Cognitive Processing and Posttraumatic Growth After Stroke

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Objective: To examine whether posttraumatic growth (PTG) after stroke is associated with cognitive processing and psychological distress and whether time since stroke moderates relationships between these variables. Method: A sample of stroke survivors (N = 60) completed the Posttraumatic Growth Inventory, the Cognitive Processing of Trauma Scale and the Hospital Anxiety and Depression Scale. Results: PTG correlated positively with four indicators of cognitive processing (i.e., positive cognitive restructuring, downward comparison, resolution, and denial) and negatively with depression. Time since stroke moderated a number of these relationships. As length of time since stroke increased, the relationships between PTG and anxiety and depression became more negative and significant, and the relationships between PTG and downward comparisons and resolution became more positive and significant. Discussion: The findings indicate the possibility of PTG after stroke and suggest that cognitive processing is an important process for engendering such growth.

Keywords: posttraumatic growth, anxiety, depression, adjustment, stroke

Stroke has many of the characteristics of a traumatic event in that it is typically unexpected, uncontrollable, and potentially life threatening (Field, Norman, & Barton, 2008); for many, it is a frightening experience (Stroke Association, 2008). Stroke is the third most common cause of death in developed countries and the single largest cause of severe disability in the United Kingdom. A stroke can cause paralysis or muscle weakness, loss of feeling, speech and language problems, memory and reasoning problems, swallowing difficulties, vision problems, coma, and potentially death (Stroke Association, 2008). A range of emotional problems may be experienced after stroke, with depression being the most frequently assessed psychological outcome (see Hackett, Yapa, & Parag, 2005). A number of studies have also focused on posttraumatic stress symptoms after stroke, with prevalence estimates for posttraumatic stress disorder ranging from 10% to 31% (Bruggiman et al., 2006; Field et al., 2008; Merriman, Norman, & Barton, 2007; Semb, Tarrier, O’Neill, Burns, & Farrager, 1998). However, a large proportion of stroke survivors adjusts well and reports few, if any, emotional problems.

Research on psychological reactions to stressful life events has traditionally focused on negative outcomes, such as distress and lower quality of life (Frazier & Kaler, 2006). However, in the past decade, a growing body of research has focused on positive outcomes after trauma. In particular, individuals have been found to report positive changes in a number of domains including their beliefs, priorities, and relationships with others after traumatic events (Park & Helgeson, 2006). Thus, Calhoun, Cann, Tedeschi, and McMillan (2000) define posttraumatic growth (PTG) as “the individual’s experience of significant positive change resulting from the struggle with a major life crisis” (p. 521). PTG has been investigated in relation to a number of medical events/conditions, including breast cancer (e.g., Cordova, Cunningham, Carlson, & Andrykowski, 2001), heart disease (Sheikh, 2004), HIV/AIDS (e.g., Milam, 2006), and amputation (Phelps, Williams, Raichle, Turner, & Ehde, 2008). However, to date, there is very limited research on PTG after stroke. To the best of our knowledge, only one study has focused on the positive consequences of stroke. Gillen (2005) conducted a qualitative study with 16 stroke survivors 6 months after stroke in which participants were asked about positive consequences attributed to stroke. Gillen reported that 10 stroke survivors were able to identify some positive consequences after stroke, suggesting the possibility of PTG after stroke. However, it should be noted that the sample was very small, PTG was not assessed with a standardized measure, and the study did not focus on any correlates of PTG after stroke.

A range of factors have been found to be associated with PTG in response to a variety of traumatic events. In a narrative review of the literature, Linley and Joseph (2004) noted that PTG was consistently associated with cognitive appraisals (regarding threat, harm, and controllability), coping (i.e., problem focused, acceptance, positive reinterpretation), personality (i.e., optimism, religiosity), cognitive processing (i.e., rumination, intrusions, avoidance), positive affect, and time since event. A more recent meta-analysis of the correlates of PTG by Helgeson, Reynolds, and Tomich (2006) revealed that the strongest effect sizes were found for coping variables (i.e., positive...
reappraisal, acceptance, denial). Significant effects were also found for event severity (i.e., perceived threat, objective severity), personality (i.e., optimism, religiosity), sociodemographic variables (i.e., age, gender, ethnicity), psychological health (i.e., positive affect, depression), and indicators of cognitive processing (i.e., intrusive–avoidant thoughts).

Most models of PTG (see O’Leary, Alday, & Ickovics, 1998) have proposed that, for PTG to occur, an individual has to experience the event as a crisis. Without the sense of crisis, there would be little reason either for distress or to find positive ways to overcome this distress. Tedeschi and Calhoun (2004) further argued that the experience of a highly stressful life event shatters an individual’s beliefs about the self and the world, which leads to the reinterpretation and assimilation of the traumatic event into the individual’s existing worldview. This process of meaning-making helps the individual reach a higher level of functioning and to rebuild new goals and beliefs, resulting in the perception that one has grown through this process.

