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The prospective role of defeat and entrapment in depression and anxiety: A 12-month longitudinal study

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ABSTRACT

The concepts of "defeat" (representing failed social struggle) and "entrapment" (representing an inability to escape from a situation) have emerged from the animal literature, providing insight into the health consequences of low social rank. Evolutionary models suggest that these constructs co-occur and can lead to the development of mental disorders, although there is limited empirical evidence supporting these predictions. Participants ($N=172$) were recruited from economically deprived areas in North England. Over half of participants (58%) met clinical cut-offs for depression and anxiety, therefore we conducted analyses to establish whether participant outcomes were dependent on baseline defeat and entrapment levels. Participants completed measures of defeat, entrapment, depression and anxiety at two time-points twelve months apart. Factor analysis demonstrated that defeat and entrapment were best defined as one factor, suggesting that the experiences co-occurred. Regression analyses demonstrated that changes in depression and anxiety between T1 and T2 were predicted from baseline levels of defeat and entrapment; however, changes in defeat and entrapment were also predicted from baseline depression and anxiety. There are implications for targeting perceptions of defeat and entrapment within psychological interventions for people experiencing anxiety and depression and screening individuals to identify those at risk of developing psychopathology.

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1. Introduction

Amongst group living animals, social hierarchies regulate access to resources, thereby preventing excessive competitive behaviour between group members (Gilbert, 1992). The hierarchy provides each animal with a social rank position in the group, which influences their behaviour; for example, knowing when it is adaptive to compete with others for resources and when to withdraw to be protected from injury. When animals experience social defeat and lose rank position within the hierarchy, they are likely to experience behaviours that mirror those of psychopathology in humans (Price et al., 1994). Psychobiological theories have attempted to understand mental health difficulties in terms of the dysregulation of basic processes that were once adaptive for humans in their evolutionary past (Gilbert, 2001). This has suggested a central role for defeat, representing a sense of failed social struggle, and entrapment, representing perceptions of there being no way out of an aversive

situation in the development of psychopathology in humans (Taylor et al., 2011). This paper provides an exploration of the structure of defeat and entrapment, and the first test of whether defeat and entrapment prospectively predict higher levels of depression and anxiety twelve months later.

Defeat and entrapment were originally identified as two constructs based on evolutionary theories of depression (Price et al., 1994) through animal observation showing that socially defeated animals engaged in short term self-protective strategies, including social withdrawal, decreased sleep and feeding, and hypervigilance (Sloman et al., 2000). These behaviours are adaptive for animals as a short-term protective strategy in reaction to dangerous situations. This has been termed the Involuntary Defeat Syndrome (IDS) and occurs following a defeat to protect the animal from experiencing further harm (Sloman, 2000). As an adaptive strategy, the IDS should deactivate once the animal escapes from the defeating situation. However when a strong motivation to take flight from the aversive situation is blocked and animals cannot physically escape, animals engage in a defensive strategy known as 'arrested flight' (Dixon et al., 1989). In this situation, animals display submissive behaviours to 'cut-off' from

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the environment (Dixon, 1998), behaviours that mirror psycho-pathological responses in humans (Price et al., 1994).

1.1. Models considering the structure of defeat and entrapment

Based on animal evidence from the IDS, experiencing defeat and entrapment may be seen as a process that precedes psycho-pathology in humans. However, it is unclear whether defeat and entrapment should be conceptualised as a single construct. O'Connor (2003) suggested that defeat and entrapment are sepa-rate constructs and occur independently as responses to stressful situations dependent on whether individuals can escape from a situation. In this model, an individual only experiences entrap-ment if they cannot escape from a stressful and defeating situa-tion. An updated model suggested that entrapment is a conse-quence of defeat if a stressful situation cannot be escaped from, and therefore the two may be interdependent (Rasmussen et al., 2010). Supporting these theories, research has demonstrated that focus-ing on being trapped in a situation leads to increases in feelings of defeat, suggesting that the two constructs influence each other (Price et al., 2004) and defeat consistently leads to entrapment if individuals cannot resolve the defeating situation (Sloman et al., 2003). Although each of these perspectives specifies conditions under which perceptions of defeat and entrapment influence the experience of the other, the constructs are seen as being funda-mentally distinct.

In contrast, some models propose that defeat and entrapment are a single factor that captures feelings of failure without any means of escape (Taylor et al., 2009). In the "depressogenic loop" model, defeat and entrapment emerge from a single event and co-occur to such an extent that they form a single factor and are effectively undistinguishable (Taylor et al., 2011). In this model, defeat and entrapment are initially distinct reactions to an aversive experience, but then form a self-reinforcing loop in which defeat leads to perceptions of entrapment, which in turn leads to further defeat and perpetuates the cycle. Furthermore, an earlier model proposed that defeat and entrapment involve identical themes of lack of escape or available solutions available to an individual, and result from the same biased appraisal of a situation (Johnson et al., 2008). Whether feelings of defeat and entrapment form a single factor seems integral to understanding these con-structs. The first aim of this study is to explore the structure of defeat and entrapment and examine whether the constructs co-occur equally (as would be implied by a one factor structure) or occur separately (suggesting a multiple factor structure). Previous evidence suggests that a one-factor or two-factor model would be expected, however we conducted an exploratory factor analysis to identify the structure, as it has not previously been tested within the population studied here.

