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Predicting depression, anxiety and self-harm in adolescents: The role of perfectionism and acute life stress

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ABSTRACT

Despite the growing evidence that perfectionism is associated with adolescent psychological distress, few studies have investigated this relationship prospectively with measures designed for use in adolescent populations. In the present study, within a diathesis–stress framework, we investigated the extent to which perfectionism and acute life stress predict depression, anxiety and self-harm among adolescent school children ($n = 515$) over a 6 month period (Time 1–Time 2). Socially prescribed perfectionism (SPP), self-oriented perfectionism–critical (SOP-critical) and the associated interactions with acute life stress differentially predicted anxiety, depression and self-harm. Acute life stress was an independent predictor of depression, anxiety and self-harm. SPP predicted depression and interacted with acute life stress to predict self-harm. SOP-critical and the SOP-critical by acute life stress interaction predicted anxiety. Self-oriented perfectionism–striving (SOP-striving) did not predict any of the Time 2 measures of distress. The dimensions of perfectionism are differentially associated with psychological distress. Tailored clinical interventions focused on adolescent perfectionism should offer promise in tackling psychological morbidity in adolescence.

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Introduction

Psychological morbidity is pervasive in adolescence (O'Connor, Rasmussen, Miles, & Hawton, 2009). Although rates of depression are low in young children, they are comparable to those found in adults by middle adolescence (Southall & Roberts, 2002). Anxiety is also a common feature of adolescence (Essau, Leung, Conradt, Cheng, & Wong, 2008). In addition, recent findings from across Europe suggest that adolescent self-harm is prevalent, especially among females (Hawton & Rodham, 2006) with depression and anxiety frequently implicated in its aetiology (Hawton, Rodham, Evans, & Weatherall, 2002). Consequently, considerable research effort has focused on identifying psychological predictors of distress among adolescents (Ingram & Price, 2001).

Perfectionism, the focus of the present study, is one such predictor with a strong and independent relationship to distress across the lifespan (Flett & Hewitt, 2002; O'Connor & Sheehy, 2001; Shafran & Mansell, 2001). Although there is a large literature in adults (Enns & Cox, 2002; Hewitt & Flett, 1991; Shafran & Mansell, 2001), comparatively few studies have investigated the relationship between perfectionism and psychological health in children and adolescents

(Essau et al., 2008; O'Connor, 2007; Rice & Preusser, 2002). This may be because there are few perfectionism scales designed for use with child and adolescent populations (O'Connor, Dixon, & Rasmussen, in press; Rice, Leever, Noggle, & Lapsley, 2007). The Child and Adolescent Perfectionism Scale (CAPS; Flett, Hewitt, Boucher, Davidson, & Munro, 1997) is one such scale developed specifically for use with younger populations.¹ It is modelled on Hewitt and Flett's adult Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) and is comprised of two subscales: (a) *Self-oriented perfectionism* (SOP), defined as a strong motivation to be perfect, all-or-nothing thinking and self-reported high achievement expectations, and (b) *Socially prescribed perfectionism* (SPP) which assesses the extent to which an individual believes that others hold unrealistically high expectations of their behaviour.²

¹ The Adaptive/Maladaptive Perfectionism Scale (AMPS; Rice & Preusser, 2002) has recently been validated for use in child/adolescent populations (Rice, Kubal, & Preusser, 2004) but its use is not as widespread as the CAPS.

² Other perfectionism scales exist (see Enns & Cox, 2002; O'Connor, 2007). They include: Frost's Multidimensional Perfectionism Scale (Frost, Marten, Lahart, & Rosenblate, 1990); the Depressive Experiences Questionnaire (Blatt, D'Afflitti, & Quinlan, 1976) which includes the self-criticism subscale; the Burns Perfectionism Scale (Burns, 1980); the Almost Perfect Scale (Slaney, Rice, & Ashby, 2002) the Perfectionism Questionnaire (Rheaume, Freeston, & Ladouceur, 1995) and the Multidimensional Inventory of Perfectionism in Sport (Stöber, Otto, & Stoll, 2004). However, in the interests of brevity, we have limited discussion to studies employing Hewitt and Flett's instrument.

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Taking an overview of the child and adolescent depression literature, almost without exception, SPP is positively related to depression in clinical and non-clinical populations (Castro et al., 2004; Essau et al., 2008; Hewitt et al., 2002; Huggins, Davis, Rooney, & Kane, 2008; McCreary, Joiner, Schmidt, & Jalongo, 2004;). SPP is also associated cross-sectionally with suicidal ideation, hopelessness and self-harm (Boergers, Spirito, & Donaldson, 1998; Donaldson, Spirito, & Farnett, 2000; Enns, Cox, & Inayatulla, 2003; Hewitt, Newton, Flett, & Callander, 1997; O'Connor, Fraser, Whyte, MacHale, & Masterton, 2009; O'Connor, Rasmussen, & Hawton, 2009; O'Connor, Rasmussen, Miles, & Hawton, 2009). The case has yet to be made prospectively (see Enns et al., 2003). To our knowledge, this is the first study to investigate the utility of the CAPS to predict adolescent self-harm.

