

Contemporary perspectives on goal setting in rehabilitation

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Acknowledgements

My co-authors...



Prof Richard Siegert
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Prof Kath McPherson
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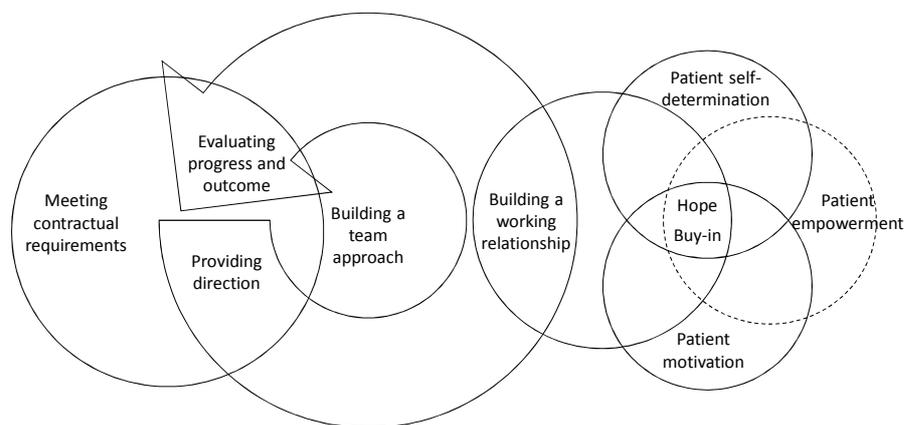
The Cochrane CCR Group, especially...

- Megan Pictor
- John Kis-Rigo
- Rebecca Ryan
- Sophie Hill

... and all the peer-reviewers and participants



Different purposes of goal setting



Levack et al. (2006a)

Content

Exploration of 3 issues in goal setting for rehab:

- Evidence of effect on health outcomes
- Use of goals as an outcome measure
- Use of goals to enhance human performance



Effects of goal setting on health outcomes

Summary of some key findings from a Cochrane review



Aim of review

- To assess the best evidence of the effects of **goal setting**, and activities to enhance **goal pursuit**, for improving health outcomes in **adults with acquired disability** participating in **rehabilitation**.

Background



- Prior systematic reviews of goal setting in rehabilitation have shown:
 - Some evidence that goals could influence immediate patient performance on set tasks & adherence to treatment regimes
 - No consistent evidence for any generalizable effects on patient outcomes

Levack et al. (2006b)

- Findings reproduced by
 - Rosewilliam et al. (2011)
 - Sugavanam et al. (2013)

What's different about this review?



- Published protocol: a priori analysis plan

(Levack et al. 2012)
- Search more comprehensive
 - 9000+ titles & abstracts screened; including non-English and grey literature; including unpublished theses; quasi-RCTs
- Categorisation of studies by comparison type
 - e.g. control = no goal setting VERSUS control = 'usual care' goal setting
- Meta-analysis of outcome data

Results (n=39)



Heterogeneity of populations...

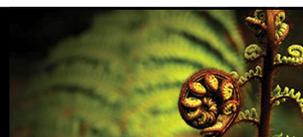
People with:

- Musculoskeletal & pain conditions
- Cardiac conditions
- Respiratory conditions
- Mental health conditions
- Age-related disability

Receiving:

- PT
- OT
- Nursing
- Psychology
- Vocational
- MDT

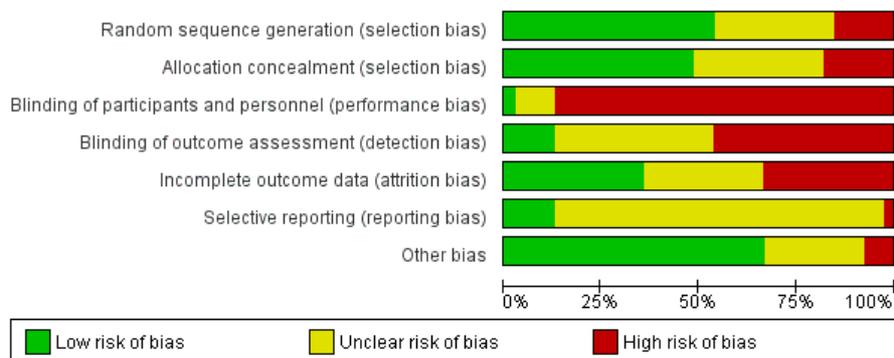
Results (n=39)



Variance in goal setting methods...

