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Review

A meta-analysis of perceptions of defeat and entrapment in depression, anxiety problems, posttraumatic stress disorder, and suicidality

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ABSTRACT

Background: There is a burgeoning literature examining perceptions of being defeated or trapped in different psychiatric disorders. The disorders most frequently examined to date are depression, anxiety problems, posttraumatic stress disorder (PTSD), and suicidality.
Aims: To quantify the size and consistency of perceptions of defeat and entrapment in depression, anxiety problems, PTSD and suicidality, test for differences across psychiatric disorders, and examine potential moderators and publication bias.
Method: Random-effects meta-analyses based on Pearson's correlation coefficient *r*.
Results: Forty studies were included in the meta-analysis ($n=10{,}072$). Perceptions of defeat and entrapment were strong (around $r=0.60$) and similar in size across all four psychiatric disorders. Perceptions of defeat were particularly strong in depression ($r=0.73$). There was no between-study heterogeneity; therefore moderator analyses were conducted in an exploratory fashion. There was no evidence of publication bias.
Limitations: Analyses were cross-sectional, which precludes establishing temporal precedence or causality. Some of the meta-analyses were based on relatively small numbers of effect sizes, which may limit their generalisability.
Conclusions: Perceptions of defeat and entrapment are clinically important in depression, anxiety problems, PTSD, and suicidality. Similar-sized, strong relationships across four different psychiatric disorders could suggest that perceptions of defeat and entrapment are transdiagnostic constructs. The results suggest that clinicians and researchers need to become more aware of perceptions of defeat and entrapment.

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1. Introduction

There is a burgeoning literature examining perceptions of being defeated or trapped in different psychiatric disorders and problems. To date, this research has focused on examining perceptions of defeat and entrapment in relation to depression, anxiety problems, posttraumatic stress disorder (PTSD) and suicidality, but there is emerging evidence to suggest that perceptions of being defeated or trapped are also apparent in a range of other psychiatric disorders (Taylor et al., 2011a).

Perceived defeat involves a perception of failed struggle and powerlessness resulting from the loss or significant disruption of social status, identity, or hierarchical goals (Gilbert, 2000; Gilbert and Allan, 1998; Rohde, 2001; Sloman et al., 2003). Gilbert (2000) describes three main classes of events with the potential to induce perceptions of defeat: (1) A failure to attain, or loss of, valued social and material resources; (2) social put-downs or attacks from others; and (3) internal sources of attack, such as self-criticism, unfavourable social comparisons, or unachievable ambitions. Example defeat cognitions include: "I feel I have lost my standing in the world" and "I feel defeated by life" (Gilbert and Allan, 1998). The idea that an individual perceives that they have metaphorically struggled against or been beaten back by one or more triggering experiences, is conceptually important, and distinguishes defeat from loss or failure (Taylor et al., 2011a). Perceptions of defeat in the context of trauma and PTSD have been conceptualised slightly differently to the rest of the defeat literature, as a perceived loss of psychological autonomy, worthiness and competence, and a sense of not being human any more (Dunmore et al., 2001).

Perceived entrapment occurs when the usual psychobiological motivation to escape threat or stress is blocked because of no or low likelihood of individual agency, or rescue by others (Dixon, 1998; Dixon et al., 1989; Gilbert, 2001; Gilbert and Allan, 1998; Sloman et al., 2003). As with perceptions of defeat, individuals can experience perceptions of entrapment in relation to external (e.g., difficult job or relationship; unwanted role as a caregiver) or internal (e.g., health problems; unwanted negative thoughts or emotions) experiences. Example entrapment cognitions include: "I am in a situation I feel trapped in" and "I feel trapped inside myself" (Gillbert and Allan, 1998). Entrapment is differentiated from hopelessness, which does not involve a motivation to escape, or sense of diminished status (Gilbert and Allan, 1998; Ehlers et al., 1998).

Perceptions of defeat and entrapment have been theoretically linked to the development and maintenance of various psychiatric disorders via malfunction of the "Involuntary Defeat Strategy" (IDS) (Sloman, 2000; Sloman et al., 2003; Taylor et al., 2011a). The IDS is thought to be a genetically hard-wired, evolutionarily adaptive response to perceptions of defeat, which is activated automatically as a short-term damage limitation strategy in the context of social competition or conflict for evolutionarily meaningful resources (Gilbert, 1992; Nettle, 2004; Sloman, 2000; Sloman et al., 2003). The IDS functions to signal a submissive no-threat status to others, facilitates withdrawal from unachievable ambitions, and inhibits further activity so as to avoid excessive costs (Price et al., 1994; Sloman et al., 2003). These functions are achieved via the affective, cognitive, and behavioural components of the human IDS, which are thought to include negative cognitions concerning personal adequacy and self-efficacy, toning-down of the positive reward-orientated affect system, behavioural inhibition, and hypervigilance (Taylor et al., 2011a). The IDS is suggested to contribute to perceptions of entrapment, contingent on an individual's judgment about their ability to escape a defeating experience. Under optimal circumstances, the IDS is assumed to be active for only a brief period of time, deactivating once the individual has managed to escape, obtain help, or accept a particular defeat and move on to new goals (Sloman, 2000). For example, an individual's IDS could deactivate when they escape an abusive relationship, elicit meaningful help from others, or accept a job loss. Various psychiatric disorders are suggested to emerge as a result of intense, chronic, inflexible or inappropriate IDS activation (Nettle, 2004; Sloman et al., 2003; Taylor et al., 2011a).

