

Data supplement to:

Cristea et al. Efficacy of cognitive bias modification interventions in anxiety and depression: meta-analysis. *Br J Psychiatry* doi: 10.1192/bjp.bp.114.146761

Online supplement DS1

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Online supplement DS2

List of studies included in the meta-analysis

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Table DS1 Selected characteristics of included studies of cognitive bias modification interventions

Study ^a	Population ^a	N	CBM ^b	Control ^b	Conc Tx ^b	Symptom Measures ^c	D ^d	Ns ^d	FU ^d
Amir, 2008	SP sympt (LSAS > 26)	94	ABM (disgust faces)	No cont		STAI-S	L	1	-
Amir, 2009	GAD diagnosis (SCID)	29	ABM (threat words)	No cont		SCID; HAM-A; STAI-S/T; BDI-II; HAM-D; WDQ; PSWQ	L	8	-
Amir, 2010	SP sympt (LSAS >= 26)	57	CBM-I (benign)	No cont		STAI-S	L	1	-
Amir, 2011	GSP diagnosis (SCID)	112	ABM (disgust faces)	No cont		LSAS	L	8	-
Baert , 2010 St 1	Depressed students (BDI-II > 19)	55	ABM (negative words)	No cont		BDI-II; MASQ, POMS-SF; RSQ-RRS	H	10	-
Baert , 2010 St 2	MDD patients (MINI)	44	ABM (negative words)	No cont	TAU	BDI-II; MASQ; POMS-SF; RSQ-RRS	H	10	-
Beard, 2008	SP students (SPAI-SP > 92)	27	CBM-I (benign)	No cont		SPAI-SP; STAI-T; BDI-II	L	8	-
Boettcher et al, 2013	SP diagnosis (SCID) (community)	129	ABM (threat) (words/words & faces)	ABM (attend); No cont (words/words& faces)		LSAS-SR; SPS; SIAS; MADRS; BAI; QOLI	H	14	4 mths
Bowler, 2012	High SA (FNE >= 17)	71	CBM-I (benign)	cCBT; WL		FNE; SPIN; STAI-T; BDI-II	L	4	-
Carlbring , 2012	SP diagnosis (SCID)	79	ABM (disgust faces)	No cont		SCID; LSAS-SR; SPS; SIAS; BAI; SPSQ; QOLI	H	8	4 mths
Eberl, 2012	Alcohol dependency (primary)	475	A-AAT	WL	TAU (CBT)	Relapse	L	12	1 yr
Field, 2009	Tobacco smokers	72	ABM (smoking pictures)	ABM (attend); No cont		QSU brief	L	1	1 day
Harris, 1998	Unselected students	42	ABM (spider pictures)	ABM (attend)		SPQ	L	1	-
Hazen , 2009	Severe worry (PSWQ > 60)	24	ABM (threat words)	No cont		PSWQ; STAI-S; BDI-II	L	5	-