- Patient involvement in goal setting (prescribed → negotiated → self-selected)
- Development of an implementation plan
- Degree of written or oral feedback progress towards goals
- Goal approach (e.g. GAS, COPM, GMT, etc)
- Underlying goal theory

Risk of bias (n=39)

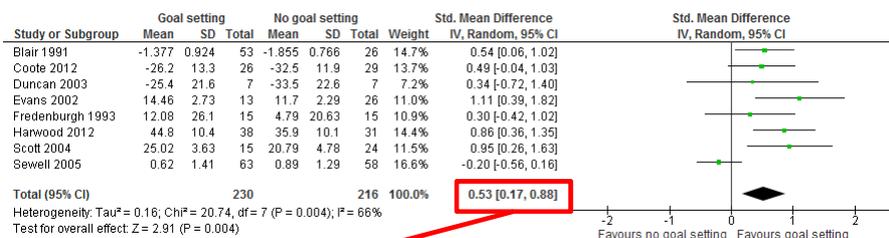


Results: Comparison groups

1. Structured goal setting +/- goal pursuit strategies vs. no goal setting (n = 18)
2. Structured goal setting +/- goal pursuit strategies vs. 'usual care' goal setting
3. Goal pursuit strategies vs. no goal pursuit strategies
4. One structured goal setting approach vs. another

Goal setting versus no goal setting

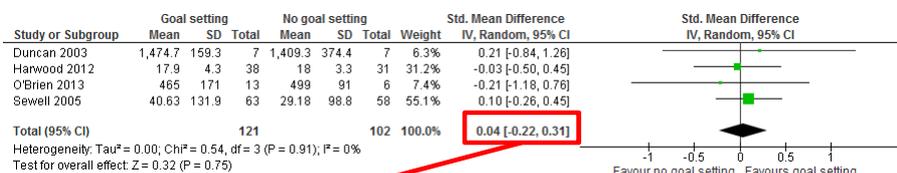
- Meta-analysis of HRQOL & self-reported emotional status outcomes



SMD 0.53 (95 % CI 0.17 to 0.88)

Goal setting versus no goal setting

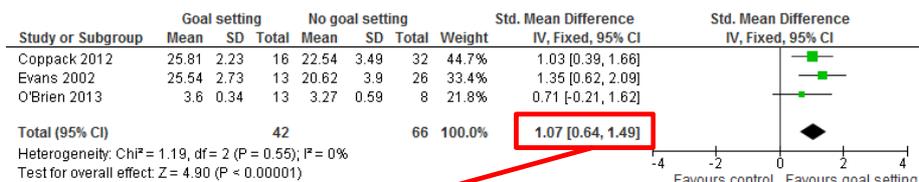
- Meta-analysis of activity outcomes



SMD 0.04 (95% CI -0.22 to 0.31)

Goal setting versus no goal setting

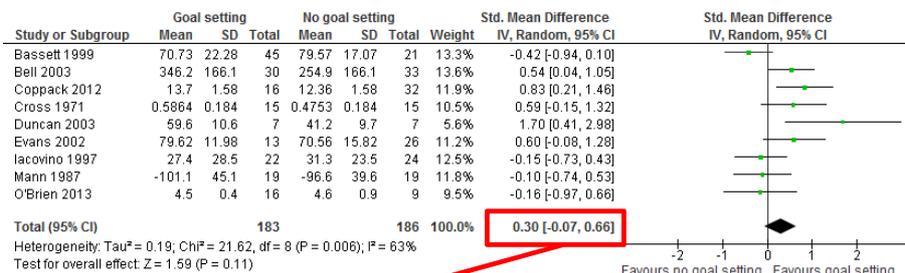
- Meta-analysis of self-efficacy outcomes



SMD 1.07 (95% CI 0.64 to 1.49)

Goal setting versus no goal setting

- Meta-analysis of motivation, adherence, & engagement measures



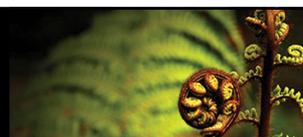
SMD 0.30 (95% CI -0.07 to 0.66)

Discussion



- Some (weak) evidence that any goal setting in rehab (compared to no goal setting) results in improved HRQOL or emotional status
- No evidence re. improvements in activity
- Some evidence re. improvement in self-efficacy
- Equivocal results re. impact on patient engagement in rehabilitation
- **Insufficient studies to undertake subgroup analysis**

Discussion



- Different reasons for using goals, and different rehabilitation contexts, will required different approaches to goal setting in clinical practice.
- One person in one rehab context may well benefit from more than one approach to goal setting.

Hardwood et al. 2012

- Maori & PI people with stroke
 - Grp 1. 'Take Charge' session (goal group)
 - Grp 2. Inspirational DVD
 - Grp 3. 'Take Charge' session plus DVD
 - Grp 4. Usual care
- The 'Take Charge' session resulted in significant improvements in SF-36 (physical) and less dependency on others.

