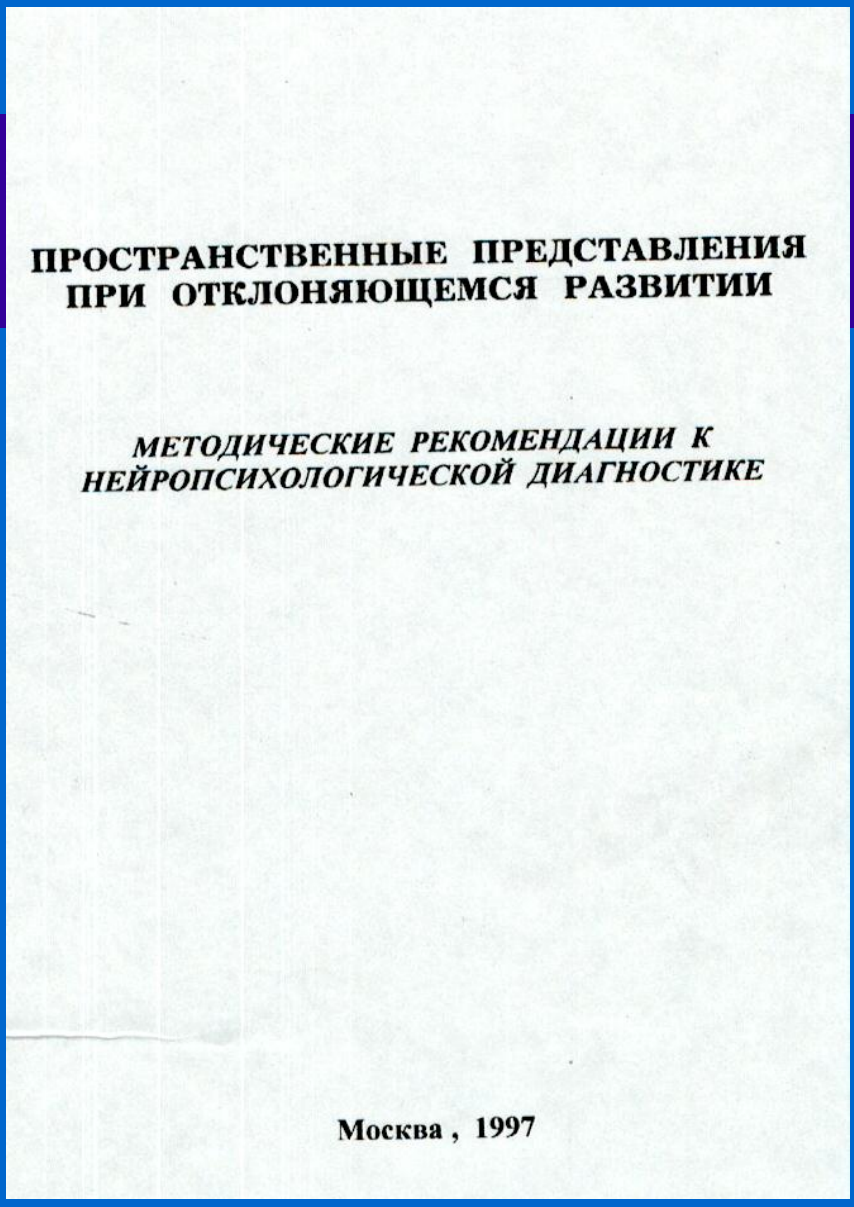


Obsessive movements during drawing and writing in patient with hematoma of the left pre-motor area

Luria, A. R. (1962) Higher cortical functions in man and their disturbances in local brain lesions. Moscow University Press, Russia, p. 172