1.2. Defeat and entrapment as prospective predictors of depression and anxiety

Similarities have been noted between the behaviours of ani-mals experiencing IDS and those of humans experiencing mood disorders (Gilbert and Allan, 1998). This has led to the prediction that excessive IDS activation in humans may partly account for the development of psychopathology. This relationship is likely to be pronounced in contexts where an individual is caught in a low social rank position (Price et al., 1994). Therefore perceptions of defeat and entrapment, which signal excessive IDS activation, are expected to increase anxiety and depression over time, as they theoretically precede psychopathology. The second aim of the current study was to provide an empirical test of this expectation. Research has demonstrated cross-sectional relationships between defeat, entrapment and depression in clinical and non-clinical

settings. Higher levels of defeat have been associated with depres-sion in students (Gilbert and Allan, 1998; Wyatt and Gilbert, 1998; Sturman et al., in press) and psychiatric inpatients (Gilbert et al., 2001b), anxiety in students and psychiatric inpatients (Gilbert et al., 2001a) and anxiety and depression in patients with chronic pain (Tang et al., 2007; Tang et al., 2010). Entrapment has been associated with depression in people diagnosed with schizophre-nia (Gilbert et al., 2002; Birchwood et al., 2005; White et al., 2007), informal caregivers (Martin et al., 2006), formerly depressed students (Sturman and Mongrain, 2005) and people experiencing psychoses (Clare and Singh, 1994). Higher levels of entrapment prospectively predicted depression in patients with schizophrenia (Rooke and Birchwood, 1998; Iqbal et al., 2000), the recurrence of major depression after 16 months amongst students (Sturman and Mongrain, 2008) and episodes of combined depression and anxiety within a community sample (Kendler et al., 2003). Perceived entrapment has also been associated with social anxiety in people diagnosed with schizophrenia (Birchwood et al., 2006). However, entrapment and anxiety were not associated in a sample of formerly depressed students (Sturman and Mongrain, 2005), and when controlling for depression, the relationship between defeat, entrapment and anxiety was not observed (Gilbert et al., 2001).

Taylor et al. (2011) conducted a review of research studying the relationship between defeat, entrapment and psychopathology, and emphasised the need for longitudinal research. Of the studies measuring depression, 79% were cross-sectional, and of studies investigating anxiety, all but one were cross-sectional. No long-itudinal studies have investigated whether defeat and entrapment predict anxiety and depression, except in the context of a co-morbid psychiatric disorder, which cannot be generalised to non-clinical settings (Rooke and Birchwood, 1998). Furthermore, within the limited longitudinal research that has been conducted, no studies have considered the impact of depression and anxiety on perceptions of defeat and entrapment. Therefore the current study examined the key predictions of defeat and entrapment models within a community sample, specifically individuals with difficult life conditions, to establish how the relationship between defeat, entrapment and psychopathology functions within the general population.

Defeat and entrapment are expected to predict increased depression and anxiety over time, as these variables are associated with poorer psychosocial functioning and chronic IDS activation. The negative effects associated with a situation of perceived inescapable defeat have been attributed chronic IDS activation leading to increased frustration and stress, which can develop into depression (Gilbert, 2000). When the IDS is responded to with inhibition of exploratory behaviours this can lead to a limited capacity to engage with and act upon social opportunities that could improve an individual's situation (Gilbert, 2000). Individuals facing socioeconomic deprivation are particularly vulnerable to feeling defeated and trapped, as they are caught in an aversive, low social rank situation that can be very difficult to escape. For example, deprivation is related to fewer education and work opportunities (Department for Communities and Local Government, 2011). Likewise, poor general health experienced by this popula-tion may prevent individuals from entering employment, leaving them with a lower income and therefore fewer opportunities to access resources, making these circumstances difficult to escape from (Eisemann, 1986; Adler et al., 1994). These individuals also face higher rates of morbidity and mortality (Department of Health and Social Security, 1980), elevated levels of stress and frustration that are associated with socioeconomic deprivation (Adams et al., 2004) and a perceived lack of control (Ross et al., 1990), which often precede mental disorders including depression (Dixon et al., 1989). Consequently socioeconomically deprived

individuals may feel caught in an aversive situation that they cannot escape from. The heightened risk of psychopathology in this group could be partially explained by an increase in defeat and entrapment. However, as perceptions of defeat may be continuous rather than related to a single event (Sturman and Mongrain, 2008), when high levels of defeat and entrapment are combined with the environmental pressures that individuals are already faced with in situations of socioeconomic deprivation, such as high levels of unemployment (Perkins and Rinaldi, 2002), the hypothesised consequences of perceived defeat and entrapment would account for increases in feelings of depression and anxiety.

