Got GAS?
A Primer on Goal Attainment Scaling

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Reasons for Inclusion

- Workshop participants serve persons across the life span (birth to death).
- Over the years workshop participants reported they serve persons with a ever growing range of life and clinical challenges.
- While there are an array of excellent published standardized tools available, sometimes using a fixed set of items does not provide a good fit for specific outcome measurement needs.

Example Case

- The Centre for Ability (CFA) in BC, Canada provides community-based services to enhance the quality of life for children, youth and adults with disabilities:
  - that facilitate and build competencies, and
  - foster inclusion in all aspects of life.
- CFA serves the spectrum of presenting issues and life challenges for a wide age range of persons served. To meet their performance measurement needs they have adopted both standardized and goal attainment based tools.
Centre for Abilities Goal Categories

- Posture and Mobility
- Play and Learning
- Self-Care
- Communication
- Cognition
- Learning and applying knowledge (caregivers)
- Emotional well-being - child/youth/caregivers
- Community participation and social life

Session Objectives
To provide an overview on Goal Attainment Scaling (GAS) developed by Kiresuk and Sherman, 1968:

- The origins and thinking behind the tool
- Explain the GAS Scales development requirements.
- Provide examples of completed GAS scales.
- Provide contemporary literature based resources using or testing the application of GAS

Origins of Goal Attainment Scaling
A Goal Attainment Scale

<table>
<thead>
<tr>
<th>Level of Attainment</th>
<th>Goal or Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>Much less than expected</td>
</tr>
<tr>
<td>-1</td>
<td>Somewhat less than expected</td>
</tr>
<tr>
<td>0</td>
<td>Expected level of outcome</td>
</tr>
<tr>
<td>+1</td>
<td>Somewhat more than expected</td>
</tr>
<tr>
<td>+2</td>
<td>Much more than expected</td>
</tr>
</tbody>
</table>

Background

Goal Attainment Scaling (GAS) developed by Dr. Thomas J. Kiresuk and Dr. Robert E. Sherman in 1968.

Goal Attainment Scaling (GAS) was field tested as an outcome measure(s) in randomized clinical field trials on effectiveness of Mental Health Services. (NIMH Grant #5 ROI 1678904 Department of Health, Education and Welfare)

Background

- Kiresuk and Sherman were interested in testing whether an idiographic-based tool based on patient-specific goals as part of the clinical process.
- Specifically, could it be practical and useful in performance measurement, and
- Would GAS be accepted by clinicians and patients as part of the treatment process, rather than a managerial add-on.
Goal Attainment Follow-up Guide

- The approach is called Goal Attainment Scaling (GAS) and the original tool was called a Goal Attainment Follow-up Guide (GAFG).
- The GAFG is based on setting realistic outcome expectations for persons served.
- Each GAFG should reflect person-centered goals based on a service intervention for one person served.

Goal Attainment Continuum

The expected outcome with intervention is scored as: 0
- More than expected outcomes scored as:
  +1 (somewhat more than expected)
  +2 (much more than expected)
- Less than expected outcomes scored as:
  -1 (somewhat less than expected)
  -2 (much less than expected)
GAS Methodology

- Unlike traditional standardized tools or measures:
  - GAS is an idiographic approach for measuring outcomes to score individual goal achievement after or during intervention:
    - Each patient has his/her own outcome measures.
    - Scored to allow statistical analysis

The Process

- Determine who develops the follow-up guide.
  - The person served
  - Other family members or collaterals
  - The clinician or service worker
  - A combination of any of the above
- Determine the target follow-up period, that is what is realistic for achieving the individual goals

The Process Steps

- Step 1: select goal or scale areas
- Step 2: Identify the expected level of outcome
- Step 3: Identify criteria that reflect less than expected results
- Step 4: Identify criteria that reflect more than expected results

Note: all expected levels of goal achievement should be set based on using the intervention
Step 1: select scales (or goals)

Using a person-centered approach:
- Identify areas where behaviors, skills, or activities should be developed, increased, or minimized
- Most often 3 to 5 goals are set

Step 2: Identify an expected level

These criteria are used to reflect treatment success; it is listed as the (0) or expected level of goal attainment.
- Focus on:
  - Is the goal relevant to treatment?
  - Is the expected status reasonable with treatment services?

Step 3: Identify less than expected

Identify criteria that reflect less than expected results
- If the criteria are somewhat less than the expected result, it should be listed as the (-1)
- If the criteria is much less than the expected result, it should be listed as the (-2)
Step 4: More than Expected

Identify criteria that reflect more than expected results

- If the criteria are somewhat more than the expected result, it should be listed as the (+1)
- If the criteria is much more than the expected result, it should be listed as the (+2)

Eerily Like “SMART” Goals

- Goals should be realistic:
  - Not too easily accomplished
  - Not too difficult to achieve
- Goals should be specific:
  - Measurable
  - Not vague
- Goals should be valid:
  - Independent observers agree on whether outcome was reached

Select Examples
Autism Spectrum Example
Source: Cardillo and Choate, 1994

Much less than expected -2: When given a model and prompted, will ask questions of adults.