Cognitive processing of the traumatic event is therefore seen to be an important process for engendering PTG. Research on the correlates of PTG is consistent with this position, as a number of indicators of cognitive processing (e.g., rumination, intrusions, positive reappraisal, acceptance) have been related to PTG (Helgeson et al., 2006; Linley & Joseph, 2004). Williams, Davis, and Milsap (2002) have developed a measure of cognitive processing of traumatic experiences that assesses five aspects of cognitive processing; namely, positive cognitive restructuring, downward comparison, resolution, denial, and regrets. The first three aspects are indicative of enhanced cognitive processing and are expected to be related to more growth, whereas the latter two aspects are indicative of a lack of processing and are not expected to be related to growth. Phelps et al. (2008) used a modified version of the scale and found that positive aspects of cognitive processing (including positive cognitive restructuring, downward comparison, and resolution) assessed within 9 weeks of amputation were predictive of PTG at 12-month follow-up.

One unresolved issue in the PTG literature is the extent to which reports of PTG reflect actual growth or are illusory (i.e., nonveridical; Park & Helgeson, 2006). Thus, rather than reflecting significant life changes that are made as a result of the trauma, PTG may reflect the operation of cognitive distortions, or illusions, that help the individual cope with the distress associated with the trauma, as detailed in cognitive adaptation theory (Taylor, 1983). For example, Moore, Norman, Harris, and Makris (2006) found that benefit finding in the first month after a thrombosis was associated with elevated levels of anxiety, more thrombosis worries, and poorer mental functioning. However, as time elapses, reports of PTG may be more likely to reflect significant life changes and/or reprioritization of life values in response to the trauma and, as a result, reports of PTG should be related to positive psychological well-being. Consistent with this proposition, Helgeson et al. (2006) reported that time since trauma moderated a number of relationships between PTG and psychological distress in their meta-analysis. PTG was related to less depression and more positive affect in studies in which the time since the traumatic event was more than 2 years, whereas PTG was related to higher levels of global distress when time since the traumatic event was less than 2 years. A similar argument can be put forward regarding the relationship between cognitive processing and PTG. Tedeschi and Calhoun (1995) argued that PTG may take time to develop after actual life changes made in response to the trauma. Given that cognitive processing is seen to be important for promoting PTG, the relationship between cognitive processing and PTG should strengthen over time.

The present study seeks to extend previous work by assessing PTG following stroke using a standardized measure of PTG: the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). The study also assesses the extent to which psychological distress (i.e., anxiety, depression) and indicators of cognitive processing (i.e., positive cognitive restructuring, downward comparison, resolution, denial, regrets) are associated with PTG. A number of sociodemographic (i.e., age, gender, education) and medical (i.e., time since stroke) variables are also assessed to control for the effects of these factors in the analyses. Moreover, the present study also examines the extent to which time since stroke moderates relationships between these variables and PTG. In particular, it is hypothesized that anxiety and depression will have positive relationships with PTG when assessed shortly after the stroke, whereas these relationships will be negative when more time has lapsed since the stroke. In addition, it is hypothesized that the positive relationships between the cognitive processing measures and PTG will strengthen as time since stroke increases.

Method

Participants and Procedure

The study received ethical approval from the local National Health Service (NHS) Research Ethics Committee. Adult (≥18 years old) stroke survivors were recruited from an outpatient assessment and rehabilitation center based in a NHS hospital in the United Kingdom. Stroke survivors attending the center received a tailored program of therapy (e.g., physiotherapy, speech therapy, occupational therapy, clinical psychology) according to their specific needs. Stroke survivors who attended the center over a 6-month recruitment period were invited by the center staff to take part in the research. Individuals who were unable to complete the questionnaire because of cognitive impairment resulting from stroke were excluded. Stroke survivors who indicated that they were interested were then approached by the researcher to outline the study in more detail. All 15 eligible participants who were approached agreed to take part in the study. On gaining informed consent, we gave participants a study questionnaire to complete at the center. Because of the low number of participants recruited by this method, a second recruitment method was used. Stroke survivors who had attended the center in the previous 4 years (n = 200) were identified from the center’s records to be sent an information sheet, consent form, and study questionnaire. Individuals’ general practitioners were contacted to check whether potential participants were still alive and resident at the same address; 30 potential participants were excluded at this point. Completed questionnaires were returned by 45 stroke survivors (26.5% response rate).

