Goal Attainment Scaling Integrated with Motivational Interviewing: Responding to the Need for Patient-Centered Outcome Measures

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The Need

• Outcome measures for cognitive rehabilitation that
  – apply to a heterogeneous population being treated with a range of interventions
  – capture impact of specific rehabilitation efforts
  – are measurable and reliable
The Tension when Selecting Outcome Measures for Cognitive Rehabilitation

An Option
Goal Attainment Scaling

**Definition:** A measurement methodology that allows clinicians to develop and monitor progress on individualized goals.

**Characteristics:**
- Criterion referenced
- Collaboratively identified
My Objectives

• Overview of Goal Attainment Scaling
• Overview of Motivational Interviewing
• Share eGAS as potential tool for clinicians to use Goal Attainment Scaling as a reliable and valid outcome measure for cognitive rehabilitation

The GAS Process

• Decomposes overarching goals into five discrete levels
• Allows clinicians and clients to clearly define a range of outcomes
• Can measure longitudinal change
• Can measure degree to which intervention is effective
GAS Example: Checking Voicemail

+2 Client will independently initiate checking voicemail on his phone for 7 or more instances in response to ping while at volunteer position

+1 Client will independently initiate checking voicemail on his phone in at least 4-6 instances in response to ping while at volunteer position

0 Client will independently initiate checking voicemail on his phone in at least 1-3 instances in response to ping while at volunteer position

-1 Client does not independently initiate checking voicemail on his phone

--2 Client unwilling to bring phone

--- Functional Domain: Social Communication
--- Cognitive Domain: Memory & EF
--- Intervention Approach: Training ATC

GAS Example: Improving Grades

+2 Client will receive all A's and B's at end of quarter

+1 Client will receive one C and all the rest A's or B's at end of quarter

0 Client will receive two C's and A's or B's for the other two classes at end of quarter

-1 Client will receive three C's and either an A or B for the fourth class at end of quarter

2 Client will receive one D or F at end of quarter

--- Functional Domain: School Performance
--- Cognitive Domain: Executive Function
--- Intervention Approach: Training Istudyz Homework App (ATC)
Summary of Benefits

- Client-centric versus population-centric
- Aggregate results across patients receiving the same treatment with different goals
- Use with different goals for same patient
- Can assess progress towards a goal

GAS Studies Have Shown

Recent review of literature (Krasini et al., in press) showed that GAS used in experimental studies can have acceptable:

- Content validity
- Inter-rater reliability
- Test-retest reliability
SMART Criteria for Writing Rehabilitation Goals

- Specificity
- Measurability
- Attainability
- Relevant
- Time-specificity

(Boven’Eerdt et al., 2009)

Additional Criteria: SMARTED

- Specificity
- Measurability
- Attainability
- Relevant
- Time-specificity
- Equidistant
- uniDimensional

(Ruble et al., 2012)
**GAS: Improving Grades**

+2 Client will receive all A’s and B’s at end of quarter

- +1 Client will receive one C and all the rest A’s or B’s at end of quarter

- 0 Client will receive two C’s and A’s or B’s for the other two classes at end of quarter

- -1 Client will receive three C’s and either an A or B for the fourth class at end of quarter

- -2 Client will receive one D or F at end of quarter

- -3 Client will receive all D or F at end of quarter

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**Need for GAS Quality Appraisal Criteria**

To be used as research outcome measure we need:

- Criteria that would allow judgment of the quality of GAS methodology in individual rehabilitation studies,
- Guidelines to reduce bias, and strengthen GAS validity and reliability.

(Krasini et al., in press)
GAS Criteria Needed to Guide the Two Gas Phases

Phase 1: Goal Formulation Process
Phase 2: Goal Scoring Process

Developed GAS Quality Appraisal Criteria for RCT (Krasini et al., in press)

Content Validity Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative goal setting</td>
<td>The client/family is included in goal selection</td>
</tr>
<tr>
<td>Relevance</td>
<td>GAS scales verified by external judge to check for clinical significance</td>
</tr>
<tr>
<td>ICF classification</td>
<td>GAS themes correspond to functional domains.</td>
</tr>
<tr>
<td>Specificity</td>
<td>GAS scales verified by external judge to check for relationship to intervention</td>
</tr>
</tbody>
</table>
Developed GAS Quality Appraisal Criteria for RCT (Krasini et al., in press)

Reliability in Scale Construction

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equidistance of levels</td>
<td>Difficulty from one level to the next is equal and verified by external judge</td>
</tr>
<tr>
<td>Pre-intervention performance</td>
<td>Baseline performance has been verified; performance is comparable across groups</td>
</tr>
<tr>
<td>Attainability/ difficulty</td>
<td>GAS scales verified by external judge to be reasonable and achievable</td>
</tr>
<tr>
<td>Time-specificity</td>
<td>Authors specify time-frame for goal achievement</td>
</tr>
</tbody>
</table>

Developed GAS Quality Appraisal Criteria for RCT (Krasini et al., in press)