In the current study we investigated the longitudinal effects of defeat and entrapment on depression and anxiety within a community sample recruited from economically deprived areas. Firstly an exploratory factor analysis was conducted to establish how defeat and entrapment were best defined, and second, we examined whether defeat and entrapment predicted increases in depression and state anxiety twelve months later. We also tested whether depression and anxiety predicted defeat and entrapment at twelve months, as no previous research has investigated the relationship in this direction.

2. Materials and methods

2.1. Participants and procedure

One hundred and ninety five participants (age range 18–65 years; $M = 36.9$ years, S.D. $= 8.30$; Male:Female $= 36:64$) were recruited on an opportunistic basis through advertisements in workplaces and community groups within three areas of North England. They did not receive payment for participation (for baseline characteristics see Table 1). Participants were eligible to participate if they lived within these areas, were aged 18 or over and had the capacity to provide informed consent. A power analysis was conducted using G*Power 3 (Faul et al., 2007). As no previous research has investigated the prospective relationship between defeat, entrapment, depression and anxiety, the analysis was based on research considering the prospective relationship between entrapment and depression at $r = 0.21–0.23$ (Iqbal et al., 2000; Sturman and Mongrain, 2008). Our sample of participants had power > 0.95 to detect effects of this size. We recruited participants from areas ranked within the top 8.55% of economic deprivation in England, with economic deprivation comprising of income, employment, access to services, crime, health, education and living environment deprivation (Department for Communities and Local Government, 2011). In the areas sampled, the average percentage of individuals claiming benefits was 42.5%, compared to a national average of 19% and the average pass rate for 5 or more GCSEs (highest level of qualification taken in compulsory education with the UK) in 2010 was 23.5%, including one area with a 0% pass rate, compared to the national average of 55% (Office for National Statistics, 2011).

We recruited from areas of high socioeconomic deprivation specifically to obtain a community sample with a wide range of lifetime experiences, especially more problematic life circumstances that are associated with the development of mental health difficulties. Participants completed measures of defeat, entrapment, depression and anxiety, at two points approximately 12 months apart. We predicted that this timescale would be sufficient for experiences of defeat and entrapment to develop and lead to depression and anxiety. Contact details for each participant were taken at Time 1 (T1) and they were contacted up to three times at Time 2 (T2) before exclusion from the study. Twenty-two participants did not complete the measures at Time 2 (a retention rate of 88%) and were not included in analyses. Prior to analysis, one further participant's data was removed for inappropriate completion of questionnaires.

2.2. Measures

Defeat was measured by the *Defeat Scale*, a self-report measure of 16 questions assessing individuals' perceptions of losing rank position and failed struggle during the past seven days, e.g., "I feel defeated by life" (Gilbert and Allan, 1998). Items are rated on a five-point scale; higher scores indicate feelings of more defeat. The *Entrapment Scale* is a self-report measure of 16 questions that assess motivation to escape, e.g., "I am in a situation I feel trapped in" (Gilbert and Allan, 1998). Items are rated on a five-point scale; higher scores indicate more feelings of entrapment. Both scales have demonstrated concurrent validity with submissive behaviour, $r = 0.34–0.48$ (internal and external entrapment), $r = 0.35$ (defeat) and hopelessness when controlling for depression, $r = 0.38–0.46$ (internal and external entrapment), $r = 0.35$ (defeat) (Gilbert and Allan, 1998).

Anxiety was measured using the state sub-scale of the *State-Trait Anxiety Inventory* (STAI; Spielberger et al., 1970). This consists of 20 items measuring the current intensity of anxiety experienced by individuals as an emotional state (e.g., "I feel tense"). Participants rate the intensity of their current feelings of anxiety ("right now, at this moment") on a four-point scale, with higher scores indicating greater feelings of anxiety. The maximum score on the scale is 80, and scores above 39 are thought to represent a clinically relevant level of anxiety (Spielberger et al., 1983). The test–retest reliability of this scale has been demonstrated as $r = 0.81$ across 104 days (Spielberger et al., 1983).