2. The present study

A recent narrative review reported convergent evidence across a range of designs, samples and measures, of perceptions of defeat and entrapment in depression, anxiety problems, PTSD, and suicidality (Taylor et al., 2011a). The present meta-analysis aims to quantify the size and consistency of these relationships for the first time. We also aim to explore a key but as yet untested question in the literature regarding whether perceptions of defeat and entrapment are stronger in particular psychiatric disorders. For example, do depressed individuals experience stronger perceptions of being defeated than individuals experiencing PTSD, or individuals who are suicidal? Meta-analysis additionally enables us to examine whether a number of potential moderator variables attenuate or accentuate the magnitude of these relationships, and whether the findings reported in the literature to date have been influenced by publication bias. Addressing these questions has the potential to guide the future expansion of the defeat and entrapment literature and highlight the potential importance of perceptions of defeat and entrapment for clinical practise.

3. Method

3.1. Selection of articles

This review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Standards (Moher et al., 2009). PsycINFO, MEDLINE and Web of Knowledge databases were searched from the end of the systematic literature search conducted for the narrative review (Taylor et al., 2011a), to August 2013, using the following terms: *Defeat*, *entrapment*, and *trapped,* along with *anxiety*, *PTSD*, *depression*, and *suicide* (*depres$*, *anxi$*, *suicid$*, *stress*, *symptoms*, *distress*). Secondary sources (review articles, book chapters, conference abstracts, reference sections of selected articles) were also examined, and all researchers with one or more publication in this area were emailed to request unpublished data and forthcoming research for potential inclusion. These methods yielded a preliminary database of 286 published studies, which included 51 studies included in the previous narrative review (Taylor et al., 2011a). This initial pool of studies was reviewed by two authors (AS and PT) to determine eligibility for inclusion, with 100% agreement.

3.2. Inclusion and exclusion criteria

Inclusion criteria for quantitative studies were that they: (1) used adult (18 years+) participants; (2) were written in English; (3) included a quantitative measure of perceptions of defeat and/or entrapment and a symptom-based or diagnostic measure of depression, anxiety problems, PTSD or suicidality; (4) employed measures with adequate reliability and validity, as demonstrated by published psychometric properties; and (5) reported Pearson's correlation coefficient *r* or provided sufficient statistical information to compute this statistic (Borenstein et al., 2009). Authors of papers with unclear statistical information were contacted to request further information. The inclusion and exclusion criteria meant that thirteen studies were excluded from the current meta-analysis which had been included in the narrative review (Taylor et al., 2011a) and eleven studies were included here that had not been included in the previous review. Details of the literature sifting process are shown in Fig. 1. Included studies are described in Table 1. Forty studies met all of the requirements for inclusion.

3.3. Dependant effect sizes

When studies reported several effect sizes for the same relationship, an average effect size was computed. When studies reported dependant measures of entrapment (e.g., separate internal and external entrapment effect sizes reported within the same study), we applied Cheung and Chan's adjusted-weighting procedure to calculate an average entrapment effect size with an adjusted sample size (Cheung and Chan, 2004). These procedures ensured that the statistical analyses were based on independent effect sizes in the sense that each study contributed a defeat effect size and/or an entrapment effect size for each specific psychiatric disorder. Two studies contributed effect sizes from two independent samples (Gilbert and allan, 1998; Gilbert et al., 2002). Data from the first time point was used for longitudinal studies.

3.4. Moderator variables

The following information from each included study was coded in order to generate potential moderator variables: Mean age; percentage of sample female; cross-sectional design versus "other" design (longitudinal, prospective); year of publication; clinical versus community sample; type of defeat and entrapment measure; and type of depression measure (see Table 4). The Entrapment subscale of the Personal Beliefs about Illness Questionnaire (PBIQ) consists of items assessing perceptions of psychosis as something frightening and uncontrollable (Birchwood et al., 1993, 2012). Three concerns with this scale meant that we examined the entrapment measure used as a moderator variable: (1) The entrapment subscale of the PBIQ includes only four items, which are unlikely to capture the full phenomenology of perceptions of entrapment (Taylor et al., 2011a); (2) the scale was developed in the absence of an overarching exploratory or confirmatory factor analysis, meaning that there is no solid evidence to support the authors' distinction between subscales; and (3) the PBIQ may have poor construct validity, as it appears to measure coping difficulties and low self-efficacy, rather than perceptions of entrapment. Following recommendations by Borenstein et al. (2009), subgroups for categorical moderator analyses had to include at least six effect sizes.

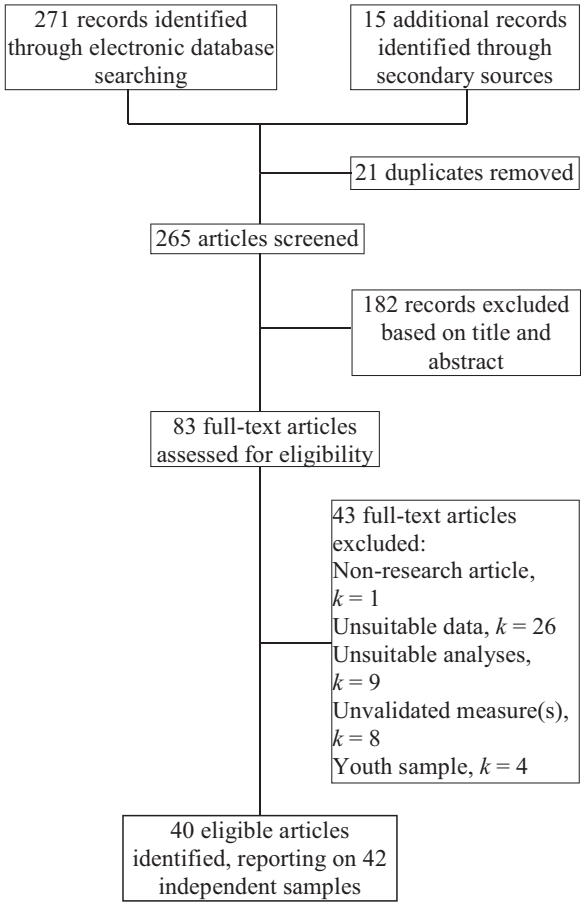

Fig. 1. Flow diagram of the study selection procedure.

