

**Elaborating the Cry of Pain model of suicidality:  
Testing a psychological model in a sample of first-time and repeat self-harm  
patients**

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## **Abstract**

**Objectives.** Few studies have specifically tested the Cry of Pain model (Williams, 2001). This model conceptualises suicidal behaviour as a behavioural response to a stressful situation which has three components: defeat, no escape potential, and no rescue. In addition, the model specifies a mediating role for entrapment on the defeat-suicidal ideation relationship, and a moderating role for rescue factors on the entrapment-suicidal ideation relationship. This is the first study to investigate the utility of this psychological model in a sample of first-time and repeat self-harm (SH) patients.

**Method.** One hundred and thirteen patients who had been admitted to hospital following an episode of SH (36 first-time, 67 repeat) and 37 hospital controls completed measures of defeat, entrapment/escape potential, rescue (social support and positive future thinking), as well as depression, anxiety and suicidal ideation.

**Results.** Analyses highlighted differences between the three participant groups on all of the Cry of Pain variables. Hierarchical regression analysis confirmed that total entrapment and internal entrapment mediated the relationship between defeat and suicidal ideation, whilst impaired ability to think positively about the future (but not social support) moderated the relationship between total and internal entrapment and suicidal ideation.

**Conclusions.** The findings provide further empirical support for the Cry of Pain model. The findings are discussed in relation to theory and practice and we recommend that the findings are replicated within a prospective design.

## **Introduction**

Recent psychological research has led to the development of the Cry of Pain model (CoP model), an entrapment model of suicidality, which suggests that suicidal ideation and behaviour are the end products of a perception of being trapped in a stressful situation from which there is no escape and no rescue (Williams, 2001; Williams & Pollock, 2000, 2001; See Figure 1). This model builds upon the diathesis-stress hypothesis (Alloy et al., 1999; O'Connor & Sheehy, 2000; 2001), Baumeister's Escape Theory of Suicide (Baumeister, 1990) and Gilbert's phenomenon of "arrested flight" (Gilbert, 1989; Gilbert & Allan, 1998).

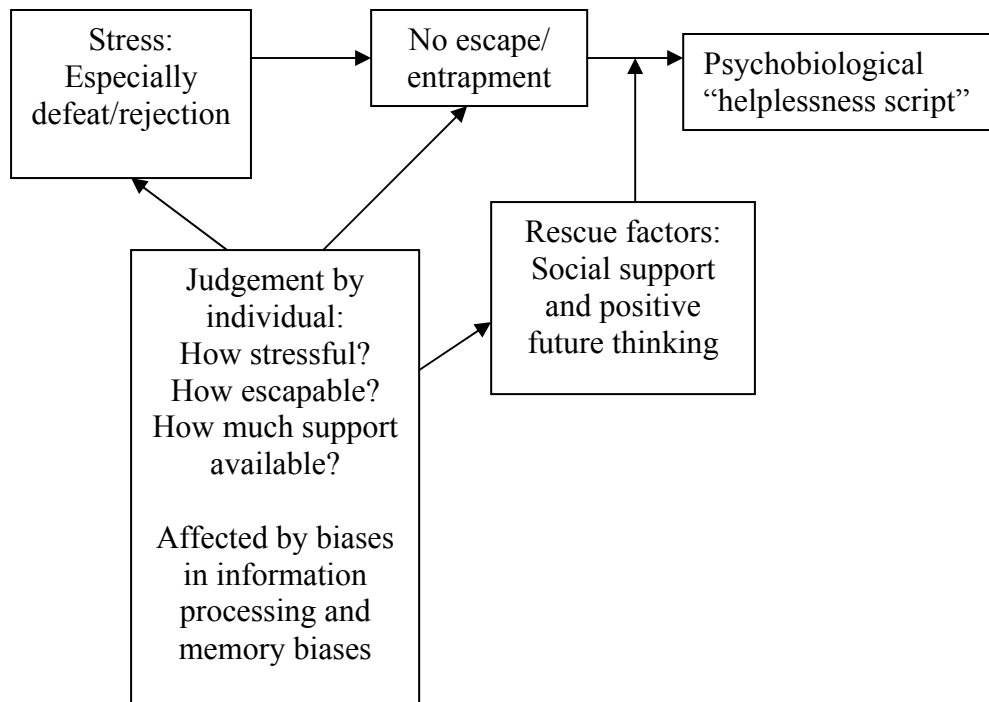
Williams and colleagues (2001) go beyond Baumeister's (1990) postulation that suicide is driven by the desire to escape from self. They draw upon the concept of "arrested flight" from the animal behaviour literature. Arrested flight describes a situation where an animal is defeated but cannot escape. According to data from animal conflicts, it is the state of entrapment, where the motivation to take flight is blocked that is particularly dangerous (see MacLean, 1990). Cautiously, Williams and Gilbert have argued that there is an analogous reaction in humans that could explain depression and suicidal behaviour. Williams (2001) and Williams and Pollock (2000, 2001) suggest that suicidal behaviour (whether the outcome is life or death) should be seen as a "cry of pain" rather than the traditional "cry for help". They argue that although some self-harming behaviour may not be motivated by a wish to die, a common theme in these behaviours is a wish to escape from an unbearable situation. Thus, the most important component of the behaviour is the idea that it is born out of mental anguish. Only secondary is the suggestion that the behaviour may have a communicative motive. In this way, although some self-harming behaviours may not

be motivated by a wish to die, most share the wish to escape from an unbearable situation.

