The relationship between perfectionistic self-presentation and reactions to impairment and disability following spinal cord injury

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Abstract

Univariate and multivariate relationships between perfectionistic self-presentation and reactions to impairment and disability following spinal cord injury were examined. One hundred and forty-four adults with spinal cord injury ($M = 48.18$ years, $SD = 15.96$) completed self-report measures. Analyses revealed that, after controlling for time since injury and gender, perfectionistic self-presentation predicted six of eight reactions, shock, depression, and internalised anger particularly strongly. In addition, at multivariate level, perfectionistic self-presentation was positively related to non-adaptive reactions and negatively related to adaptive reactions. The findings suggest that perfectionistic self-presentation may contribute to poorer psychosocial adaptation to spinal cord injury.

The World Health Organisation (2013) has estimated that between 250,000 and 500,000 people suffer a spinal cord injury (SCI) every year. A SCI entails physical damage to the spinal cord and paralysis. As a result of paralysis, individuals can experience poor or complete loss of motor control, impaired sensory awareness, and impaired homeostatic regulation. Due to these permanent impairments, SCI requires individuals to adapt to profound changes to their lives. This includes obvious altered physical capabilities but also changed social, sexual, and vocational roles (Middleton, Tate, & Geraghty, 2003). Individuals display considerable variability in the degree to which they are able to adapt to SCI. It has been found, for example, that up to 30% of people who suffer SCI report clinically significant levels of depression (Craig, Tran, & Middleton, 2009). In the current study we sought to better understand factors that may undermine adaptation to SCI by examining the relationship between perfectionistic self-presentation and reactions to impairment and disability following the injury.

Psychosocial adaptation and SCI

There is considerable debate regarding the conceptualisation of the psychosocial adaptation that follows SCI and other chronic illnesses and disabilities (CID) (Livneh & Wilson, 2003). There is, however, broad agreement that adaptation is best characterised as a process whereby a person moves from a state of conflict between current and desired self-concept towards a new state of acceptance (Livneh & Parker, 2005). Livneh and Antonak (1997) define psychosocial adaptation as "…an evolving, dynamic, general process through which the individual gradually approaches an optimal state of person-environment congruence" (pp.8). In Livneh's (2001) corresponding model of psychosocial adaptation he differentiates between three parts: (i) events that can be attributed directly or indirectly to how the CID started and biological, psychological, and contextual variables active at the onset of the CID; (ii) the relationship between CID triggered reactions (or reactions to

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impairment and disability) and contextual variables (disability, sociodemographic, personality, and external factors), and (iii) the degree to which a person successfully adapts to CID in terms of real world functioning. This model provides a broad framework in which the complex process of adaptation to CID can be understood.

In the current study we focus on reactions to impairment and disability. Reactions to impairment and disability refer to overlapping response phases during the adaptation process (Livenh & Wilson, 2003). Livneh's model (Livneh & Antonak, 1990, 1997) includes eight reactions. Listed in decreasing proximity to the onset of CID, these reactions are shock (an emergency reaction to the CID onset), anxiety (a panic-stricken reaction upon initial realisation of the crisis), denial (the first active defence mobilization against early realisation of the situation via wishful and unrealistic ideas about recovery), depression (the realisation of true loss and future limitations), internalised anger (self-directed resentment and bitterness often associated with feelings of self-blame), externalised hostility (retaliation against functional limitations directed at other persons, objects or aspects of the environment via aggressive acts and verbalisations), acknowledgment (a cognitive acceptance of the conditions permanency and the future implications), and adjustment (both an affective internalization, or emotional acceptance, of new functional limitations and a sociobehavioural reintegration into new life situations). The last two reactions are considered adaptive and the other six non-adaptive with the caveat that denial may be independent from both sets of reactions (Livneh & Antonak, 1990, 1997).

Adaptation to SCI has received considerable attention in research. The work of Craig, Kennedy, Krause, and Tate, among others, is particularly noteworthy (see Chevalier, Kennedy, & Sherlock, 2009; Craig et al., 2009; Post & Leeuwen, 2012; for reviews). Their research has provided extensive information on the experiences of those with SCI and suggests that most people are able to adapt well to their changed lives. However, the findings

of this research also suggest that individual trajectories can vary in the adaptation process and a significant minority of individuals experience mental health difficulties following SCI. In addition, successful adaptation is influenced by various factors and includes contextual disability-related variables (e.g., time since injury), socio-demographic variables (e.g., gender), situational appraisals and coping processes (e.g., perceptions of threat vs challenge), and personality factors (e.g., neuroticism and extraversion). This research also includes impressive longitudinal studies that have tracked those with SCI over decades of their lives and studies that indicate psychosocial adaptation to SCI can be improved via intervention (see Mehta et al., 2011).

