Identifying effective behaviour change techniques in brief interventions to reduce alcohol consumption

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Society for the Study of Addiction: York, Oct 2010

Acknowledgments

- Prof Robert West
- Dr Craig Whittington
- Zainab Hamoudi
- Feri Zarnani

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Background

- Brief interventions for excessive alcohol use have a small but clinically significant effect (Cochrane, 2007)
- Little is known about the 'active ingredients' within these multi-faceted interventions
- This limits the capacity to
  - develop evidence-based training for those delivering such interventions
  - design more effective interventions

Current reliable methods for describing content: adherence and/or competence

- Examples
  - The UK Alcohol Treatment Trial Process Rating Scale (UKATT PRS) (Tober et al, 2008),
  - Yale Adherence and Competence Scale (YACS) (Carrol et al, 2000)
  - Motivational Interviewing Treatment Integrity Scale (MITI) (Madson and Campbell, 2006).
  - The Adherence-Competence Scale for IDC for Cocaine Dependence (Barber, Mercer, Krakauer and Calvo, 1996)
- Reliable at level of sub-scales, between 5 and 11 items
  - very generic and/or describe therapeutic style and/or multicomponent
    - e.g. ‘encouraging abstinence’, ‘task oriented’, ‘12-step facilitation’

How best to specify content?

- Need a consistent terminology for specifying intervention content
  - that can be reliably applied to
    - intervention protocols and published reports
    - training programmes and clinical practice

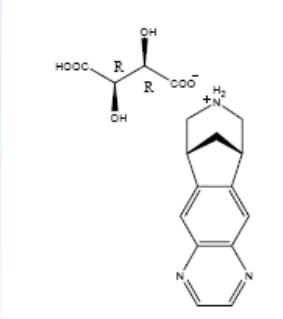
Example of the problem: Descriptions of "behavioural counselling" in two interventions

Title of journal article	Description of "behavioural counseling"
The impact of ***behavioral counseling*** on stage of change fat intake, physical activity, and cigarette smoking in adults at increased risk of coronary heart disease	"***educating*** patients about the benefits of lifestyle change, encouraging them, and suggesting what changes could be made" (Steptoe et al. *AJPH* 2001)
Effects of internet ***behavioral counseling*** on weight loss in adults at risk for Type 2 diabetes	"***feedback*** on ***self-monitoring*** record, ***reinforcement***, recommendations for change, answers to questions, and general support" (Tate et al. *JAMA* 2003)

Biomedicine vs behavioural science …
example of smoking cessation effectiveness

Varenicline *JAMA*, 2006

- Intervention content



- Mechanism of action
  - Activity at a subtype of the nicotinic receptor where its binding produces agonistic activity, while simultaneously preventing binding to a4b2 receptors

Behavioural counselling *Cochrane*, 2005

- Intervention content
  - Review smoking history & motivation to quit
  - Help identify high risk situations
  - Generate problem-solving strategies
  - Non-specific support & encouragement
- Mechanism of action
  - *None mentioned*

Recent work

- Developed taxonomies of intervention components ("behaviour change techniques/ BCTs")
  - individual and group behavioural support for smoking cessation
    - 71 BCTs (Michie, Churchill & West, online)
  - interventions to increase physical activity and healthy eating
    - 40 BCTs (Michie et al, in press)

Effectiveness research using taxonomy approach

- Question
  - What is the association between intervention content and outcome in the Stop Smoking Services?
- Method
  - BCT analysis of treatment manuals from 43 primary care organisations
  - 4 week quit rates obtained from DH for >100,000 smokers in those services

West, Walia, Hyder, Shahab & Michie, 2010

Results

- Mean of 22 BCTs
  - range 9-37
- 9 BCTs associated with both self-reported and CO-verified 4-week quit rates e.g.
  - strengthen ex-smoker identity
  - provide rewards contingent on abstinence
  - advise on medication
  - measure CO
- Further 5 BCTs associated with CO-verified but not self-reported quit rates e.g.
  - advise on/facilitate use of social support
  - provide reassurance

Brief interventions for excessive alcohol use

Study objectives

1. Develop a taxonomy for reliably describing treatment manuals and published reports
2. Compare BCTs in guidance documents with those in treatment manuals and trialled interventions (Kaner et al, 2007)
3. Investigate evidence of effectiveness of BCTs
4. Compare BCTs with those used for other behaviours