Few studies have investigated the relationship between SPP and child and adolescent anxiety. Some studies have found a relationship between SPP and anxiety (Essau et al., 2008; Hewitt et al., 2002) but others have found that the relationship does not hold when other key variables (e.g., baseline mood) are partialled out (McCreary et al., 2004). The inconsistent findings may reflect the paucity of sufficiently powered studies or it may be that SPP is more closely associated with depression and suicidal risk than anxiety. In support of the latter postulation, SPP may be particularly associated with depression and suicidality in adolescence as it is a time when young people are especially sensitive to public failure, social acceptance and social integration (Berndt, 1979; Hewitt et al., 1997; Mack, 1986).

The findings relating SOP to child or adolescent distress are equivocal. For example, SOP was associated with depression and anxiety among 10–15 year olds in one study (Hewitt et al., 2002) but it failed to predict concurrent depressive diagnostic status in another (Huggins et al., 2008), or suicide ideation among adolescent psychiatric patients in a further study (Hewitt et al., 1997).

Drawing again from the adult literature, two explanations for these inconsistencies are plausible. The first focuses on the ongoing conceptual debate within the perfectionism literature which posits that perfectionism is comprised of adaptive as well as maladaptive components (e.g., Bieling, Israeli, & Antony, 2003; Campbell & Di Paula, 2002). Consonant with this viewpoint, there is a growing consensus that perfectionism is usefully conceptualised as comprising two higher order (latent) dimensions/factors: personal standards (PS) and evaluative concerns (EC) perfectionism (see Dunkley, Blankstein, Masheb, & Grilo, 2006; Hewitt, Flett, Besser, Sherry, & McGee, 2003; O'Connor et al., 2007; Shafran, Cooper, & Fairburn, 2002, 2003). PS perfectionism is the setting of high standards and goals for oneself whereas EC perfectionism is characterised by "overly critical evaluations of one's own behaviour, an inability to derive satisfaction from successful performance and chronic concerns about others' criticism and expectations" (Dunkley et al., 2006, p.65).

PS perfectionism comprises the adaptive components of perfectionism including striving for perfectionism whereas EC perfectionism, the maladaptive factor, includes self-criticism and SPP (Dunkley, Zuroff, & Blankstein, 2003; Dunkley et al., 2006). In essence, this higher order dichotomy suggests that SOP is comprised of two sub-components, a striving-type component which is adaptive and a self-critical, maladaptive dimension. Consequently, it is the mixed nature of SOP which may account for the equivocal findings in the literature. Indeed, two recent studies (McCreary et al., 2004; O'Connor et al., 2009) yielded clear support for Dunkley and colleagues' higher order conceptualisation. Specifically, they found that the SOP dimension was better modelled as two factors (SOP-striving and SOP-critical) with SPP scaling well as a single factor. As a result, we have employed the 3-factor version of the CAPS in the present study and predicted that SOP-critical and SPP but not SOP-striving would be associated with psychological distress.

A second explanation for the unpredictable SOP findings concerns the role of stress and other moderators. In addition to being conceptually mixed, the SOP–distress relationship is known to vary as a function of the presence or absence of moderators, for example, stress (e.g., Hewitt et al., 2002) or coping (O'Connor & O'Connor, 2003). This explanation would be consistent with the diathesis–stress hypothesis; exponents of which point to the merits of investigating the extent to which the vulnerability associated with perfectionism is activated by stress (Flett, Hewitt, Blankstein, & Mosher, 1995; Hewitt & Flett, 1993; O'Connor & O'Connor, 2003; Rice & Lapsley, 2001). In other words, it may be that the deleterious effect of SOP on well-being becomes especially apparent when activated by stress. By contrast, the relationship between SPP and depressive symptoms is more direct, less affected by moderating factors (Flett et al., 1995). With respect to stress, there is good evidence that the occurrence of negative life events contributes to the onset and maintenance of depression, anxiety and self-harm in childhood and adolescence (e.g., Hawton et al., 2002; Ingram & Price, 2001). Although depression, anxiety and self-harm may have different aetiologies, for the most part, there is no consistent evidence in the perfectionism literature to posit differential hypotheses, so for the majority of the hypotheses we aggregated the different measures of distress.

Therefore, in the present study, we investigated whether perfectionism differentially predicts psychological distress and the extent to which its effects are moderated by acute stress (i.e., life stress). We were particularly interested in acute stress in light of the recent findings suggesting that acute stress is potentially more important than chronic stress in depression (Muscatell, Slavich, Monroe, & Gotlib, 2009).