Russian neuropsychology: current examples of Luria

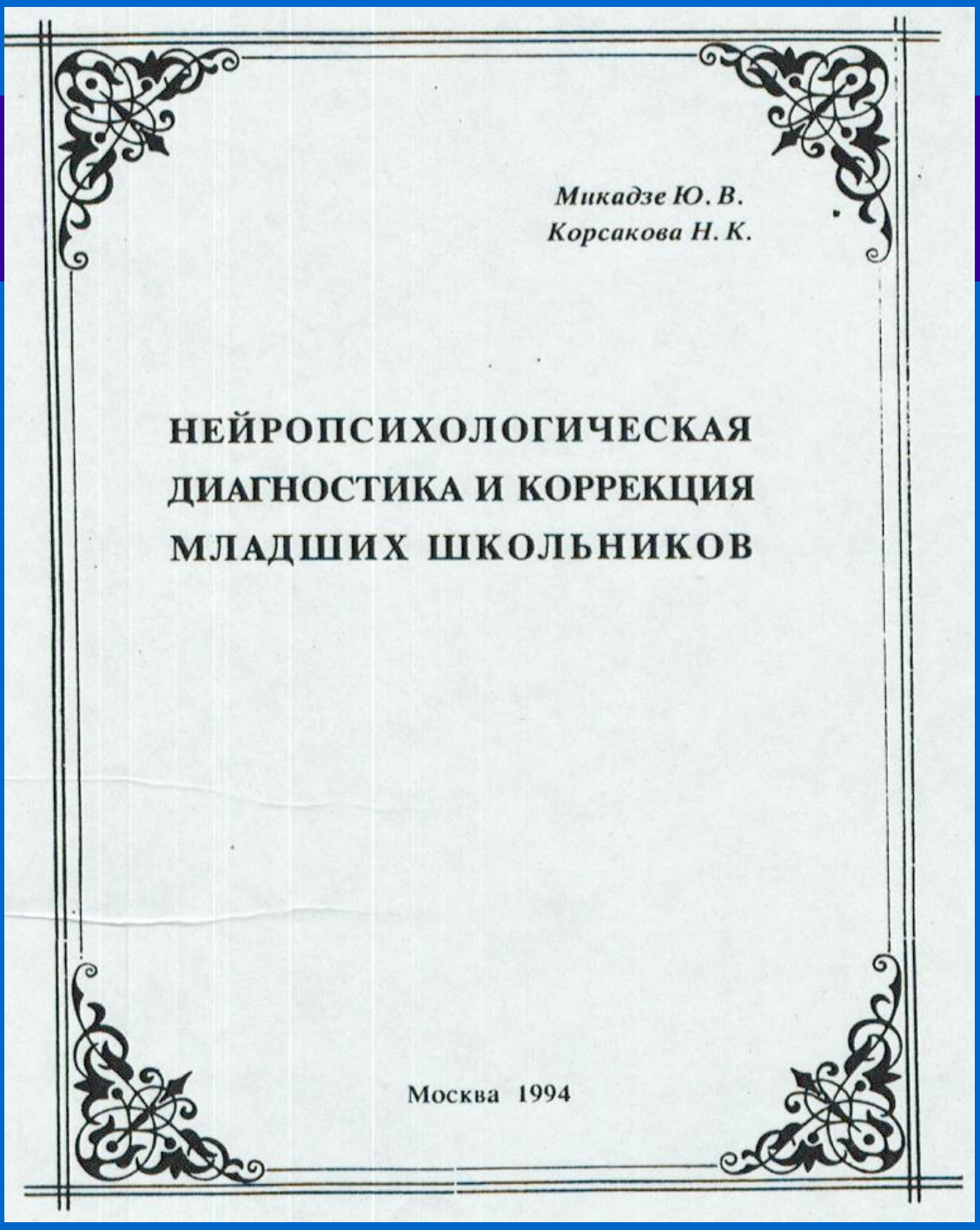
- Homskaya
- Akhutina
- Mikadze
- Glozman



Spatial Representations in children with abnormal development

methodical recommendation to neuropsychological diagnostics

A.V. Semenovich, S.O. Umrihin



NEUROPSYCHOLOGICAL DIAGNOSTICS AND CORRECTION OF ELEMENTARY SCHOOL STUDENTS

Yu. V. Mikadze, N.K. Korsakova

Table of penalty-points for quantitative evaluation of memory in elementary school children

Приложение 3

Таблица начисления штрафных баллов

№№ предъявления стимульного материала	Количество допущенных ошибок											
	0	1	2	3	4	5	6	7	8	9	10	...
1	0	1	2	3	4	5	6	7	8	9	10	Б
2	1	2	4	6	8	10	12	14	16	18	20	А
3	2	3	6	9	12	15	18	21	24	27	30	Л
4	3	4	8	12	16	20	24	28	32	36	40	Л
5	4	5	10	15	20	25	30	35	40	45	50	Ы
. . . . . .												