Heeren , 2012	GSP diagnosis (MINI)	60	ABM (threat faces)	ABM (attend); No cont		LSAS; FNE	L	4	2 wk
Hirsch , 2007	Unselected students	24	CBM-I (positive)	CBM-I (negative)		STAI-S	L	1	-
Holmes, 2005 St 2	Unselected students	51	CBM-I (benign) (verbal/imagery)	CBM-I (negative) (verbal/imagery)		STAI-S	L	1	-
Hoppitt , 2010	Unselected community volunteers	112	CBM-I (non-threat) (active/passive)	CBM-I (threat) (active/passive)		STAI-S	L	1	-
Lang , 2009	Unselected students	40	CBM-I (positive)	CBM-I (negative)		PANAS	L	1	1 wk
Lang , 2012	Current MDD episode	28	CBM-I (positive)	No cont		BDI; HAM-D; STAI-T; IES; RIQ	L+ H	7	2 wks
Lester, 2011 St 1	Unselected students	60	CBM-I (non-negative)	CBM-I (negative)		STAI-S; PANAS	L	1	-
Lester, 2011, St 2	Cognitively vulnerable students (0.5 SD > CCL)	70	CBM-I (non-negative & positive)	WL		STAI-T; STAI-S; BDI-II; PANAS; CCL	L	2	-
Li, 2008	SP students (27% highest scores on the SIAS)	24	ABM (threat faces)	No cont		SIAS; SPS; FNE	L	7	-
Mackintosh,2006 St 2	Unselected community volunteers	40	CBM-I (positive) (visual/auditory)	CBM-I (negative) (visual/auditory)		STAI-S	L	1	-
Mathews, 2007	High TA (STAI-T > 40)	40	CBM-I (positive)	WL		STAI-S	L	4	1 wk
Murphy, 2007	High SA (FNE >= 17)	66	CBM-I (positive); CBM-I (non-negative)	No cont		STAI-S	L	1	-
Najmi, 2010	OC contamination sympt (MOCI cleaning > 4)	52	ABM (threat words)	No cont		MOCI; STAI-S	L	1	-
Neubauer, 2013	SA diagnosis (SCID)	59	ABM (disgust faces)	No cont		SCID; SPS; SIAS; LSAS-SR; BDI-II	H	8	4 mths
Peters, 2011	Unselected students	54	CBM-I (positive)	CBM-I (negative)		POMS-D	L	1	-
Rapee, 2013	SP (ADIS-IV)	134	ABM (threat words)	No cont	CBT	ADIS-IV; SIAS; SPS; DASS-D; LIS	L+ H	13	6 mths
Salemink, 2007a	Unselected students	128	CBM-I (positive)	CBM-I (negative)		STAI-S	L	1	-
Salemink, 2009	High TA (STAI-T > 45) + ASSIQ > 1.57	36	CBM-I (positive)	No cont		STAI-S ; STAI-T; FNE; SCL-90	H	8	-
Salemink, 2007b	Unselected students	81	CBM-I (positive)	CBM-I (negative)		STAI-S; STAI-T	L	1	-
Schmidt, 2009	GSP diagnosis	39	ABM (disgust	No cont		SCID-SA; LSAS; BSPTS;	L	8	4

Schoenmakers, 2010	(SCID) Alcohol dependency (primary) inpatients	43	faces) ABM (alcoholic pictures)	Categorization task	CBT	SPAI; STAI-T; BDI-II DAQ; Relapse	L	5	3	mths
Schoorl, 2013	PTSD diagnosis (outpatients)	102	ABM (trauma pictures)	No cont		CAPS; SRIP; HAM-D	H	8	3	wks
See, 2009	Unselected students	40	ABM (threat words)	No cont		STAI-T; STAI-S	H	15	-	
Sharpe, 2012 St 1	Acute back pain (physiotherapy)	54	ABM (pain words)	No cont	TAU	Pain VAS (current)	L	1	3	mths
Sharpe, 2012 St 2	Chronic pain	34	ABM (pain words)	No cont	CBT	Pain VAS;RMDQ;TSK; DASS; FPQ-R;ASI; PSEQ	L+H	4	6	mths
Steel, 2010	Schizophrenia diagnosis + anxiety (STAI-T > 40)	25	CBM-I (positive)	WL		STAI-S	L	1	-	
Steinman, 2010	High anxiety sensitivity students (ASI >= 27.5)	75	CBM-I (positive)	No cont; WL		ASI; PANAS-FS	L	1	-	
Tran, 2011	Unselected students	50	CBM-I (positive)	CBM-I (negative)		RSES	L	1	-	
Watkins, 2009	Dysphoria community volunteers (BDI-II > 14)	70	CNT	Bogus training; WL		HAM-D; BDI-II; RSQ-RRS; ATS	L+H	8	-	
Watkins, 2012	Current MDD episode or subthreshold	121	CNT	RT; TAU	TAU	HAM-D; BDI-II; PHQ-9; GAD-7; RSQ-RRS	L+H	4	3 & 6	mths
Wells, 2010	Depressed students (9<= BDI-II <= 16)	34	ABM (sad pictures)	No cont		BDI-II	L	4	2	wks
Wiers, 2011	Alcohol dependency (primary)	214	A-AAT (explicit); A-AAT (implicit)	No cont; WL	CBT	Relapse	L	4	1	yr
Yiend, 2005 St 1	STAI-T< 45 (community)	20	CBM-I (positive)	CBM-I (negative)		STAI-S	L	1	-	
Yiend, 2005 St 2	STAI-T< 45 (community)	24	CBM-I (positive) (passive)	CBM-I (negative) (passive)		STAI-S	L	1	-	
Yiend, 2005 St 3	STAI-T< 45 (community)	20	CBM-I (positive)	CBM-I (negative)		STAI-S	L	1	-	