3.5. Publication bias

Publication bias was initially assessed through visual inspection of funnel plots. Next, Vevea and Woods' sensitivity analysis procedure was performed, which applies various a priori weights representing different types and severities of theoretical publication bias effects (Vevea and Woods, 2005). This sensitivity analysis method is argued to be particularly useful compared to alternative methods for detecting publication bias because it estimates bias in

Table 1
Characteristics of studies included in the meta-analysis.

Article	Sample details	*N*	Defeat and/or entrapment data analysed	Measure of defeat and/or entrapment	Psychiatric disorder	Measure(s) of psychiatric disorder	Mean age (SD)	Percentage of sample female
Allan and Gilbert (2002)	University undergraduates	197	External entrapment	Defeat and entrapment scales	Depression	CES-D	23.40 (8.0)	62.9
Birchwood et al. (1993)	Medicated; mixed psychosis sample	84	Internal entrapment	PBIQ	Depression	BDI	48.05 (13.2)	35.7
Birchwood et al. (2007)	First-episode schizophrenia spectrum disorder	79	Internal entrapment	PBIQ	Anxiety problems	Social interaction anxiety scale	Not reported	22.8
Birchwood et al. (2012)	First-episode schizophrenia spectrum disorder	150	Internal entrapment	PBIQ-R	Depression	Calgary depression scale for schizophrenia	23.37 (4.98)	Not reported
Carvalho et al. (2013) Sample 1	Depressed outpatients	106	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI	37.9 (10.6)	74.0
Carvalho et al. (2013) Sample 2	School and private institution community convenience sample	116	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI	35.9 (10.3)	75.0
Clare and Singh (1994)	Medicated; mixed psychosis and other affective disorders	11	Internal entrapment	PBIQ	Depression	BDI	35.00 (not reported)	27.3
Dunmore et al. (1997)	Mixed physical and sexual assault victims	20	Defeat	MDTS	PTSD	PTSD symptom scale self-report	38.10 (11.4)	75.0
Dunmore et al. (1999)	Mixed physical and sexual assault victims	92	Defeat	MDTS	PTSD	PTSD symptom scale self-report	38.60 (16.2)	47.8
Dunmore et al. (2001)	Assault survivors	57	Defeat	MDTS	PTSD	PTSD symptom scale self-report	Not reported	54.4
Garcia-Campayo et al. (2010)	Chronic pain (Fibromyalgia) outpatients	250	Defeat	PSPS	Depression; anxiety problems	HADS	44.90 (7.2)	91.6
Gilbert and Allan (1998) Sample 1	University undergraduates	302	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI	22.90 (8.0)	77.2
Gilbert and Allan (1998) Sample 2	Depressed patients	90	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI	22.90 (8.0)	77.2
Gilbert et al. (2002) Sample 1	University undergraduates	193	Defeat; external entrapment	Defeat and entrapment scales	Depression; anxiety problems	MASQ	22.90 (7.7)	76.7
Gilbert et al. (2002) Sample 2	Mixed psychiatric inpatients	81	Defeat; external entrapment	Defeat and entrapment scales	Depression; anxiety problems	MASQ	36.80 (13.0)	60.5
Gilbert et al. (2004)	Depressed inpatients and outpatients	50	External entrapment	Custom interview concerning entrapment	Depression	BDI-II	43.45 (not reported)	46.0
Gilbert et al. (2005)	University undergraduates	166	Internal and external entrapment	Defeat and entrapment scales	Depression	CES-D	22.07 (7.2)	83.1
Goldstein and Willner (2002)	University undergraduates	32	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI	Not reported	100.0
Griffiths et al. (2014)	Community sample from low SES backgrounds	195	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression; anxiety problems	CES-D; STAI: state subscale	36.90 (8.3)	64.0
Gumley et al. (2004)	Schizophrenia spectrum disorder	38	Internal entrapment	PBIQ	Anxiety problems	Brief symptoms interview: social anxiety	34.35 (8.4)	26.3
Iqbal et al. (2000)	Schizophrenia spectrum disorder	105	Internal entrapment	PBIQ	Depression	BDI	Not reported	Not reported
Jobson and O'Kearney (2009)	Community sample: traumatic experiences	106	Defeat	Mental defeat rated from narrative	PTSD	Post-traumatic stress diagnostic scale	37.21 (13.4)	69.1
Karatzias et al. (2007)	Schizophrenia spectrum disorder	138	Internal entrapment	PBIQ	Depression; anxiety problems	SCID: comorbid anxiety or affective disorder	36.60 (9.8)	28.3
Martin et al. (2006)	Caregivers of Alzheimer disease patients	70	External entrapment	CES	Depression	CES-D	Not reported	Not reported
O'Connor et al. (2013)	Individuals who had attempted suicide attending A&E	70	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression; suicidality	HADS; suicide ideation subscale of the suicide probability scale	35.6 (13.24)	58.57
Panagioti et al. (2012)	Community sample: experienced a traumatic event	56	Defeat; internal and external entrapment	Defeat and entrapment scales	PTSD; suicidality	Suicidal behaviours questionnaire–revised; post-traumatic diagnostic scale	29.10 (11.5)	82.1
Rasmussen et al. (2010)	Individuals who had attempted suicide	103	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression; anxiety problems; suicidality	Suicide probability scale; HADS	34.92 (13.4)	59.0
Stommel et al. (1990)	Caregivers of elderly relatives	307	External entrapment	CBS-E	Depression	CES-D	Not reported	Not reported