Sewell et al. 2005

- People with COPD in pulm rehab.
 - Grp 1. Exercise based on COPM-derived goals (goal group)
 - Grp 2. Generic exercise (control)
- Both groups improved dramatically on HRQoL and exercise capacity, but...
- No signif. diff. between groups



Using goal achievement as an outcome measure



Primarily a discussion of Goal Attainment Scaling (GAS)

Score	Individual scale items	Standardised scale items
+2	Walk up and down a flight of 12 steps six times in two minutes without use of a stick.	Greatly exceed expected outcome
+1	Walk up a flight of 12 steps without use of a stick	Slightly exceeded expected outcome
0	Walk up a flight of 12 steps independently with aid of stick	Walk up a flight of 12 steps independently with aid of stick
-1	Walk up a flight of 12 steps with assistance of one person and stick	Not quite achieved expected outcome
-2	Not be able to walk up a flight of 12 steps even with maximal assistance	Nowhere near the expected outcome

T-Scores



$$\text{Overall GAS Score} = 50 + \frac{10 \sum (W_i X_i)}{\sqrt{0.7 \sum W_i^2 + 0.3 (\sum W_i)^2}}$$

Where:

- i = no. of goal for an individual patient
- X_i = the GAS score for each goal
- W_i = the weighting assigned to each goal
- Σ = means the 'sum of'

(Kiresuk & Sherman, 1968)

Drivers of goal achievement as an outcome



Since the 1970's

- Desire for **individualised outcome measures** to address heterogeneity in rehab populations.
- Dissatisfaction with the **sensitivity** of standard outcome measures.
- A move in the 80's towards healthcare as a **business** rather than a **service**, in need of KPIs

GAS in the UK



- Reporting on GAS outcomes now a contractual requirement in UK neurorehab services
- Used for benchmarking service performance

(NHS England, 2013; Turner-Stokes, 2014)

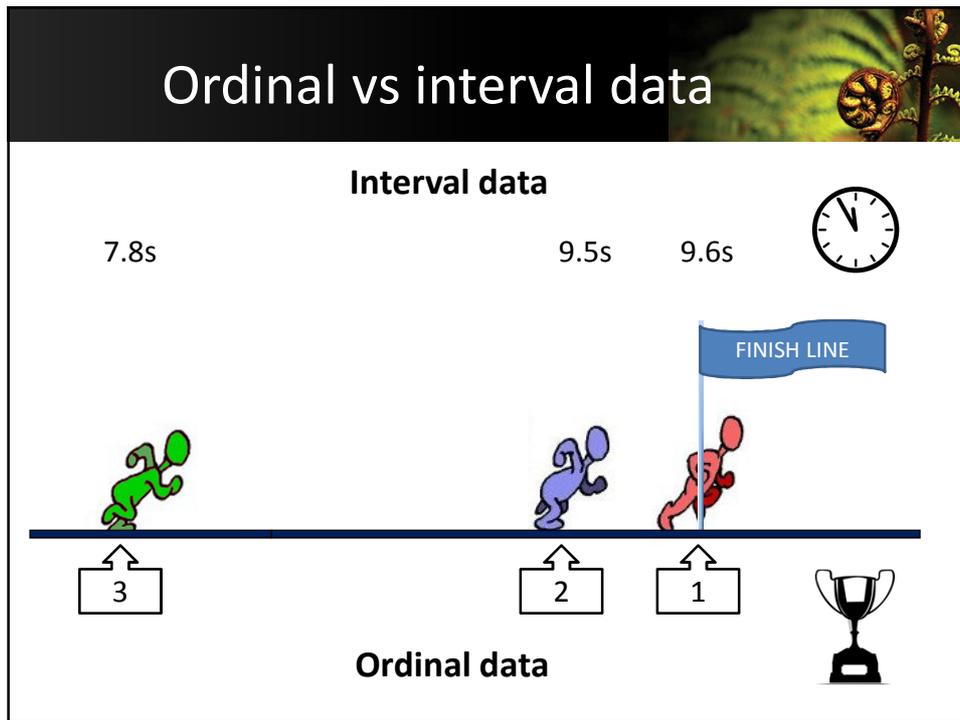
Should we be doing the same in NZ?
How valid is GAS as an outcome measure?

GAS as an measure of service performance



(Some) of my reservations:

- GAS T-scores assume GAS data is interval data when it is not
- GAS scales are not necessarily unidimensional
- GAS scores are difficult to interpret clinically
- GAS scores are open to observer bias
- Using goals for outcome evaluation may impact on other possible uses for goal setting



Interval data:

- Has a numerical value
- Is in a specific order, and
- The difference between each value on the measure is the same.