The present study

We recruited adolescents from secondary schools and measured their psychological distress (depression, anxiety and self-harm) and life stress at baseline and again six months later at Time 2. Six months was chosen as a suitable follow-up period as it fitted comfortably within a school academic year and it was also of sufficient duration to examine changes in acute life stress and psychological distress. We aimed to determine the extent to which acute life stress and perfectionism predicted psychological distress over time and whether there was evidence for the perfectionism diathesis–stress hypothesis. As the previous perfectionism research evidence is equivocal, we are limited in the directional hypotheses we can formulate. Nonetheless, we proposed four key hypotheses:

- (1) Acute life stress experienced during the course of the study would be an independent predictor of psychological distress (depression, anxiety and self-harm);
- (2) SPP and SOP-critical would be more strongly related to psychological distress than SOP-striving;
- (3) Consistent with Flett et al. (1995), the influence of SPP on depression would be direct and not moderated by acute stress;
- (4) The interaction between SOP-critical perfectionism and acute life stress experienced between Time 1 and Time 2 would explain additional variance in psychological distress beyond their independent effects.

Method

Participants

We recruited 737 adolescents from three Scottish schools to participate in a 'Lifestyle and Coping' study. There were 367 females and 369 males with an overall mean age of 15.2 years ($SD = .7$). The boys ($M = 15.2$, $SD = .7$) and girls ($M = 15.2$, $SD = .8$) did not differ

significantly in age, $t(733) = .64, ns$. At Time 2, we followed up 515 of these young people thereby yielding a response rate of 70%. Consequently, the majority of the analyses are based on the $n = 515$. However, we had to exclude an additional 15 respondents from the self-harm analyses as it was not possible to determine whether they had self-harmed or not between Time 1 and Time 2.

Procedure

We obtained ethical approval from the Stirling University Psychology Department ethics committee. Written consent was obtained from all respondents. All pupils were provided with an envelope into which to insert and seal their completed questionnaires. Each participant was also given an information/support sheet to take away with them which included contacts for useful support organisations. To ensure anonymity respondents were given a unique reference code.

Measures

At Time 1 and Time 2 (6 months later), all participants completed a modified version of the 'Lifestyle and Coping' survey used in Oxford for the Child and Adolescent Self-harm in Europe (CASE) survey (see Madge et al., 2008; O'Connor, Fraser, et al., 2009; O'Connor, Rasmussen, & Hawton, 2009; O'Connor, Rasmussen, Miles, et al., 2009). This is an anonymous self-report questionnaire which takes approximately 30 min to complete. The original survey was developed in collaboration with experts in school-based studies and underwent extensive piloting in schools and an adolescent psychiatric unit. We only report on those measures pertinent to the present study below (see O'Connor, Fraser, et al., 2009; O'Connor, Rasmussen, & Hawton, 2009; O'Connor, Rasmussen, Miles, et al., 2009 for full details).

Acute life stress

This is a measure of 20 potentially stressful life events that are relevant to adolescent school children. The life events were developed following extensive piloting in schools and an adolescent psychiatric unit (see Hawton & Rodham, 2006). Participants were asked to indicate whether or not each event had happened in the past 12 months and/or more than 12 months ago or not at all. Examples of events include 'Have you been bullied at school?' and 'Have you been seriously physically abused?' To be comprehensive, the measure included a final, open-ended question 'Has any other distressing event occurred involving you, your family or close friends?' At Time 2, six months later the participants completed the same measures of stressful life events. From the participants' responses, for each life event, we were able to determine whether a participant experienced a *new* stressful life event between Time 1 and Time 2, i.e., in the previous six months. Consequently, we created a total *acute* life stress score by calculating the total number of new life events experienced by the young people between Time 1 and Time 2. Such a method is common in the literature (e.g., Southall & Roberts, 2002); aggregating the number of events is as effective as employing severity assessments (Johnston, Wright, & Weinman, 1995; Monroe & Simons, 1991).

Depression and anxiety

These were assessed via the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), which consists of 14 questions, seven corresponding to the anxiety subscale (e.g., "Worrying thoughts go through my mind") and seven corresponding to the depression subscale (e.g., "I have lost interest in my appearance"). The mean Cronbach's alphas published in the literature for HADS-anxiety and depression are .83 and .82, respectively (Bjelland, Dahl, Haug, & Necklemann, 2002). Internal consistency in the present

study ranged between .64 and .78. The HADS is a widely used measure in Europe which is a reliable and valid measure of affect (Bjelland et al., 2002; Cameron, Crawford, Lawton, & et al., 2008) and it has been validated for use in adolescent populations (White, Leach, Sims, Atkinson, & Cottrell, 1999). The sensitivity and specificity for both subscales is approximately .80 and the correlations between the HADS and other measures of depression and anxiety are between .60 and .80 (Bjelland et al., 2002). Concurrent validity was established via comparison with psychiatric ratings scales (anxiety, $r = .54$; depression, $r = .79$; Zigmond & Snaith, 1983).