Against this backdrop, there have been a smaller number of studies that have directly examined reactions to impairment and disability following SCI. The findings of this research have illustrated how reactions to impairment and disability discriminate between those experiencing a SCI in terms of onset (recent onset versus long term injury) as well as between different groups (civilians versus veterans) (e.g., Livenh & Antonak, 1990; Livneh & Martz, 2003). In addition, there is also evidence that reactions to impairment and disability are related to individual differences in a sense of coherence (belief that the world is comprehensible, manageable and meaningful), a future time orientation (degree of general concern, engagement, and involvement in the future), and hope (a sense of successful agency and pathways to meaningful goals) (Livneh, & Martz, 2014; Lustig, 2005; Martz, 2004). Research therefore provides some support for Livneh's (2001) model and the relationship between reactions to impairment and disability and personality characteristics.

Perfectionistic self-presentation and CID

One personality factor that may be important in terms of reactions to impairment and disability is perfectionism. Perfectionism is broadly defined as a commitment to excessively high standards and overly critical self-evaluation (Frost, Marten, Lahart, & Rosenblate,

1990). It is thought to be a personality characteristic that can manifest as a trait, cognitive

style, and presentational style (Flett, Hewitt, Blankstein, & Gray, 1998; Hewitt & Flett, 1991;

Hewitt et al., 2003). In terms of the latter, perfectionistic self-presentation (PSP) is a style of

impression management that includes the facets of perfectionistic self-promotion (seeking

opportunities to demonstrate one's perfection), non-display of imperfection (minimising the

public display of mistakes, flaws, and shortcomings) and non-disclosure of imperfection

(minimising admission of mistakes, flaws, and short-comings). PSP is thought to stem from a

desire to protect and boost low and fragile self-esteem (Hewitt et al., 2003). In accord,

research has found that it is associated with a range of maladaptive outcomes including a

lower sense of being important to others (Flett et al., 2012), depression (Flett, Besser &

Hewitt, 2014), and suicide ideation (Roxborough et al., 2012).

Researchers have recently begun to examine the role of perfectionism in health. This

includes examining whether perfectionism predicts the experiences of those with various CID

(e.g., Flett et al., 2011; Molnar, Flett, Sadava & Colautti, 2012; Shanmugasegaram et al.,

2014). This research has almost exclusively focused on trait perfectionism. However, more

recently perfectionistic self-presentation has begun to receive attention. Of the two studies to

date, the first examined the relationship between PSP, other personality characteristics (trait

perfectionism, optimism, and neuroticism), health-related coping, and the physical and

psychosocial impact of CID among individuals with irritable bowel syndrome (Flett et al.,

2011). The second examined the relationship between PSP, other personality characteristics

(trait perfectionism and type D personality), and health-related coping among cardiac

rehabilitation patients (Shanmugasegaram et al., 2014). In both studies PSP was related to

coping strategies considered less conducive to psychosocial adaptation (e.g., emotional

preoccupation). In addition, in Flett et al.'s study, PSP was also related to greater negative

psychosocial impact of illness and remained so after controlling for the physical impact of the

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illness, neuroticism, and optimism. As such, initial indication is that PSP is associated with how people cope with and adapt to CID.

Examining PSP and SCI offers a further opportunity to illuminate the nature of PSP within context of CID. Flett et al (2011) has argued that perfectionism may exacerbate the impact of CID for a number of reasons. In particular, perfectionism entails negative cognitive biases that exacerbate stressful situations (stress reactivity) and also makes it difficult to adjust achievement behaviour following illness (stress generation). In both of these regards, PSP would be expected to be associated with less adaptive and more non-adaptive reactions to SCI. The irrational desire to portray life as ideal and to be 'perfectly healthy,' discussed by Flett et al in context of irritable bowel syndrome, is especially relevant to SCI. This is because the visible nature of SCI (e.g., use of a wheel chair), ongoing health complications, and requirement of self-care make depicting an image of being 'perfectly healthy' impossible. In addition, PSP is thought to be underpinned by a highly negative self-view. Therefore, in a similar manner to how trait perfectionism is associated with a pessimistic attributional style (i.e., the tendency to attribute negative events to internal, stable, and global factors; Chang & Sanna, 2001), it is possible that SCI may be viewed as affirmation of some inherent lack of importance, worth, or value, and worsen reactions to SCI. Finally, personal and professional goals will be fundamentally challenged following SCI and those exhibiting PSP are likely to lack the flexibility to reassess and adjust these goals easily and may have particular difficultly accepting that this is required.