Development of taxonomy: method

- Source material
  - 9 guidance documents describing recommended practice identified via expert consultation (n=11)
  - 3 treatment manuals identified by contacting experts and a sample of primary care health organisations
- Analysed into component BCTs
  - two independent coders identified BCTs
    - assessed inter-coder reliability

The guidance documents

1. Babor & Higgins-Biddle (2001) Brief intervention for hazardous and harmful drinking: A manual for use in primary care. World Health Organization: Geneva.
2. U.S. Department of Health & Human Services (2005). Helping patients who drink too much: A clinician's guide. National Institute on Alcohol Abuse and Alcoholism
3. Anderson et al (2005). Alcohol and Primary Health Care: Clinical Guidelines on Identification and Brief Interventions. Department of Health of the Government of Catalonia: Barcelona.
4. Gual et al. (2005). Alcohol and Primary Health Care: Training Programme on Identification and Brief Interventions. Department of Health of the Government of Catalonia: Barcelona.
5. National Health Service (2008) Your drinking and you. The facts on alcohol and how to cut down. Department of Health.
6. National Institute on Alcohol Abuse and Alcoholism (2001). How to Cut Down on Your Drinking. Department of Health and Human Services.
7. Kaner, E. et al (2006). How much is too much? Level 1 Simple Structured Advice. Institute of Health & Society:,Newcastle University.
8. Kaner, E. et al (2006). How much is too much? Level 2 Extended Brief Interventions. Institute of Health & Society:,Newcastle University.
9. Kaner, E and Heather, N. (2007). How much is too much? Patient Booklet. Institute of Health & Society. Newcastle University

The treatment manuals

- Tober et al (2002) Manual For Motivational Enhancement Therapy (DRAFT).
- Copello et al (2009) Social Behaviour and Network Therapy for Alcohol Problems
- Central and North West London NHS Foundation Trust alcohol intervention protocol (accessed 2009).

Results: 1. The taxonomy and its application

- 42 BCTs identified
  - 34 from guidance documents
  - additional 8 from treatment manuals
- Reliably extracted
  - average inter-rater agreement 80%
- Cochrane reviewed interventions
  - 19 of 42 BCTs in 18 trials, 6 BCTs in only 1 trial
- NHS treatment manuals
  - 8 BCTs from guidance documents not included
  - 8 additional BCTs