Self-harm

Self-harm (SH) was recorded if a respondent answered yes to the following question "have you ever deliberately taken an overdose (e.g., pills or other medication) or tried to harm yourself in some other way (such as cut yourself)?" If participants reported SH, they were asked when they had last self-harmed. If a participant answered 'yes' to the SH question, they were asked to describe what they did on that occasion. Classification of an episode as SH was based on the agreed CASE criteria. The CASE criteria define SH as an "act with a non-fatal outcome in which an individual deliberately did one or more of the following: initiated behaviour (e.g., self-cutting, jumping from a height), which they intended to cause self-harm; ingested a substance in excess of the prescribed or generally recognised therapeutic dose; ingested a recreational or illicit drug that was an act the person regarded as self-harm; ingested a non-ingestible substance or object." (Hawton & Rodham, 2006, p.29). Consistent with other studies in Europe (e.g., Schmidtke et al., 1996) and elsewhere (e.g., Carter, Reith, Whyte, & McPherson, 2005), the definition of SH employed herein includes intentional self-injury and self-poisoning, irrespective of motivation or suicidal intent. Such an inclusive definition embodies the often mixed nature of self-harm intentions (Bancroft, Skrimshire, & Simkin, 1976; Hjelmeland et al., 2002) and the assertion that suicidal intent is a dimensional rather than a binary phenomenon (Harriss, Hawton, & Zahl, 2005). However, see Silverman, Berman, Sanddal, O'Carroll, and Joiner (2007a, 2007b) for further discussion of the difficulties around determining suicidal intent and a revised nomenclature for the study of suicide and self-harm. As participants were asked the SH questions at Time 1 and Time 2, we were able to ascertain whether they had self-harmed during the study period.

Perfectionism

Perfectionism was assessed via the 14-item version of the Child and Adolescent Perfectionism Scale (CAPS-14; O'Connor et al., 2009). This is derived from the 22-item CAPS (Flett et al., 1997) and follows the same three-factor structure as McCreary et al. (2004). It is comprised of three dimensions (1) socially prescribed perfectionism (SPP; 7 items), e.g., 'There are people in my life who expect me to be perfect', (2) self-oriented perfectionism-critical (SOP-critical; 4 items), e.g., 'I get mad at myself when I make a mistake', and (3) self-oriented perfectionism-striving (SOP-striving; 3 items), e.g., 'I try to be perfect in everything I do'. The three scales had good internal consistency in the present study (alphas = .86, .75, .78 for SPP, SOP-critical, SOP-striving, respectively). The psychometric properties for this sample have been reported previously and the subscales have good test-retest (6 month) reliability, the intraclass correlation coefficients over 6 months for SPP, SOP-critical and SOP-striving are .61, .65 and .64, respectively (O'Connor, Fraser, et al., 2009; O'Connor, Rasmussen, & Hawton, 2009; O'Connor, Rasmussen, Miles, et al., 2009).

Results

Of the initial sample, 70% ($n = 515$) completed measures at both time points, at Time 1 and Time 2, approximately six months later.

Our follow-up rate compares favourably to other studies in the field (e.g., Wingate, Van Orden, Joiner, Williams, & Rudd, 2005). There was no significant sex difference between those who did/did not complete Time 2, $\chi^2(1) = 1.78$, *ns*, but the mean age of those who did not complete the Time 2 measures ($M = 15.38$, $SD = .74$) was significantly higher, $t(735) = 4.34$, $p < .001$, than those who did ($M = 15.13$, $SD = .69$). With two exceptions (stress and SOP-striving), the groups did not differ significantly on the Time 1 variables (i.e., depression, anxiety, SPP and SOP-critical); range: $t(735) = .22$ to 1.6, *ns*). Those who completed measures at Time 2 reported significantly lower levels of stress at baseline ($t(735) = 4.97$, $p < .001$) and higher levels of SOP-striving ($t(735) = 4.87$, $p < .001$) compared with those who did not do so ($M = 2.44$, $SD = 2.22$ vs. $M = 3.41$, $SD = 2.65$ and $M = 10.77$, $SD = 2.63$ vs. $M = 9.71$, $SD = 2.83$, respectively). The most commonly reported acute stressors reported between Time 1 and Time 2 were someone close to the young person died (7.7%), serious arguments/fights with friends (7.4%) or parents (7.1%) whereas family suicide (.9%), physical abuse (.9%) and sexual abuse (1.2%) were among the least frequently reported. As expected (see Table 1), the mean scores for depression and anxiety were within the 'normal' range, a cut-off score of 8+ (for each subscale) is most frequently employed as indicative of possible clinical disorder (Bjelland et al., 2002). However, the mean anxiety scores were close to the clinical cut-off score. In addition, levels of depression and anxiety were significantly higher among those who reported self-harm between Time 1 and Time 2 compared to those who did not report self-harm ($M = 5.81$, $SD = 3.62$; $M = 5.5$, $SD = 3.3$; $M = 11.17$, $SD = 3.14$; $M = 10.6$, $SD = 3.50$ for depression at Time 1 and Time 2, anxiety at Time 1 and Time 2, respectively; range of $t(513) = 4.55$, $p < .001$ and $t(513) = 5.90$, $p < .001$, respectively).