1 Negative relationship with PTG.
Measures

The PTGI (Tedeschi & Calhoun, 1996) is a 21-item self-report measure of positive outcomes after traumatic experiences scored with 6-point response scales ranging from 0 (I did not experience this change as a result of my crisis) to 5 (I experienced this change to a very great degree as a result of my crisis). In the present study, “my crisis” was amended to “my stroke.” Scores can range from 0 to 105, with high scores indicating positive growth. The scale had excellent internal reliability (α = 0.92) in the present study.

The Cognitive Processing of Trauma Scale (CPOTS; Williams et al., 2002) is a 17-item scale measuring cognitive processing of traumatic experiences, scored on –3 to 3 response scales. The CPOTS measures five aspects of cognitive processing: (a) positive cognitive reconstructuring, (b) downward comparison, (c) resolution, (d) denial, and (e) regrets. The five subscales were found to have satisfactory internal reliabilities in the present study (αs = 0.73, 0.81, 0.81, 0.67, 0.76, respectively).

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) is a 14-item questionnaire with two subscales measuring anxiety and depression. Each subscale contains seven items scored on 4-point Likert-type scales ranging from 0 to 3 to indicate degree of psychological distress. Both the anxiety (α = 0.90) and depression (α = 0.78) subscales were found to have satisfactory internal reliabilities in the present study.

In addition, a range of demographic/clinical information (i.e., age, gender, religion, ethnicity, level of education, marital status, time since stroke) was also assessed.

Results

Sample Characteristics

The total number of participants in the present study was 60 (34 men, 26 women). Participants ranged in age from 41 to 88 years (M = 71.67, SD = 10.64). Thirty-three participants were married, and 24 were single, divorced, or widowed (missing data n = 3). Most participants left full-time education before the age of 16 (M = 15.30, SD = 1.39). Time since stroke ranged from 5 to 99 months (M = 32.02, SD = 23.91, missing data n = 10). All 60 participants categorized themselves as “White British.” Fifteen participants were recruited from the assessment and rehabilitation center, and 45 participants were recruited from postal questionnaires. A multivariate analysis of variance (MANOVA) revealed no differences in responses to the study psychological variables (i.e., positive cognitive restructuring, downward comparisons, resolution, denial, regrets, anxiety, depression, PTG) between participants recruited at the assessment center (n = 15) and those recruited by postal questionnaire (n = 45), F(8, 50) = 1.83, p = .09. However, time since stroke was significantly longer for the postal questionnaire sample (M = 39.11, SD = 24.04) than for the assessment center sample (M = 13.79, SD = 10.58), t(48) = 3.78, p < .001.

Correlation Analyses

As shown in Table 1, a significant negative correlation was found between the PTGI and depression. In addition, significant positive correlations were found between the PTGI and four of the
five CPOTS subscales: those measuring positive cognitive restructuring, downward comparison, resolution, and denial. Of the demographic/clinical variables, only education correlated significantly with the PTGI, $r(58) = .33$ (95% confidence interval [CI] = .08, .54), $p = .01$, so that higher levels of PTG were associated with leaving full-time education at a later age.

Regression Analyses Predicting PTGI Scores

The independent variables that were found to correlate significantly with the PTGI (i.e., positive cognitive restructuring, downward comparison, resolution, denial, depression, education) were entered together in a regression analysis to predict PTGI scores (see Table 2). These variables explained 49% of the variance in PTGI scores, $F(6, 52) = 8.41, p < .001$, with denial and education making significant unique contributions to the regression equation.

Moderated Regression Analyses With Time Since Stroke

We conducted moderated regression analyses to assess whether time since stroke moderated relationships between the independent variables (i.e., anxiety, depression, and the cognitive processing scales) and PTGI. Because of the relatively low statistical power of moderated regression analyses (Anguinis & Stone-Romero, 1997), the moderating effect of time since stroke was considered separately for each variable in turn. Thus, for each regression analysis, the independent variable (e.g., anxiety), the moderator (i.e., time since stroke), and their interaction were entered together in a single block to predict PTGI scores. The variables were mean centered before computing the interaction terms to minimize any problems of multicollinearity. A significant interaction term would indicate that time since stroke moderates the relationship under investigation. Simple slopes analysis can then be used to decompose significant interactions by computing regression lines at three levels of the moderator (i.e., the mean level and 1 standard deviation above and 1 SD below the mean of time since stroke; Aiken & West, 1991).