Consistent with the arrested flight phenomenon, Williams proposes that suicidal behaviour is reactive: it is the response to a stressful situation which has three components which act together to increase suicidal risk: (1) the presence of defeat, (2) perception of no escape and (3) perception of no rescue (See Figure 1). Williams and Pollock (2000, 2001) argue that judgements regarding perceptions of defeat, escape (entrapment) and rescue are determined, at least in part, by psychological variables. Thus, when attempts at solving current problems are perceived to be unsuccessful, the individual feels powerless in escaping from the situation. In turn, this can lead to hopelessness as the individual thinks that the future will hold little opportunity for rescue or positive outcome. According to the CoP model, rescue factors can moderate the relationship between entrapment and suicidality thereby reducing suicide risk. One such potential rescue factor is positive future thinking. Previous research has suggested that, relative to depressed controls, suicidal individuals show a deficit in “positive future thinking”, as assessed using the future thinking task (MacLeod et al., 1997) which asks participants to generate as many thoughts about positive things that might happen to them in the future. However, there is no difference between these two groups in “negative future thinking” (e.g. Hunter & O’Connor, 2003). Suicidal patients, when asked what they are looking forward to in the future generate significantly fewer positive events compared to controls – in other words they have fewer reasons for living. Consistent with O’Connor et al. (2007, 2008) and O’Connor (2003), in the present study, we operationalised rescue both in terms of positive future thinking and social support and hypothesised that the rescue factors would moderate

the relationship between entrapment and suicidal ideation. In addition, the model suggests that lack of escape/entrapment mediates the defeat-suicidality relationship therefore this formed another hypothesis.

Figure 1. The Cry of Pain model (adapted from Williams, 2001)



Further rationale for the study was as follows. Although we recently found direct evidence to support the CoP model (O'Connor, 2003), to date, no studies have investigated whether first-timers differ from repeat self-harmers on the CoP dimensions. In addition, there has been a recent call to recognise the complexity of suicidal behaviour by investigating differences between suicidal sub-groups (Leenaars, DeLeo, Diekstra, Goldney, Kelleher, Lester & Nordstrom, 1997). Indeed, research shows that repeat self-harmers, when compared to first-timers, consistently report higher levels of psychological distress (e.g. O'Connor et al., 2007; MacLeod et al., 2004). Consequently, we reasoned that repeat SH patients would differ from the first-timers and controls on the CoP variables.

Furthermore, no published CoP studies have employed the Defeat and Entrapment Scales, which were devised by Gilbert & Allan (1998) to operationalise defeat and entrapment in the context of depression (see Johnson, Gooding & Tarrier, 2008 for a discussion). If these scales are shown to be useful with self-harm (SH) populations, they could be incorporated into future risk assessment/treatment protocols. Therefore, the central aims of the study were to extend the existing literature by (i) determining whether the Cry of Pain Model (i.e. defeat, entrapment and no rescue) distinguishes repeat self-harmers from first-time self-harmers and matched controls, and (ii) investigating whether the Cry of Pain variables account for suicidal ideation variance in a SH population over and above standard clinical variables (e.g. anxiety, depression, SH history and suicidal intent). Specifically, we hypothesised that (i) repeat SH participants would report significantly higher levels of defeat and entrapment, and lower levels of perceived rescue (social support and ability to think positively about the future) relative to first-time SH participants and hospital

controls, and (ii) among the SH participants entrapment would mediate the relationship between defeat and suicidal ideation, whilst (iii) rescue factors would buffer (moderate) the effect of entrapment on suicidal ideation.

## **Method**

### *Participants and Procedure*

We recruited 103 patients who had been admitted overnight to two central Scotland general hospitals following an episode of self-harm. Each participant was given a short introduction about the study and what participation would entail before they were invited to take part. However, patients were excluded from the study if they met the following criteria: (i) participants who were unfit for interview, (ii) those from whom we could not obtain informed consent, and (iii) those participants for whom English was not their first language. All participants had been assessed by the psychiatric liaison team prior to being approached and ethical permission was obtained from the Department of Psychology, University of Stirling ethics committee as well as the NHS Central Office for Research Ethics Committee.

Of the 103 participants, 61 were female (59%), and the overall mean age was 34.92 years ( $SD=13.40$ ). Men ( $M=33.98$  years,  $SD=11.20$ ) and women ( $M=35.57$  years,  $SD=14.79$ ) did not differ on age,  $t(101)=-.59$ , *ns*. Thirty-six participants had no previous history of SH and these participants were coded as first-time SH participants. The remaining participants (i.e. 67 participants), who had engaged in SH at least once previously, were coded as repeat SH patients. Within the repeat SH group 43% ( $N=29$ ) had self-harmed once previously, 15% ( $N=10$ ) had self-harmed twice previously, 9% ( $N=6$ ) had self-harmed three times previously, and 33% ( $N=22$ ) had self-harmed four or more times previously.