Note. ^a St, study; SP, social phobia; LSAS, Liebowitz Social Anxiety Scale; GAD, generalized anxiety disorder; SCID, Structured Clinical Interview for DSM-IV; sympt, symptoms; GSP, generalized social phobia; BDI-II, Beck Depression Inventory-II; MDD, major depressive disorder; MINI, Mini International Neuropsychiatric Interview; HAM-D, Hamilton Depression Rating Scale; SPAI-SP, Social Phobia and Anxiety Inventory-Social Phobia; SA, social anxiety; FNE, Fear of Negative Evaluation; PSWQ, Penn State Worry Questionnaire; SD,

standard deviation; CCL, Cognition Checklist; SIAS, Social Interaction Anxiety Scale; TA, trait anxiety; STAI-T, State Trait Anxiety Inventory-Trait; OC- Obsessive compulsive; MOCI, Maudsley Obsessive Compulsive Inventory; ADIS-IV, Anxiety Disorders Interview Schedule for DSM IV; ASSIQ, Ambiguous Social Situation Interpretation Questionnaire; PTSD, Post-traumatic stress disorder; ASI, Anxiety Sensitivity Index;

^b CBM, cognitive bias modification; ABM, attention bias modification; CBM-I, cognitive bias modification-intepretation; A-AAT, Alcohol approach and avoidance training; CNT, Concreteness training; No cont, no contingency; cCBT, computerized cognitive-behavioral therapy; WL, waitlist; RT, relaxation training; TAU, treatment as usual; Conc Tx, concurrent therapy;

^c STAI-S, State Trait Anxiety Inventory-State; HAM-A, Hamilton Anxiety Rating Scale; WDO, Worry Domains Questionnaire; MASQ, Mood and Anxiety Symptom Questionnaire; POMS-SF, Profile of Mood States-Short Form; RSQ-RRS, Response Style Questionnaire-Ruminative Response Scale; LSAS-SR, Liebowitz Social Anxiety Scale-self report; SPS, Social Phobia Scale; MADRS Montgomery-Asberg Depression Scale; BAI, Beck Anxiety Inventory; QOLI, Quality Of Life Inventory; SPIN, Social Phobia Inventory; SPSQ, Social Phobia Screening Questionnaire; QSU, Questionnaire of Smoking Urges; SPQ, Spider Phobia Questionnaire; PANAS, Positive and Negative Affect Schedule; IES, Impact of Event Scale; RIQ, Response to Intrusions Questionnaire; POMS-D, Profile of Mood States-Depression; DASS-D, Depression, Anxiety and Stress Scale-Depression; LIS, Life Interference Scale; SCL-90, Symptom Checklist-90; BSPS, Brief Social Phobia Scale; DAQ, Desires for Alcohol Questionnaire; CAPS, Clinician Administered PTSD Scale; SRIP, Self-Rating Inventory for Post-Traumatic Stress Disorder; VAS, Visual Analogue Scale; RMDQ, Rolland-Morris Disability Questionnaire; TSK, Tampa Scale for Kinesiophobia; FPQ-R, Fear of Pain Questionnaire Revised; PSEQ, Pain Self-Efficacy Questionnaire; PANAS-FS, Positive and Negative Affect Schedule Fear Scale; RSES, Resultant Self-Esteem Scale; ATS, Attitudes Toward Self; PHQ-9, Patient Health Questionnaire-9; GAD-7, Generalized Anxiety Disorder-7;