Sturman (2011)	University undergraduates	119	Internal and external entrapment	ISQ	Depression; anxiety problems	CES-D; social anxiety interaction scale and social phobia scale	19.00 (Not reported)	79.8
Sturman and Mongrain (2008)	Formerly depressed students	146	Internal and external entrapment	Defeat and entrapment scales	Depression	SCID: depression	Not reported	71.9
Tang et al. (2007)	Chronic pain patients	302	Defeat	PSPS	Depression; anxiety problems	HADS	46.10 (12.3)	72.7
Tang et al. (2010)	Chronic pain patients	133	Defeat	PSPS	Depression; anxiety problems	HADS	46.10 (Not reported)	Not reported
Taylor et al. (2010a)	Schizophrenia spectrum disorder	78	Defeat; internal and external entrapment	Defeat and entrapment scales	Suicidality	Beck scale of suicidal ideation	42.50 (11.8)	25.6
Taylor et al. (2010b)	University undergraduates with past or current suicidal ideation	93	Defeat; internal and external entrapment	Defeat and entrapment scales	Suicidality	Suicidal behaviours questionnaire–revised	23.45 (7.1)	81.7
Taylor et al. (2011b)	University undergraduates		Defeat; internal and external entrapment	Defeat and entrapment scales	Depression; suicidality	BDI-II; suicidal behaviours questionnaire–revised	19.61 (4.5)	83.5
Trachsel et al. (2010)	Community sample (general population)	540	Internal and external entrapment	Defeat and entrapment scales	Depression	CES-D	Not reported	63.2
Troor and Baker (2008)	Female office workers	74	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI-II	24.60 (7.6)	100.0
Troop (Forthcoming)	Eating disorder inpatient and outpatients	114	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression; PTSD	Post-traumatic diagnostic scale	33.70 (10.3)	96.5
Troop and Hiskey (2013)	Community sample recruited from stress and trauma-related websites	275	Defeat; internal and external entrapment	Defeat and entrapment scales	PTSD	Post-traumatic diagnostic scale	31.60 (11.4)	75.0
Troop et al. (2014)	Eating disorder history	189	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI-II	35.50 (9.9)	96.0
White et al. (2007)	Schizophrenia spectrum disorder	100	Internal and external entrapment	PBIQ	Depression	Calgary depression scale for schizophrenia	39.40 (11.2)	22.0
Willner and Goldstein (2001)	Mothers of children with special educational needs	76	Defeat; internal and external entrapment	Defeat and entrapment scales	Depression	BDI	40.20 (7.2)	Not reported
Wyatt and Gilbert (1998)	University undergraduates	113	Defeat	Defeat and entrapment scales	Depression	CES-D	24.88 (8.3)	77.9
Yoon (2003)	Caregivers of family member with functional and/or cognitive impairment	311	External entrapment	CBS-E	Depression	Self-rating depression scale	56.10 (15.6)	81.0

BDI=Beck Depression Inventory, BDI-II=Beck Depression Inventory-II, CBS-E=Caregiver Burden Scale-Entrapment subscale, CES=Caregiver's Entrapment Scale, CES-D=Centre for Epidemiological Studies Depression Scale, HADS=Hospital Anxiety and Depression Scale, MASQ=Mood and Anxiety Symptoms Questionnaire, MDTS=Mental Defeat during Trauma Scale, PBIQ=Personal Beliefs about Illness Questionnaire, PBIQ-R=Personal Beliefs about Illness Questionnaire-Revised, PSPS=Pain Self Perception Scale, SCID=Structured Clinical Interview for DSM-IV Disorders, STAI-State=State Trait Anxiety Scale-State subscale.

the population effect size itself, rather than being dependant on significance testing: it is more useful to know the effect of publication bias on population effect size estimates, and to correct for it, than to know how many studies would be needed to reverse a conclusion (Vevea and Woods, 2005).

3.6. Statistical analyses

Field and Gillett's (2010) syntax were conducted using SPSS version 19 and R version 3.0.1 to run Hedges and Vevea's (1998) random-effects meta-analysis and Vevea and Woods' (2005) sensitivity analysis. Twenty-four studies reported both defeat and entrapment effect sizes in relation to a specific psychiatric disorder, enabling a direct comparison of the strength of defeat and entrapment effect sizes within studies. There were sufficient numbers of studies to calculate within study comparisons of defeat and entrapment effect sizes for depression, suicidality and anxiety problems only. We adapted Borenstein et al.'s (2009) procedure for comparing dependant standardised mean differences within studies to examine mean differences between dependant correlations within studies. First, a difference score was calculated for each study that reported a defeat and an entrapment effect size in relation to the same psychiatric disorder. The weighted mean of the difference scores for each psychiatric disorder was then tested against the Null-Hypothesis of equal means using an inverse variance calculation. A statistically significant positive deviation from 0 indicates that defeat demonstrated the strongest relationship with a particular psychiatric disorder; a statistically significant negative deviation from 0 indicates that entrapment demonstrated the strongest relationship with a particular psychiatric disorder.

Moderator analyses were conducted using a random-effects general linear model (Overton, 1998). Analogue ANOVAs were conducted for categorical moderator variables, and meta-regressions were conducted for continuous moderator variables. The regression coefficient *b* and its associated 95% confidence interval are reported for continuous moderator variables (*b* is reported in Fisher's *Zr* units). Spearman's rho correlation coefficients are reported for continuous moderator analyses.

4. Results

Forty studies contributed 84 effect sizes for inclusion ($N=10{,}072$ adult participants). Sample sizes used in statistical analyses ranged from nine (Clare and Singh, 1994) to 311 (Yoon, 2003) ($M=119.90$, $SD=73.68$). Five studies used a prospective or longitudinal design (20.24% of total effect sizes). Two studies reported diagnostic (categorical) measures of psychiatric disorder (Jobson and O'Kearney, 2009; Karatzias et al., 2007).