Somewhat less than expected -1: When prompted, will ask questions of adults during 50% of the opportunities presented.

Expected level of outcome 0: Independently asks questions to obtain information from adult in classroom during 80% of opportunities presented.

Somewhat more than expected +1: Independently uses questions with at least two different adults in classroom during 80% of opportunities presented.

Much more than expected +2: Independently asks questions of adults in classroom and in at least one other context during 100% of opportunities.

Rehabilitation Example
Source: McDougall and King, 2007

-2 The client is able to lift his head and right arm when attempting to roll from supine to prone over his left side.

-1 The client is able to roll half way from supine to prone over his left side (and attain left-side lying).

0 The client is able to roll from supine to prone over his left side.

+1 The client is able to roll from supine to prone and half way back to supine over his left side (and attain left-side lying).

+2 The client is able to roll from supine to prone and back to supine over his left side.
Non-Verbal Options

- Pictures can work very effectively for many clients with cognitive issues
- Particularly helpful in areas of gerontology and mental retardation
**Contrast - Two Rehab Patients**

<table>
<thead>
<tr>
<th>Level of attainment</th>
<th>Goal of an 80 year old woman who well her four family alices</th>
<th>Goal of a 74 year old man who well her four family alices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much better than expected</td>
<td>Able to collect mail from mailbox independently and able to walk 500 feet in 5 minutes.</td>
<td>Able to travel to the shopping centre independently on public transport.</td>
</tr>
<tr>
<td>Somewhat better than expected</td>
<td>Able to collect mail from the mailbox independently on free days and on any day.</td>
<td>Able to travel to the shopping centre on public transport in the presence of one other person.</td>
</tr>
<tr>
<td>Program goal (expected performance at end of intervention)</td>
<td>Able to collect mail from the mailbox with assistance on free days.</td>
<td>Able to travel to the shopping centre 4 times per week.</td>
</tr>
<tr>
<td>Somewhat less than expected (no change in baseline performance)</td>
<td>Unable to collect mail from the mailbox.</td>
<td>Requires private transport and assistance to travel to shopping centre.</td>
</tr>
<tr>
<td>Much less than expected</td>
<td>Unable to collect mail from the mailbox.</td>
<td></td>
</tr>
</tbody>
</table>

**Most Exceptional Resource**

Goal Attainment Scaling (GAS) in Rehabilitation

A practical guide

Further information and advice may be obtained from:

President, T.Y. Eaton/Oxley DMD FRCP
United Council of Rehabilitation, Leipziger Orakelstrasse 1,
Regional Rehabilitation Unit,
Nordwick Park Hospital,
Westdahl Road,
Hove: Middessex.
May 1997

**Appendix 1: Worked example**

Patient 54 was referred for rehabilitation following a stroke. Her goals for treatment are:
- to reduce her shoulder pain
- to improve independence in dressing
- to improve her grip pattern.

<table>
<thead>
<tr>
<th>1. Reducing shoulder pain</th>
<th>She had severe shoulder pain rating 6-10 on a scale, diminishing her sleep and waking her 2-3 times a night</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected outcome</td>
<td>We expected to reduce her pain to around 3-5, and to reduce night time waking through pain to once a night</td>
</tr>
<tr>
<td>2. Ease of dressing</td>
<td>She needed help to dress her upper body</td>
</tr>
<tr>
<td>Expected outcome</td>
<td>We expected that she would be able to dress her upper body herself</td>
</tr>
<tr>
<td>3. Able to drive</td>
<td>She was unable to drive</td>
</tr>
<tr>
<td>Expected outcome</td>
<td>We expected that she would be able to return to driving again as adapted car</td>
</tr>
</tbody>
</table>
Most Exceptional Resource

GOAL ATTAINMENT SCALING: Description, Utility, and Applications in Pediatric Therapy Services (McDougall and King), Thames Valley Children’s Centre, London, Ontario

Excellent publication and practices resources included in the Appendices.
- A - GAS Training Procedures
- B - Common Errors in Writing GAS Scales
- C - GAS Checklist
- D - Examples of GAS Scales in Pediatric Therapy

Therapy Discipline: Physical Therapy
Target Area: Movement Functions

-2 The client is able to lift his head and right arm when attempting to roll from supine to prone over his left side.
-1 The client is able to roll half way from supine to prone over his left side (and attain left-side lying).
0 The client is able to roll from supine to prone over his left side.
+1 The client is able to roll from supine to prone and half way back to supine over his left side (and attain left-side lying).
+2 The client is able to roll from supine to prone and back to supine over his left side.