The aim of this study was to examine the relationship between PSP and reactions to impairment and disability following SCI. It was hypothesised that facets of PSP would positively predict non-adaptive reactions (shock, anxiety, denial, depression internalised anger and externalised hostility) and negatively predict adaptive reactions (acknowledgment and adjustment). In addition, these relationships were expected to be evident at univariate

level (when reactions are examined individually) and multivariate level (when reactions are examined simultaneously).

Method

Participants

One hundred and forty-four adults (aged 18 years or older) with SCI participated in the study. The participants were mostly male (75%), middle-aged (M = 48.18 years, SD = 15.96, range of 18-78), white British (88%)[1], married (48%), and paraplegic (57%). The total time since injury ranged from 1 month to 660 months (M = 148.00, SD = 165.97). Participants were recruited from hospital (n = 48) and a community (n = 96) settings in the UK. Recruitment in a hospital setting was coordinated with medical care professionals who distributed information sheets. If patients expressed an interest in participation, they then met the first author to discuss participation. Recruitment in a community setting was via targeted advertisement with wheelchair user groups or SCI groups (e.g. mouth painting classes, online support forums, and SCI charities). All participants provided informed consent prior to taking part. Thereafter, participants completed a multi-section questionnaire. Questionnaires were completed either independently or with the assistance of a researcher (first author) where necessary. Ethical approval was obtained from both the institution of the lead researcher and the National Health Service.

Instruments

Perfectionistic Self-Presentation. PSP was measured using the Perfectionistic Self-Presentation Scale (PSPS; Hewitt et al., 2003). The PSPS comprises 27 items and three subscales, namely perfectionistic self-promotion (10 items; e.g., 'If I seem perfect, others will

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[1] Marital status and ethnicity was recorded using the categories included in the most recent UK Census survey (https://www.ons.gov.uk/census/2011census).

see me more positively'), nondisplay of imperfection (10 items; e.g., 'errors are much worse if they are made in public rather than in private') and nondisclosure of imperfection (7 items; e.g., 'I should always keep my problems to myself'). These are measured on a 7-point scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Evidence has been provided by Hewitt et al. (2003) to support the validity and reliability of the instrument including factor structure and internal reliability. The PSPS has also been used in research among individuals with CID (Flett et al., 2011; Shanmugasegaram et al., 2014).

Reactions to Impairment and Disability. Reactions to impairment and disability were measured using the Reaction to Impairment and Disability Inventory (RIDI) (Livneh & Antonak, 1990, 2008). The RIDI consists of 60 items and eight subscales: shock (7 items; e.g., 'my mind goes blank'), anxiety (8 items; e.g., 'I find myself trembling without any reason'), denial (7 items; e.g., 'if I become a better person my problems will be cured'), depression (8 items; e.g., 'I am a failure as a person'), internalised anger (8 items; e.g., 'I am embarrassed about my impairment'), externalised hostility (7 items; e.g., 'nobody is going to tell me what to do'), acknowledgement (7 items; e.g., 'I have been through a crisis and feel that I understand things better') and adjustment (8 items; e.g., 'I am satisfied with my present abilities despite my disability'). The instructions of the instrument were altered so to focus respondents on SCI. Participants respond to the frequency they have experienced each item on a 4-point scale from 1 (Never) to 4 (Often). Evidence has been provided by Livneh and colleagues (Livneh & Antonak, 1990, 2005; Livneh, Martz & Bodner, 2006) to support the validity and reliability of the instrument including factor structure and internal reliability. The use of the RIDI is also common in research examining adaptation to SCI (e.g., Livneh, & Martz, 2014; Lustig, 2005; Martz, 2004).

Results

Preliminary Analysis

Prior to conducting the primary analyses, data were assessed in terms of missing data and screened for univariate and multivariate outliers using procedures described by Tabachnick and Fidell (2007). Due to large amounts of missing data (>5%), one participant was removed. There were 120 remaining cases with complete data and 23 cases with incomplete cases. Incomplete cases displayed a very low amount of missing items (M = 1.57 items, SD = 0.90, range = 1 to 4). In addition, Little's MCAR test provided evidence that data was missing completely at random: χ^2 (1793) = 1866.27, p >.05. Missing values were subsequently replaced using the mean of the non-missing items from the subscale in each individual case (see Graham, Cumsille, & Elek-Fisk, 2003).