^d D, Delivery; L, Laboratory; H, Home; Ns, number of sessions; FU, follow-up; mths, months; yr, year; wk, week

Table DS2 Effects of CBM interventions, compared to control, at posttest, for all samples and outcome categories^a

Variable	n _{comp}	g	95% CI	z	I ^{2b}	NNT	p ^c
Anxiety (all measures)	41	0.37	0.20 to 0.54	4.28	73 ^d (63~80)	4.72	
One effect size per study (only highest)	38	0.39	0.21 to 0.57	4.26	74 ^d (65~81)	4.59	
One effect size per study (only lowest)	38	0.37	0.19 to 0.55	4	75 ^d (65~81)	4.72	
Outliers removed ^e	37	0.23	0.14 to 0.32	4.96	2 ns (0~38)	7.69	
Subgroup analysis ^f							
Participant compensation Yes	20	0.34	0.21 to 0.47	5.24	0 ns (0~48)	5.10	0.028
No	17	0.12	-0.01 to 0.27	1.71	20 ns (0~55)	14.71	
Sample type Clinical	11	0.20	0.01 to 0.40	2.12	40 ns (0~70)	8.93	0.890
Subclinical/analogue	13	0.26	0.10 to 0.42	3.2	0 ns (0~57)	6.85	
Unselected	12	0.26	0.09 to 0.43	3.01	0 ns (0~58)	6.58	
Recruitment Patient samples	4	0.41	0.08 to 0.73	2.48	31 ns (0~75)	4.27	0.346
Community	15	0.15	-0.002 to 0.32	1.93	21 ns (0~57)	11.11	
Students	18	0.25	0.12 to 0.39	3.76	0 ns (0~50)	6.85	
Delivery Laboratory only	26	0.31	0.20 to 0.42	5.44	0 ns (0~43)	5.56	0.03
Home component	10	0.08	-0.08 to 0.26	0.96	21 ns (0~60)	21.74	
Bias targeted Attentional	16	0.12	-0.01 to 0.25	1.73	16 ns (0~49)	14.71	0.048
Interpretational	20	0.31	0.18 to 0.45	4.57	0 ns (0~48)	5.56	
General anxiety	34	0.38	0.17 to 0.59	3.58	77 ^d (68~83)	4.59	
One effect size per study (only highest)	31	0.41	0.18 to 0.63	3.56	78 ^d (70~85)	4.27	
One effect size per study (only lowest)	31	0.38	0.15 to 0.61	3.30	78 ^d (71~85)	4.59	
Outliers removed ^e	30	0.18	0.08 to 0.28	3.46	0 ns (0~41)	9.80	
Subgroup analysis							
Participant compensation Yes	17	0.29	0.15 to 0.43	4.01	0 ns (0~51)	6.17	0.054
No	13	0.07	-0.10 to 0.24	0.81	20 ns (0~58)	25	
Sample type Clinical	6	0.04	-0.19 to 0.28	0.383	20 ns (0~65)	45.45	0.251
Subclinical/analogue	12	0.20	0.03 to 0.36	2.42	0 ns (0~58)	8.93	
Unselected	11	0.30	0.11 to 0.48	3.25	0 ns (0~60)	5.95	
Recruitment Patient samples	3	0.23	-0.11 to 0.57	1.29	17 ns (0~91)	7.69	0.462
Community	12	0.09	-0.08 to 0.28	1.06	9 ns (0~48)	17.86	
Students	15	0.24	0.10 to 0.38	3.32	0 ns (0~54)	7.46	
Delivery Laboratory only	22	0.28	0.15 to 0.40	4.40	0 ns (0~46)	6.41	0.006
Home component	8	-0.03	-0.22 to 0.15	-0.35	0 ns (0~68)	-	
Bias targeted Attentional	10	0.04	-0.12 to 0.21	0.52	8 ns (0~65)	45.45	0.034
Interpretational	20	0.28	0.14 to 0.41	4.07	0 ns (0~48)	6.41	
Social anxiety	10	0.40	0.06 to 0.74	2.34	74 ^d (53~86)	4.39	
Outlier removed ^g	9	0.23	-0.001 to 0.46	1.95	44 ns (0~75)	7.69	
Subgroup analysis							
Participant compensation Yes	5	0.53	0.28 to 0.79	4.13	0 ns (0~79)	3.36	0.001
No	4	-0.02	-0.24 to 0.19	-0.25	0 ns (0~85)	-	