Correlations and hierarchical regression analyses

Zero-order correlations, means and standard deviations for all variables are presented in Table 1. All of the measures of psychological distress were significantly inter-correlated. The moderate correlations between depression and anxiety fall within the range of correlations (.40–.74) reported in the literature (Bjelland et al., 2002). With the exception of depression Time 1, acute life stress (i.e., the number of new stressful life events reported between Time 1 and Time 2) correlated with all indices of psychological distress. SPP and SOP-critical were associated positively with depression, anxiety and

self-harm, however only SPP was correlated with acute stress. Finally, SOP-striving was correlated negatively with depression Time 1 and acute stress. Although all three dimensions of perfectionism were correlated with depression Time 1, the relationships between SOP-critical/SPP and depression were stronger than that for SOP-striving and depression ($Z_{diff(513)} = 6.13$, $p < .001$ and $Z_{diff(513)} = 6.76$, $p < .001$, for SOP-critical vs. SOP-striving and SPP vs. SOP-striving, respectively). As SOP-striving was not correlated with any of the measures of Time 2 distress, it was excluded from all multivariate analyses. Age only correlated with one variable, positively with SPP.

Perfectionism and acute life stress as predictors of depression

As age and sex differences exist in respect of affect (O'Connor, Fraser, et al., 2009; O'Connor, Rasmussen, & Hawton, 2009; O'Connor, Rasmussen, Miles, et al., 2009), we controlled for their potential effects in the multivariate analyses. We conducted a hierarchical regression analysis to determine whether acute life stress and perfectionism independently and interactively predict Time 2 depression (beyond baseline mood). Depression Time 1, anxiety Time 1, age and sex were entered in the first step of the regression, followed by acute life stress between Time 1 and Time 2 and the perfectionism dimensions at steps 2 and 3 respectively. To test the diathesis–stress hypothesis, the respective interactive terms (i.e., SOP-critical by acute life stress and SPP by acute life stress interactions) were then added at step 4. In the final model, anxiety Time 1 ($\beta = .152$ $t(513) = 3.38$, $p < .001$), depression Time 1 ($\beta = .394$ $t(513) = 9.41$, $p < .001$), acute life stress ($\beta = .076$ $t(513) = 1.98$, $p < .05$) and SPP ($\beta = .105$ $t(513) = 2.38$, $p < .05$) each independently predicted depression Time 2. Step 1 accounted for 29% of the Time 2 depression variance, with acute life stress and SPP accounting for an additional 8% and 1.6%, respectively. SOP-critical did not predict depression prospectively nor did either of the perfectionism by acute life stress interactions (see Table 2).

Perfectionism and acute life stress as predictors of anxiety

We conducted another hierarchical regression analysis, as outlined above, with anxiety Time 2 as the dependent variable. On this occasion, in addition to the independent effects of baseline mood (anxiety, $\beta = .515$ $t(513) = 12.79$, $p < .001$, and depression, $\beta = .082$ $t(513) = 2.19$, $p < .05$) and acute life stress ($\beta = .171$ $t(513) = 5.00$, $p < .001$),

Table 1

Correlations, means, SDs and ranges for study variables for those who completed measures at Time 1 and Time 2.

| | Age | Depression Time 1 | Anxiety Time 1 | Depression Time 2 | Anxiety Time 2 | Acute stress (Time 1–Time 2) | SPP | SOP-critical | SOP-striving | Self-harm (Time 1–Time 2) |
|--|-------|-------------------|----------------|-------------------|----------------|------------------------------|---------|--------------|--------------|---------------------------|
| Age | – | | | | | | | | | |
| Depression Time 1 | –.60 | – | | | | | | | | |
| Anxiety Time 1 | –.05 | .412*** | – | | | | | | | |
| Depression Time 2 | .026 | .505*** | .378*** | – | | | | | | |
| Anxiety Time 2 | .025 | .335*** | .633*** | .488*** | – | | | | | |
| Acute Stress (Time 1–Time 2) | .052 | .067 | .150*** | .141*** | .251*** | – | | | | |
| SPP | .085* | .289*** | .361*** | .313*** | .304*** | .113** | – | | | |
| SOP-critical | .042 | .212*** | .350*** | .254*** | .319*** | .001 | .497*** | – | | |
| SOP-striving | .057 | –.079* | .000 | –.010 | .008 | –.119** | .215*** | .378*** | – | |
| Self-harm ^a (Time 1–Time 2) | .073 | .215*** | .255*** | .199*** | .211*** | .157*** | .081* | .144*** | .012 | – |
| Mean | 15.13 | 3.66 | 7.80 | 3.44 | 7.48 | 1.17 | 18.43 | 6.69 | 10.77 | n/a |
| SD | .69 | 2.50 | 3.38 | 2.70 | 3.81 | 1.47 | 6.01 | 3.31 | 2.63 | n/a |
| Range | 14–17 | 0–16 | 0–19 | 0–14 | 0–19 | 0–10 | 7–34 | 4–20 | 3–15 | 0–1 |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Acute Stress (Time 1–Time 2) = new life stress between Time 1 and Time 2; SPP = socially prescribed perfectionism; SOP-critical = Self-oriented perfectionism–critical; SOP-striving = Self-oriented perfectionism–striving; Self-harm (Time 1–Time 2) = self-harmed reported between TIME 1 and TIME 2.