2. Comparison of BCTs: guidance documents vs interventions in Cochrane review

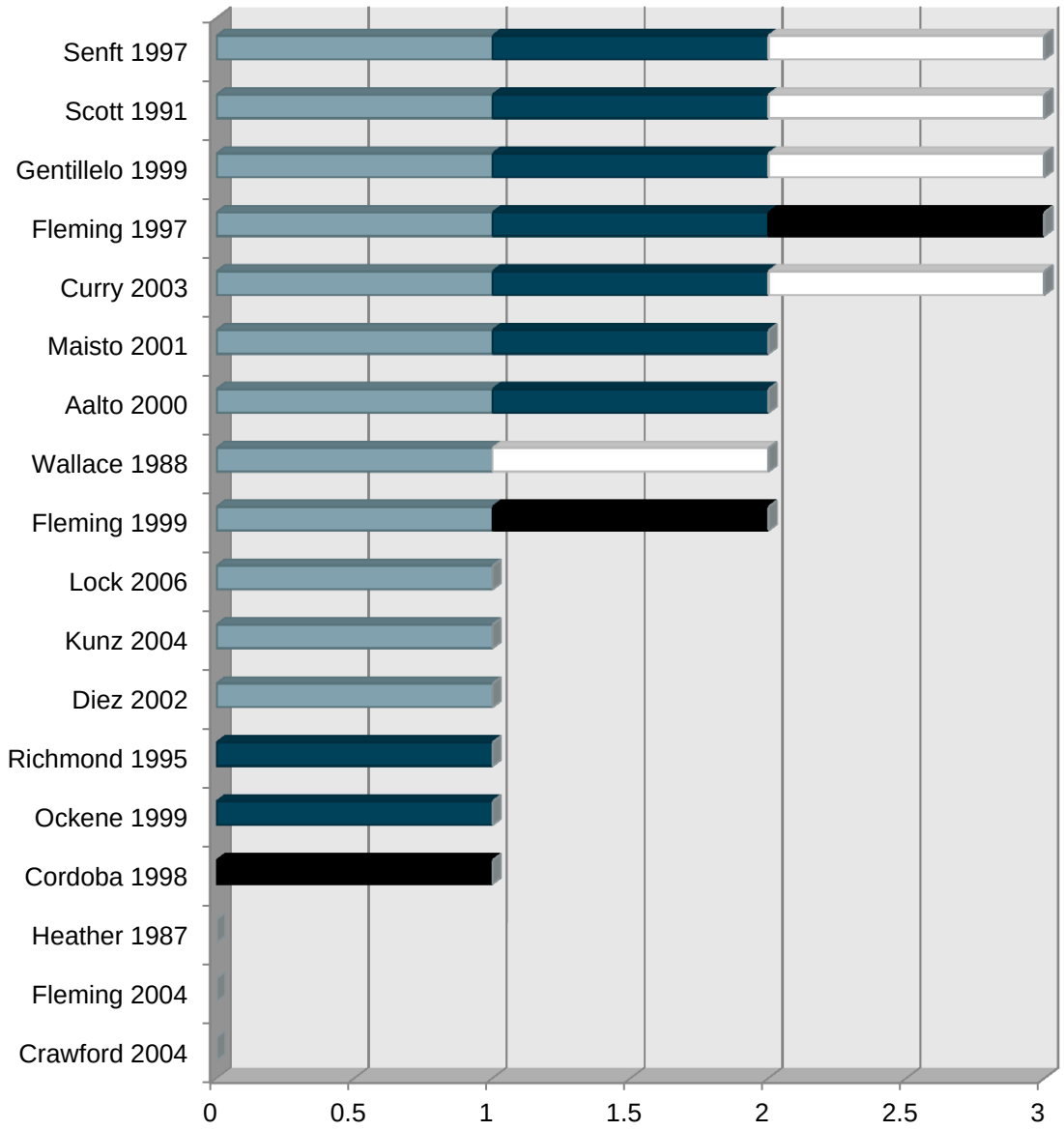
BCTs in majority of guidance documents (all present in treatment manuals)	**Frequency in 9 guidance documents**
Facilitate goal setting	9
Identify reasons for wanting and not wanting to reduce excessive alcohol use	7
Facilitate action planning/ help identify relapse triggers	7
Advise on/facilitate use of social support	6
Provide information on consequences of excessive alcohol use and reducing excessive alcohol use	5
Boost motivation and self-efficacy	5
Provide feedback on performance	5
Behaviour substitution	5