4.1. Between study analyses

Separate analogue ANOVAs were conducted for defeat effect sizes and entrapment effect sizes to examine whether perceptions of defeat and entrapment are stronger in particular psychiatric disorders. These analyses revealed statistically signifcant differences between the four psychiatric disorder groups in relation to defeat, $Q(3)=24.33$, $p=0.001$, but not entrapment, $Q(3)=2.74$, $p=0.46$. Table 2 shows that all population effect size estimates were fairly similar in size and represented statistically reliable, large effects (Cohen, 1998). There was no significant between study heterogeneity. The effect size between defeat and depression was particularly large ($r=0.73$) and, with the exception of the suicidality and entrapment effesssct size, was statistically significantly larger than all other effect sizes. This appears to explain the statistically significant ANOVA result of differences across the four psychiatric disorder groups with regard to perceptions of defeat.

4.2. Within study analyses

Table 3 shows that defeat effect sizes were, on average, $r=0.11$ statistically significantly larger than entrapment effect sizes in their respective relationship with depression. This result corresponds with the non-overlapping confidence intervals between defeat and depression and entrapment and depression in Table 2. Entrapment effect sizes were, on average, $r=0.09$ larger than defeat effect sizes in their respective relationship with suicidality, and this difference was borderline statistically significantly ($p=0.06$). On average, defeat and entrapment effect sizes were not statistically significantly different from one another in their respective relationship with anxiety problems.

4.3. Moderator analyses

The absence of significant between-study heterogeneity meant that our moderator analyses were conducted in an exploratory fashion, as has been done in previous meta-analyses (Trickey et al., 2012).

4.3.1. Depression

Four groups were formed in order to determine whether the measure of depression used moderated depression effect sizes

Table 2
Meta-analyses of perceptions of defeat and entrapment in depression, anxiety problems, posttraumatic stress disorder and suicidality.

Analysis	*k*	*Q*	I^2 (95% confidence interval)[a]	95% Confidence interval for *r*			*z*	r_{pb}
				Lower	Mean	Upper		
Defeat	39	42.07	0.10 (0.00,0.39)	0.62	0.66	0.69	23.45***	0.66
Depression	19	18.45	0.02 (0.00,0.50)	0.69	0.73	0.77	20.11***	0.73
Anxiety problems	7	5.97	0.00 (0.00,0.71)	0.54	0.58	0.63	20.36***	0.58
PTSD	7	6.41	0.06 (0.00,0.73)	0.48	0.58	0.66	9.50***	0.58
Suicidality	6	5.16	0.03 (0.00,0.75)	0.48	0.55	0.62	12.07***	0.55
Entrapment	45	45.22	0.05 (0.00,0.32)	0.56	0.61	0.64	22.52***	0.60
Depression	29	29.28	0.04 (0.00,0.34)	0.57	0.62	0.67	17.48***	0.62
Anxiety problems	7	5.09	0.00 (0.00,0.66)	0.40	0.53	0.63	7.39***	0.52
PTSD	3	0.32	0.00 (0.00,0.35)	0.52	0.58	0.64	14.63***	0.58
Suicidality	6	4.89	0.00 (0.00,0.74)	0.52	0.62	0.70	9.91***	0.62

***=$p<0.01$; *k*=number of studies; r_{pb}=estimate of the population effect size under severe two-tailed publication bias (Vevea and Woods, 2005), PTSD=posttraumatic stress disorder.

[a] 95% confidence intervals are calculated as proposed by Higgins and Thompson (2002).

Table 3
Within study mean difference comparisons of defeat and entrapment effect sizes.

Psychiatric disorder	*K*	95% Confidence interval for Δ*r* Lower	Mean difference Δ*r* defeat – entrapment	Upper	*z*
Depression	14	0.04	0.11	0.18	2.87**
Anxiety problems	4	−0.10	−0.04	0.03	−1.11
Suicidality	6	−0.10	−0.09	0.01	−1.85

**= p < 0.01; k=number of studies.

(Table 4). There was a statistically significant moderating effect, $Q(3)=13.05$, $p=0.005$. Effect sizes obtained using the Beck Depression Inventory were statistically-significantly larger than those obtained using the Hospital Anxiety and Depression Scale ($Q(1)=4.91$, $p=0.027$) and "Other" depression measures ($Q(1)=7.29$, $p=0.007$), and borderline statistically-significantly larger than those obtained using the Centre for Epidemiologic Studies Depression scale ($Q(1)=3.49$, $p=0.060$). Two groups were formed in order to determine whether the measure of defeat and entrapment used moderated depression effect sizes (Table 4). There was a statistically-significant moderating effect for measure of defeat and entrapment on depression effect sizes, $Q(1)=13.93$, $p=0.000$. Table 4 shows that effect size estimates obtained using the Defeat and Entrapment Scales (Gilbert and Allan, 1998) were statistically-significantly larger than those obtained using alternative defeat and entrapment measures. Two groups were formed in order to determine whether the type of sample moderated depression effect sizes. Table 4 shows that effect sizes obtained in community samples were significantly larger than those obtained in clinical samples, $Q(1)=7.09$, $p=0.008$. The percentage of females in a sample was examined as a continuous moderator of depression effect sizes, revealing a strong positive statistically-significant relationship ($b=0.007$, $p<0.001$, $r_s=0.51$), such that studies with a higher percentage of female participants tended to observe larger depression effect sizes. The mean age of samples demonstrated a modest negative statistically-significant relationship with depression effect sizes ($b=-0.008$, $p=0.027$, $r_s=-0.32$). Year of publication did not moderate depression effect sizes ($b=0.007$, $p=0.181$).