Three participants were removed due to being identified as univariate outliers (zscore ±3.29, p < .001, two-tailed). No multivariate cases were removed: Mahalanobis distance used for assessment was χ^2 (11) = 31.264, p < .001. Subsequently, the final sample consisted of 140 participants (47 inpatients, 93 outpatients) that were predominantly male (74%), white British (89.3%), paraplegic (56.4%) with an age range of 18-78 years (M = 48.03, SD = 15.92), married (47.9%), and a time since onset of injury from 1 month to 660 months (M = 147.78, SD = 167.71). Following removal of outliers, so that the variables more closely approximated a normal distribution, a number of variables were transformed (shock, anxiety, denial, depression, externalised hostility [all LOG10 transformations]). The transformed variables were almost perfectly correlated with the corresponding original variables (r = .98 to .99). Subsequent bivariate correlations and multiple regression analyses, including standard errors and hypothesis tests, were also based on 95% bias-corrected accelerated (BCa) bootstrap estimates (1000 resamples).

Finally, each instrument was assessed in terms of internal reliability (Cronbach's α). These are displayed in Table 1. Acknowledgement and denial displayed lower levels of internal reliability (<.70). Rather than not analyse these subscales further, we retained them

for exploratory purposes. Consequently, the findings concerning these particular subscales should be interpreted cautiously.

Descriptive statistics and bivariate correlations

Table 1 displays descriptive statistics and bivariate correlations. The participants reported moderate levels of PSP, low levels of non-adaptive reactions, and high levels of adaptive reactions. We note that there were no discernible differences in perfectionistic self-promotion and nondisclosure of imperfection scores in our sample compared to previous student, community, and clinical samples (see Hewitt et al., 2004). However, nondisplay of imperfection was slightly lower in our sample. In terms of the RIDI, scores were generally similar to other samples of veterans and civilians with spinal cord injuries with slightly lower shock and denial evident in our sample (see Livneh & Antonak, 2008). Examination of the bivariate correlations revealed that perfectionistic self-promotion displayed medium significant positive relationships with four non-adaptive reactions (shock, anxiety, depression, and internalised anger), was unrelated to two others (denial and externalised anger), and had a small-to-medium significant negative relationship with one adaptive reaction (adjustment). Nondisplay of imperfection and nondisclosure of imperfection displayed a very similar pattern of relationships though in the case of nondisplay of imperfection these were typically larger (i.e., medium-to-large). In addition, these two facets were related to an additional non-adaptive reaction (externalised hostility).

Hierarchical multiple regression analyses

To examine the univariate predictive ability of PSP for each reaction, a series of hierarchical multiple regression analyses were conducted. In each analysis, step one was composed of gender and time since injury. These two variables were included so to control for the gender differences and variability in the time since onset of injury in the sample (no other control variables were included). In step two, the three facets of PSP were added.

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Overall variance explained in each step was examined, as was incremental predictive ability from step one and step two. The results of the analyses are reported in Table 2.

The analyses revealed that the overall models explained 7% to 32% of variance in the eight reactions. Step one accounted for 1% to 8% of variance. Step two accounted for a further 4% to 29% of variance. On six occasions, the incremental predictive ability in step two was statistically significant: shock, anxiety, depression, internalised anger, externalised hostility, and adjustment (also marginally for acknowledgement, p = .06). In these models, in terms of individual predictors of each reaction, nondisplay of imperfection was a moderate-to-large significant positive unique predictor of all six reactions. Nondisclosure of imperfection was a small-to-moderate significant positive unique predictor of two reactions (depression and internalised anger). Finally, perfectionistic self-promotion was not a unique predictor of any reactions.

Canonical correlation analysis

To examine the multivariate relationships between PSP and reactions to CID, two canonical correlation analyses were conducted. These were conducted following the guidelines provided by Tabachnick and Fidell (2007). In the analyses, facets of PSP were included as a set of manifest predictor variables (to load on a new latent/synthetic variable or variate) and reactions (non-adaptive and adaptive) were used as another set of manifest criterion variables (to load on two other new latent/synthetic variables or variates). The multivariate relationship is assessed by examining the relationship between manifest variables and the latent/synthetic variables (structure coefficients, r_s, above .30 were considered meaningful) and the correlation between the two variates (a canonical function and corresponding canonical correlation, R_C, with R_C above .30 were considered meaningful). The results of the analyses are reported in Table 3.