Ninety-four of the participants (91%) were admitted to hospital following an overdose, 5 participants were admitted as a result of self-cutting, and 4 participants were admitted due to a combination of both self-poisoning and cutting. These results are consistent with past research showing that approximately 90% of all SH admissions via accident and emergency departments tend to be cases of overdose (e.g. Hawton, Fagg, Simkin & Mills, 1994). It is, however, acknowledged that the present sample does not represent a consecutive sample, but rather is a reflection of the practical limitations of recruiting SH patients from general hospitals.

In order to investigate differences between those with and without SH history, we also recruited 37 hospital controls. The control sample was, as far as possible, matched for age and sex, and consisted of individuals who had been admitted with a physical health problem to the same acute receiving ward as the self-harm patients<sup>1</sup>. There were 21 females (57%) with a mean age of 42 years (SD=9.54). Univariate analysis of variance revealed a significant difference in age between the 3 groups ( $F(2, 137)=4.721, p<.01$ ). Post hoc Scheffe tests revealed a significant difference in age between the two SH participant groups and the control group (both  $p<.05$ ), with the control participants (M=42.41 years, SD=10.91) being significantly older than both the first-time SH participants (M=34.17 years, SD=13.78) and the repeat SH participants (M=35.33 years, SD=13.28). There were comparable proportions of women and men in the three participant groups ( $\chi^2=.375, df=2, ns$ ). The groups did not differ in verbal fluency ( $F(2, 134)=1.20, ns$ ), so it is not included in any of the substantive analyses.

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<sup>1</sup> A priori, we aimed to recruit 37 participants to each of the three participant groups (i.e. first-time SH, repeat SH, and matched controls); however, over the course of the study period we managed to recruit almost twice the proposed number of repeat self-harmers. To maximise statistical power in the regression analyses, we decided to include all participants (see statistical analyses section).



## Measures

### Cry of Pain Measures

Defeat. Defeat is conceptualised as sensitivity to environmental cues that signal defeat, and which give rise to an overpowering feeling of needing to escape. Feelings of defeat were assessed using the Defeat Scale (Gilbert & Allan, 1998). This is a 16 item self-report measure of perceived failed struggle and loss of rank (e.g. 'I feel defeated by life'). Respondents indicate on a five point Likert-type scale the extent to which each item describes their feelings (0=not at all to 4=extremely). This scale has been found to have good psychometric properties (Gilbert & Allan, 1998; Gilbert et al., 2002). Cronbach's alpha for the current study was .95.

Entrapment. Entrapment represents the sense of being unable to escape the feeling of defeat and rejection, and is measured by the Entrapment Scale (Gilbert & Allan, 1998). This is a 16 item measure of entrapment which includes two subscales: internal entrapment (perceptions of entrapment by one's own thoughts and feelings: e.g. 'I feel powerless to change myself'; 6 items) and external entrapment (perceptions of entrapment by external situations: e.g. 'I feel trapped by other people'; 10 items). Cronbach's alphas were good for the total entrapment scale ( $\alpha=.92$ ), the internal ( $\alpha=.92$ ) and the external ( $\alpha=.85$ ) entrapment subscales.

Rescue. Two types of rescue factors were included in the study: Social support and positive future thinking.

Social support was measured by the Medical Outcomes Study (MOS) social support survey (Sherbourne & Stewart, 1991). It consists of 18 questions which assess the extent to which a person is satisfied with the support they have available to them. The overall functional social support index has been found to exhibit good internal

consistency (Hays, Sherbourne & Mazel, 1992). The Cronbach's alpha for this study was .93.

The future thinking task (FTT; MacLeod et al., 1998) entails asking participants to think of positive and negative events that they are looking forward to/worried about in the future across three time periods – the next week (including today), the next year, and the next five to ten years. Participants are asked to generate as many as possible in one minute per time period. Two composite measures of future thinking are developed from the responses, one for positive future thoughts (i.e., positive week + positive year + positive 5-10 years) and the other for negative future thoughts. Each time period is presented verbally, and one at a time, and participants are asked to generate as many instances as possible within a one minute time period. More specifically, participants are asked to say out loud a description of as many events as possible, and to keep trying until the time is up. This procedure is repeated for both positive and negative events; however, research has consistently shown that it is impaired positive future thinking, rather than increased negative future thinking which is detrimental to psychological well-being (e.g. MacLeod et al., 1997; O'Connor et al., 2000, 2004, 2007). Consequently, only positive future thinking (events/things they were looking forward to or would enjoy) is reported herein. Before administration of the FTT, all participants completed a standard verbal fluency task (Lezak, 1976) – to control for general cognitive fluency. This task involves asking participants to generate as many words as possible in response to three letters (F, A, S), with 30 seconds allowed for each letter.