^a Although self-harm is a dichotomous variable, we have included it here for completeness.

Table 2

Hierarchical regression analyses testing the moderating effect of acute life stress on the relationship between perfectionism and depression/anxiety.

| | Depression | | | | Anxiety | | | | | |
|--------|----------------------------------|----------------|---------------------------|------------|---------|----------------------------------|----------------|---------------------------|------------|----------|
| | Variable | R ² | Δ R ² for step | Final beta | t | Variable | R ² | Δ R ² for step | Final beta | t |
| Step 1 | Age | .294 | .294*** | .040 | 1.07 | Age | .414 | .414*** | .018 | .53 |
| | Gender | | | .043 | 1.12 | Gender | | | -.068 | -1.95 |
| | Anxiety Time 1 | | | .152 | 3.38*** | Anxiety Time 1 | | | .515 | 12.79*** |
| | Depression Time 1 | | | .394 | 9.41*** | Depression Time 1 | | | .082 | 2.19* |
| Step 2 | Acute Life Stress | .302 | .008* | .076 | 1.98* | Acute Life Stress | .436 | .022*** | .171 | 5.00*** |
| Step 3 | SPP | .318 | .016** | .105 | 2.38* | SPP | .449 | .013** | .016 | .40 |
| | SOP-critical | | | .060 | 1.36 | SOP-critical | | | .115 | 2.95** |
| Step 4 | SPP × Acute Life Stress | .320 | .002 | .043 | 1.08 | SPP × Acute Life Stress | .456 | .007* | -.048 | -1.35 |
| | SOP-critical × Acute Life Stress | | | -.022 | -.55 | SOP-critical × Acute Life Stress | | | .094 | 2.62** |

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

SOP-critical ($\beta = .115$ $t(513) = 2.95$, $p < .01$) and the SOP-critical by acute life stress interaction ($\beta = .094$ $t(513) = 2.62$, $p < .01$) were also significant predictors of anxiety Time 2. Step 1 variables (predominantly anxiety Time 1 and depression Time 1) accounted for 41% of the Time 2 anxiety variance, acute life stress added an additional 2% with SOP-critical and its interaction with stress explaining an additional 1.3% and .7%, respectively. SPP did not predict Time 2 anxiety independently or concomitantly with acute stress (see Table 2).

To probe the SOP by acute life stress interaction, consistent with Aiken and West (1991), we plotted regression lines of best fit at high (one standard deviation above the mean) and low levels (one standard deviation below the mean) of SOP-critical and acute life stress. Next, we conducted further tests separately on the high and low acute life stress lines to determine whether they differed from zero. This revealed that the high stress line differed significantly from zero ($\beta = .214$ $t(513) = 3.88$, $p < .001$) but the low stress line did not ($\beta = .016$ $t(513) = .30$, ns). As illustrated in Fig. 1, anxiety Time 2 was significantly higher among those respondents who reported high levels of SOP-critical and had experienced high levels of acute life stress between Time 1 and Time 2.

Perfectionism and acute life stress as predictors of self-harm

During the six month follow-up period, 31 respondents (6.2%) reported self-harm between Time 1 and Time 2. The majority of

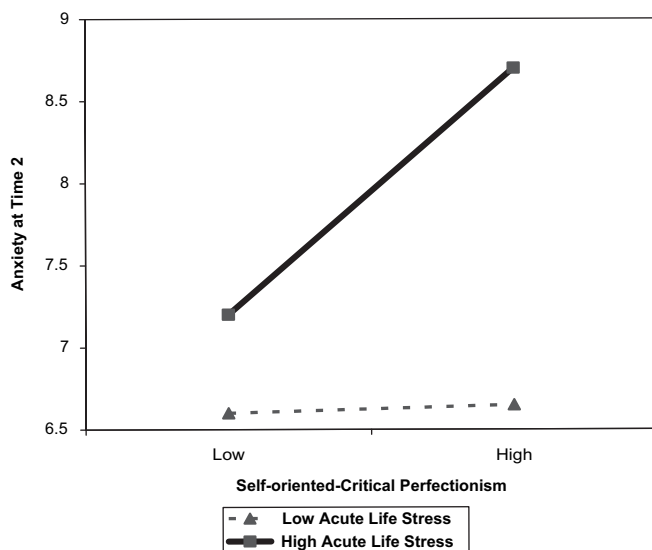


Fig. 1. Predicting Time 2 anxiety as a function of acute life stress experienced and self-oriented-critical perfectionism.