Depression was measured using the *Center for Epidemiologic Studies Depression Scale* (CES-D; Radloff, 1977). This scale contains 20 items and measures depressive symptoms in the general population. Participants rate how often they have experienced certain feelings during the past week (e.g.,"I had trouble keeping my mind on what I was doing"), on a four-point scale from "rarely or none of the time" to "most or all of the time". The maximum score on the scale is 60, scores of 16–26 represent mild depression and scores of 27 and above represent major depression. This scale has test–retest reliability of $r = 0.61$ over three months (Devins et al., 1988) and $r = 0.49$ over twelve months (Radloff, 1977), and high sensitivity (92%) and specificity (87%) to clinical assessment of depression in a sample of older adults using a cut-off of 21 (Lyness et al., 1997), which represents mild depression. However, a cut-off of 16 has been shown to successfully detect diagnosable depressive disorders within a community sample (Myers and Weissman, 1980).

3. Results

3.1. Preliminary analysis

Preliminary analyses were conducted to examine the frequency distributions of depression and anxiety across the sample. These demonstrated that data from the sample was negatively skewed, with the majority of the sample reporting some mental health difficulties. For depression, as measured by the CES-D (Radloff, 1977) at T1, 76 participants (44%) were below the standard cut off for depression, 42 participants (24%) met the criteria for mild depression, and 54 participants (32%) met the criteria for major depression. At T2, 73 participants (42%) were below the cut off for depression, 55 participants (32%) met the criteria for mild depression and 44 participants (26%) met the criteria for major depression. For anxiety as measured by the STAI (Spielberger et al., 1970), at both T1 and T2, 99 participants (58%) met the criteria for clinical anxiety.

Table 1
Baseline sample characteristics.

	Time 1 ($n = 195$)
Gender	
Male	71 (36%)
Female	124 (64%)
Highest education level	
None	9%
GCSE	39%
A level	37%
First degree	10%
Postgraduate	2%
Other	3%
Employment status	
Employed	88%
Self-employed	4%
Unemployed	8%
Ethnicity	
White European	69%
Black African/Caribbean	18%
Other	13%
Depression clinical cut-off	
Above	63%
Below	37%
Anxiety clinical cut-off	
Above	55%
Below	45%

The internal consistency of the scales was measured at Time 1. This demonstrated Cronbach's alphas of 0.87 for the Defeat Scale and 0.96 for the Entrapment Scale, which exceeds the standard value for adequate levels of internal consistency (> 0.90; Nunnally, 1978). Test–retest reliability of the scales at the two time points was measured, which demonstrated Intra-Class Coefficients (ICC) of 0.88 for the Defeat Scale and 0.90 for the Entrapment Scale, which both exceed acceptable ICC values of > 0.80 (Bruton et al., 2000).

3.2. Factor analysis

To explore the structure of the *Defeat Scale* and *Entrapment Scale* (Gilbert and Allan, 1998), a maximum-likelihood exploratory factor analysis (EFA) was conducted on items of both scales completed by participants at T1. Bartlett's test confirmed that an EFA was appropriate ($\chi^2[496]=4872.65$, $p < 0.001$) and a Keiser–Meyer–Olkin (KMO) test indicated an adequate participant:item ratio of 6.1:1 (KMO$=0.96$). The first ten initial eigenvalues (and % of variance accounted for) from the EFA were 17.70 (55.32%), 1.82 (5.70%), 1.18 (3.71%), 1.05 (3.28%), 1.00 (3.12%), 0.87 (2.72%), 0.73 (2.28%), 0.70 (2.18%), 0.65 (1.99%), and 0.57 (1.78%).

A parallel analysis (PA) of 1000 datasets using the 95% cut-off (O'Connor, 2000) was conducted to establish how many factors to extract. PA creates random datasets with the same number of cases and variables as the actual dataset. An EFA is performed on each dataset, and any factors within the actual dataset with eigenvalues that exceed those that emerge in less than 5% of PA datasets are defined as having not arisen due to chance variation within the data. The first five eigenvalues extracted for 95% of the simulated datasets were equal to or less than 1.85, 1.73, 1.64, 1.57 and 1.49. In the actual data set, only the first eigenvalue exceeded chance values, suggesting one factor should be extracted.

As a further test, an EFA was conducted with forced two-factor extraction, using oblique rotation as it was assumed the two constructs were related. No item from either scale loaded above 0.40, considered a reasonable loading of an item on a factor (Velicer et al., 1982), whereas on the first factor, 81% loaded above 0.60. This demonstrates that a second extracted factor would be poorly defined and not representative of items. Furthermore, scores on the *Defeat Scale* correlated with scores on the *Entrapment Scale* at $r=0.91$, suggesting that the constructs are too conceptually similar to be measured separately. These analyses suggest that items from both scales are represented by one factor, therefore for regression analyses each participant was given a summed score for combined defeat and entrapment ($\alpha=0.91$) (Table 2).

