The Mayo-Portland Adaptability Inventory (MPAI-4): Overview

James F. Malec, PhD, ABPP-Cn,Rp
PM&R, Indiana University School of Medicine
Rehabilitation Hospital of Indiana
Indianapolis, IN USA

MPAI-4 Development Collaborators

• Muriel Lezak, PhD
• Anne Moessner, RN, MSN
• Miriam Kragness, PhD
• Irwin Altman, PhD
• Shannon Swick, MA
• Randall Evans, PhD
• Karen Finlay, PhD
• Ann Kent
• Devan Parrott
• Thomas Murphy
• Mary Pat Murphy
• Vicki Eicher
• Jim Dever
• Brian Danaher, PhD
• John Seeley, PhD
• Jeff Gau, PhD
• Jacob Kean, PhD

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Mayo-Portland Adaptability Inventory: MPAI-4
- Structure for neuropsychological or team outpatient evaluation
- Outcome and program evaluation
- Input from patient and significant other
- Available in English, Spanish, Danish, French, German, Swedish, Portuguese, Hebrew, Dutch
- www.tbims.org/combi/mpai

A Comprehensive Measure: MPAI-4
- Current version is product of over 15 years of research
- 30-items
- Three subscales: Ability, Adjustment, Participation
- Psychometric properties established using classic and modern psychometric techniques

Measurement Methodology: Traditional vs. Rasch
- Identifies items ordinally related to each other and to people as described by a linear construct
- Each item represents a level on the construct
- Misfitting or redundant items are discarded
- Quantitative relationship among items can be translated to a parametric equivalent measure
## Measurement Methodology: Traditional vs. Rasch

<table>
<thead>
<tr>
<th>Traditional</th>
<th>Rasch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship of numbers to other numbers</td>
<td>How numbers distinguish among people</td>
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<tr>
<td>Typically assumes items have same value and are additive</td>
<td>Items may have varying impact in describing a linear dimension</td>
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</tbody>
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## MPAI-4: Concurrent and Predictive Validity

- Disability Rating Scale, Rancho scale, neuropsychological measures, and MPAI completed by a significant other (Bohac, Malec, & Moessner, 1997; Malec & Thompson, 1994)
- Outcome of Comprehensive Day Rehabilitation Program (Malec, 2001)
- Outcome of Specialized Vocational Services (Malec, Buffington, Moessner, & Degiorgio, 2000)
- Intensity of outpatient rehabilitation required for return to work (Malec & Degiorgio, 2002)
MPAI-4: Ability Index

- Mobility
- Use of hands
- Audition
- Vision
- Motor speech
- Dizziness
- Verbal Communication
- Nonverbal Communication

- Memory
- Attention/concentration
- Fund of information
- Novel Problem-solving
- Visuospatial abilities

MPAI-4: Adjustment Index

- Anxiety
- Depression
- Irritability, anger, aggression
- Pain/headache
- Fatigue
- Sensitivity to mild symptoms
- Inappropriate social interaction

- Impaired self-awareness
- Family/significant relationships
- Initiation
- Social contact
- Leisure activities

MPAI-4: Participation Index

- Initiation
- Social contact
- Leisure activities
- Self care
- Residence
- Transportation
- Employment
- Managing Money
MPAI-4 Co-morbidities

- Alcohol/other substance abuse or dependency
- Legal issues
- Other disabling conditions

Levels of Measurement: Focused

- Participation Index
- Represents last and most meaningful challenges for rehabilitation
- Perspectives of person with TBI, SO, staff vs. rater bias
- 3-rater Participation Index correlates highly with Full Scale (r = .76)
- Minimal ceiling effects

Cumulative Distributions of Participation Index Total Raw Scores by Rater Group and 3-Rater Composite

- 3-rater composite
- People with ABI
- SO
- Staff
The National Database Project

MPAI-4 Database Project

• Small Business Technology Transfer Program (STTR)
  – Tom Murphy, PI/CEO Inventive Software Solutions, Philadelphia
  – John Seeley, Jeff Gau, Brian Danaher: Oregon Research Institute, Portland
  – Jim Malec: Rehabilitation Hospital of Indiana/IU School of Medicine