Quantitative modal scales for verbal, visual and motor memory

Приложение 4

Модальные шкалы

I. Шкала слухоречевой памяти

ТЕСТЫ	Параметры																																	
	1 эффективность	прочность	3 Устойчивость к интерферирующим воздействиям						5 Объем непоср. памяти	4 Регуляция и контроль				6 Устойчив. семантич. отнесенн.				7 Синтагматизация				8 Сохранение порядка I тип				9 Сохранение порядка II тип			
	балл	балл	кол-во ошибок					балл	балл	кол. ош.			балл	кол. ош.			балл	кол. пропусков	сохр. порядка	кол. синтагм	балл	кол. ош.			балл	кол. ош.			балл
			1 воспр.	2 воспр.	3 воспр.	4 воспр.	5 воспр.			1 воспр.	2 воспр.	3 воспр.		1 воспр.	2 воспр.	3 воспр.						1 воспр.	2 воспр.	3 воспр.		1 воспр.	2 воспр.	3 воспр.	
Ia																														
Iб																														
Iв																														
Средняя оценка по всем тестам																														

Суммарный средний бал
шкалы слухоречевой памяти _____

Приложение 4 (продолжение)

Модальные шкалы

II. Шкала зрительной памяти

ТЕСТЫ	Параметры																																	
	11 эффективность	прочность	13 Устойчивость к интерферирующим воздействиям						15 Объем непоср. памяти	14 Регуляция и контроль				16 Устойчив. семантич. отнесенн.				17 Синтагматизация				18 Сохранение порядка I тип				19 Сохранение порядка II тип			
	балл	балл	кол-во ошибок					балл	балл	кол. ош.			балл	кол. ош.			балл					кол. ош.			балл	кол. ош.			балл
			1 воспр.	2 воспр.	3 воспр.	4 воспр.	5 воспр.			1 воспр.	2 воспр.	3 воспр.		1 воспр.	2 воспр.	3 воспр.		1 воспр.	2 воспр.	3 воспр.		1 воспр.	2 воспр.	3 воспр.		1 воспр.	2 воспр.	3 воспр.	
IIa																														
IIб																														
IIв																														
Средняя оценка по всем тестам																														

Суммарный бал шкалы
зрительной памяти _____

Russian neuropsychology: Bechterev

- History
- Psychometric approach
- Current representations:
  - Tonkonogy
  - Wasserman
  - Meerson

IV. Spanish Neuropsychology

- General History
- Barcelona
- Madrid & Granada

V. North American Neuropsychology

- General History
- Educational Requirements
- Current Trends
- Professional Practice Patterns
- Test Usage
- Reimbursement and National Health Care Policy

North American Neuropsychology: current trends

- Methodology
- Psych Lit
- Archives of Clinical Neuropsychology (NAN)
- Journal of the International Neuropsychological Society (INS)
- Neuropsychology Review
- Neuropsychology Conferences

Current trends

- Abstracted Articles
- Selected Journals
- Neuropsychology Review
- Conferences
- Neuropsychology Listserve

abstracted articles

- Abstracting Service
  - Psych Info
  - Psych Lit
- Categories Searched
  - Educational/Professional Issues
  - Diagnostic Issues
  - Testing
  - Treatment/Rehabilitation
  - Legal Issues

topics in Psych Info

- Tests (20%)
- Diagnostic Issues (20%)
- Professional Concerns (12%)
- Rehabilitation (6%)
- Forensics (4%)

specific topics in Psych Info

- Attentiion
- Problem Solving
- Language
- Premorbid Function
- Violence
- Psychopatholog y
- Vocational Issues
- Neurotoxicity
- Psychosocial Issues
- Interface with Other Professions

topics in Psych Lit

- Professional Issues (45%)
- Diagnostic Concerns (21%)
- Testing (10%)
- Rehabilitation (7%)
- Forensics (5%)

journal review

- Journal of the International Neuropsychological Society (JINS; INS)
- Archives of Clinical Neuropsychology (CAN; NAN)
- Neuropsychology Review (NR; NAN)

Journal of the International Neuropsychological Society

- Diagnosis (71%)
- Testing (20%)
- Rehabilitation (5%)
- Professional Issues (<1%)

Archives of Clinical Neuropsychology

- Testing (40%)
- Diagnostic Issues (40%)
- Professional Issues (10%)
- Rehabilitation (3%)
- Forensics (1%)

Neuropsychology Review

- Diagnostic Issues (53%)
- Testing (9%)
- Professional Concerns (11%)
- Rehabilitation (9%)
- Forensics (6%)

conferences

- Division 40- Neuropsychology (APA)
- International Neuropsychological Society (INS)
- National Academy of Neuropsychology (NAN)