3.3. The predictive role of defeat and entrapment for changes in anxiety

To ensure that our data met underlying assumptions, we conducted several tests before the regression analyses. The majority of participants' data was positioned to the right of the mean, suggesting that the data were negatively skewed. A Kolmogorov–Smirnov test was conducted which was significant for all variables ($p > 0.05$), demonstrating that the data significantly deviated from normality, and therefore prior to analysis, a square root transformation was performed to normalise the data. Following transformation, we found a non-significant Kolmogorov–Smirnov test for all variables ($p < 0.05$). As we were conducting several regression analyses, we tested for auto-correlation between variables using a Durbin–Watson statistic. This indicated non auto-correlation between variables (DW$=1.70$–1.93), represented by a value near to 2, suggesting that there was no correlation between the error values associated with variables at T1 and T2. As we were studying variables that had previously been

Table 2
Factor loadings of the defeat and entrapment scales.

		Combined defeat and entrapment
1.	I feel I'm in a deep hole I can't get out of (e)	0.853
2.	I would like to get away from who I am and start again (e)	0.839
3.	I feel trapped inside myself (e)	0.831
4.	I want to get away from myself (e)	0.823
5.	I would like to escape from my thoughts and feelings (e)	0.823
6.	I often have the feeling that I would just like to run away (e)	0.816
7.	I have a strong desire to escape from things in my life (e)	0.805
8.	I feel powerless (d)	0.804
9.	I feel completely knocked out of action(d)	0.798
10.	I feel that I have lost important battles in life (d)	0.782
11.	I can see no way out of my current situation (e)	0.775
12.	I feel that I have sunk to the bottom of the ladder (d)	0.774
13.	I feel that I have lost my standing in the world (d)	0.771
14.	I feel down and out (d)	0.770
15.	I feel that I have given up (d)	0.768
16.	I feel there is no fight left in me (d)	0.766
17.	I have a strong desire to get away and stay away from where am now (e)	0.763
18.	I feel powerless to change myself (e)	0.746
19.	I feel trapped by other people (e)	0.741
20.	I feel defeated by life (d)	0.727
21.	I feel that my confidence has been knocked out of me (d)	0.717
22.	I am in a situation I feel trapped in (e)	0.711
23.	I feel that I am one of life's losers (d)	0.710
24.	I feel powerless to change things (e)	0.704
25.	I feel trapped by my obligations (e)	0.701
26.	I feel that life has treated me like a punch bag (d)	0.683
27.	I feel that I have not made it in life (d)	0.676
28.	I would like to get away from other more powerful people in my life (e)	0.592
29.	I feel that I am a successful person (d) (R)	0.565
30.	I am in a relationship I can't get out of (e)	0.513
31.	I feel able to deal with whatever life throws at me (d) (R)	0.494
32.	I feel that I am basically a winner (d) (R)	0.430

Note: (R) denotes reverse coded item, (e) denotes item is from entrapment scale, and (d) denotes item is from defeat scale.

shown to correlate, we conducted correlational analyses to check for multicollinearity issues between variables. The variables correlated at $r=0.45$–0.61, demonstrating no multicollinearity issues ($r > 0.8$; Tabachnick and Fidell, 2001).

Separate regression analyses were conducted for depression and anxiety to investigate whether defeat and entrapment predicted changes in depression and state anxiety. For both, the basic analysis involved regression the T2 score of the outcome variable (depression or anxiety), on its corresponding Time 1 (T1) score and the T1 combined defeat and entrapment score. This analysis predicts the residual change in the outcome variable between T1 and T2. We used this method rather than calculating change scores, as these can be problematic when change between the average scores at baseline and subsequent time points varies between participants, as those with higher scores regress towards the mean score from the baseline time point, leading to misleading results (Hayes, 1988). The basic model for anxiety was significant ($R^2=0.46$, $F(2, 169)=71.37$, $p < 0.001$) with T1 defeat and entrapment predicting changes in anxiety ($\beta=0.29$, $t(169)=3.38$, $p=0.001$, $r_{sp}=0.19$). As expected, T1 anxiety also remained a significant predictor of T2 anxiety ($\beta=0.44$, $t(169)=5.14$, $p= < 0.001$, $r_{sp}=0.29$). The robustness of this model was tested through several further analyses. To test whether defeat and entrapment differentially predicted changes in anxiety for men and women we conducted a moderation analysis following the recommendations of Aiken and West (1991), including centering all variables prior to analysis, through a hierarchical multiple regression. In Step 1, T2 anxiety was predicted from T1 anxiety and T1 defeat and entrapment, as above. In Step 2, T2 anxiety was additionally predicted by gender (coded 0 and 1) and the
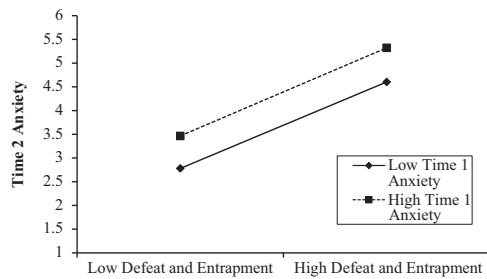
Fig. 1. Interaction between defeat and entrapment, Time 1 anxiety and Time 2 anxiety.