### Measures of Psychological Distress

Suicidal Ideation. Suicidal ideation was assessed using the suicidal ideation subscale of the Suicide Probability Scale (SPS; Cull & Gill, 1988). The suicidal

ideation subscale is aimed at establishing an individual's reported thoughts or behaviours associated with suicide. This subscale contains 8 items which range in focus from establishing the specificity of suicide plans (e.g. "I have thought of how to do myself in"), to determining the meaning of suicidal behaviour and thoughts within a social context (e.g. "In order to punish others I think of suicide"). The statements are evaluated by way of 4 responses: none or a little of the time (0), some of the time (1), good part of the time (2), and most or all of the time (3), and are scored such that a high score on the scale indicates a higher level of assessed risk. The scale has been shown to have high levels of reliability and validity (Cull & Gill, 1988). For the current study Cronbach's alpha was .88.

Anxiety and Depression. The Hospital Anxiety and Depression Scale was used to assess anxiety and depression (HADS; Zigmond & Snaith, 1983). The scale consists of 14 questions, of which seven correspond to the anxiety subscale (e.g. "Worrying thoughts go through my mind") and seven correspond to the depression subscale (e.g. "I have lost interest in my appearance"). Items are rated on a 0-3 point scale indicating strength of agreement with each item. The HADS is a reliable and valid measure of affect (Bjelland, Dahl, Haug & Necklemann, 2002). In the current study, Cronbach's alpha was .81 and .80 for anxiety and depression respectively.

General Questions. These included: (i) type of self-harm, (ii) suicidal intent (measured via the suicidal intent question from Beck's Suicide Intent Scale (Beck et al., 1974), and (iii) SH history. Presentation of the psychological measures was counterbalanced to control for transfer effects. However, the future thinking task was always completed first to minimise contamination.

Statistical Analyses.

To define sample size, we assumed a medium to large effect size of .30, consistent with other studies in the field. As a result, setting alpha at .05, power at .80 with 3 groups the power calculation yielded a sample of 111 participants (37 in each group). In addition to conducting the formal G-Power analysis, based on previous research with this population (e.g., O'Connor, 2003), a sample of 37 participants per group is more than adequate. As noted in footnote 1, we managed to recruit more repeat SH participants than anticipated.

We conducted two types of analyses. First, we report any differences between the three participant groups (first-time SH, repeat SH and control) for all the measures (Hypothesis 1), and we provide descriptive analyses (correlations, means and SDs) for the SH sample. Next, to test the utility of the Cry of Pain model, we conducted regression analyses on the SH participant data to test hypotheses two and three. As general cognitive fluency (FAS) was not correlated with suicidal ideation, it is excluded from all multivariate analyses ( $r = -.149$ , *ns*).

## **Results**

### *Descriptive Statistics*

To determine whether the Cry of Pain variables distinguished between the three participant groups (Hypothesis 1), and to investigate any differences in suicidal ideation and depression/anxiety, we conducted a gender x group multivariate analysis of variance test (MANOVA). The test revealed that the three participant groups differed significantly on all of the Cry of Pain variables (Defeat:  $F_{(2, 134)} = 63.86$ ,  $p < .001$ ; Total entrapment:  $F_{(2, 134)} = 57.77$ ,  $p < .001$ ; Internal entrapment:  $F_{(2, 134)} = 52.66$ ,  $p < .001$ ; External entrapment:  $F_{(2, 134)} = 49.24$ ,  $p < .001$ ; Social support:  $F_{(2, 134)} = 26.62$ ,

$p < .001$ ; Positive future thinking:  $F(2, 134) = 5.24, p < .01$ ) (See Table 1). There were no main effects for gender, nor were there any group by gender interactions.

**Table 1. Mean scores<sup>a</sup> (standard deviations in parentheses) for variables by group and levels of significance**

Variable	Control <sup>c</sup> (N=36)	First-time <sup>c</sup> (N=36)	Repeat <sup>c</sup> (N=67)	<i>F</i>	<i>P</i> <sup>b</sup>
Defeat	10.49 (10.07) <sub>x</sub>	34.14 (16.54) <sub>y</sub>	43.34 (14.28) <sub>y</sub>	63.86	.001
Total entrapment	7.95 (10.59) <sub>x</sub>	33.53 (17.16) <sub>y</sub>	40.15 (15.24) <sub>y</sub>	57.77	.001
Internal entrapment	2.73 (4.44) <sub>x</sub>	14.67 (8.40) <sub>y</sub>	17.03 (7.12) <sub>y</sub>	52.66	.001
External entrapment	5.22 (6.75) <sub>x</sub>	18.86 (9.52) <sub>y</sub>	23.07 (9.34) <sub>y</sub>	49.24	.001
Social support	55.59 (12.13) <sub>x</sub>	42.53 (13.03) <sub>y</sub>	34.09 (15.31) <sub>y</sub>	26.62	.001
Positive future thinking	6.49 (3.28) <sub>x</sub>	4.94 (4.26) <sub>x</sub>	3.72 (3.99) <sub>y</sub>	5.24	.01
Suicidal ideation	1.16 (2.30) <sub>x</sub>	14.92 (5.31) <sub>y</sub>	18.01 (7.00) <sub>y</sub>	105.57	.001
Depression	2.57 (3.51) <sub>x</sub>	9.08 (5.27) <sub>y</sub>	12.48 (5.33) <sub>y</sub>	45.37	.001
Anxiety	6.38 (5.26) <sub>x</sub>	11.67 (6.06) <sub>y</sub>	13.63 (5.03) <sub>y</sub>	21.94	.001