Perfectionistic self-presentation and non-adaptive reactions. Multivariate test of significance revealed a significant model: Wilks's λ .60, F (15,364) = 4.95, p <.001. One meaningful canonical function and corresponding correlation was evident (R_C = .60). The r_s values indicated that each facet of PSP loaded meaningfully (>.30) on the predictor variable (r_s = -.56 to -.97). Based on these loadings, this was considered to be reflective of (opposing) PSP. The r_s values indicated that the all five reactions also loaded meaningfully on the criterion variable (r_s = -.55 and -.88). Based on these loadings, this was considered to be reflective of (opposing) non-adaptive reactions. Latent (opposing) PSP explained an average of 62% of variance in the manifest facets and latent (opposing) non-adaptive reactions explained an average of 57% of variance in the five manifest reactions. Overall, the canonical correlation suggests that PSP is related to higher non-adaptive reactions.

Perfectionistic self-presentation and adaptive reactions. Multivariate test of significance revealed a significant model: Wilks's λ 0.79, F (6, 270) = 5.47, p <.001. One meaningful canonical function and corresponding correlation was evident (R_C = .43). The r_s values indicated that each facet of PSP loaded meaningfully (>.30) on the predictor variable (r_s = -.52 to -.95). Based on these loadings, this was considered to reflective of (opposing) PSP. The r_s values indicated that the two reactions also loaded meaningfully on the criterion variable (r_s = .42 and .99). Based on these loadings, this was considered to be reflective of adaptive reactions. Latent (opposing) PSP explained an average of 60% of variance in the manifest facets and latent (opposing) adaptive reactions explained an average of 59% of variance in the two manifest reactions. Overall, the canonical correlation suggests that PSP is related to lower adaptive reactions.

Discussion

The aim of the current study was to examine the relationship between PSP and reactions to impairment and disability following SCI. It was hypothesised that facets of PSP

would positively predict non-adaptive reactions (shock, anxiety, denial, depression, internalised anger and externalised hostility) and negatively predict adaptive reactions (acknowledgment and adjustment). These relationships were expected to be evident at univariate and multivariate levels. In support of the hypotheses, at univariate level facets of PSP were significant positive predictors of shock, anxiety, depression, internalised anger, and externalised hostility and a significant negative predictor of adjustment and, marginally, acknowledgment. However, contrary to the hypotheses, facets of PSP did not predict denial. Again in support of the hypotheses, at multivariate level PSP was positively associated with non-adaptive reactions to impairment and disability and negatively associated with adaptive reactions to impairment and disability.

The findings are consistent with previous work that has found PSP to be related to poorer psychosocial adaptation to CID (Flett et al., 2011; Shanmugasegaram et al., 2014). At a univariate level, it was evident that differentiating between the three facets of PSP is important in this relationship and that, even though highly correlated, not doing so may mean important unique effects might be missed. Here, nondisplay of imperfection was consistently the strongest predictor, or the only predictor, of each individual reaction. This was not the case in the two previous studies to examine PSP and psychosocial adaptation to CID (viz. irritable bowel syndrome and cardiac rehabilitation). However, this has been the case in studies examining other outcomes (e.g., self-esteem, anxiety, and depression; Besser, Flett & Hewitt, 2010; Hewitt et al., 2003). This particular finding may therefore be because nondisplay of imperfection is especially important in context of SCI or, alternatively, this finding may reflect a general trend towards this facet of PSP being more problematic. Given that nondisplay of imperfection is underpinned by the desire for concealment, and that social stigma is an important issue in the lives of those with SCI (Hammell, 2007), in this instance we speculate it is more likely the former.

PSP was an especially large predictor of shock, depression, and internalised anger (incremental predictive variance of 30% or higher). We speculate that a pattern of emotion regulation characterised by both expressive suppression (inhibiting the emotion-expressive behaviour; Gross, 1998) and emotion preoccupation (fixating on emotional consequences; Endler, Parker & Summerfeldt, 1998) may help explain these findings. The tendency to hide emotions predicts poorer well-being generally and has been found to predict poorer adaptation to CID. This is because hiding emotions is thought to leave emotions unresolved and denies individuals opportunity of relief by sharing of experiences and bond building with others (de Ridder et al., 2008). We are not aware of any study that has examined the relationship between PSP and expressive suppression. However, trait perfectionism has been found to be positively related to this form of emotion regulation (e.g., Bergman et al. 2007) and it is likely this is the case for PSP. PSP has, however, been found to be associated with emotional preoccupation in the context of CID and, again, this is associated with poor adaptation to CID (Flett et al., 2011; Shanmugasegaram et al., 2014). One can envisage how the habitual use of a combination of these two forms of emotion regulation may inhibit the proper processing of reactions such as shock and internal anger and how they may allow a sense of depression to develop and endure over time.