self-harmers were female (65%; 20/31). To determine whether acute life stress and perfectionism predicted self-harm, we conducted a multivariate logistic regression analysis, similar to the hierarchical analyses described above (see Table 3). In the final model, baseline mood (anxiety, OR = 1.23, 95% CI = 1.07–1.42, $p < .01$, and depression, OR = 1.20, 95% CI = 1.03–1.41, $p < .05$), acute life stress (OR = 1.35, 95% CI = 1.06–1.73, $p < .05$) and the interaction between SPP and acute life stress (OR = .93, 95% CI = .88–.99, $p < .05$) predicted self-harm group membership. There were no other significant predictors. The regression model successfully classified 95% of the participants. Next, we graphed the SPP by acute life stress interaction (one standard deviation above and below the mean for acute life stress and socially prescribed perfectionism) which showed that although acute life stress was an independent predictor of self-harm (i.e., probability of self-harm), among those young people reporting low levels of acute life stress, their probability of self-harm increased as a function of increases in SPP (see Fig. 2).

Discussion

The present study yielded considerable support for the study's hypotheses. Acute life stress was an independent predictor of psychological distress in all of the prospective analyses (hypothesis 1). In support of the second hypothesis, SPP and SOP-critical were more strongly related to psychological distress than SOP-striving. The third hypothesis was also supported. SPP was a direct and independent predictor of depression over time with no evidence that its relationship with depression was moderated by acute life stress.

Finally, there was some evidence to support the fourth hypothesis as the SOP-critical perfectionism by acute life stress

Table 3

Multivariate logistic regression analyses testing the moderating effect of acute life stress on the relationship between perfectionism and self-harm.

| | Self-harm (Time 1–Time 2) | | | |
|--------|----------------------------------|------------|--------------------------------|-----------|
| | Variable | Final Wald | Odds ratio ^a 95% CI | |
| Step 1 | Age | .87 | 1.34 | .73–2.45 |
| | Sex | 2.05 | 1.96 | .78–4.94 |
| | Anxiety Time 1 | 8.11 | 1.23** | 1.07–1.42 |
| | Depression Time 1 | 5.32 | 1.20* | 1.03–1.41 |
| Step 2 | Acute Life Stress | 5.78 | 1.35* | 1.06–1.73 |
| Step 3 | SPP | .72 | .96 | .89–1.05 |
| | SOP-critical | 2.87 | 1.14 | .98–1.31 |
| Step 4 | SPP × Acute Life Stress | 5.82 | .93* | .88–.99 |
| | SOP-critical × Acute Life Stress | 1.79 | 1.06 | .97–1.15 |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.^a Odds ratio for 1 point increase in score (excluding sex).

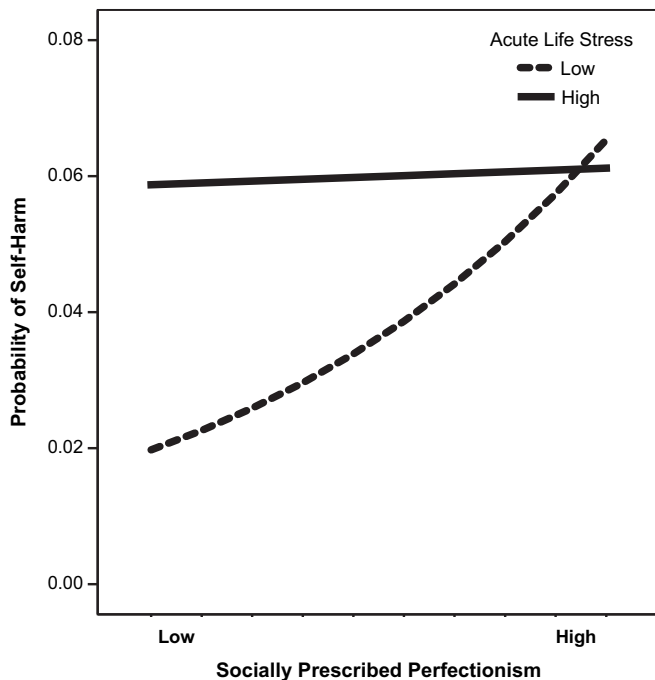


Fig. 2. The probability of self-harm between Time 1 and Time 2 as a function of acute life stress and socially prescribed perfectionism.

interaction accounted for additional variance in psychological distress beyond their independent effects. This interaction is noteworthy as it is recognised that moderator effects are particularly difficult to detect in field studies and typically account for between 1 and 3% of variance (McClelland & Judd, 1993). Moreover, post hoc slope coefficients are more meaningful descriptors of the importance of moderators than variance increments as they describe the rate of change in the dependent variable for different levels of the moderator (Champoux & Peters, 1987). Consequently, inspection of the slope coefficients emphasises the theoretical and clinical implications of the acute life stress–SOP critical interaction.