• Develop a national database system for the Mayo-Portland Adaptability Inventory (MPAI-4)
  • Web-based, secure, user friendly
  • To measure outcomes and change over the course of postacute rehabilitation
  • And provide feedback to providers about the effectiveness of their programs relative to other similar programs for similar patients
MPAI-4 Database Project

- A Web-Enabled Client/Person Served Outcomes Reporting Service for any size provider (HIPAA compliant)
- Each organization's data is protected and secured
- Allow individual organizations to compare and analyze their internal data to regional or national data
- Developing normative data for post-hospital brain injury
- Can add tools/scales in addition to MPAI-4
REPORTING AND ANALYSIS

Data Analysis

Individual
- Reflects Improvement, Regression or Maintenance of Functional Status
- Facilitates Treatment planning

Facility Data Analysis
- Help to identify client trends

Group Data Analysis
- Create normative data

Sample Group Data Analysis
- By Funder type
- By Age at injury
- By Age at first admission to Rehab
- By Cause of Injury & Type of Injury
- By Years post-injury prior to admission
- By Program Description
- By Functional Category (improved, maintained, regressed)
- By Demographics
MPAI-4 Database Project

- Provide feedback to providers about the effectiveness of their programs relative to other similar programs for similar patients
- Provide Data Useful for:
  - Advocacy
  - Policy Development
  - Disability Determination
  - Determination of Needs for Medical, Rehabilitation, Vocational, Independent Living and Other Services for people with ABI

The MPAI-4 in Practice

Outcome Measurement and Analysis
Outcomes by Program Type and Goals

The Pennsylvania Association of Rehabilitation Facilities (PARF)

MPAn-4 Total Raw Score by Program Type over Time

Programmatic Differences in Outcome Expectations

- Average chronicity for all programs > 5 years
  - Greatest for Supported Living Programs
- Stability = Goal of Residential and Supported Living Programs
- Progress = Goal of Intensive Programs
- Goals appropriately adjusted for chronicity and severity of disability
Planning and Monitoring Individual Progress

Keyforms
Helen Badge & Jennie Brentall
New South Wales, Australia

Demonstrating Change

Linking the MPAI-4 to the International Classification of Functioning (ICF)

- Principal Investigator: Jan Lexell, M.D., Chair, PM&R, Lund University, Sweden
- Co-investigator: Lars Jacobsson, neuropsychology doctoral candidate, Lund University
Linking the MPAI-4 to the International Classification of Functioning (ICF)

- Each item links to specific functional areas that may be targeted for intervention
- Linkage is more specific for Ability and Participation than Adjustment

ICF Linking Examples: Verbal Communication

- b1670 Reception of language
- b1671 Expression of language
- b1672 Integrative language functions
- d166 Reading
- d170 Writing
- d310 Communicating with - receiving - spoken messages
- d320 Communicating with - receiving - formal sign language
- d325 Communicating with - receiving - written messages
- d330 Speaking
- d340 Producing messages in formal sign language
- d345 Writing messages
- d360 Using telecommunication devices
- d3601 Using writing machines
- d3602 Using communication techniques
- d3603 Storing daily necessities
- d3604 Storing daily necessities
- d3605 Disposing of garbage
- d3606 Taking care of plants, indoors and outdoors
- d3607 Taking care of animals

ICF Linking Examples: Residence

- d2301 Managing daily routine
- d2302 Completing the daily routine
- d2303 Managing one's own activity level
- d2700 Ensuring one's physical comfort
- d3701 Managing diet and fitness
- d5702 Maintaining one's health
- d6300 Preparing simple meals
- d6301 Preparing complex meals
- d6400 Washing and drying clothes and garments
- d6401 Cleaning cooking area and utensils
ICF Linking Examples: Anxiety, Depression

- b1520 Appropriateness of emotion
- b1521 Regulation of emotion
- b1522 Range of emotion

Take Home Points

- The MPAI-4 and the Client Info System are based on state-of-the-art psychometric and database technologies
- The MPAI-4 Client Info System will support
  - Rehabilitation program evaluations using large national samples
  - Rehabilitation program planning and monitoring in individual cases
  - Data for advocacy and policy development

Key References

- Lewis J. Mapping the Mayo-Portland Adaptability Inventory to the International Classification of Functioning, Disability and Health. J Head Trauma Rehabil 2011;26:45-72.
- Malec J. Manual for the Mayo-Portland Adaptability Inventory. www.tbims.org/compass