BCTs: Guidance documents vs treatment manuals

3. Evidence of effective BCTs

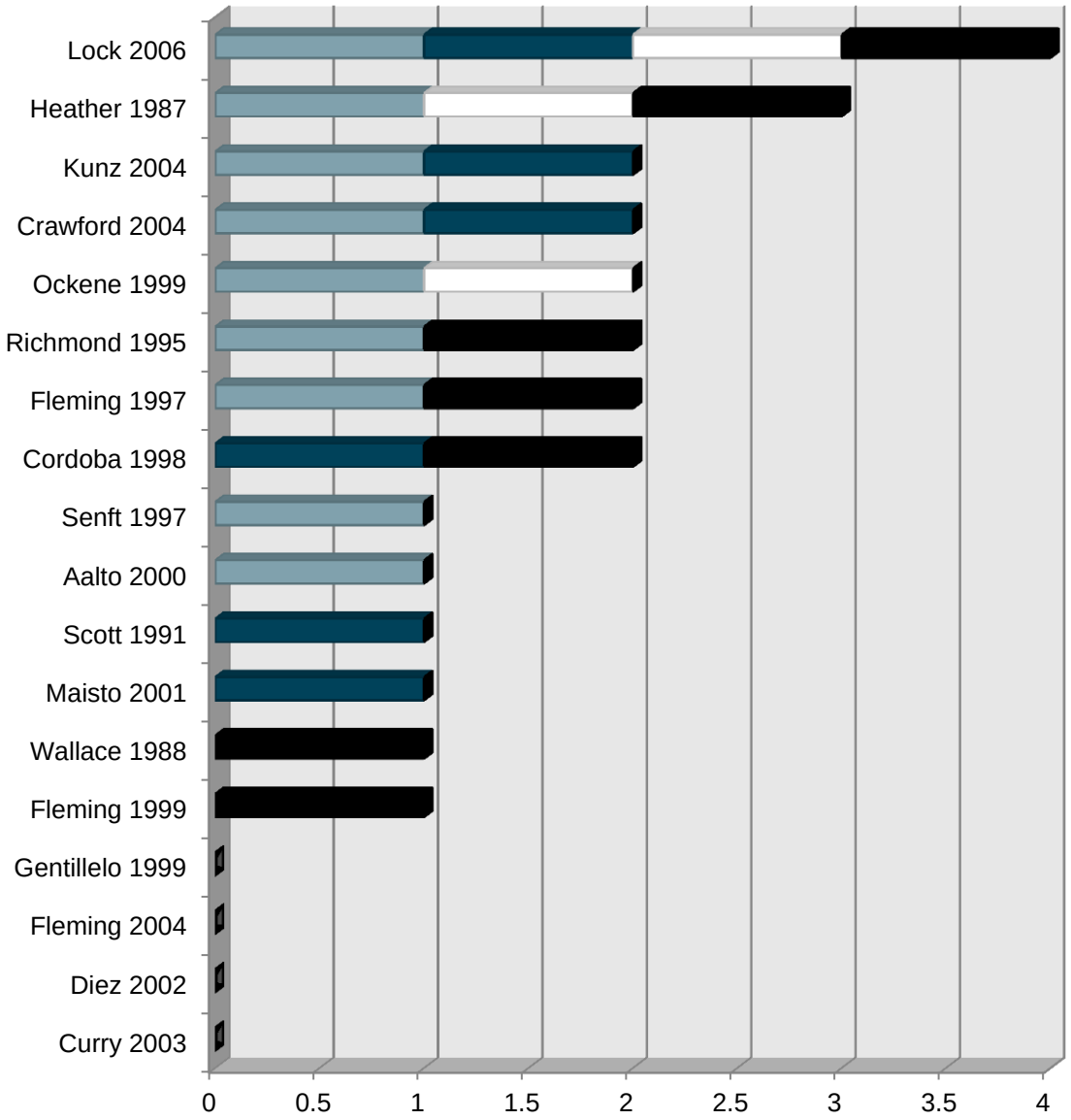
- Meta-regression of 18 trials in Cochrane review
- Three multivariate models for BCTs appearing in at least 3 trials
  - motivation cluster e.g.
    - seek commitment, information on consequences, reward effort
  - self-regulation cluster e.g.
    - self-recording, goal setting, action planning, review of goals
  - non-theory cluster
    - assessment, written materials, motivational interviewing

Motivation cluster



- Info. on consequences
- Boost motivation and self efficacy
- Provide normative information
- Prompt commitment
- Provide rewards

Self-regulation cluster



- Facilitate action planning
- Facilitate goal setting
- Prompt review of goals
- Prompt self-recording