The only reaction not predicted by PSP was denial. It is not clear why this was the case. It is possible that levels of PSP has little influence on the experience of denial or that the relationship is more complex such as non-linear (e.g., curvilinear) or subject to moderating factors (e.g., time since injury). These possibilities have some support in existing research (e.g., Greenhouse, Meyer, & Johnson, 2000). Disentangling the PSP-denial relationship is further complicated by the complexity of denial as possibly both an adaptive and non-adaptive reaction. For instance, denial may be useful in the short-term and ward of extreme feeling of anxiety and depression. However, if denial persists after these feelings

have subsided, and rehabilitation is compromised as a consequence, denial will be unhelpful and even harmful (de Ridder et al., 2008). Unfortunately, the lower internal reliability and introduction of substantial measurement error ultimately means it is difficult to infer anything from the lack of findings involving this subscale. With this in mind, the current findings are inconclusive in regards to the relationship between PSP and denial.

The univariate findings were complemented by the multivariate findings. Specifically, PSP was associated with poorer psychosocial adaptation (viz. higher non-adaptive and lower adaptive reactions). Multivariate relationships have not been examined in previous research examining PSP and psychosocial adaptation to CID (Flett et al., 2011; Shanmugasegaram et al., 2014). We consider this to be an important oversight because of the benefits of multivariate models when examining complex inter-related outcomes. These models are more likely to closely match the reality of the experiences of those with CID. That is, the experience of a mix of multiple reactions that can be loosely arranged as more or less adaptive and non-adaptive that will help or hinder psychosocial adaptation. As illustrated here, facets of PSP predict a number of individual reactions that are likely to be problematic but, overall, PSP is associated with a collection of reactions that will almost certainly undermine psychosocial adaptation to SCI and other CID.

Clinical implications

One of the main difficulties that face those with SCI is the development of secondary conditions (e.g., cardiac arrhythmias, urinary tract infections, and gastroparesis; Cardenas, Hoffman, Kirshblum, & McKinley, 2004). It is estimated that as many as 95% of people with SCI have a secondary condition and over half will be hospitalised as a consequence (Anson & Shepherd, 1996). Most secondary conditions can be avoided or managed effectively by self-care (e.g., self-administered medication, nutrition, and exercise). Those with higher nondisclosure and nondisplay of imperfection are likely to find engaging in proper self-care

more difficult as they seek to portray a false image of good health. We suggest that assessing PSP may be useful to help identify individuals for whom this may be a problem. Thereafter, challenging and changing the irrational beliefs underpinning PSP may offer a means of promoting psychosocial adaptation to SCI and also help prevent the extreme psychological difficulties associated with PSP (e.g., depression and suicide ideation). We believe interventions aimed at managing and treating trait perfectionism, including flexible, non-intrusive self-help strategies, provide a useful starting point in this regard (see Lloyd, Schmidt, Khondoker, & Tchanturia, 2015), and will be especially effective if informed by existing programmes aimed at improving adaptation to SCI (see Mehta et al., 2011).

Limitations and other future directions

The findings must be considered in context of the limitations to the study. One limitation is that a cross-sectional design was employed. Therefore, causality or direction of causality cannot be inferred. It may be that reactions to impairment contribute to more or less PSP or the relationship is reciprocal. Future research should examine these possibilities using longitudinal designs. Relatedly, psychosocial adaptation and the reactions observed here are part of process that unfolds over time. Although time since injury was controlled statistically, the study can offer only a static snapshot of this dynamic process. Again, future research using longitudinal designs would be better able to capture this process. Another limitation is the reliance on self-report measures. This may contribute to common method variance and inflate the observed relationships. To avoid this, other-report measures (e.g., views of clinicians or relatives) may be useful in future research and also avoid any response bias or concealment on the part of the participants. Finally, two subscales of the RIDI (denial and acknowledgement) displayed lower levels of internal reliability. As noted earlier, findings involving these particular subscales should be interpreted cautiously and may require especial scrutiny in future work.

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Conclusion

Research is beginning to emerge that suggests PSP is associated with poorer psychosocial adaptation to CID. We found further evidence of this relationship in context of SCI. Specifically PSP, and nondisplay of imperfection, in particular, was associated with less adaptive and more non-adaptive reactions to SCI.

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Table 1. Descriptive statistics, internal reliabilities and bivariate correlations for demographic variables, perfectionistic self-presentation scale and reactions to impairment and disability inventory.