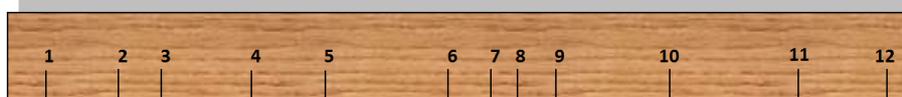
When data is *treated* as interval data, we assume these characteristics to be true.

Ordinal data:

- Has a numerical value
- Is in a specific order, and
- The difference between each value on the measure is **not** the same.

Limitations of ordinal data

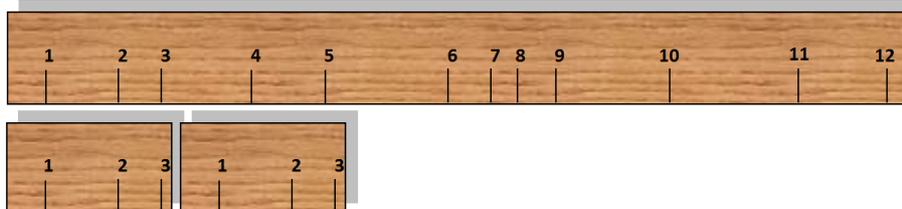
- Imagine an 'ordinal ruler'...



- The order of numbers on this ruler would *mean something*, but not the relative values on this ruler.

Limitations of ordinal data

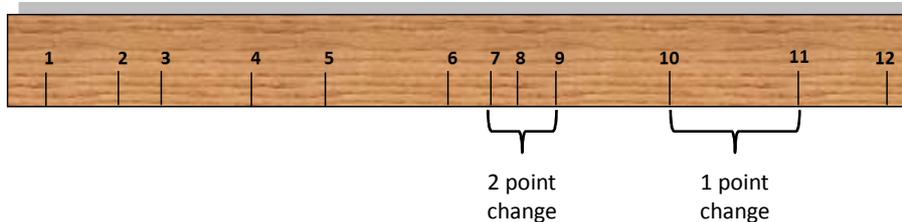
- Imagine an 'ordinal ruler'...



- $3 + 3$ on does not necessarily equal 6

Limitations of ordinal data

- Imagine an 'ordinal ruler'...



- A change of 2 points on one part of this ruler (e.g. from 7 to 9) might be *smaller* than a 1 point change on another part of the ruler (e.g. from 10 to 11)

Limitations of ordinal data

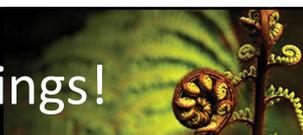


This means:

- Adding, multiplying, dividing scores
- Means
- Standard deviations etc...

... are inappropriate with ordinal data

T-Scores do all these things!



$$\text{Overall GAS Score} = 50 + \frac{10 \sum (WiXi)}{\sqrt{0.7 \sum Wi^2 + 0.3(\sum Wi^2)}}$$

Where:

- i = no. of goal for an individual patient
- Xi = the GAS score for each goal
- Wi = the weighting assigned to each goal
- Σ = means the 'sum of'

- In 15% of simulated data, the maths of T-scores produces clinically important difference where no different should exist

(Tennant, 2007)

Unidimensionality & GAS?