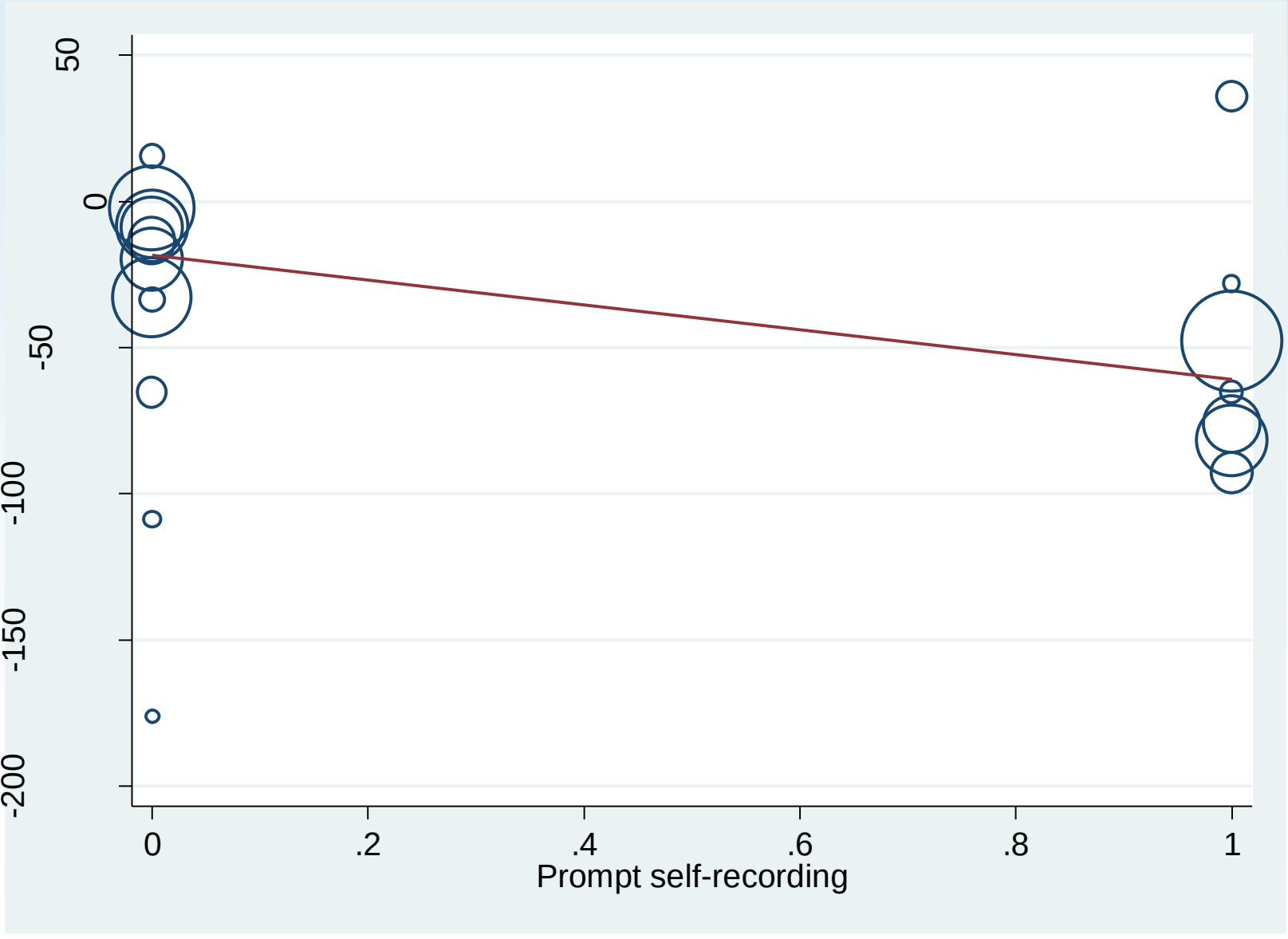
Results of meta-regression

- Substantial between-study heterogeneity of effect sizes (I^2 = 61%)
  - no outliers, publication bias unlikely
- Only the self-regulation cluster explained a significant amount of the variation in effect sizes between studies
  - adjusted R^2 = 98% (residual I^2 = 29%)
- Within self-regulation cluster, prompting self-recording was the most important BCT
- Within motivation cluster, prompting commitment there and then most important

Multivariate meta-regression analysis for the self-regulation cluster

Behaviour Change Technique	**Yes *k* (N)**	**No *k* (N)**	**β (95% CI)**	**P-value**
Facilitate action planning/know how to identify relapse triggers	9 (3398)	9 (3785)	14.78 (-15.02, 44.58)	.303
Facilitate goal-setting	6 (1992)	12 (5191)	-21.75 (-61.34, 17.83)	.256
Prompt review of goals	3 (761)	15 (6422)	-28.50 (-72.51, 15.51)	.185
Prompt self-recording	7 (2807)	11 (4376)	-50.49 (-78.00, 22.99)	**.002**