This study has extended the adolescent perfectionism literature in a number of key respects. First, few prospective studies have been conducted with adolescents and fewer still have employed a measure of perfectionism designed specifically for use with adolescents (McCreary et al., 2004; O'Connor et al., 2009; Rice et al., 2007; Rice & Preusser, 2002). Second, our findings add to the growing literature that the individual dimensions of perfectionism are differentially associated with psychological distress (Bergman, Nyland, & Burns, 2007; Bieling et al., 2003; Dunkley et al., 2006; Slade & Owens, 1998; Stoeber & Rambow, 2007). Moreover, there was clear support for the three-factor operationalisation of the Child and Adolescent Perfectionism Scale (McCreary et al., 2004; O'Connor et al., 2009). Indeed, distinguishing between the self-critical and striving components of self-oriented perfectionism is merited empirically as well as theoretically (e.g., Dunkley et al., 2006).

The SPP main effect as a predictor of depression is consistent with much of the previous adolescent and adult research (Castro et al., 2004; Essau et al., 2008; Hewitt, Flett, & Ediger, 1996; Huggins et al., 2008; McCreary et al., 2004). It also supports the assertion that SPP is the most important predictor of depression when considered alongside other personality factors (Hewitt & Flett, 1993). Although this is the first study to investigate the relationship between the three CAPS dimensions and self-harm, our findings concur with findings in the adult literature which show SPP to be more strongly associated with self-harm than self-oriented perfectionism

(O'Connor et al., 2007). The six month prevalence of self-harm fits with 12 month figures reported in the UK (9.7% and 8.6% for Scotland and England, respectively) using the same methodology (Hawton et al., 2002; O'Connor, Fraser, et al., 2009; O'Connor, Rasmussen, & Hawton, 2009; O'Connor, Rasmussen, Miles, et al., 2009).

There are a number of clinical implications of this study. First, we would tentatively suggest that perfectionistic beliefs associated with the prediction of depression and self-harm may differ from those associated with adolescent anxiety. As improved typologies of those at risk of psychological morbidity can only aid treatment and outcome (Jobes, Jacoby, Cimboric, & Husted, 1997), we would urge further research to determine whether the pattern of differences reported here are robust and not merely statistical artefacts reflecting minor differences in shared vs unique variance. Given that adolescents are especially sensitive to public failure, social acceptance and social integration (Berndt, 1979; Hewitt et al., 1997; Mack, 1986), clinical interventions for depressive symptoms should pay particular attention to socially prescribed perfectionistic beliefs. Second, it would be beneficial to investigate potential mechanisms which may mediate the SPP–depressive symptoms/self-harm pathway. Possible mechanisms include social support (O'Connor, 2000; Sherry, Law, Hewitt, Flett, & Besser, 2008), thoughts of entrapment/defeat (O'Connor et al., 2007) and coping (Dunkley et al., 2003). Conversely, interventions to tackle anxiety should focus on negative cognitions about the self especially those characterised by self-criticism.

Third, although diathesis–stress models usually posit that it is the interaction between cognitive vulnerability and high stress which work concomitantly to predict outcome, the self-harm findings suggest that (when the independent effect of acute stress is controlled), as SPP levels increase, even modest levels of acute stress can be pernicious. This 'stress-threshold-lowering' effect may be clinically important as it suggests that the risk of self-harm may be elevated even among those socially prescribed perfectionists who have experienced relatively few stressors. Finally, our findings clearly show that SPP and SOP-critical are significantly more pernicious than SOP-striving, indeed SOP-striving was not associated with any of the measures of Time 2 distress.

Although the present study has advanced adolescent perfectionism research in a number of key respects, three potential limitations are worthy of comment. First, we relied entirely on self-report measures. Future research should incorporate more objective measures of life stress and multi-wave study designs. Second, as we did not include chronic stressors in our analyses, future research could usefully incorporate these stressors, for example, it may be that the relationship between chronic life stress and perfectionism is stronger than the acute life stress–perfectionism relationship. It would also be useful to investigate whether the type, duration, frequency and intensity of the stressors moderate the perfectionism–distress relationship. Third, although the sample size was more than adequate for the main analyses, a larger sample may have teased out additional, small statistical effects in the prediction of self-harm. Indeed a larger sample of self-harmers would afford the opportunity to investigate the differences between sub-groups of self-harmers (e.g., first-timers versus repeaters, those with and without suicidal intent). Nonetheless, a replication of the self-harm findings with a larger sample of cases would be desirable to determine the robustness of the reported effects. It is also worth noting that some of the statistical relationships may have been artificially suppressed given that those who completed questionnaires at both Time 1 and Time 2 reported significantly lower levels of baseline stress than those who did not.

To conclude, the present study supports the growing body of evidence that cognitive vulnerability factors are implicated in the aetiology of psychological morbidity in adolescence. Moreover, it emphasises the pernicious effect of acute life stress across different typologies of distress and suggests that specific perfectionistic

beliefs are differentially associated with the prediction of depression, anxiety and self-harm.

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