Reliability in Rating Levels

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authors report Inter-rater reliability (IRR)</td>
<td>Methods explain IRR</td>
</tr>
<tr>
<td>Preciseness</td>
<td>Five GAS levels have been precisely described pre-intervention for each scale</td>
</tr>
<tr>
<td>Measurability</td>
<td>GAS scales verified by external judge to check for measurability.</td>
</tr>
<tr>
<td>Unidimensionality</td>
<td>External judge verifies that levels all relate to same scale</td>
</tr>
<tr>
<td>Context of measurement</td>
<td>Performance context is clearly defined (e.g., prompts, cueing, supports)</td>
</tr>
</tbody>
</table>
Developed GAS Quality Appraisal Criteria for RCT (Krasini et al., in press)

Other Criteria

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>Researchers receive training in GAS</td>
</tr>
<tr>
<td>Examiner bias</td>
<td>Person scoring GAS at end is different than the one establishing GAS or treating client</td>
</tr>
<tr>
<td>Statistical analysis</td>
<td>Ordinal nature of GAS scales is preserved using non parametric statistics (rank tests, medians, boxplots).</td>
</tr>
<tr>
<td>Example of GAS</td>
<td>Researchers provide at least one full example of GAS extracted from trial</td>
</tr>
</tbody>
</table>

Challenges when using GAS for Clinical Outcome Measurement particularly for Cognitive Rehabilitation

- Patient characteristics: unawareness; difficulty with generation
- Specificity: Patient goals may not be related to intervention
- Treatment culture: Not conducive to collaboration
- Clinician knowledge about GAS: limited; scales not reliable, measurable or valid
A Potential Solution: Build eGAS

- Integrate collaborative interview techniques into GAS process
- Provide clinician with efficient training/reference
- Provide clinician with interview prompts and GAS criteria
- Make tool electronic with built in efficiencies

Motivational Interviewing

- eGAS relies on MI to ensure collaboration and buy-in
- MI Techniques (OARS)
  - Open ended questions
  - Affirmation
  - Reflective listening
  - Summarizing
(Rolnick & Miller, 1991)
eGAS Framework

- Collaborative Interview based on principles and processes of Motivational Interviewing
- GAS elements
- Development and pilot supported by Clinical Research Collaboration Grant Awarded by ASHFoundation 2014-15

eGAS menu screens
eGAS interview and goal setup

- GAS Interview
  - Open Ended Questions
  - Affirmations
  - Day in
  - Strategy Selection
  - Completing the GAS

- GAS Progress Evaluation

- eGAS - Goal Attainment Scaling

- eGAS - Goal Attainment Evaluation
  - Functional Goal Domain
  - Underlying Cognitive Domain
  - Therapy Approaches
  - GAS Levels
  - Measurement Plan

- eGAS Progress
  - Goal
  - Baseline
  - Post Treatment
  - Notes

- T score: 41.0143
### Progress eval for multiple clients

<table>
<thead>
<tr>
<th>Client</th>
<th>Task</th>
<th>Change</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary Jane</td>
<td>Walk outside more</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Take the stairs more often</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Johnny</td>
<td>Stopping skipping class</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Do homework</td>
<td>-1</td>
<td>1</td>
</tr>
</tbody>
</table>

### eGAS demonstration video

- Select a Client
- Create New Client
- Smart Manual
MI Language: Underlying Cognitive Domain/Functional Goal Domain

R: I think it bothers her that I don’t finish anything. That’s what she says.
C: So maybe you forget what you’re doing....
R: It’s not like I forget anything important. I’m not doing anything.
C: Why aren’t you doing anything?
R: Because she won’t let me.
C: What things might she allow you to do?
R: I don’t know.
C: What would you do if you were given more latitude, something other than returning to work?
R: I’d like to design a garden, a vegetable garden. I’m not working so it might be nice to be able to grow our own food. Maybe get some chickens for eggs, build a composter. I could make some... use some...(pause)...where was I going?

MI Language: Goal Formulation

C: If you don't mind my asking, what would be the most important thing for you? What would be a 10?

R: Going back to work.

C: Okay. What if we develop a plan to build the garden as a project to help you learn the areas in which you might not need any help and the areas in which you might -- like planning, execution of the plan, memory, attention to details, developing routines and strategies to eliminate the getting lost...
MI Language : Generating the Scale

Okay, first off, what would be the best outcome of this garden project for you?

R: I would grow all of our vegetables. We would only need to buy stuff like meat and milk, stuff that I couldn’t grow.

C: Ah. So what do you think you would be able to accomplish in your first season, say the first summer that you have this garden? What percentage of vegetables for your family?

R: Maybe half. There would be a learning curve.

Client GAS

+2 Will grow all (100%) of family’s veggies by the end of the summer.
+1 Will grow 75-99% of family’s veggies by the end of the summer.
0 Will grow 51-74% of family’s veggies by the end of the summer.
-1 Will grow 25-50% of family’s veggies by the end of the summer.
-2 Will grow less than 25% of family’s veggies by the end of the summer.

Importance: 3
Difficulty: 2
Feedback? Ideas?

THANK YOU!