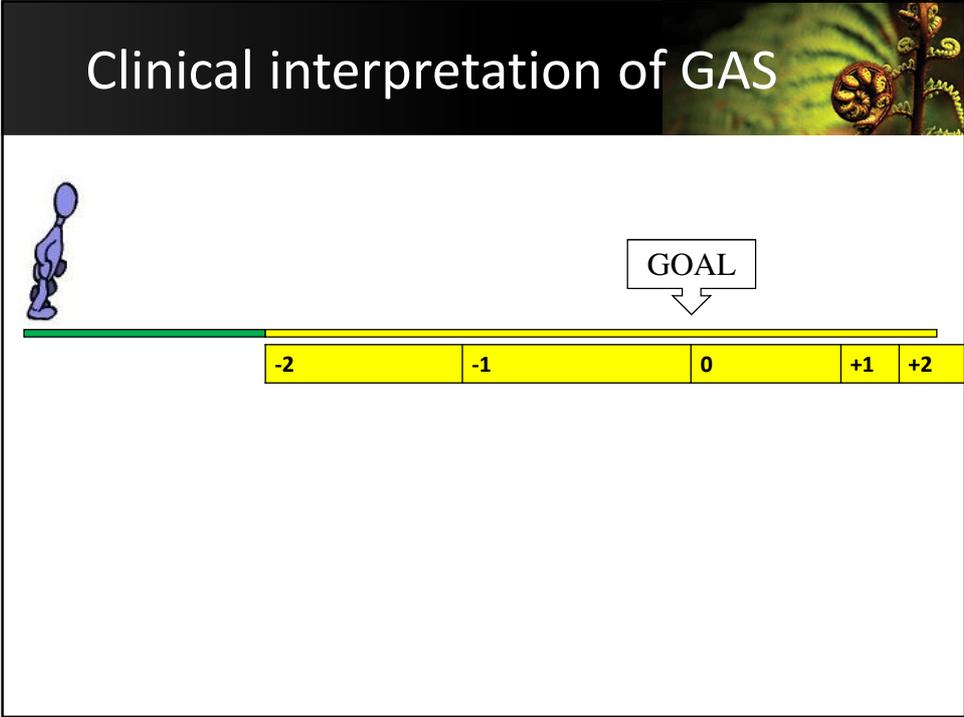
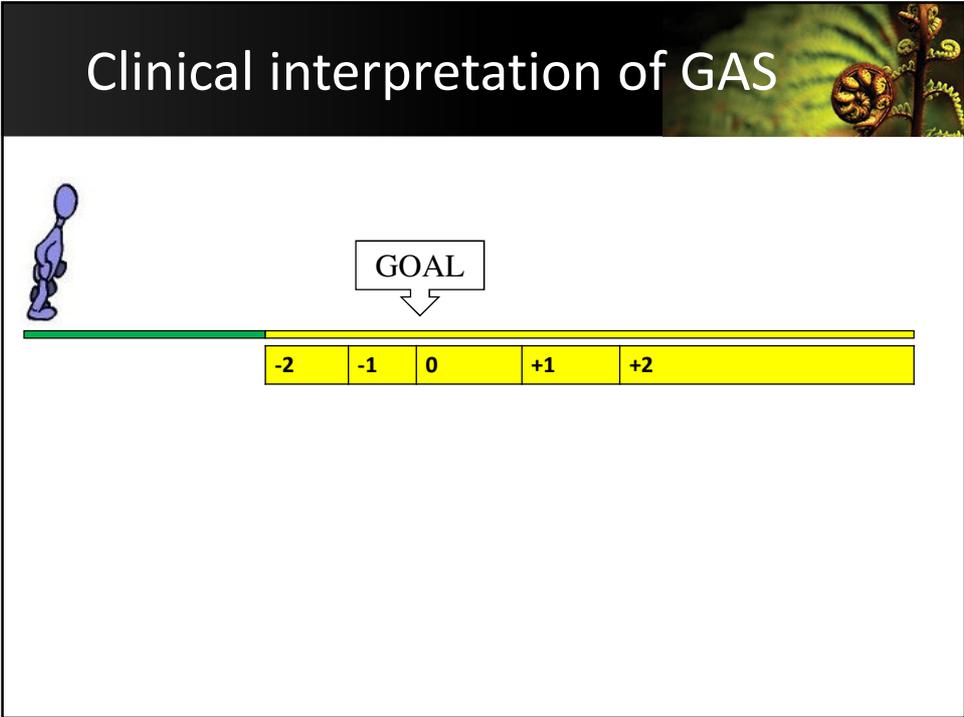
Score	Individual scale items
+2	Able to go to the zoo by him/herself
+1	Able to eat candy floss
0	Able to sit independently in chair for 1 hour
-1	Able to stay awake in bed for 1 hour
-2	Mostly dead