<sup>a</sup> except for positive future thinking where the total score is presented

<sup>b</sup> Main effects from group x gender MANOVA reported here

<sup>c</sup> Means with different subscripts within rows differ significantly, as a minimum, at  $p < .05$

We conducted post-hoc Scheffe tests (See Table 1) on the main effect of participant group which revealed that repeat SH participants reported significantly higher levels of defeat than the first time SH participants ( $p < .01$ ), whilst the controls were significantly lower on defeat than both these groups (Repeat:  $p < .001$ ; First-time:  $p < .001$ ). These differences were also evident for entrapment: the control participant group reported significantly lower levels of both internal entrapment ( $p < .001$ ), external entrapment ( $p < .001$ ) and total entrapment ( $p < .001$ ), than the first-time and the repeat SH participants respectively.

In addition, those in the repeat SH group were significantly lower on social support (a hypothesised rescue variable) than the first-time SH participants ( $p < .05$ ). Furthermore, both the repeat SH participants ( $p < .001$ ) and first-time SH participants ( $p < .001$ ) were significantly lower in social support than were the hospital controls. The post-hoc tests also demonstrated that repeat SH participants reported significantly fewer positive future thoughts than did the controls ( $p < .01$ ). There was no significant difference in the number of positive future thoughts between first-time and repeat attempt participants.

### *Correlation analyses*

Zero-order correlations for the total SH sample are presented in Table 2. These analyses showed that, for the SH sample, suicidal ideation was positively associated with hopelessness, depression and anxiety. In addition, it was also positively correlated with defeat and entrapment, whilst it was negatively correlated with both of the rescue measures: social support and positive future thinking. In terms of the CoP variables, we found that defeat was positively correlated with entrapment,

**Table 2. Zero-order correlations, means and standard deviations (in parentheses) for the SH participants**

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Defeat	-								
2. Entrapment (total)	.81	-							
3. Entrapment (internal)	.81	.92	-						
4. Entrapment (external)	.72	.95	.75	-					
5. Social support	-.41	-.40	-.38	-.38	-				
6. Positive future thinking	-.37	-.34	-.33	-.31	.33	-			
7. Suicidal ideation	.57	.71	.63	.69	-.43	-.35	-		
8. Depression	.58	.64	.63	.57	-.43	-.47	.51	-	
9. Anxiety	.63	.65	.64	.59	-.38	-.33	.41	.66	-
Mean	40.13	37.81	21.60	16.20	37.04	4.15	16.93	11.29	12.94
(SD)	(10.49)	(7.95)	(2.73)	(5.22)	(55.59)	(6.69)	(1.16)	(2.57)	(6.38)

All correlations were significant at  $p < .01$

*Note.* Repeat SH and first-time SH participants are collapsed into one group.

and both entrapment and defeat were negatively correlated with social support and positive future thinking<sup>2</sup>.

*Entrapment as a mediator of the defeat and suicidal ideation relationship*

To maximise statistical power, the remaining analyses focus on the SH sample as a whole. Although we do not distinguish between first-time and repeat SH participants in the subsequent analyses, we do control for SH history and suicidal intent. According to Baron and Kenny (1986), mediation is suggested if the following conditions are met: (i) the independent variable (i.e. defeat) predicts the mediator (i.e. entrapment), (ii) the independent variable affects the dependent variable (i.e. suicidal ideation), (iii) the mediator affects the dependent variable when the independent variable is controlled for, and finally, (iv) full mediation is suggested when the relationship between the independent and the dependent variable has been reduced to non-significance after the mediator has been controlled for.

We conducted three sets of regression analyses. In each regression, to ensure a rigorous test of the defeat-entrapment-suicidal ideation pathway, we controlled for anxiety, depression, and SH history and suicidal intent at step 1. Defeat was entered as the predictor of suicidal ideation at step 2, and, at step 3, to test conditions iii and iv, we included entrapment (either the total score or the internal or external subscale) as the mediator. After controlling for the step 1 variables, defeat significantly predicted suicidal ideation at step 2 ( $\beta = .313$ ,  $t(102) = 2.838$ ,  $p < .01$ ). At step 3, the regression analysis revealed that total entrapment significantly predicted suicidal ideation ( $\beta = .566$ ,  $t(102) = 6.071$ ,  $p < .001$ ), whilst the relationship between defeat and suicidal ideation was reduced to non-significance when total entrapment was controlled for, thus, indicating mediation ( $\beta = -.125$ ,  $t(102) = -1.018$ ,  $ns$ ). We repeated this step for the