Fig. 2. Interaction between defeat and entrapment, Time 1 depression and Time 2 depression.

interaction between gender and T1 defeat and entrapment, to see whether the predictive value of defeat and entrapment was dependent on gender. Step 2 did not significantly improve fit ($\Delta R^2 = <0.001$, $\Delta F(1, 168) = <0.001$, $p=0.510$) demonstrating that the predictive value of defeat and entrapment for changes in anxiety is equally as strong for both genders.

We also performed a further moderation analysis to test whether defeat and entrapment differently predicted changes in anxiety depending on the person's baseline level of anxiety. This would occur, for example, if defeat and entrapment only predicted changes in anxiety amongst individuals with low T1 anxiety or individuals with high T1 anxiety. In Step 1, as above, T2 anxiety was predicted from T1 anxiety and T1 defeat and entrapment. In Step 2, T2 anxiety was additionally predicted from the integration between T1 anxiety and T1 defeat and entrapment. Step 2 did not significantly improve fit ($\Delta R^2 = <0.001$, $\Delta F(1, 168) = 0.09$, $p=0.763$) demonstrating that the predictive value of defeat and entrapment for changes in anxiety is equally as strong irrespective of people's initial levels of anxiety (Fig. 1)

3.4. The predictive role of defeat and entrapment for changes in depression

We repeated these analyses with depression as the outcome. The basic overall model was significant ($R^2 = 0.519$, $F(2, 169) = 91.15$, $p=0.001$) with T1 defeat and entrapment predicting changes in depression ($\beta=0.25$, $t(169)=3.16$, $p=0.002$, $r_{sp}=0.17$). As expected, T1 depression also remained a significant predictor of T2 depression ($\beta=0.52$, $t(169)=6.69$, $p= <0.001$, $r_{sp}=0.36$). Again, the robustness of this model was tested with subsequent analysis. To test whether defeat and entrapment differentially predicted changes in anxiety for men and women we conducted a moderation analysis, through a hierarchical multiple regression. In Step 1, T2 depression was predicted from T1 depression and T1 defeat and entrapment, as above. In Step 2, T2 depression was additionally predicted by gender (coded 0 and 1) and the interaction between gender and T1 defeat and entrapment, to see whether the predictive value of defeat and entrapment was dependent on gender. Step 2 did not significantly improve fit ($\Delta R^2 = <0.001$, $\Delta F(1, 168) = 0.35$, $p=0.556$) demonstrating that the predictive value of defeat and entrapment for changes in depression is equally as strong for both genders.

We also performed a further moderation analysis to test whether defeat and entrapment differently predicted changes in depression depending on the person's baseline level of depression. This would occur, for example, if defeat and entrapment only predicted changes in depression amongst individuals with low T1 depression or individuals with high T1 depression. In Step 1, as above, T2 depression was predicted from T1 depression and T1 defeat and entrapment. In Step 2, T2 depression was additionally predicted from the integration between T1 depression and T1 defeat and entrapment. Step 2 did not significantly improve fit ($\Delta R^2 = <0.001$, $\Delta F(1, 168) = <0.001$, $p=0.995$) demonstrating

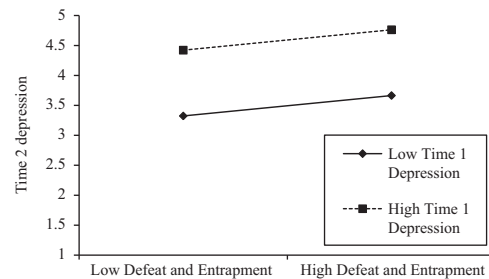that the predictive value of defeat and entrapment for changes in depression is equally as strong irrespective of people's initial levels of depression (Fig. 2)

3.5. The predictive role of depression and anxiety for changes in defeat and entrapment

To test the direction of the relationship between defeat, entrapment and psychopathology, regression analyses were conducted to test whether Time 1 (T1) depression and anxiety scores predicted Time 2 defeat and entrapment scores. Analyses were conducted separately for anxiety and depression due to the potential for substantial overlap between the constructs causing multi-collinearly problems for the analysis, leading to less interpretable coefficients associated with either predictor.