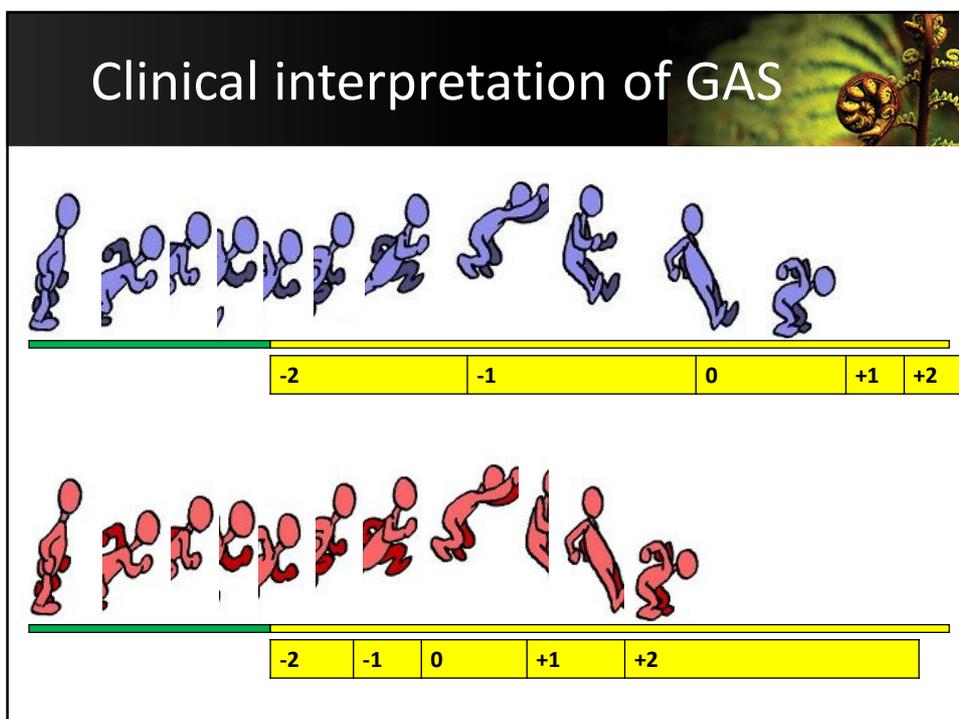
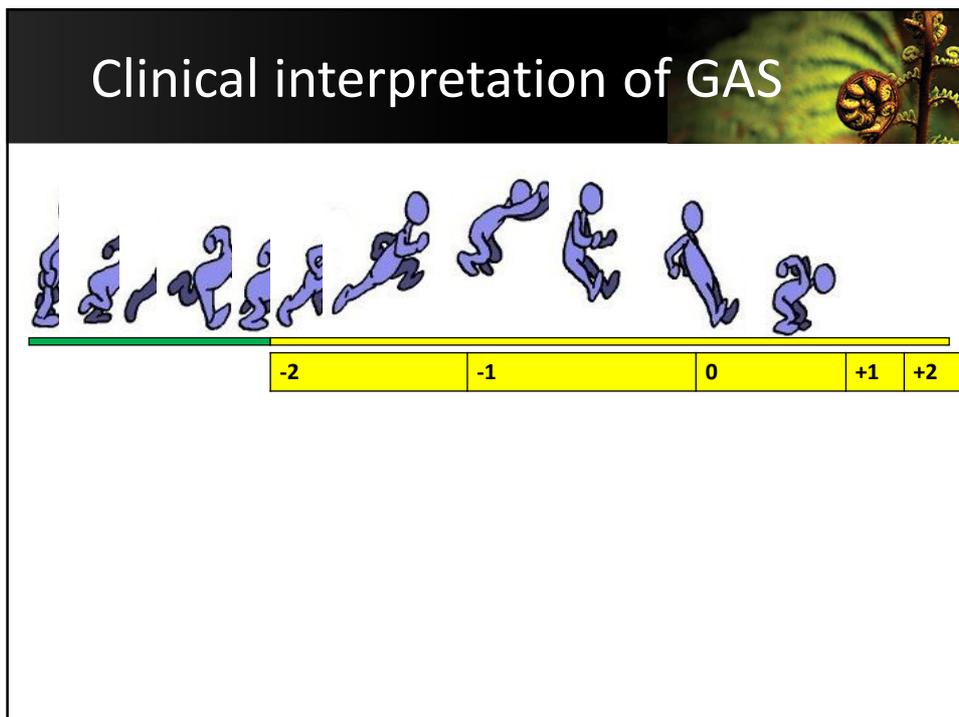
Clinical interpretation of GAS



GOAL







Clinical interpretation of GAS



What do GAS scores mean?

- If done 100% correctly, all GAS scores should be '0' (i.e. the expected outcome)
- If teams consistently score over '0', this may be evidence of 'attempts to inflate their results by setting goals over-cautiously'

(Turner-Stokes, 2009, p. 364)

Impact of GAS goals on other possible uses for goal setting



Goals and patient motivation

What is motivation?



- 'Motivation' is:
 - '... Mental functions that produce the incentive to act; the conscious or unconscious driving force for action.'
- (World Health Organisation, 2001, p. 51)

Motivation in rehab?



- A personality trait? (inside the individual)
- A behaviour influenced by environmental or social variables?
- A result of interaction between the two?

(Maclean and Pound, 2000)
- However, motivation is not the only purpose of goal setting, and...
- Goal setting is not the only influence on motivation

Motivational theories

- Drive reduction theories
 - Affective-arousal theories
 - Needs theories
 - Cognitive theories
 - Cognitive dissonance theory
 - Interest theory
 - Need Achievement theory
 - Needs Hierachy theory...
- ... etc

i.e. Goal planning is not the only way to influence motivation

Mechanisms of motivation via goal planning (& evidence)



