The Effects of Graded Tasks on Physical Activity (Behaviour Change Taxonomy Version 1: 8.7): A Systematic Review and Meta-Analysis

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Introduction

- At a time when people are becoming less physically active[1] it is important that interventions used to increase physical activity are evidence based[2].
- **Graded Tasks have been associated with effective physical activity interventions[3]**.
- This research contributes to addressing the call for more detailed observations of the functions of individual Behaviour Change Techniques (BCTs)[4].

A systematic review and meta-analysis was undertaken to answer the following research questions:

- **To what extent is the behaviour change technique Graded Tasks (BCT Taxonomy Version 1 (BCTTv1)[5] number 8.7), delivered alongside any other BCTs, effective in increasing physical activity?**
- **To what extent is the BCT Graded Tasks (8.7) uniquely effective in increasing physical activity?**
- **Which BCTs are commonly administered alongside Graded Tasks (8.7) and to what extent are they uniquely effective in increasing physical activity?**

The BCTTv1[5] defines Graded Tasks as:

> Set easy-to-perform tasks, making them increasingly difficult, but achievable, until the behaviour is performed

Goal Setting (Behaviour)

The nature of Graded Tasks necessitates Goal Setting. Breaking down the goals involves adjustments to frequency, intensity and/or duration, core components of Action Planning

Action Planning

Additional nuance was required for this systematic review

- At least two increments
- Only upward progression; maintenance phases allowed

Box 1

Methods

- Prior to starting the review, a precise definition of Graded Tasks was required, beginning with the BCTTv1 and adding further details (box1).
- Nine databases were searched alongside hand-searching.
- **Included studies were randomised controlled trials of interventions aiming to increase physical activity by means of Graded Tasks either in isolation or with other BCTs.**
- Double coding of BCTs was undertaken, to identify BCTs which co-occurred with Graded Tasks.
- The primary meta-analysis employed a random effects model to calculate a pooled effect size for post-intervention physical activity outcomes using Hedges' *g* for standardised mean differences with 95% confidence intervals.

Discussion

- **Graded Tasks were used within complex interventions alongside a range of other BCTs.** This is consistent with the multifaceted approach commonly seen in effective physical activity interventions[6].
- **The moderate effect size observed in these interventions may stem from the characteristics of Graded Tasks, Goal Setting, Action Planning, often accompanied by personalisation.** Goal setting has demonstrable effectiveness as a BCT[7] and personalisation likely enhances effectiveness[8].
- Feedback and Self-Monitoring, the most effective of the commonly occurring BCTs, are well suited to such structured personalised interventions.