Division 40 conferences

- Diagnostic Issues (51%)
- Testing (21%)
- Rehabilitation (11%)
- Professional Issues (12%)
- Forensics (4%)

Division 40- diagnostics

- Syndromes
  - Head Injury
  - Dementia
- Developmental
  - Pediatric
  - Aging
- Psychopathology
  - Schizophrenia
  - Depression

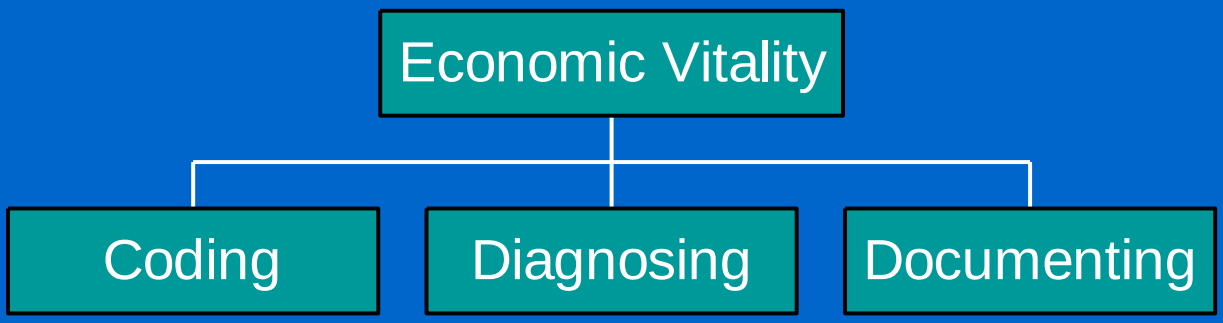
Neuropsychology Listserv

- Diagnostics (54%)
- Forensic Issues (23%)
- Professional Concerns (9%)
- Testing (7%)