<i>Sample type</i>	<i>Clinical</i>	6	0.11	-0.13 to 0.35	0.89	43 ns (0~78)	16.13	<i>0.025</i>
<i>Subclinical/analogue</i>		3	0.65	0.24 to 1.07	3.13	0 ns (0~90)	2.75	
Recruitment	Community	5	0.11	-0.16 to 0.39	0.80	54 ^d (0~83)	16.13	0.111
	Students	4	0.47	0.13 to 0.82	2.71	0 ns (0~85)	3.76	
<i>Delivery</i>	<i>Laboratory only</i>	5	0.53	0.28 to 0.79	4.13	0 ns (0~79)	3.36	<i>0.001</i>
<i>Home component</i>		4	-0.02	-0.24 to 0.19	-0.25	0 ns (0~85)	-	
Generalized anxiety		3	0.68	0.31 to 1.05	3.64	0 ns (0~90)	2.63	
Panic symptoms		4	0.02	-0.43 to 0.44	0.10	51 ns (0~84)	83.33	
Depression		17	0.43	0.16 to 0.71	3.17	74 ^d (59~84)	4.1	
Outliers removed ^h		15	0.33	0.16 to 0.50	3.82	27 ns (0~61)	5.43	
Subgroup analysis								
Participant compensation	Yes	6	0.32	0.08 to 0.57	2.60	9 ns (0~77)	5.43	0.921
	No	9	0.34	0.10 to 0.58	2.77	41 ns (0~73)	5.10	
Sample type	Clinical	9	0.24	0.02 to 0.46	2.19	39 ns (0~72)	7.46	0.184
<i>Subclinical/analogue</i>		4	0.52	0.18 to 0.86	2.99	0 ns (0~85)	3.42	
Recruitment	Patient samples	5	0.36	0.05 to 0.66	2.30	35 ns (0~76)	5	0.374
	Community	6	0.23	-0.05 to 0.51	1.60	40 ns (0~76)	7.69	
	Students	4	0.54	0.21 to 0.86	3.27	0 ns (0~85)	3.31	
<i>Delivery</i>	<i>Laboratory only</i>	6	0.52	0.26 to 0.79	3.85	0 ns (0~75)	3.36	0.123
<i>Home component</i>		9	0.25	0.03 to 0.47	2.24	40 ns (0~72)	7.14	
<i>Bias targeted</i>	<i>Attentional</i>	9	0.13	-0.03 to 0.30	1.52	0 ns (0~65)	13.51	<i>0.014</i>
<i>Interpretational</i>		4	0.59	0.27 to 0.91	3.60	0 ns (0~85)	3.05	

Note.

^a All results are reported with Hedges *g*, using a random effects model

^b The *p* levels in this column indicate whether the Q-statistic is significant (the I^2 statistic does not include a test of significance)

^c The *p* levels in this column indicate whether the difference between the effect sizes in the subgroups is significant (significant results are marked with italic)

^d $p < 0.05$

^e Outliers were defined as studies in the 95% CI was outside the 95% CI of the pooled studies. (Below the 95% CI: Steel et al., 2010; Above the 95% CI: Lester et al., 2011 Study 1; Lester et al., 2011 Study 2; Schmidt et al., 2009)

^f Subgroup analysis were conducted using a mixed effects model.

^g Above the 95% CI: Schmidt et al., 2009

^h Below the 95% CI: Baert et al., 2011 Study 1; Above the 95% CI: Lester et al., 2011 Study 2

n_{comp} = number of comparisons; NNT= numbers needed to treat; ns = not statistically significant ($P > 0.05$)