4.3.2. Anxiety problems

Year of publication emerged as a strong positive statistically-significant moderator of anxiety problem effect sizes ($b=0.023$, $p=0.010$, $r_s=0.74$), indicating that more recently published studies reported a stronger relationship between defeat and entrapment and anxiety problems. By contrast, sample gender composition ($b=0.004$, $p=0.077$), mean age ($b=0.006$, $p=0.197$) and the type of defeat and entrapment measure used ($Q(1)=1.62$, $p=0.203$), did not statistically significantly moderate anxiety problem effect sizes.

4.3.3. PTSD and suicidality

Year of publication ($b=0.04$, $p=0.320$), sample gender composition ($b=0.001$, $p=0.558$), and mean age ($b=0.000$, $p=0.986$), did not statistically significantly moderate suicidality effect sizes; year of publication ($b=0.010$, $p=0.279$), sample gender composition ($b=-0.003$, $p=0.381$), and mean age ($b=-0.030$, $p=0.090$), did not statistically significantly moderate PTSD effect sizes.

4.3.4. Entrapment measure

Use of the PBIQ emerged as a statistically-significant moderator of entrapment effect sizes, $Q(1)=11.06$, $p=0.001$. Table 4 shows that effect sizes obtained using the PBIQ were statistically significantly smaller than those obtained using alternative measures of entrapment.

4.4. Publication bias

Funnel plots relating to the meta-analyses reported in Table 2 were created in order to explore the distribution of effect sizes against their standard errors. These are displayed in Fig. 2. Small numbers of studies ($>k=10$) meant that we did not create a funnel plot for PTSD effect sizes. There were some outliers; however, these appeared in similar numbers at both ends of the effect size distributions, suggesting that these did not unduly bias population effect size estimates. The standard errors for the majority of studies were fairly similar in size and located towards the top of the funnel, suggesting high precision for most of the included studies. The only exception concerned the suicidality effect sizes, which are all located at the base of the funnel plot. Given that some degree of asymmetry is to be expected with relatively few data points (Sterne et al., 2011), the seven funnel plots generally appear fairly symmetrical and funnel-shaped. None of the funnel plots show a sparsely populated left side: the hallmark indicator of publication bias as a result of unpublished studies reporting small effect sizes or null-findings.

Table 4
Moderator analyses of depression effect sizes.

Moderator	Groups	*k*	95% Confidence interval for *r* Lower	Mean	Upper	*z*
Depression measure	BDI/BDI-II	24	0.67	0.72	0.77	19.26***
	CES-D	8	0.62	0.65	0.68	29.83***
	HADS	7	0.58	0.62	0.66	20.86***
	Other depression measures	9	0.42	0.57	0.69	6.48***
Defeat and entrapment measure	Defeat and entrapment scales	36	0.67	0.70	0.73	25.49***
	Other defeat and entrapment measures	12	0.46	0.55	0.63	9.8***
Clinical status of sample	Community	16	0.69	0.73	0.76	21.88***
	Clinical	32	0.58	0.63	0.68	16.88***

***=$p<0.01$; *k*=number of studies; BDI=Beck Depression Inventory, BDI-II=Beck Depression Inventory-II, CES-D=Centre for Epidemiological Studies Depression Scale, HADS=Hospital Anxiety and Depression Scale, Other depression measures consisted of the Mood and Anxiety Symptoms Questionnaire, Structured clinical interview for DSM-IV disorders, Calgary Depression Scale for Schizophrenia and the Self-Rating Depression Scale, Other defeat and entrapment measures consisted of Personal Beliefs about Illness Questionnaire, Personal Beliefs about Illness Questionnaire-Revised, Mental Defeat During Trauma Scale, Pain Self Perception Scale, Custom Interview Concerning Entrapment, Mental Defeat Rated from Narrative, Carer's Entrapment Scale and the Carer Burden Scale-Entrapment subscale.