Bubble plot of mean diff (Alcohol g/day) against the BCT

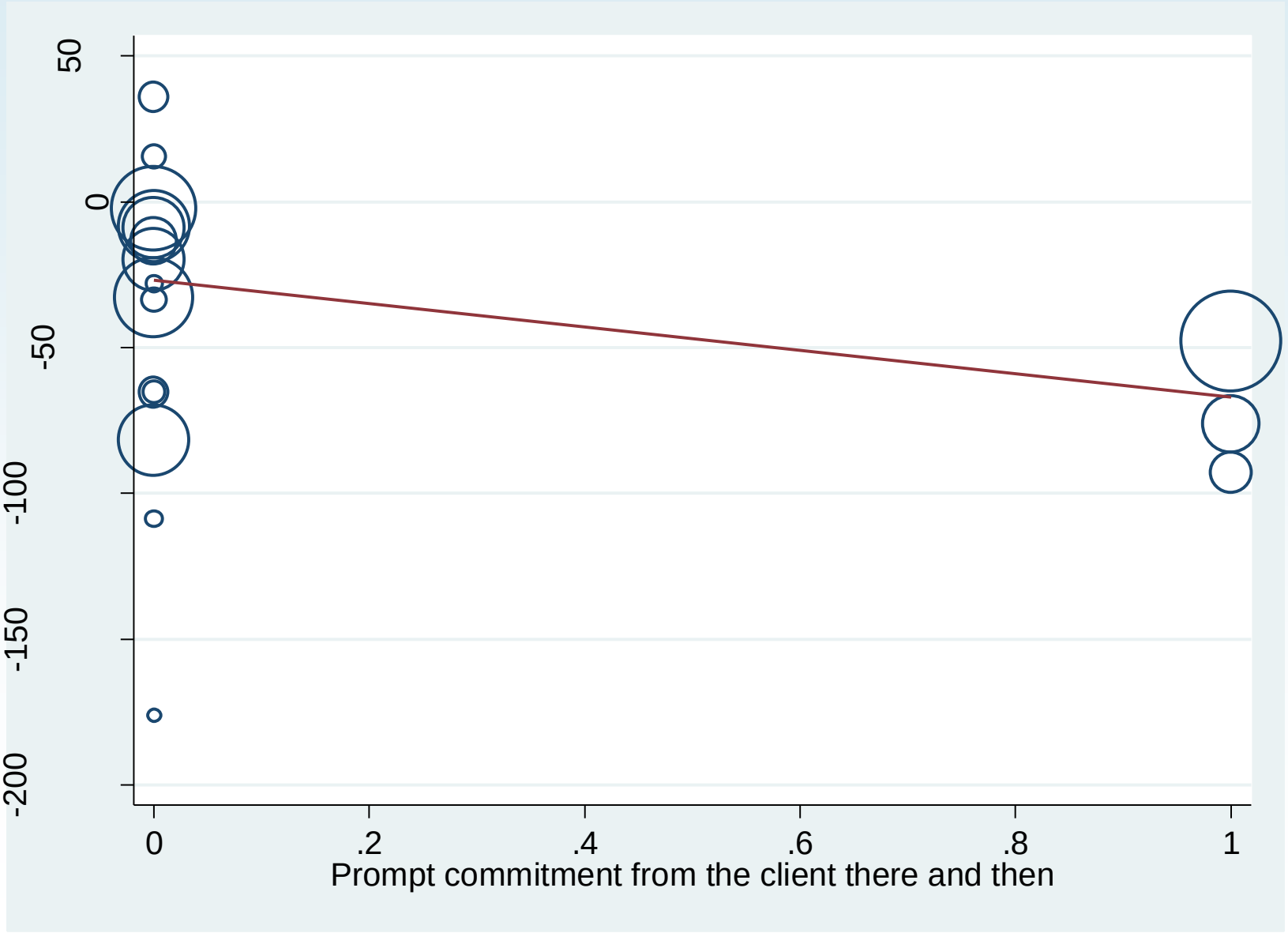


For the BCT:
0=No
1=Yes

Multivariate meta-regression analysis for the motivation cluster

Behaviour Change Technique	**Yes *k* (N)**	**No *k* (N)**	**β (95% CI)**	**P-value**
Provide information on consequences of drinking and drinking cessation	12 (5048)	6 (2135)	13.49 (-28.25, 55.23)	.497
Boost motivation and self efficacy	9 (3795)	9 (3388)	28.68 (-4.72, 62.08)	.086
Provide normative information about others' behaviour and experiences	5 (2746)	13 (4437)	-38.10 (-82.83, 6.63)	.089
Prompt commitment from the client there and then	3 (1478)	15 (5705)	-54.00 (-97.53, 10.48)	**.019**
Provide rewards contingent on effort or progress	0	18 (7183)	–	–

Bubble plot of mean diff (Alcohol g/day) against the BCT



For the BCT:
0=No
1=Yes

4. BCTs used for other behaviours

- 26 BCTs used to intervene with other behaviours but not in brief alcohol interventions
  - 6 in smoking cessation
  - 21 in physical activity/healthy eating interventions
- 'Behavioural substitution' used in alcohol but not in other interventions

Conclusion

- It is possible to reliably identify BCTs recommended for brief interventions for excessive alcohol interventions
- This provides a methodological tool for specifying intervention content
  - thus improving reporting, replication and implementation
- Also provides the basis for investigating the effectiveness of BCTs within effective multi-component interventions
- Brief alcohol interventions could be improved by a more systematic approach to identifying and applying BCTs associated with better outcomes

More information from

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