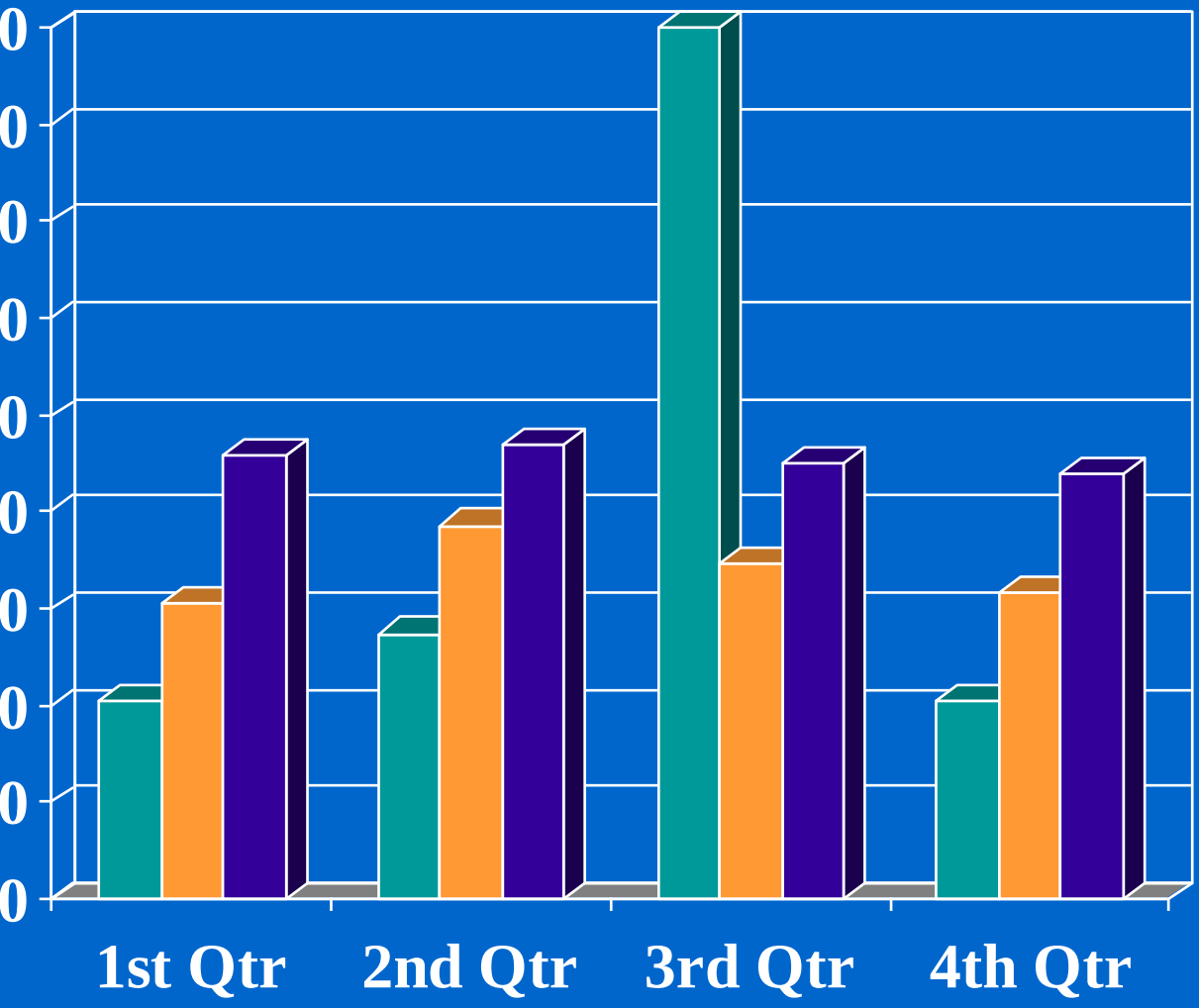
Neuropsychology Listserv observations

- National to International
- Economic Issues Control the Discipline
- Primary Testing Concerns Involve Ecological and Criterion Validity
- Rehabilitation is Becoming Increasingly Important
- A Lack of Cohesive Theory Exists

Economic Issues



Economic Issues



Test Usage

- Overview of study
- Purpose of study

study sample I

- Organization: National Academy of Neuropsychology
- Description:
  - Approximately 4,000 members
  - Independent organization dedicated to clinical neuropsychology

study sample II

- Rationale:
  - Not an interest group (e.g., Division 40 of APA)
  - Not multidisciplinary (e.g., International Neuropsychological Society)

study sample III

- Sample Description
  - 2700= Total members of NAN in 1994
  - 1200= Total # sampled
  - 324= Initial response (27%)
  - 242= Second response (20%)
  - 566= Total responses (47%)
  - 119= Reported <5hrs/week of evaluations
  - 447= Total used from original sample

introduction

- Rationale
  - HCFA/Third Party Reimbursers
  - Establish a baseline of test used with time values
- Prior Research
  - Practice Surveys (e.g., Hartlage, et al; Putnam, et al)
  - Test Surveys (e.g., Ball, et al; Lees-Haley, et al)

results

- Hours Spent Testing
- Percentage of Batteries
- Minutes to Administer
- Percentage of Testing with Computers
- Tests

results I
time spent testing

Hours	***N***	***%***
0-4	116	21
5-9	62	11
10-14	92	16
15-20	105	19
>20	188	33

results II
number & % of batteries

- ***Practice Areas*** ***N*** ***%***
- Adaptive 194 43
- Aphasia 205 46
- Behavioral Med 127 28
- Developmental 115 27
- Intellectual 354 79
- Neurobehavioral 228 51

results III
minutes to administer test

Practice Areas	*Score*	*Admin. Int.*
Adaptive	74	32 48
Aphasia	61	24 39
Behavioral Med	110	35 58
Developmental	113	36 59
Intellectual	122	34 61
Neurobehavioral	80	26

results IV
testing with computers

Activity	***%***
Administration	2
Scoring	10
Interpretation	3

results V
test frequency

- Total # of tests= 102
- Tests used exclusively by neuropsychologists= 8
- Longest tests used=
  - HRNNB (400 mins.)
  - Wechsler Scales (130 mins.)

results V
top 26 tests

- MMPI
- WAIS-R
- WMS-R
- TRAIL MAKING
- FAS WORD FLUENCY
- FINGER TAPPING
- HRNB
- BOSTON NAMING
- CATEGORY TEST
- WRAT-R/III
- BECK DEPRESSION
- REY COMPLEX FIGURE TEST
- WISCONSIN CARD SORTING
- CALIFORNIA VERBAL LEARN.
- GROOVED PEGBOARD
- WISC-R/III
- APHASIA SCREENING TEST
- RORSCHACH INKBLOT
- HOOPER VISUAL ORGAN.
- HAND DYNAMOTER
- DEMENTIA RATING SCALE
- STROOP
- PASAT
- MILLON
- BENDER GESTAL

summary

- First extended study on:
  - Tests used in clinical practice
  - Overallratings
  - Assessment of time values
- Implications:
  - Clinical Practice
  - Public Policy