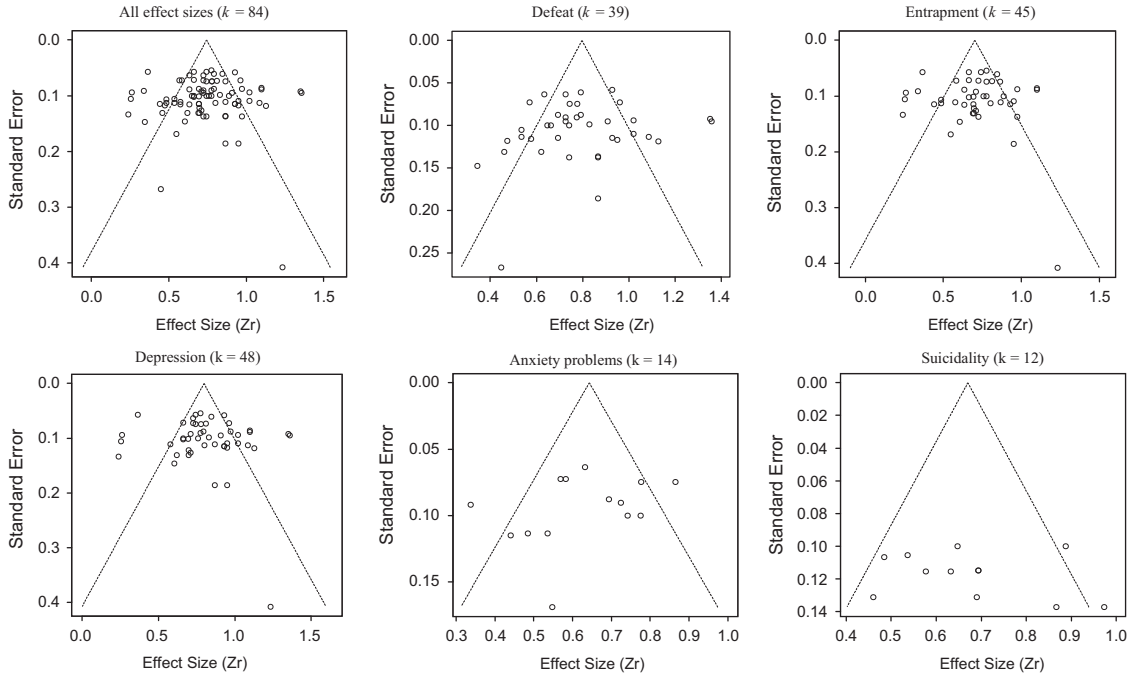

Fig. 2. Funnel plots of meta-analyses reported in Table 1. Diagonal lines represent a 95% confidence interval.

We next conducted Vevea and Woods' (2005) sensitivity analysis, which quantifies the effect of publication bias. In Table 2, r_{pb} is reported as an estimate of the population effect size when corrected for severe two-tailed publication bias. Severe two-tailed publication bias refers to a weighting function that simulates a hypothetical scenario in which studies publishing correlations near zero are less likely to be published and included in a meta-analysis, while significant correlations are more likely to be published and therefore included in a meta-analysis (Vevea and Woods, 2005). Comparing the unadjusted r with the adjusted r_{pb} in Table 2, it is evident that the two correlations are almost identical for each meta-analysis. These results and the funnel plots suggest that publication bias had no effect on the results reported.

5. Discussion

This meta-analysis quantitatively summarised findings from forty studies which examined perceptions of defeat and entrapment in depression, anxiety problems, PTSD, and suicidality; four psychiatric disorders commonly encountered in mental health services (Kessler et al., 2012; Nock et al., 2012). This meta-analysis extends the earlier narrative review of these relationships (Taylor et al., 2011a) by: (1) bringing the literature synthesis up to date through the inclusion of recent, important studies; (2) applying more stringent inclusion and exclusion criteria, making conclusions more robust; (3) quantifying for the first time the size and consistency of the population effect size for each of the relationships; (4) testing whether perceptions of defeat and entrapment are stronger in depression, anxiety problems, PTSD, or suicidality; (5) examining potential moderator variables; and (6) examining the potential for publication bias in the literature.

The effect sizes reported here are large (Cohen, 1998), providing evidence for the clinical significance of perceptions of defeat and entrapment in depression, anxiety problems, PTSD, and suicidality (Cohen, 1998; Kraemer et al., 2003). Moreover, the publication bias analyses indicate that the meta-analytic results are not artificially inflated, and can be considered robust. Given the correlational nature of this meta-analysis, it is worth noting at this point that a number of studies in the literature provide preliminary evidence to suggest that the observed large correlations are not simply due to psychiatric comorbidity (Taylor et al., 2011a). For example, perceptions of defeat have been found to statistically significantly predict suicidality twelve months later when controlling for depressive symptoms (Taylor et al., 2011b) perceptions of entrapment have been found to statistically significantly predict social anxiety problems when controlling for depressive and psychotic symptoms (Birchwood et al., 2007; Gumley et al., 2004), and perceptions of defeat have been found to statistically significantly predict PTSD when controlling for depression (Jobson and O'Kearney, 2009).

The similar magnitude correlations between defeat and entrapment and the four psychological problems may be especially noteworthy for suicidality researchers because several theories of suicidality posit a prominent role for perceptions of defeat and entrapment (e.g., Baumeister, 1990; O'Connor, 2011; Williams, 2001). Whilst the present results potentially corroborate these theories, they also suggest that additional variables to defeat and entrapment are needed to explain the specific phenomenology of suicidality. It is noteworthy that our within study analyses revealed a slightly stronger relationship between entrapment and suicidality, relative to the relationship between defeat and suicidality, although this difference was not statistically significant. Although the within study analyses probably have higher validity than the between study analyses, additional research is required to arrive at a firm conclusion regarding whether perceptions of entrapment constitute a particular risk for suicidality, independent of perceptions of defeat.

This meta-analysis assumed that different triggers are interchangeable and homogeneous in bringing about perceptions of defeat or entrapment across different psychiatric disorders. For example, perceptions of entrapment by traumatic experiences were treated as being equivalent to perceptions of entrapment as a result of a caregiving role. The absence of significant between-study heterogeneity across all analyses supports this assumption and suggests that the literature should adopt broad (Taylor et al.,

2011a) rather than disorder-specific (Birchwood et al., 1993, 2012; Dunmore et al., 2001) definitions and conceptualisations of defeat and entrapment.

5.1. Moderator variables

One important aim of this meta-analysis was to examine whether moderator variables attenuate or accentuate the consistency of perceptions of defeat and entrapment in depression, anxiety problems, PTSD and suicidality. Moderator analysis revealed that the gender composition of samples significantly moderated depression effect sizes, whereby samples containing a higher percentage of females showed a stronger relationship. This finding is consistent with the well-established findings that adult women are twice as likely as men to experience depression (Kessler et al., 1993; Nolen-Hoeksema, 1990). Future research is required to directly explore whether gender and other individual difference and diversity variables such as culture, ethnicity and age, moderate relationships between perceptions of defeat and entrapment, and different psychiatric disorders.