Hypothesised mechanisms of motivation via goal setting



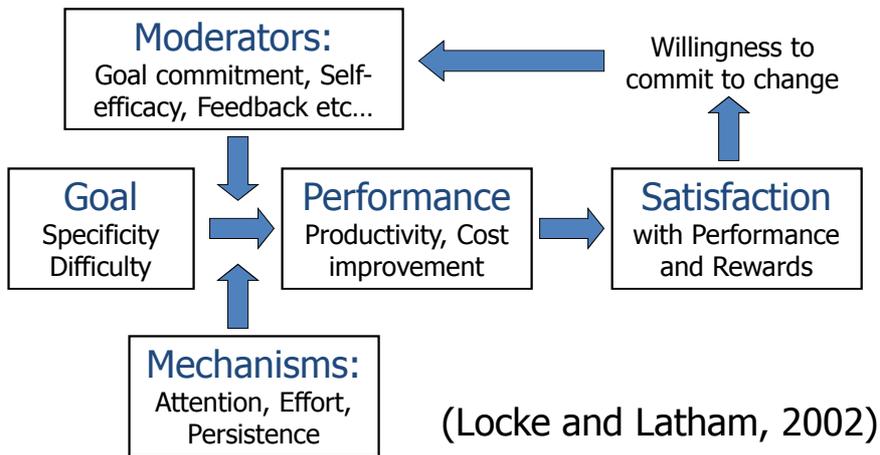
1. Skinner's Operant Conditioning
2. Bandura's Social Learning Theory
3. Locke & Latham's Goal Setting Theory
4. Carver & Scheier's Self-regulation Theory

Goals create drive

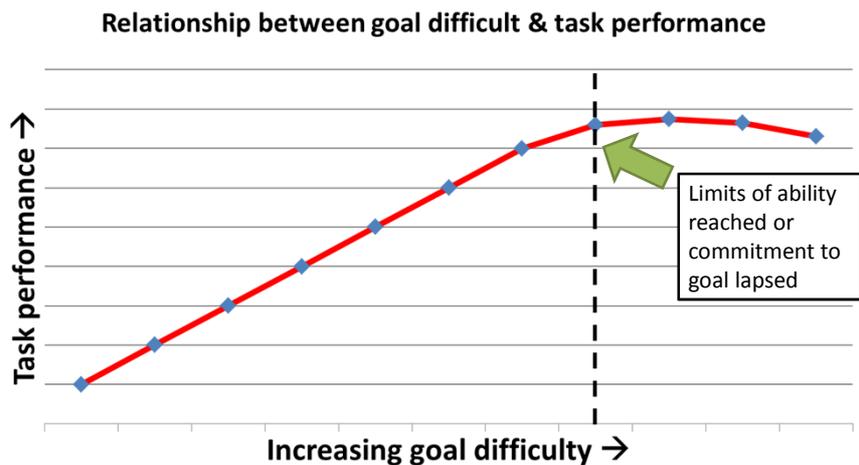


Because it was there

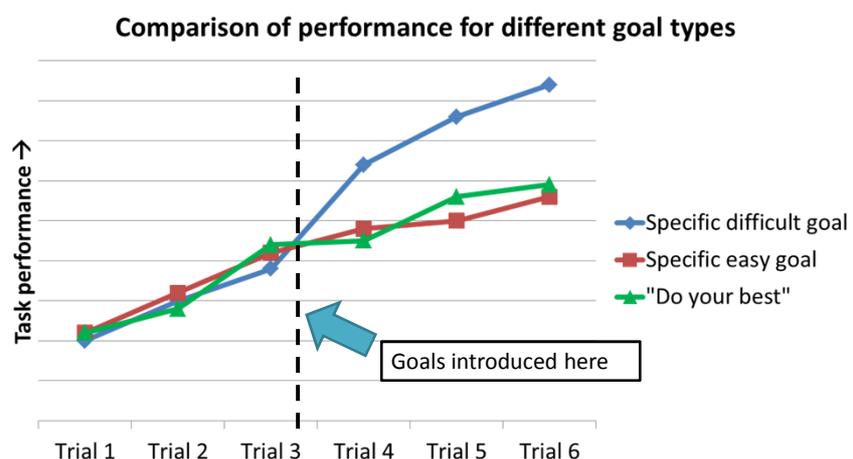
Locke and Latham's Goal Setting Theory



Locke and Latham's GST



Locke and Latham's GST



Locke and Latham's GST

Effect size

- Effect size associated with high goal difficulty:
SMD 0.52 to 0.82 (see [Cohen's d](#))
- Effect size associated with specific difficult goals vs 'do you best' instructions:
SMD 0.42 to 0.82

(Locke & Latham, 1990)

Because it was there



Strategies:

- Set specific, challenging goals
- Inform patients about these goals
- Encourage patients to believe they could achieve their goals
- Inform patients about their progress toward the goals, encouraging them to try harder

Because it was there



One additional implication:

- Need to evaluate outcome on the basis of actual achievements rather than on goal attainment

Because it was there

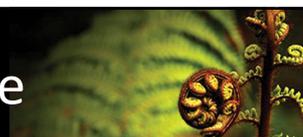


Discourse:

‘Goals influence the choice (direction), intensity, and persistence of behavior. Therefore, goal-setting has a motivational aspect for both patients and team members.’