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<sup>2</sup> All reported correlations are significant at  $p < .001$  level of significance



two entrapment subscales (internal and external entrapment) separately, and these analyses revealed that both internal and external entrapment significantly predicted suicidal ideation (Internal:  $\beta=.485$ ,  $t(102)=4.682$ ,  $p<.001$ ; External:  $\beta=.641$ ,  $t(102)=6.451$ ,  $p<.001$ ), whilst the relationship between defeat and suicidal ideation was reduced to non-significance when internal or external entrapment was controlled for, thus, suggesting mediation (External:  $\beta=.035$ ,  $t(102)=.314$ ,  $ns$ ; Internal:  $\beta=-.004$ ,  $t(102)=-.028$ ,  $ns$ ). Sobel tests confirmed the significant reduction in the relationship between defeat and suicidal ideation in all three regression analyses (Total:  $z=4.63$ ,  $p<.001$ ; External:  $z=3.91$ ,  $p<.001$ ; Internal:  $z=3.05$ ,  $p<.01$ ).

*Positive future thinking and social support as moderators of the entrapment and suicidal ideation relationship*

To test for the moderating effects of positive future thinking/social support, we conducted a series of hierarchical regression analyses (See Table 3). Consistent with Aiken and West (1991) we mean centred the cry of pain variables (i.e. the predictor variables) prior to the moderation analyses. We again entered anxiety, depression, SH history and suicidal intent at step 1, and entered entrapment (total entrapment, internal entrapment or external entrapment) in the second step of each regression. At step three we included either social support or positive future thinking, whilst in the final step we entered the relevant multiplicative term to test for the interaction (e.g. total entrapment x social support).

We conducted three regression analyses to investigate the effect of entrapment x positive future thinking in the prediction of suicidal ideation. In the first regression, total entrapment ( $\beta=.641$ ,  $t(102)=6.45$ ,  $p<.001$ ) was a significant predictor of suicidal ideation, and the total entrapment and positive future thinking interaction was also

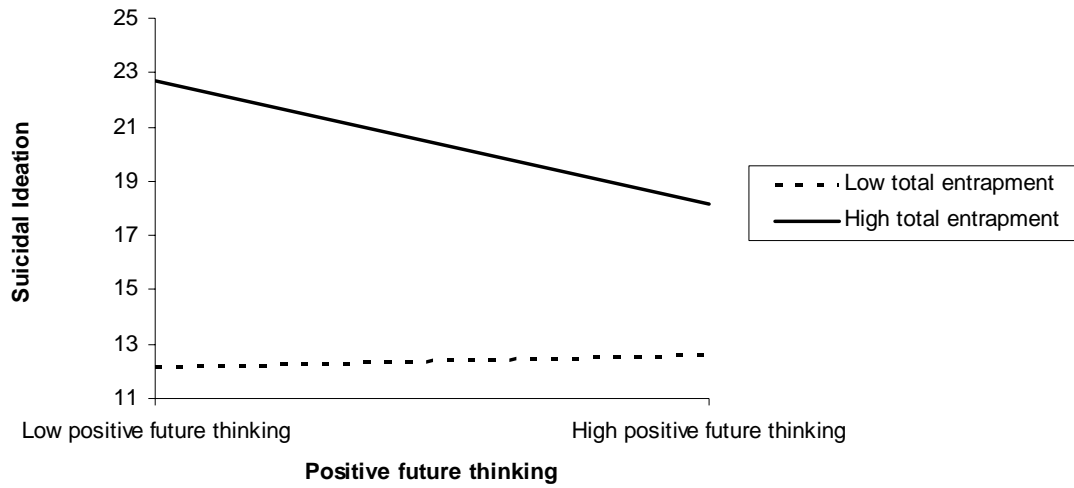
significant ( $\beta=-.183$ ,  $t(102)=-2.64$ ,  $p<.01$ ) in the prediction of suicidal ideation. To probe the interaction, consistent with Aiken and West (1991), we plotted the regression lines of best fit at high (1 standard deviation above the mean) and low (1 standard deviation below the mean) levels of total entrapment and positive future thinking. Next we carried out tests on each of the high and low total entrapment lines to determine whether they differed significantly from zero: we found that the high ( $\beta=-.309$ ,  $t(102)=-2.847$ ,  $p<.01$ ) but not the low ( $\beta=.027$ ,  $t(102)=.303$ ,  $ns$ ) entrapment slope differed significantly from zero (Figure 2, panel A).

We conducted the same analyses with the internal and external entrapment subscales and found that although both subscales independently predicted suicidal ideation (External:  $\beta=.566$ ,  $t(102)=6.071$ ,  $p<.001$ ; Internal:  $\beta=.485$ ,  $t(102)=4.682$ ,  $p<.001$ ), only internal entrapment interacted with positive future thinking to predict suicidal ideation ( $\beta=-.222$ ,  $t(102)=-2.939$ ,  $p<.01$ ). Again, to probe this interaction we plotted regression lines of best fit at high and low levels of internal entrapment and positive future thinking. These calculations showed that the high ( $\beta=-.331$ ,  $t(102)=-3.005$ ,  $p<.01$ ) but not the low ( $\beta=.050$ ,  $t(102)=.520$ ,  $ns$ ) internal entrapment slope differed significantly from zero (Figure 2, panel B).