Purpose of Current Study

- Examine Variables Affecting Neuropsychological Performance
- Specifically, Determine Whether Anxiety is a Critical Variable

method

- Participants & Groups for Initial and Ongoing Studies
- Neuropsychological Tests
- Procedure

computerized neuropsychological tests

- Practice Resistant
  - Visual Field Attention
  - Visual-Spatial Memory
  - Decision Time
- Practice Sensitive
  - Rotor Pursuit
  - Paired Associates
  - Digits Backwards

initial study

- Tests: computerized
- Bypass Patients: N= 21, Age= 61
- Non-surgery Patients: N= 26, Age= 56
- Surgery Patients: N= 8, Age= 61

ongoing study

- Tests: Similar computerized
- Bypass Patients: N= 40, Age= 62, tested between 1 and 30 days after surgery
- Controls: N= 49, Age= 62, non-hospitalized

results

- Neuropsychological Findings
- Role of Anxiety

initial study: NP results

- Bypass: Mixed results
  - 4 Tests= Slight Improvement
  - 2 Tests= Poorer
- Non-Surgery Combined: Improved
  - 4 Tests= Improved
  - 2 Tests= Same

initial study

- Measure: Mean Change Score on State Anxiety
- Bypass: -5.1 (11.8)
- Non-Surgery: 2.62 (7.7)
- Surgery: -.13 (5.1)

initial study (cont)

• Bypass:	39.4	35.3
• Non-Surgery:	36.7	39.4
• Surgery:	34.5	34.4

initial results (cont)

- Pearson Product-Moment Correlations:
- Significant between several neuropsychological tests
- Non-significant between State Anxiety scores and any neuropsychological test score

ongoing study: NP Rslt.

- Pre-operatively: No group differences
- Post-operatively:
  - Bypass Worse than Controls
  - Non-verbal worse than Non-verbal

ongoing study

- Measure: Standard scores
- Pre-operative: Non-significant but higher scores for bypass
- Post-operative: Non-significant but higher scores for controls; however, significant treatment X session interaction (p.0054)

ongoing study

- Measure: Standard scores
- Pre-operative: Non-significant but higher scores for bypass
- Post-operative: Non-significant but higher scores for controls; however, significant treatment X session interaction (p.0054)

discussion

- Summary of Initial Study
- Summary of Ongoing Study
- Implications for the Study of Anxiety & Cognition

VI. Common Variables

- Positive Aspects
- Negative Concerns

Negative concerns

- Economic Vs. Empirical Principles
- Egos Vs. Issues
- Culturally-Implicit Restrictions
- Intellectual Imperialism

VII. Common Outcomes

- Culturally Sensitive
- Culturally Specific
- Neuropsychology as the measurement of cultural knowledge Vs. Neuropsychology as the measurement of cognitive capacity

VIII. Proposal for a More Universal Neuropsychology

- Standardized Nomenclature
- Standardized Protocols
- Cognitive Equivalance
- Normative & Shared-data Bases
- Implicit Abolition of Natural & Cultural Boundaries
- Development of Universal Theories
- Value for Society

IX. Case Studies/Examples

- A.. Ardila and colleagues
- J. Glozman/D. Tupper
- E. O. Wilson
- R. W. Sperry

X. Why Here?

- The Super Neuropsychological Powers & the Lack of Progress
- SLAN & Other Groups
- Latin America as a Proving Ground

XI. Why Now?

- Y2K
- Y6B
- New Milleneum

XI. Musings

- Summary
- Conclusions
- Directions
- Questions & Tomatoes

Musings: summary

- Russian, European, & North American neuropsychology
- Limitations of current practice & theory
- Alternative perspectives

Musings: directions

- Neuropsychology is a hybrid discipline
- Neuropsychology should be available exclusion/fragmentation should be avoided
- Ignored disciplines must be integrated
- Historical & philosophical underpinnings must be understood
- The subjective should be

Musings: conclusions

- Is neuropsychology nothing more than:
  - a discipline for highly developed countries?
  - a field for egos in which to battle personal agendas?
  - an understanding of an individual of the cultural context of cognitive activity?
  - an over-valued and under-studied discipline?
  - Of little value to the common person & society?

Musings: questions and tomatoes

- ?s
- …