Most Exceptional Resource

Department of Veterans Affairs, Government of Australia

- The new Rehabilitation Guide can now access the Rehabilitation Guide in the new and improved CLIK
- Includes a well written section developed for rehabilitation personnel on use of Goal Attainment Scaling.
**DVA Example**

- **Goal:** Increase mobility and weight-bearing capacity

  - **-1:** Cannot walk around the block even with or without an aid at 3 months
  - **+1:** Walk around the block three times per week using the aid sparingly at 3 months
  - **-2:** Cannot walk around the block even with or without an aid at 3 months
  - **+2:** Walk around the block three times per week without an aid at 3 months

**Effects on Current Process**

- Minimal impact on DVA Staff, as providers establish the goals with clients and monitor progress.
- Once familiarity with the process is established, minimal cost impact.

**GAS Scoring**

- **Overall GAS scores:**
  - Calculated with T-score formula
  - Computation based on compilation of goals and weights
Weighting of Goals

- Goals can be weighted according to:
  - Relative importance of goal to the individual
  - It may involve anticipated difficulty
  - Weighting may reflect sequencing, that is approaching goals in an order

The GAS Score Calculation

- Overall GAS = 50 + 10 \( S(w_i x_i) \) / \( \sqrt{[1-r \sum w_i^2 + r(\sum w_i)^2]} \)

  Where:
  - \( w_i \) = the weight assigned to the nth goal (if equal weights, \( w_i = 1 \))
  - \( x_i \) = the numerical value achieved (between -2 and +2)
  - \( r \) = the expected correlation of the goal scales

GAS Scoring Tools

- Weighting tools:
  - Calculation tables are presented in the reference materials and in Goal Attainment Scaling: Applications, Theory, and Measurement
  - There are a number of GAS spreadsheet calculators on Internet or on the attached link:
    - GAS calculator for Weighted Scales - 2016 update.xlsx
<table>
<thead>
<tr>
<th>bb1</th>
<th>no link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bboegemann, 7/14/2016</td>
</tr>
</tbody>
</table>
GAS Scoring Tools

- If you do not weight the scales the scores can be directly looked up.
- This is done by simply adding up the scale scores. If you had 3 scales and they were scored -1, -2, and 0 = -3 for the total.
- Using the score conversion table for programs using un-weighted scales the GAS would be 36 (3 scales with total score of -3).

Goal Attainment Score Conversion for Equally Weighted Scales (Baxter, 1972)

Final Thoughts

Interesting?
Recap

GAS Utility

- It has been argued that GAS:
  - Improves clarity of treatment objectives for both therapists and patients
  - Establishes realistic patient and therapist expectations
  - Increases client participation and engagement
  - Increases motivation for improvement

Special Features of GAS

- Adaptable to measure symptoms, behaviors, feelings, skills, or achievements that service intervention is designed to help.
- Totally person-centered
  - Organizes and focuses treatment on goals
  - Clarifies person-specific treatment aims
Expected Benefits

- Better engagement with clients
- Clearer plan for clients
- Clients take ownership of their goals
- Clients have better understanding of rehabilitation process

Resources

The Definitive Sourcebook

- Goal Attainment Scaling: Applications, Theory, and Measurement
  - Thomas J. Kiresuk (Editor)
  - Aaron Smith (Editor)
  - Joseph E. Cardillo (Editor)
Additional Resources

Even though I worked with Dr. Kiresuk and Dr. Sherman in the day on the Goal Attainment Scaling development project, I found the following work entertaining and most useful:

- Marson and Associates has prepared some priceless guides and resources on Goal Attainment Scaling, including the “ten commandments” which follow.
- Their work is found at: www.marson-and-associates.com/GAS

THE TEN COMMANDMENTS

The Ten Commandments of Goal Attainment Scaling were distributed as part of an in-service training conducted by the Columbus [Ohio] Community Mental Health Center.

A date on the bottom right corner indicates that it was revised in 1974. No author’s name exists on this helpful document.

- Include at least three ordinal scales on a follow-up guide except in dire straits, and even then have at least two scales.
- Have at least three levels filled-in for each scale. One filled-in level should be the expected level, and there should be at least one filled-in level on each side of the expected level.
- Include only one problem or variable on each scale.
THE TEN COMMANDMENTS

• If any of the scales on a follow-up guide are weighted, all scales should be weighted.
• The client's behavior at intake may be equivalent to any of the five levels. Avoid terms like "better than when treatment began."
• Avoid variables which are too general or vague to be accurately scored at a follow-up interview.

THE TEN COMMANDMENTS

• The levels on a scale should not overlap each other.
• If the information needed for a scale's follow-up scoring is to be obtained from a source other than the client, the special source of information should be listed.
• Avoid having two blank levels adjacent to each other on a scale.

THE TEN COMMANDMENTS

• There should be no "expected" levels which are so high that there is no possible "better than expected" level. There should be no "expected" goals which are so low that there is no possible "less than expected" levels. There should usually be a possible outcome for all levels of the scale even if some are left blank.