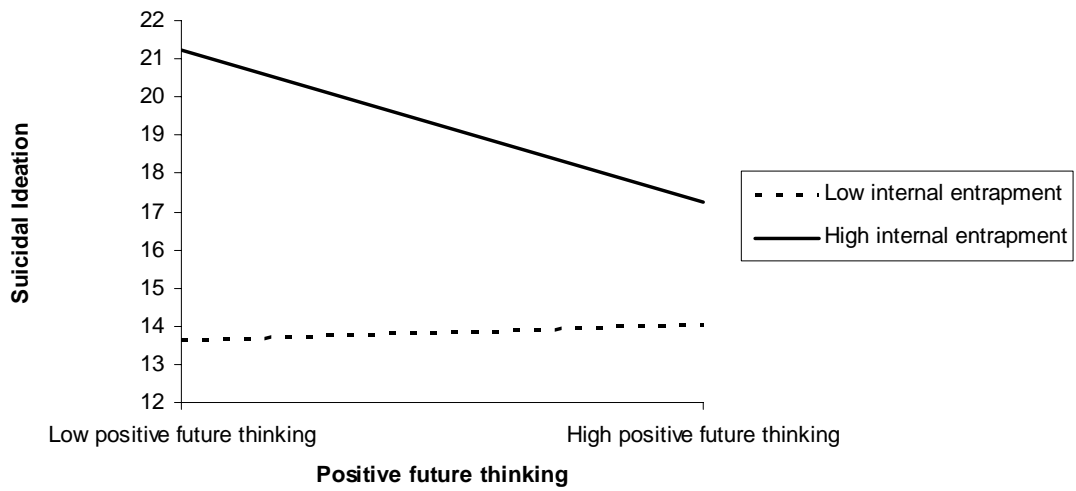
We conducted similar analyses with social support and entrapment; however, these analyses did not indicate any significant interactions (Total entrapment:  $\beta=.005$ ,  $t(102)=-.041$ ,  $ns$ ; Internal entrapment:  $\beta=.008$ ,  $t(102)=.108$ ,  $ns$ ; External entrapment:  $\beta=.040$ ,  $t(102)=.568$ ,  $ns$ ) (See Table 3).

**Figure 2. Positive future thinking as a moderator of the entrapment and suicidal ideation relationship in the SH participants**

Panel A



Panel B



**Table 3. Hierarchical regression analysis predicting suicidal ideation from entrapment and positive future thinking/social support, adjusting for SH history, suicidal intent, depression and anxiety.**

Step	Variable <b>Total entrapment</b>	$\beta$ at step	p- value for $\beta$ at step	Variable <b>Internal entrapment</b>	$\beta$ at step	p- value for $\beta$ at step	Variable <b>External entrapment</b>	$\beta$ at step	p- value for $\beta$ at step
Step 1	SH history	.207*	.05	SH history	.207*	.01	SH history	.207*	.05
	Suicidal intention	-.239**	.01	Suicidal intention	-.239**	.01	Suicidal intention	-.239**	.01
	Anxiety	.082	<i>ns</i>	Anxiety	.082	<i>ns</i>	Anxiety	.082	<i>ns</i>
	Depression	.319**	.01	Depression	.319**	.01	Depression	.319**	.01
Step 2	Entrapment	.641***	.001	Entrapment	.485***	.001	Entrapment	.566***	.001
Step 3	Positive future thinking	-.101	<i>ns</i>	Positive future thinking	-.109	<i>ns</i>	Positive future thinking	-.103	<i>ns</i>
Step 4	Entrapment x positive future thinking	-.183**	.01	Entrapment x positive future thinking	-.222**	.01	Entrapment x positive future thinking	-.106	<i>ns</i>
Step	Variable <b>Total entrapment</b>	$\beta$ at step	p- value for $\beta$ at step	Variable <b>Internal entrapment</b>	$\beta$ at step	p- value for $\beta$ at step	Variable <b>External entrapment</b>	$\beta$ at step	p- value for $\beta$ at step
Step 1	SH history	.207*	.05	SH history	.207*	.05	SH history	.207*	.05
	Suicidal intention	-.239**	.01	Suicidal intention	-.239**	.01	Suicidal intention	-.239**	.01
	Anxiety	.082	<i>ns</i>	Anxiety	.082	<i>ns</i>	Anxiety	.082	<i>ns</i>
	Depression	.319**	.01	Depression	.319**	.01	Depression	.319**	.01
Step 2	Entrapment	.641***	.001	Entrapment	.485***	.001	Entrapment	.566***	.001
Step 3	Social support	-.127	<i>ns</i>	Social support	-.155	<i>ns</i>	Social support	-.128	<i>ns</i>
Step 4	Entrapment x social support	.005	<i>ns</i>	Entrapment x social support	.008	<i>ns</i>	Entrapment x social support	.040	<i>ns</i>