Analyses initially focused on anxiety predicting changes in defeat and entrapment. The overall model was significant ($R^2 = 0.71$, $F(2, 169) = 211.81$, $p < 0.001$) with T1 anxiety predicting changes in defeat and entrapment ($\beta=0.13$, $t(169)=2.10$, $p=0.04$) and as expected, T1 defeat and entrapment also remained a significant predictor of T2 defeat and entrapment ($\beta=0.75$, $t(169)=12.13$, $p= <0.001$). We also performed a moderation analysis to test whether anxiety differently predicted changes in defeat and entrapment depending on the person's baseline level of defeat and entrapment. In Step 1, as above, T2 defeat and entrapment was predicted from T1 depression and T1 defeat and entrapment. In Step 2, T2 defeat and entrapment was additionally predicted from the integration between T1 anxiety and T1 defeat and entrapment. Step 2 did not significantly improve fit ($\Delta R^2 = <0.001$, $\Delta F(1, 168) = 0.26$, $p=0.610$) demonstrating that the predictive value of defeat and entrapment for changes in anxiety is equally as strong irrespective of people's initial levels of anxiety. With depression as a predictor of change in defeat and entrapment, the model was again significant ($R^2 = 0.72$, $F(2, 169) = 218.08$, $p < 0.001$). T1 depression predicted changes in defeat and entrapment ($\beta=0.17$, $t(169)=2.84$, $p=0.001$) and as expected, T1 defeat and entrapment also remained a significant predictor of T2 defeat and entrapment ($\beta=0.72$, $t(169)=12.10$, $p= <0.001$).

We also performed a moderation analysis to test whether depression differently predicted changes in defeat and entrapment depending on the person's baseline level of defeat and entrapment. In Step 1, T2 defeat and entrapment was predicted from T1 depression and T1 defeat and entrapment. In Step 2, T2 defeat and entrapment was additionally predicted from the integration between T1 depression and T1 defeat and entrapment. Step 2 did not significantly improve fit ($\Delta R^2 = <0.001$, $\Delta F(1, 168) = <0.001$, $p=0.783$) demonstrating that the predictive value of defeat and entrapment for changes in depression is equally as strong irrespective of people's initial levels of depression (and by extension, whether they would have scored above or below clinical cut-off).

4. Discussion

The results demonstrated that defeat and entrapment are best defined as one factor. This demonstrates that a one-factor solution is generalisable to a wider population than students, as has previously been studied (Taylor et al., 2009; Sturman, 2011). This supports theories that defeat and entrapment capture a single common, underlying psychological construct. This construct has been conceptualised as representative of an arrested or dysfunctional IDS process which individuals are unable to escape from (Taylor et al., 2011; Sturman, 2011).

The results also demonstrated that higher levels of defeat and entrapment at Time 1 were associated with increased depression and state anxiety 12 months later. This supports evidence that feelings of defeat and entrapment are associated with depression and anxiety (e.g., Gilbert and Allan, 1998; Kendler et al., 2003) and provides evidence for the "depressogenic feedback loop", in which defeat and entrapment co-occur and precede the experience of psychopathology (Taylor et al., 2011). Therefore, the current study expands on the existing literature, which has been largely cross-sectional and has considered defeat and entrapment as separate predictors of negative outcomes. Furthermore, we also demonstrated that depression and anxiety predicted defeat and entrapment twelve months later. As we recruited a sample from economically deprived areas, it is likely that they will have experienced several defeating and entrapping circumstances. These findings suggest that not only do defeat and entrapment influence psychopathology, but also that individuals with mental health difficulties may be vulnerable to defeating and entrapping experiences. The results provide the first evidence that defeat and entrapment operate in a reciprocal loop with anxiety and depression. The experience of depression and anxiety may be in itself defeat and entrapping, leading to increases in perceptions of these constructs, which in turn leads to greater depression and anxiety. Such an effect would imply a downward spiral of functioning and could potentially partially explain the longevity of depressed and anxious conditions.

As we have shown that defeat and entrapment are reliable predictors of depression and anxiety but also presented the first test of depression and anxiety predicting defeat and entrapment, further research is required to investigate this at several time points, within clinical and non-clinical samples to establish exactly how the relationship between defeat and entrapment and psychopathology operates. For example, involuntary subordination, a construct derived partly from defeat and entrapment that also incorporates submissive behaviour and social comparison, has previously been shown to predict changes in social anxiety across a two-week period (Sturman, 2011). Furthermore, Taylor et al. (2009) suggested that defeat sometimes precedes entrapment before the two constructs co-occur. Studying this within different time frames would provide a clearer evaluation of how this process develops. However, regardless of whether psychopathological problems also predict defeat and entrapment, they should be viewed as key factors that predict the experience of psychopathology and should be measured within treatment settings.

The current sample consisted of individuals who experienced a range of levels of depression and anxiety, from extremely low to more clinically relevant. Defeat and entrapment predicted subsequent mental health regardless of baseline levels of defeat and entrapment, demonstrating that defeat and entrapment are clearly key predictors of psychopathological distress twelve months laterwithin the general population.

