



Elaborating the cry of pain model of suicidality: Testing a psychological model in a sample of first-time and repeat self-harm patients

Susan A. Rasmussen^{1*}, Louisa Fraser², Michael Gotz³,
Siobhan MacHale⁴, Rhona Mackie³, George Masterton⁴,
Susan McConachie³ and Rory C. O'Connor^{2*}

¹Department of Psychology, University of Strathclyde, Glasgow, UK

²Suicidal Behaviour Research Group, Department of Psychology, University of Stirling, UK

³Liaison Psychiatry, Stirling Royal Infirmary, UK

⁴Department of Psychological Medicine, Edinburgh Royal Infirmary, UK

Objectives. Few studies have specifically tested the Cry of Pain model (CoP model; Williams, 2001). This model conceptualizes 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 CoP 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 CoP Model. The findings are discussed in relation to theory and practice and we recommend that the findings are replicated within a prospective design.

*Correspondence should be addressed to Dr Susan A. Rasmussen, Department of Psychology, University of Strathclyde, 40 George Street, Glasgow G1 1QE, UK (e-mail: s.a.rasmussen@strath.ac.uk) or Professor Rory O'Connor, Suicide Behaviour Research Group, Department of Psychology, University of Stirling, Stirling FK4 9LA, UK (e-mail: ro2@stir.ac.uk)

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 Pollock (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

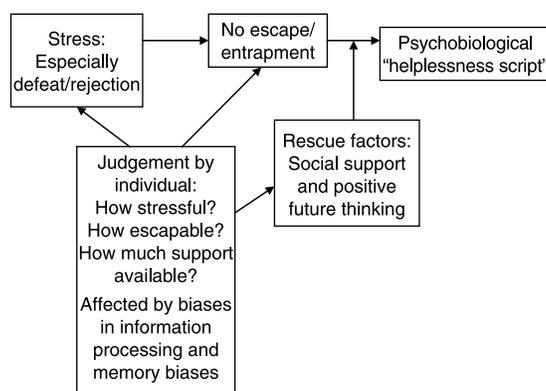


Figure 1. The Cry of Pain model (adapted from Williams, 2001).

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, Pankhania, Lee, & Mitchell, 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 operationalized rescue both in terms of positive future thinking and social support and hypothesized 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.

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 recognize the complexity of suicidal behaviour by investigating differences between suicidal subgroups (Leenaars *et al.*, 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 self-harm (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 and Allan (1998) to operationalize 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 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 CoP 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 CoP 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 SH. 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 National Health Service 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, $t(101) = -0.59$, 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, five participants were admitted as a result of self-cutting, and four 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 SH patients.¹ 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 three groups ($F_{(2,137)} = 4.721$, $p < .01$). *Post hoc* Scheffé 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 ($\chi^2 = 0.375$, $df = 2$, 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.

Measures

CoP measures

Defeat

Defeat is conceptualized as sensitivity to environmental cues that signal defeat, and which give rise to an overpowering feeling of needing to escape. Feelings of defeat were

¹ *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 maximize statistical power in the regression analyses, we decided to include all participants (see Statistical Analyses section).

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, Allan, Brough, Melley, & Miles, 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 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 5-10 years. Participants are asked to generate as many as possible in 1 min 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, Connery, & Cheyne, 2000; O'Connor, O'Connor, O'Connor, Smallwood, & Miles, 2004; O'Connor *et al.*, 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, and S), with 30 s allowed for each letter.

Measures of psychological distress

Suicidal ideation

Suicidal ideation was assessed using the suicidal ideation subscale of the Suicide Probability Scale (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 four 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 (HADS) was used to assess anxiety and depression (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 SH, (ii) suicidal intent (measured via the suicidal intent question from Beck's Suicide Intent Scale (Beck Weissman, Lester, & Trexler, 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 minimize 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 three 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 *SD*'s) for the SH sample. Next, to test the utility of the CoP Model, we conducted regression analyses on the SH participant data to test Hypotheses 2 and 3. As general cognitive fluency was not correlated with suicidal ideation, it is excluded from all multivariate analyses ($r = -.149$, ns).

Results

Descriptive statistics

To determine whether the CoP variables distinguished between the three participant groups (Hypothesis 1), and to investigate any differences in suicidal ideation and depression/anxiety, we conducted a gender \times group multivariate analysis of variance test (MANOVA). The test revealed that the three participant groups differed significantly on all of the CoP 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.