\*\*\* $p < .001$ , \*\* $p < .01$ . \* $p < .05$ 

## Discussion

This study had two specific aims: (i) to extend the previous literature by examining the ability of the CoP model to distinguish between first time SH participants, repeat SH participants and hospital controls, and (ii) to investigate further

the ability of the model to predict suicidal ideation in SH participants over and above standard clinical variables. This study yielded evidence to support both aims. To the authors' knowledge, this is the first study to test the utility of the CoP model in distinguishing between first-time SH participants, repeat SH participants and hospital controls. We found that the repeat SH participants reported significantly higher levels of defeat and lower levels of social support than the first-time SH participants, and although there was not a significant difference between the two SH groups in terms of entrapment and positive future thinking, the data did suggest a trend in the predicted direction as defeat for external entrapment and total entrapment. In addition, both the SH groups reported significantly higher levels of defeat and entrapment, and lower levels of social support, than those in the control group, whilst the repeat SH participants were significantly lower than the controls in the ability to think positively about the future. Thus, there was some support for hypothesis one.

We also found evidence for the mediating and moderating relationships specified within the CoP model. Although one previous study (O'Connor, 2003) has tested the moderating relationship between social support and entrapment in a SH sample, no research has tested the proposed mediating role of entrapment in the defeat-suicidal ideation relationship. In addition, no previous studies have controlled for the effects of suicidal intent. This study yielded support for the two hypothesised pathways (hypotheses ii and iii): The results indicated that total entrapment and internal entrapment (but not external entrapment) mediated the defeat-suicidal ideation relationship. In addition, we also found that positive future thinking moderated the relationship between total entrapment/internal entrapment and suicidal ideation. When considered alongside the earlier work of O'Connor (2003), the present findings suggest that, even after controlling for clinical factors such as depression,

anxiety, SH history and suicidal intent, the cry of pain variables are significant and important constructs in the suicidal process.

Indeed, the findings that entrapment mediated the relationship between defeat and suicidal ideation, and that positive future thinking moderated the relationship between entrapment and suicidal ideation, supports the assertion that defeat, entrapment and lack of rescue each increase suicidal risk (Williams & Pollock, 2000, 2001). We were particularly interested in the finding that, while all of the entrapment subscales (total, internal and external) predicted suicidal ideation over and above the clinical risk factors, only the total entrapment scale and the internal subscale were involved in the mediating/moderating pathways to suicidal ideation. One possible interpretation of these data is that being trapped by one's own thoughts and feelings when experienced concomitantly with few positive future expectations is considerably more deleterious than being trapped by external factors. Future studies ought to explore this possibility directly.

It is surprising that social support did not emerge as a moderator of the entrapment-suicidal ideation relationship. This may be because most people in this sample experienced low levels of support; therefore, within a relatively small sample it is difficult to detect an interactive effect. Alternatively, it may be that the operationalisation of social support in this study is too simplistic to tease out, what are, complex relationships. Needless to say, future research should explore this in more detail. It would also be informative to determine the extent to which social isolation (the relative paucity of social relationships) determines positive future thinking as it is unlikely that positive future thinking exists in a social vacuum.<sup>3</sup> Nonetheless, the present findings strongly support the role of positive future thinking

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<sup>3</sup> We would like to thank an anonymous reviewer for this observation.

in the suicidal process. Indeed, O'Connor et al. (2008) suggest that one way of explaining the importance of impaired positive future thinking in elevating suicidal ideation is that its effect is analogous to having few reasons for living and as such an inability to generate these positive thoughts suggests little hope of being rescued from an intolerable situation.

Taking the MANOVA and regression analyses together, the results suggest that the CoP model may be a very good tool for understanding suicidal behaviour. Nonetheless, it is important to replicate these findings within a prospective study as well as extending the theory with experimental studies, thereby allowing us to build an evidence base on which to establish an effective psychosocial intervention. Indeed, the current research suggests that it may be particularly beneficial to focus clinical attention on reducing cognitions related to thoughts of defeat and internal entrapment, and to develop mechanisms for promoting positive future expectations. In addition, given the high correlations between defeat and entrapment, more item analysis-type work would be useful to maximise the discriminant validity of these scales.

Three potential limitations of the study are worth noting. First, although the study was adequately powered, the sample size for the first-time participants was relatively small compared with the repeat SH group, and therefore any interpretation of the results must bear this limitation in mind. Consequently, a larger sample may be needed to tease out more clearly the differences between first-time and repeat SH participants. In addition, the study suffers from the standard limitations of cross-sectional correlational research. Although regression techniques and MANOVA are extremely useful, we acknowledge that they cannot replace experimental manipulation and control, and discussion of causality is further restricted by the lack

of a prospective component. Finally, within the repeat self-harm group we did not systematically investigate the role of the timeframe between past and current SH, and we acknowledge that there may be differences between those participants who have not self-harmed for a long period of time, and those who have a history of recent SH. This is an issue which should be investigated in future research.

To conclude, taken together, the results outlined herein provide further evidence in support of the moderating and mediating pathways suggested within the Cry of Pain model (Williams, 2001). These findings warrant replication in a prospective study, with particular focus on whether positive future thinking is a more important rescue factor than social support.

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