Results

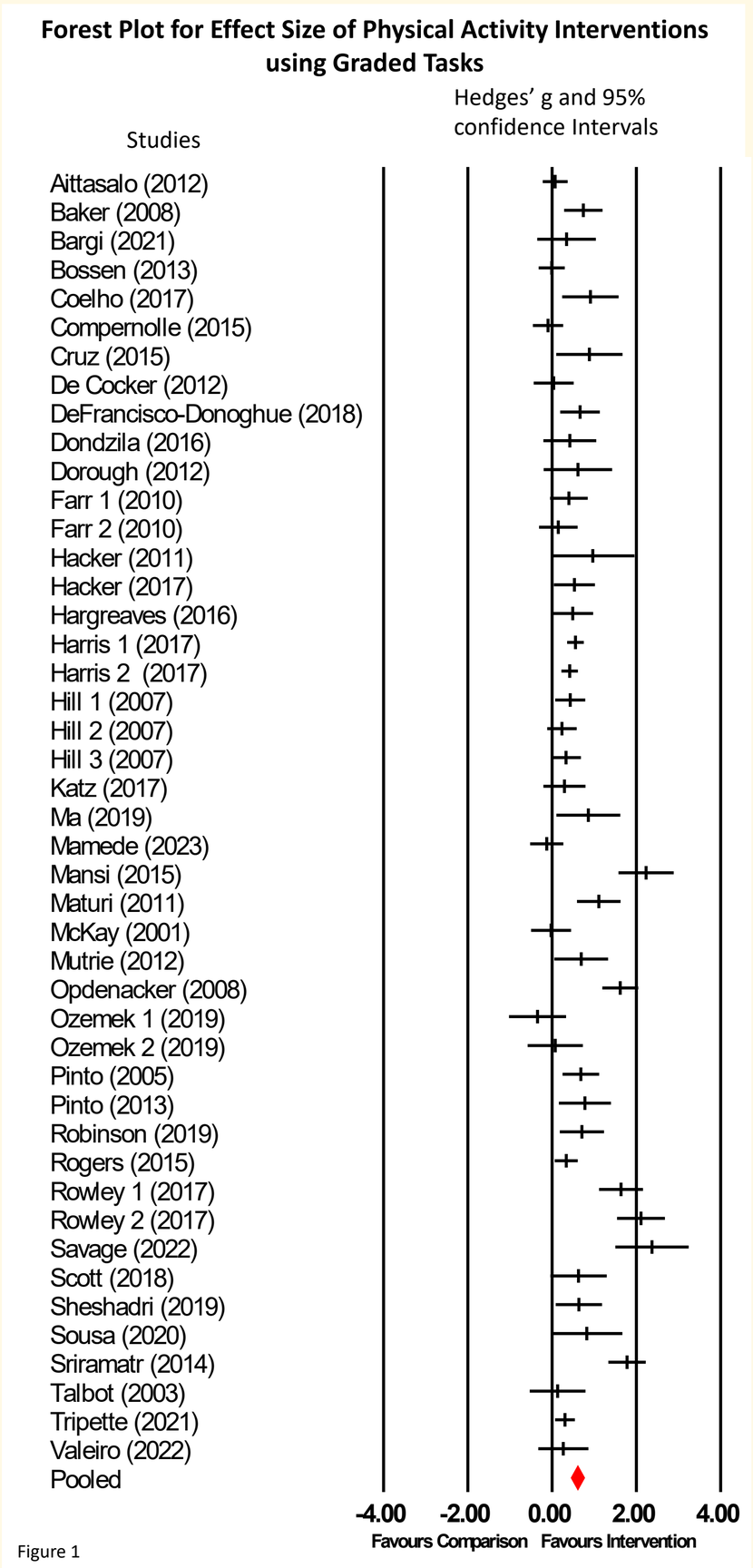

Figure 1

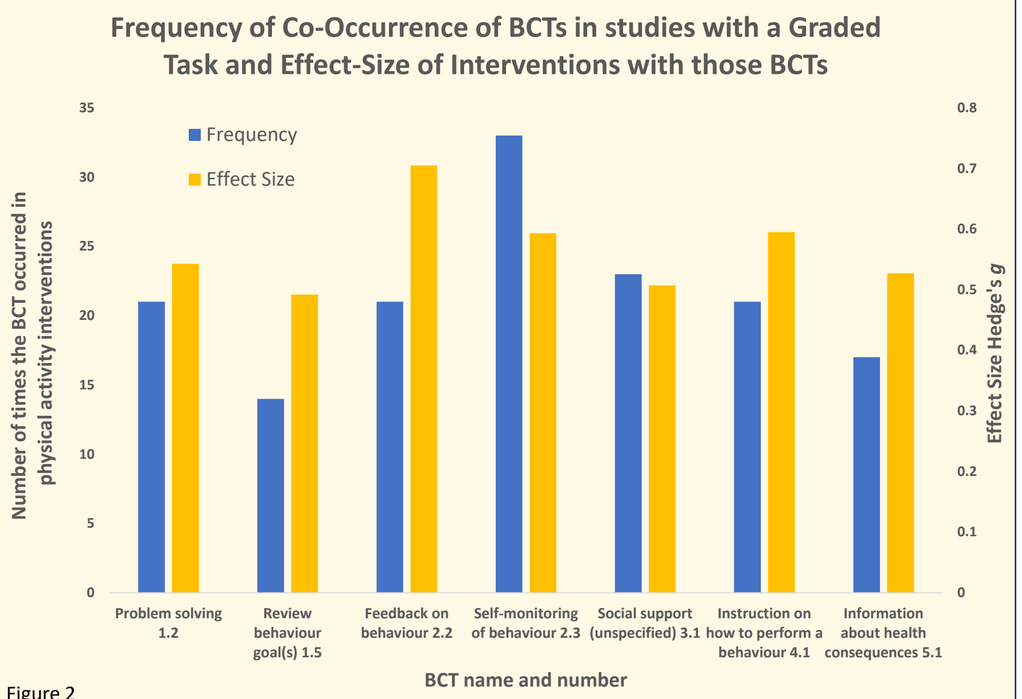

Figure 2

- The systematic review included 51 studies; 39 were included in the meta-analysis. From the 39 studies, 45 individual interventions were included in the meta-analysis.
- Number of BCTs in an intervention ranged from 4 to 29 with an average of 8.12. Forty-five different BCTS were identified across the 51 studies.
- Meta-analyses were conducted individually on the 7 BCTs which occurred in >10 studies (figure 2).
- **The combination of Graded Tasks, Goal Setting, and Action Planning was always accompanied by other BCTs.**

- **Participants engaged in an intervention containing a Graded Task were significantly more likely to undertake higher levels of physical activity than those in a comparison group (*g* = 0.602, [95% CI = 0.45-0.76])**, representing a moderate effect with a high level of heterogeneity (I^2 = 82%) (figure 1).
- When 10 high risk studies were removed the moderate effect size was retained (*g* = 0.656, [95% CI = 0.480- 0.832], I^2 = 81%).
- Trim and fill analysis gave a lower adjusted effect size of 0.347, suggesting potential publication bias.

Conclusions

- **Graded Tasks were always used alongside other BCTs, never in isolation.**
- **Physical activity interventions which included Graded Tasks were more likely to be effective compared to a comparison group without them**.
- **Consequently, Graded Tasks emerge as a potentially suitable BCT for inclusion in physical activity interventions.**

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