Variable	M	SD	α	1	2	3	4	5	6	7	8	9	10	11	12
1. Perfectionistic Self-promotion	38.54	9.98	.82	--											
2. Nondisplay of imperfection	36.98	10.97	.86	.63**	--										
3. Nondisclosure of imperfection	23.48	7.84	.76	.50**	.61**	--									
4. Shock	11.63	4.20	.78	.30**	.51**	.37**	--								
5. Anxiety	13.36	4.90	.83	.22*	.34**	.26**	.76**	--							
6. Denial	9.80	3.11	.62	.10	.03	.18*	.07	.03	--						
7. Depression	14.17	4.98	.83	.30**	.52**	.43**	.68**	.64**	-.01	--					
8. Internalised Anger	13.83	4.49	.73	.28**	.49**	.44**	.61**	.51**	.02	.73**	--				
9. Externalised Hostility	11.71	3.51	.69	.12	.28**	.23**	.50**	.51**	.01	.55**	.49**	--			
10. Acknowledgment	20.98	3.61	.59	.09	-.13	-.06	.09	.00	.11	-.13	.00	-.13	--		
11. Adjustment	25.36	4.66	.76	-.17**	-.35**	-.28**	-.41**	-.37**	.15	-.55**	-.52**	-.21**	.35**	--	
12. Gender	---	---	---	.05	.05	-.08	.23*	.24**	-.13	.16	.14	.07	.11	-.12	
13. Time Since Injury	147.78	167.71	---	-.22*	-.20*	-.18*	-.20*	-.09	-.12	-.10	-.17	.09	-.16	.26**	-.10

Note. * p <.05, two-tailed, **p <.01, two-tailed. Time since Injury is measured in months. Gender coded as 1 male 2 female. Means/SD total scores and are untransformed. Bivariate correlations include transformed variables.

Table 2. Hierarchical multiple regression analyses of perfectionistic self-presentation scale and reactions to impairment and disability.

Model	B	SE	Lower CI	Higher CI	β
Shock					
Step 1: F (2, 125) = 5.61, p < .01, R^2 = .08					
Gender	0.08	.04	0.00	0.15	.21*
Time Since Injury	-0.00	.00	0.00	-0.00	-.18*
Step 2: F (5, 122) = 11.54, p <.001, R^2 = .32, ΔR^2 = .24, p <.001					
Gender	0.08	.03	0.00	0.14	.21*
Time Since Injury	-0.00	.00	0.00	0.01	-.08
Perfectionistic self-promotion	-0.01	.01	-0.04	0.01	-.08
Nondisplay of imperfection	0.06	.01	0.03	0.08	.46***
Nondisclosure of imperfection	0.18	.01	-0.01	0.45	.13
Anxiety					
Step 1: F (2, 125) = 4.21, p < .05, R^2 = .06					
Gender	0.08	.03	0.02	0.15	.24*
Time Since Injury	-0.00	.00	0.00	0.00	-.07
Step 2: F (5, 122) = 5.34, p < .001, R^2 = .18, ΔR^2 = .11, p <.01					
Gender	0.85	.98	-0.19	0.15	.24**
Time Since Injury	0.00	.03	0.02	0.00	.01
Perfectionistic self-promotion	-0.00	.01	0.00	0.02	-.02
Nondisplay of imperfection	0.03	.01	0.00	0.06	.27*
Nondisclosure of imperfection	0.02	.01	-0.01	0.05	.13
Denial					
Step 1: F (2, 125) = 2.15, p > .05, R^2 = .03					
Gender	-0.04	.02	-0.85	0.01	-.14
Time Since Injury	-0.00	.00	0.00	0.00	-.13
Step 2: F (5, 122) = 1.83, p > .05, R^2 = .07, ΔR^2 = .04, p > .05					
Gender	-0.03	.02	-0.07	0.00	-.12
Time Since Injury	-0.00	.00	0.00	0.00	-.11
Perfectionistic self-promotion	0.01	.02	-0.02	0.05	.10
Nondisplay of imperfection	-0.02	.01	-0.05	0.01	-.18

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Nondisclosure of imperfection	0.02	.02	-0.01	0.05	.21

Depression

Step 1: $F(2, 125) = 2.22$, $p > .05$, $R^2 = .03$

Gender	0.06	.03	-0.01	0.13	.16
Time Since Injury	-0.00	.00	0.00	0.00	-.09

Step 2: $F(5, 122) = 11.68$, $p < .05$, $R^2 = .32$, $\Delta R^2 = .29$, p < .05

Gender	0.06	.03	0.00	0.12	-.17*
Time Since Injury	0.00	.00	0.00	0.00	.02
Perfectionistic self-promotion	-0.01	.02	-0.05	0.02	-.10
Nondisplay of imperfection	0.05	.01	0.03	0.08	.44***
Nondisclosure of imperfection	0.03	.02	0.00	0.06	.23*