Moderator analysis also revealed that effect sizes obtained using either version of the Beck Depression Inventory (Beck 1988; Beck et al., 1996) were statistically significantly larger than those obtained using alternative depression measures. Future research is needed to explain this finding, but we note that BDI items do not appear to inadvertently measure perceptions of defeat or entrapment. Moderator analysis revealed that depression effect sizes obtained using the Defeat and Entrapment Scales (Gilbert and Allan, 1998) were statistically significantly larger than those obtained using other measures of defeat and entrapment. The moderator analyses which examined measure of depression and measure of defeat and entrapment must be interpreted tentatively because, as a result of low numbers of effect sizes, several different measures were aggregated into one group and compared against the BDI and the Defeat and Entrapment Scales respectively, which may have masked important differences. The statistically significant moderator result for the PBIQ potentially suggests that using this measure may confound entrapment effect sizes, although is possible that different measure formats (e.g., questionnaire, narrative report) may alternatively explain these moderator results. We discussed in the Section 3 various concerns we have related to the unvalidated factor structure of the PBIQ and its limited item content. We were surprised to find that depression effect sizes obtained in community samples were significantly larger than those obtained in clinical samples. One explanation could be that the clinical group may have had a restricted range of scores, which would have limited the size of correlations. For this reason, this finding should be interpreted very tentatively.

5.2. Limitations

The present findings must be interpreted in the context of several limitations, each of which points toward important directions for future research. Several aspects of the meta-analytic methodology warrant discussion, most notably the fact that the meta-analyses for suicidality, anxiety problems and PTSD were based on relatively small numbers of effect sizes, which may limit their generalisability. Additionally, failure to obtain a statistically significant difference among subgroups in most of our moderator analyses should not be interpreted as evidence that the effect was the same across subgroups because of the potential for low statistical power arising as a result of low numbers of effect sizes (Borenstein et al., 2009; Hunter and Schmidt, 2004).

It is also important to note the heavy reliance on self-report measures and cross-sectional designs in the literature. Additional longitudinal and experimental studies which have the potential to establish temporal precedence and causality, are urgently needed. Only one study (Park et al., 2010) reported adolescent data that would have been suitable for inclusion here. This highlights the need to study defeat and entrapment in children and adolescents, which may prove to be particularly useful for clarifying questions around vulnerability and onset of perceptions of defeat and entrapment in different psychiatric disorders.

Conducting this review highlighted three recurrent shortcomings of the literature in terms of reporting conventions which are easily remedied by researchers, reviewers and journal Editors. First, it was often the case that studies did not report an effect size for every relationship examined, or sufficient statistical information that could be used to compute an effect size. Second, presentation of descriptive statistics for all variables (rather than just those that were statistically-significant), was inconsistent. Third, sample, design and individual difference variables were inconsistently reported.

5.3. Conclusion

Using meta-analysis, we quantitatively synthesised the existing literature and identified large relationships between perceptions of defeat and entrapment and depression, anxiety problems, PTSD, and suicidality. Our results attest to the important role that evolutionary psychology constructs may play in psychiatric disorders and problems. The magnitude of relationships between perceptions of defeat and entrapment and four common psychiatric conditions suggests that clinicians and researchers alike would benefit from becoming more aware of the constructs of defeat and entrapment. We hope that this meta-analysis provides a point of departure in this respect.

This study provided the first empirical test of whether relationships between perceptions of defeat and entrapment differ across psychiatric conditions. We discovered that perceptions of defeat and entrapment generally have similar-sized, strong relationships with depression, anxiety problems, PTSD, and suicidality. This is a particularly intriguing finding, and suggests that perceptions of defeat and entrapment may be transdiagnostic constructs that have similarly important relationships with all psychiatric conditions. Our findings are consistent with the theory that underpins defeat and entrapment research, which suggests that psychiatric disorders arise via malfunction of the IDS (Sloman, 2000; Sloman et al., 2003; Taylor et al., 2011a), a genetically hardwired, evolutionarily adaptive response to perceptions of defeat. The IDS is thought to be activated automatically as a short-term damage limitation strategy in the context of social competition or conflict for evolutionarily meaningful resources (Gilbert, 1992; Nettle, 2004). Psychiatric disorders are suggested to emerge as a result of intense, chronic, inflexible, or inappropriate IDS activation (Nettle, 2004; Sloman et al., 2003; Taylor et al., 2011a). The particularly large relationship between defeat and depression is also consistent with IDS theory, which conceptualises depression as the direct consequence of an IDS response that has become dysfunctional (Price et al., 1994; Sloman, 2000; Sturman, 2011; Taylor et al., 2011a).

Further research is now needed to explain these results. Two key priorities for the literature involve: (1) further clarifying the nature of the psychological aspects of the IDS (e.g., perceptions of defeat and entrapment), and (2) examining whether there is a constant linear relationship between the psychological aspects of the IDS and psychiatric conditions. The former question arises because the “Involuntary Winning Strategy” (IWS) was recently proposed (Sloman et al., 2011). The IWS is thought to be triggered by perceptions of winning and success, and a failure of the IWS to deactivate has been hypothesised as one possible mechanism underlying clinical mania (Sloman and Sturman, 2012). The IDS

and IWS are thus both thought to be triggered by the perception of agonistic social encounters, and both constructs have been linked to psychiatric conditions via their inflexible deactivation. Low levels of IDS or IWS activity would be hypothesised to counter (unhelpful) activation of the opposite system. Empirical investigation is now needed to explore this issue and test whether the IWS and IDS are two separate constructs, or in fact opposite poles of the same continuum. Once this work is achieved, it will be important to clarify whether the psychological aspects of the IDS have a constant linear relationship with different psychiatric conditions in order to shed light on research methodologies that can appropriately be used in the literature. Evidence of a constant linear relationship with psychiatric conditions would support the relevance of experimentally inducing perceptions of defeat and entrapment and using analogue samples (cf. Abramowitz et al., 2014). This research endeavour may also begin to clarify at what point, and why, perceptions of defeat and entrapment become associated with different psychiatric conditions.

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Conflict of interest

None.

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