The current study focused on an economically deprived population. This sample was selected due to the increased exposure to adversity and vulnerability to experiences of defeat and entrapment in such individuals. Over 50% of participants experienced clinically relevant levels of psychopathology, confirming the view that socioeconomically deprived individuals represent a clinically meaningful group. This suggests the importance of perception of defeat and entrapment in predisposing individuals in this group to subsequent psychopathology. We are also cautious not to overstate the generalisability of our results, instead concluding that we demonstrated an impact of defeat and entrapment on psychopathology amongst a socioeconomically deprived population, consisting of individuals with high and low levels of mental health difficulties, and suggest that further research should investigate the relationship between defeat, entrapment and psychopathology specifically comparing individuals recruited from clinical and community settings. Participants completed subjective self-report measures, and future research should consider using clinical diagnoses as a measurement of mental health difficulties. Future research could also consider inducing short-term states of defeat and entrapment, to provide a less subjective measure of individuals' experiences (e.g., Johnson et al., 2011). As we have shown the relationship between defeat and entrapment and mental health difficulties to be bi-directional, this would also help to establish causality within this relationship.

We investigated the relationship between defeat and entrapment and mental health difficulties using hierarchal multiple regression. Although this is the standard and preferred method for establishing moderator effects for continuous variables (Aguinis and Pierce, 1998), a limitation of this method is that the power to detect true interaction effects is lower than recommended levels (Frazier et al., 2004) and therefore we may have been unable to detect interactions present within the data. However, we recruited a large sample that was normally distributed after transformation and tested moderators in a relationship that was already significant, which helps to maximise the power of tests of moderator effects (Frazier et al., 2004).

This study was longitudinal across twelve months. Such designs only show causality between variables A and B when there is covariation between A and B, A temporally precedes B and other plausible explanations have been rejected. In these circumstances "causality cannot be proven… but can be made plausible" (Cook and Campbell, 1979; Zapf et al., 1996). Therefore in this research we could claim to provide causal evidence for the relationship between defeat, entrapment and psychopathology, however we are careful not to make such a strong conclusion. Instead, we interpret our results as demonstrating that feelings of defeat and entrapment are associated with increased anxiety and depression, whilst also demonstrating that depression and anxiety are associated with increased perceptions of defeat and entrapment. These relationships may result from shared variance with another variable, however even if the relationship operates indirectly our interpretations would not be altered. Future research should consider measuring these factors at several time points in order to increase the understanding of the causality within this relationship.

These results have clinical implications for treating anxiety and depression. It may be beneficial for clinicians to be increasingly sensitive towards themes of defeat and entrapment during clinical assessments, particularly with individuals from socioeconomically deprived backgrounds, where these factors may contribute to psychopathology. For example interventions could focus on the psychological processes underlying defeat and entrapment (e.g., Taylor et al., 2009). By identifying the sources of defeat and entrapment, mental health could be improved by conceptualising problems as a response to these perceptions (Taylor et al., 2011) and altering these perceptions by incorporating the factors into clinical assessment or case formulations for interventions (Tarrier, 2006). Cognitive-behavioural techniques could then be employed to modify individuals' appraisals and reduce their sensitivity to defeat signals (Swallow, 2000; Johnson et al., 2008).

Individuals could be guided to reimagine situations of defeat in the past, and use this to alter cognitions of this experience (e.g., Lee, 2006). Furthermore, by emphasising to clients the resilience they have shown and focusing on successes, a more positive image of the self may be formed (Taylor et al., 2011). Tarrier (2010) suggested that using therapeutic techniques such as the broad-minded and affective coping procedure (Johnson et al., 2013) could help prevent individuals' appraisals from focusing on defeat and entrapment, by widening their behavioural and cognitive repertoires.

These implications may be particularly relevant to individuals from economically deprived areas, as they frequently experience higher rates of psychopathology, for example, such individuals meet clinical diagnosis conditions for psychopathology approximately 2.6 times as often as individuals of higher socioeconomic status (Kohn et al., 1998). Therefore, a more tailored approach is needed to support socioeconomically deprived individuals. Screening for defeat and entrapment would allow individuals at risk for psychopathology to be identified earlier. In conclusion we demonstrated that self-reported perceptions of defeat and entrapment formed one factor and therefore capture a single common, underlying psychological construct, which encompasses feelings associated with dysfunctional IDS behaviours. Levels of this combined defeat and entrapment factor predicted increases in depression and state anxiety 12 months later regardless of whether individuals were experiencing clinically relevant levels of psychopathological symptoms initially, although levels of depression and anxiety also predicted increases in defeat and entrapment suggesting that further research should be conducted to establish the mechanisms underlying this relationship and establish causality across several time points. These results have implications for improving client well-being in clinical settings by focusing on decreasing perceptions of defeat and entrapment in therapy for the treatment of psychopathology. There are also implications for community settings, where screening for defeat and entrapment could identify individuals at risk of developing psychopathology.

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