Internalised anger

Step 1: $F(2, 125) = 2.82$, $p > .05$, $R^2 = .04$

Gender	0.17	.11	-0.01	0.41	.12
Time Since Injury	-0.00	.00	0.00	0.00	-.16

Step 2: $F(5, 122) = 10.27$, $p < .05$, $R^2 = .30$, $\Delta R^2 = .25$, p < .001

Gender	0.19	.01	0.00	0.40	-.14
Time Since Injury	0.00	.00	0.00	0.00	.02
Perfectionistic self-promotion	-0.05	.05	-0.14	0.05	-.11
Nondisplay of imperfection	0.17	.05	0.08	0.26	.38**
Nondisclosure of imperfection	0.13	.06	0.01	0.25	.25*

External hostility

Step 1: $F(2, 125) = 0.89$, $p > .05$, $R^2 = .01$

Gender	0.02	.03	-0.03	0.08	.07
Time Since Injury	0.00	.00	-0.00	0.00	.10

Step 2: $F(5, 122) = 3.52$, $p < .05$, $R^2 = .13$, $\Delta R^2 = .11$, p < .01

Gender	0.03	.03	-0.03	0.08	.09
Time Since Injury	0.00	.00	0.00	0.00	. 16
Perfectionistic self-promotion	-0.02	.02	-0.05	0.01	-.15
Nondisplay of imperfection	0.03	.01	0.00	0.05	.30*
Nondisclosure of imperfection	0.02	.02	-0.01	0.05	.16

Acknowledgement

Step 1: $F(2, 125) = 2.11$, $p > .05$, $R^2 = .03$

Gender	0.12	.11	-0.11	0.35	.09
Time Since Injury	0.00	.00	-0.00	0.00	-.15

Step 2: F (5, 122) = 2.42, p < .05, R^2 = .09, ΔR^2 = .06, p = .06

Gender	0.12	.11	-0.11	0.35	.10
Time Since Injury	0.00	.00	-0.00	0.00	-.16
Perfectionistic self-promotion	0.11	.06	0.07	0.23	.23
Nondisplay of imperfection	-0.13	.05	-0.25	-0.03	-.30*
Nondisclosure of imperfection	-0.00	.05	-0.11	0.10	-.01

Adjustment

Step 1: F (2, 125) = 5.06, p < .01, R^2 = .08

Gender	-0.13	.11	-0.33	0.07	-.10
Time Since Injury	0.00	.00	-0.00	0.00	.25

Step 2: F (5, 122) = 5.50, p < .001, R^2 = .18, ΔR^2 = .11, p < .01

Gender	-0.14	.10	-0.33	0.05	-.10
Time Since Injury	0.00	.00	0.00	0.00	.19*
Perfectionistic self-promotion	0.07	.08	-0.06	0.22	.14
Nondisplay of imperfection	-0.15	.05	-0.24	-0.05	-.32**
Nondisclosure of imperfection	-0.07	.06	-0.19	0.04	-.13

Note. SE = Standard Error, CI = Confidence Interval. *p <.05, **p <.01, ***p<.001, two-tailed; SE and CI based on BC bootstrap estimates

Table 3. Canonical correlation between perfectionistic self-presentation , non-adaptive, and adaptive reactions to impairment and disability.

	Non-adaptive Reactions			Adaptive Reactions	
	Function			Function	
Variables	R_s	R_s^2 (%)		R_s	R_s^2 (%)
Perfectionistic self-promotion	-.56	.31	Perfectionistic self-promotion	-.52	.27
Nondisplay of imperfection	-.97	.94	Nondisplay of imperfection	-.95	.90
Nondisclosure of imperfection	-.78	.61	Nondisclosure of imperfection	-.81	.66
Adequacy		.62	Adequacy		.60
Redundancy		.23	Redundancy		.11
Shock	-.84	.71	Acknowledgement	.42	.18
Anxiety	-.56	.31	Adjustment	.99	.98
Depression	-.88	.77			
Internalised Anger	-.88	.77			
Externalised Hostility	-.55	.30			
Adequacy		.57	Adequacy		.59
Redundancy		.21	Redundancy		.11
Canonical Correlation R_C		.60			.43

$R_C{}^2$	.36	.18