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 hypothesized 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, and both entrapment and defeat were negatively correlated with social support and positive future thinking.²

Entrapment as a mediator of the defeat and suicidal ideation relationship

To maximize 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),

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

Table 1. Mean scores^a (SD in parentheses) for variables by group and levels of significance

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

^a Except for positive future thinking where the total score is presented.

^b Means with different subscripts within rows differ significantly, as a minimum, at $p < .05$.

^c Main effects from group \times gender MANOVA reported here.

Table 2. Zero-order correlations, means, and SD 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 (SD)	40.13 (10.49)	37.81 (7.95)	21.60 (2.73)	16.20 (5.22)	37.04 (55.59)	4.15 (6.69)	16.93 (1.16)	11.29 (2.57)	12.94 (6.38)

^a All correlations were significant at $p < .01$.

^b Repeat SH and first-time SH participants are collapsed into one group.

(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 ($\beta = 0.313$, $t(102) = 2.838$, $p < .01$). At step 3, the regression analysis revealed that total entrapment significantly predicted suicidal ideation ($\beta = 0.566$, $t(102) = 6.071$, $p < .001$), whilst the relationship between defeat and suicidal ideation was reduced to non-significance when total entrapment was controlled for, thus, indicating mediation ($\beta = -0.125$, $t(102) = -1.018$, ns). We repeated this step for the two entrapment subscales (internal and external entrapment) separately, and these analyses revealed that both internal and external entrapment significantly predicted suicidal ideation (internal: $\beta = 0.485$, $t(102) = 4.682$, $p < .001$; external: $\beta = 0.641$, $t(102) = 6.451$, $p < .001$), 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: $\beta = 0.035$, $t(102) = 0.314$, ns; internal: $\beta = -0.004$, $t(102) = -0.028$, 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 CoP 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, internal, or external entrapment) in the second step of each regression. At step 3, 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 \times social support).

We conducted three regression analyses to investigate the effect of entrapment \times positive future thinking in the prediction of suicidal ideation. In the first regression, total entrapment ($\beta = 0.641$, $t(102) = 6.45$, $p < .001$) was a significant predictor of suicidal ideation, and the total entrapment and positive future thinking interaction was also significant ($\beta = -0.183$, $t(102) = -2.64$, $p < .01$) 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 *SD* above the mean) and low (1 *SD* 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 ($\beta = -0.309$, $t(102) = -2.847$, $p < .01$)

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	β at step	p-value for β at step	β at step	p-value for β at step
<i>Total entrapment</i>					
Step 1	SH history	0.207*	.05	0.207*	.05
	Suicidal intention	-0.239**	.01	-0.239**	.01
	Anxiety	0.082	ns	0.082	ns
	Depression	0.319**	.01	0.319**	.01
Step 2	Entrapment	0.641***	.001	0.641***	.001
Step 3	Positive future thinking	-0.101	ns	-0.127	ns
Step 4	Entrapment \times positive future thinking	-0.183**	.01	0.005	ns
<i>Internal entrapment</i>					
Step 1	SH history	0.207*	.01	0.207*	.05
	Suicidal intention	-0.239**	.01	-0.239**	.01
	Anxiety	0.082	ns	0.082	ns
	Depression	0.319**	.01	0.319**	.01
Step 2	Entrapment	0.485***	.001	0.485***	.001
Step 3	Positive future thinking	-0.109	ns	-0.155	ns
Step 4	Entrapment \times positive future thinking	-0.222**	.01	0.008	ns
<i>External entrapment</i>					
Step 1	SH history	0.207*	.05	0.207*	.05
	Suicidal intention	-0.239**	.01	-0.239**	.01
	Anxiety	0.082	ns	0.082	ns
	Depression	0.319**	.01	0.319**	.01
Step 2	Entrapment	0.566***	.001	0.566***	.001
Step 3	Positive future thinking	-0.103	ns	-0.128	ns
Step 4	Entrapment \times positive future thinking	-0.106	ns	0.040	ns

* $p < .05$; ** $p < .01$; *** $p < .001$.

but not the low ($\beta = 0.027, t(102) = 0.303, ns$) 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: $\beta = 0.566, t(102) = 6.071, p < .001$; internal: $\beta = 0.485, t(102) = 4.682, p < .001$), only internal entrapment interacted with positive future thinking to predict suicidal ideation ($\beta = -0.222, t(102) = -2.939, p < .01$). 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 ($\beta = -0.331, t(102) = -3.005, p < .01$) but not the low ($\beta = .050, t(102) = 0.520, ns$) 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: $\beta = 0.005, t(102) = -0.041, ns$; internal entrapment: $\beta = 0.008, t(102) = 0.108, ns$; external entrapment: $\beta = 0.040, t(102) = 0.568, ns$; see Table 3).