(Gauggel and Hoop, 2004, p. 445)

Because it was there



Discourse:

‘...it has also been shown that perceived authority is a very powerful determinant of goal commitment; goals assigned by authority figures typically affect individuals’ personal goals.’

(Gauggel and Hoop, 2004, p. 441)

Because it was there



Evidence:

- Some RCT-level evidence that specific, difficult goals ↑ motivation on simple cognitive or motor tasks – at least for patient with acquired brain injury (Levack et al., 2006b)

HOWEVER...

- No consistent evidence that specific, difficult goals result in better rehab outcomes
(Levack et al., 2015)

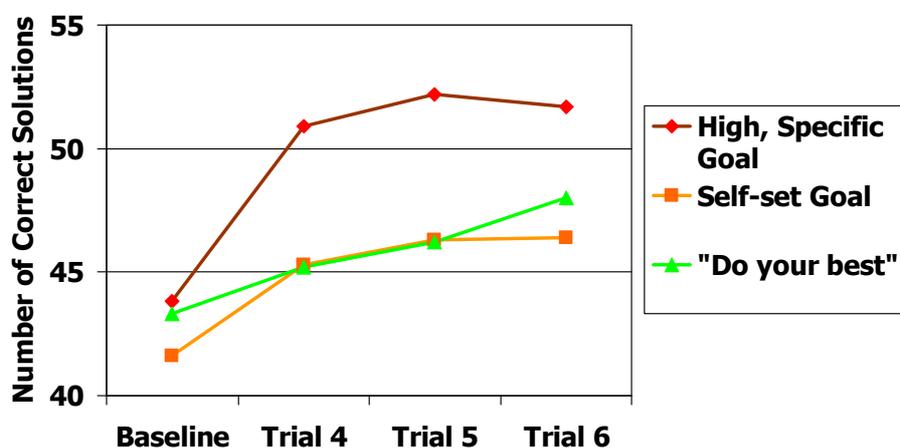
Example



Gauggel, Hoop, and Werner (2001)

- RCT, 87 patients with brain injury
- Simple arithmetic task on computer
- Pt randomly assigned to one of three groups
 1. Specific, high goal (120% of first performance)
 2. Personal goal has to be stated
 3. “Do your best” condition

Mean number of correct solutions following goal-setting



Derived from Gauggel et al (2002)

Discussion

- T-scores are probably meaningless
- Better to use non-parametric methods with raw GAS data
- Better again to use standardised outcome methods or even other individualised outcome measures than GAS
- Using goal attainment as an outcome impact on goal setting for other reasons
- However... the process of using GAS goals may have other benefits – such as discussing expectation with patients and families

SUMMARY POINTS



- Increasingly we are finding that goal setting in rehabilitation is not as simple as we once thought.
- Different approach to goal setting are required in different contexts for different people.
- Different reasons for using goal setting in clinical practice may also required different approaches.

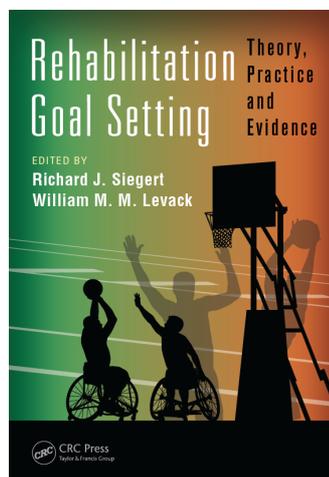
SUMMARY POINTS



- The future of goal setting in rehabilitation will be characterised by:
 - Increasing diversification,
 - Increasing specification, and
 - Increasing sophistication.
- Watch this space! 😊

Where to find more

RJ Siegert & WMM Levack (Eds). 2015. *Rehabilitation goal setting: Theory, practice, & evidence*. London: Taylor & Francis Group.



Where to find more

- Full Cochrane review:
Levack WMM, Weatherall M, et al. (2015). Goal setting and activities to enhance goal pursuit for adults with acquired disabilities participating in rehabilitation. *Cochrane Database of Systematic Reviews, Issue 7, Art. CD009727*.
- Summary for clinicians:
Levack WMM, Weatherall M, et al. (2016). Goal setting and strategies to enhance goal pursuit in adult rehabilitation: summary of a Cochrane systematic review and meta-analysis. *Eur J Phys Rehabil Med, 52(3), 400-416*.
- Podcast:
www.cochrane.org/podcasts/10.1002/14651858.CD009727.pub2
(or: <http://tinyurl.com/ha5rjdg>)



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