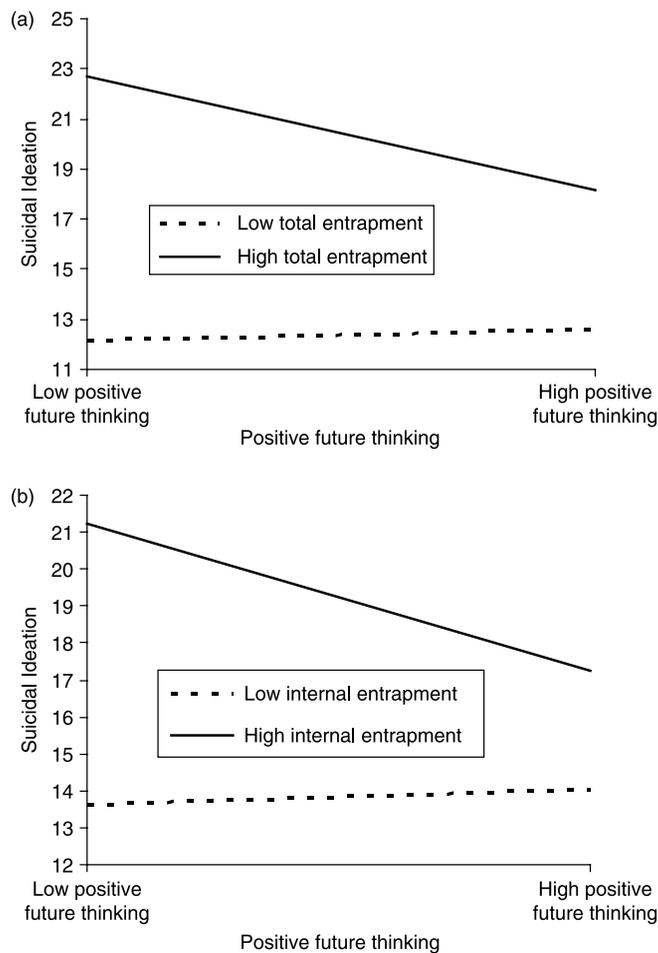


Figure 2. Positive future thinking as a moderator of the entrapment and suicidal ideation relationship in the SH participants.

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 1.

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 hypothesized pathways (Hypotheses 1 and 2): 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 CoP 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 operationalization 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.³ Nonetheless, the present findings strongly support the role of positive future thinking 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 maximize 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 SH 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 CoP 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.

Acknowledgement

This study was supported by the University of Stirling and a West of Scotland Research and Development PNf Programme Grant.

³ We would like to thank an anonymous reviewer for this observation.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regressions: Testing and interpreting interactions*. London: Sage.
- Alloy, L. B., Abramson, L. Y., Whitehouse, W. G., Hogan, M. E., Tashman, N. A., Steinberg, D. L., *et al.* (1999). Depressogenic cognitive styles: Predictive validity, information processing and personality characteristics, and developmental origins. *Behaviour Research and Therapy*, *37*, 503–531.
- Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychology research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.
- Baumeister, R. F. (1990). Suicide as escape from self. *Psychological Review*, *97*, 90–113.
- Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The hopelessness scale. *Journal of Consulting and Clinical Psychology*, *42*, 861–865.
- Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the hospital anxiety and depression scale – an updated literature review. *Journal of Psychosomatic Research*, *52*, 69–77.
- Cull, J. G., & Gill, W. S. (1988). *Suicide probability scale*. Los Angeles, CA: Western Psychological Services.
- Gilbert, P. (1989). *Human nature and suffering*. Hove and London: Erlbaum.
- Gilbert, P., & Allan, S. (1998). The role of defeat and entrapment (arrested flight) in depression: An exploration of an evolutionary view. *Psychological Medicine*, *28*, 585–598.
- Gilbert, P., Allan, S., Brough, S., Melley, S., & Miles, J. N. V. (2002). Relationship of anhedonia and anxiety to social rank, defeat and entrapment. *Journal of Affective Disorders*, *71*, 141–151.
- Hays, R. D., Sherbourne, C. D., & Mazel, R. M. (1993). RAND 36-item health survey. *Health Economics*, *2*(3), 217–227.
- Hawton, K., Fagg, J., Simkin, S., & Mills, J. (1994). The epidemiology of attempted suicide in the Oxford area England 1989–1992. *Crisis*, *15*, 123–135.
- Hunter, E., & O'Connor, R. C. (2003). Hopelessness and future thinking in parasuicide: The role of perfectionism. *British Journal of Clinical Psychology*, *42*, 355–365.
- Johnson, J., Gooding, P., & Tarrier, N. (2008). Suicide risk in schizophrenia: Explanatory models and clinical implications, the schematic appraisal model of suicide (SAMS). *Psychology and Psychotherapy*, *81*, 55–77.
- Leenaars, A. A., De Leo, D., Diekstra, R. F. W., Goldney, R. D., Kelleher, M. J., & Lester, D. (1997). Consultations for research in suicidology. *Archives of Suicide Research*, *3*, 139–151.
- Lezak, M. D. (1976). *Neuropsychological assessment*. New York: Oxford University Press.
- MacLean, P. D. (1990). *The triune brain in evolution*. New York: Plenum Press.
- MacLeod, A. K., Pankhania, B., Lee, M., & Mitchell, D. (1997). Parasuicide, depression, and the anticipation of positive and negative future expectancies. *Psychological Medicine*, *27*, 973–977.
- MacLeod, A. K., Tata, P., Evans, K., Tyrer, P., Schmidt, U., & Davidson, K. (1998). Recovery of positive future thinking within a high-risk parasuicide group: Results from a pilot randomized controlled trial. *British Journal of Clinical Psychology*, *37*, 371–379.
- MacLeod, A. K., Tata, P., Tyrer, P., Schmidt, U., Davidson, K., & Thompson, S. (2004). Personality disorder and future-directed thinking in parasuicide. *Journal of Personality Disorders*, *18* (5) 459–466.
- O'Connor, R. C. (2003). Suicidal behaviour as a cry of pain: Test of a psychological model. *Archives of Suicide Research*, *7*, 297–308.
- O'Connor, R. C., Connery, H., & Cheyne, W. (2000). Hopelessness: The role of depression, future directed thinking and cognitive vulnerability. *Psychology, Health and Medicine*, *5*, 155–161.
- O'Connor, R. C., Fraser, L., Whyte, M. C., MacHale, S., & Masterton, G. (2008). A comparison of specific positive future expectancies and global hopelessness as predictors of suicidal ideation in a prospective study of repeat self-harmers. *Journal of Affective Disorders*, *110*, 207–214.

Copyright © The British Psychological Society

Reproduction in any form (including the internet) is prohibited without prior permission from the Society

30 Susan A. Rasmussen et al.

- O'Connor, R. C., O'Connor, D. B., O'Connor, S. M., Smallwood, J., & Miles, J. (2004). Hopelessness, stress and perfectionism: The moderating effects of future thinking. *Cognition and Emotion*, *18*, 1099-1120.
- O'Connor, R., & Sheehy, N. P. (2000). *Understanding suicidal behaviour*. Chichester, WS: Wiley Blackwell.
- O'Connor, R. C., & Sheehy, N. P. (2001). State of the art: Suicidal behaviour. *The Psychologist*, *14*, 20-24.
- O'Connor, R. C., Whyte, M. C., Fraser, L., Masterton, G., Miles, J., & MacHale, S. (2007). Predicting short-term outcome in well-being following suicidal behaviour: The conjoint effects of social perfectionism and positive future thinking. *Behaviour Research and Therapy*, *45*, 1543-1555.
- Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey. *Social Science and Medicine*, *32*(6), 705-714.
- Williams, J. M. G. (2001). *The Cry of Pain*. London: Penguin.
- Williams, J. M. G., & Pollock, L. R. (2000). The psychology of suicidal behaviour. In K. Hawton & K. van Heeringen (Eds.), *The international handbook of suicide and attempted suicide* (pp. 79-93). Chichester, WS: Wiley.
- Williams, J. M. G., & Pollock, L. R. (2001). Psychological aspects of the suicidal process. In K. van Heeringen (Ed.), *Understanding suicidal behaviour* (pp. 76-93). Chichester, WS: Wiley.
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, *67*, 361-370.

Received 8 July 2008; revised version received 21 January 2009