Time since stroke moderated four relationships with PTGI scores (see Table 3). First, time since stroke moderated the anxiety–PTGI relationship (see Figure 1); the relationship was nonsignificant under low (B = −2.82; 95% CI = −4.91, 10.55; $p = .47$) and moderate (B = −2.73; 95% CI = −8.30, 2.84; $p = .33$) levels of time since stroke but significant under high levels of time since stroke (B = −8.28; 95% CI = −15.83, −0.73; $p = .03$). Second, time since stroke moderated the depression–PTGI relationship (see Figure 2); the relationship was nonsignificant under low levels of time since stroke (B = −1.32; 95% CI = −3.02, 0.38; $p = .13$) but significant under moderate (B = −2.42; 95% CI = −3.75, −1.10; $p = .001$) and high (B = −3.53; 95% CI = −5.28, −1.78; $p < .001$) levels of time since stroke. Third, time since stroke moderated the downward comparison–PTGI relationship (see Figure 3); the relationship was nonsignificant under low (B = −1.62; 95% CI = −7.55, 4.32; $p = .59$) and moderate (B = 2.54; 95% CI = −1.87, 6.95; $p = .25$) levels of time since stroke but significant under high levels of time since stroke (B = 6.69; 95% CI = 1.86, 11.52; $p = .008$). Fourth, time since stroke moderated the resolution–PTGI relationship (see Figure 4); the relationship was nonsignificant under low levels of time since stroke (B = 2.18; 95% CI = −2.49, 6.86; $p = .35$) but significant under moderate (B = 4.96; 95% CI = 1.61, 8.31; $p = .005$) and high (B = 7.73; 95% CI = 3.79, 11.68; $p < .001$) levels of time since stroke.

Table 2
Summary of Regression Analysis for Variables Predicting PTGI Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>95% CI lower</th>
<th>95% CI upper</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive cognitive restructuring</td>
<td>1.68</td>
<td>−1.38</td>
<td>4.74</td>
<td>0.15</td>
</tr>
<tr>
<td>Downward comparison</td>
<td>0.39</td>
<td>−2.76</td>
<td>3.54</td>
<td>0.03</td>
</tr>
<tr>
<td>Resolution</td>
<td>2.05</td>
<td>−1.46</td>
<td>5.55</td>
<td>0.17</td>
</tr>
<tr>
<td>Denial</td>
<td>4.00</td>
<td>0.81</td>
<td>7.20</td>
<td>0.30</td>
</tr>
<tr>
<td>Depression</td>
<td>−1.12</td>
<td>−2.36</td>
<td>0.05</td>
<td>−0.23</td>
</tr>
<tr>
<td>Education</td>
<td>4.69</td>
<td>1.12</td>
<td>8.26</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Note. $N = 60$. $R^2 = .49$. 95% confidence interval [CI] = .23, .59. PTGI = Posttraumatic Growth Inventory.

Table 3
Time Since Stroke as a Moderator of Relationships Between Anxiety, Depression, Downward Comparison, Resolution, and PTGI Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>95% CI lower</th>
<th>95% CI upper</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety–PTGI relationship</td>
<td>−2.73</td>
<td>−8.30</td>
<td>2.84</td>
<td>−0.14</td>
</tr>
<tr>
<td>Time since stroke</td>
<td>−0.06</td>
<td>−0.30</td>
<td>0.17</td>
<td>−0.08</td>
</tr>
<tr>
<td>Anxiety × time since stroke</td>
<td>−0.23</td>
<td>−0.45</td>
<td>−0.01</td>
<td>−0.30</td>
</tr>
<tr>
<td>Depression–PTGI relationship</td>
<td>−2.42</td>
<td>−3.75</td>
<td>−1.10</td>
<td>−0.46***</td>
</tr>
<tr>
<td>Time since stroke</td>
<td>−0.03</td>
<td>−0.24</td>
<td>0.18</td>
<td>−0.04</td>
</tr>
<tr>
<td>Depression × time since stroke</td>
<td>−0.05</td>
<td>−0.09</td>
<td>−0.0002</td>
<td>−0.25*</td>
</tr>
<tr>
<td>Downward comparison–PTGI relation</td>
<td>2.54</td>
<td>−1.87</td>
<td>6.95</td>
<td>0.16</td>
</tr>
<tr>
<td>Time since stroke</td>
<td>0.07</td>
<td>−0.16</td>
<td>0.31</td>
<td>0.09</td>
</tr>
<tr>
<td>Downward comparison × time since</td>
<td>0.17</td>
<td>0.04</td>
<td>0.30</td>
<td>0.38*</td>
</tr>
<tr>
<td>Resolution–PTGI relationship</td>
<td>4.96</td>
<td>1.61</td>
<td>8.31</td>
<td>0.39**</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.12</td>
<td>0.00</td>
<td>0.23</td>
<td>0.27*</td>
</tr>
</tbody>
</table>

Note. $N = 50$. PTGI = Posttraumatic Growth Inventory.

* $R^2 = .11$. 95% confidence interval [CI] = .00, .25. b $R^2 = .28$. 95% CI = .05, .43. c $R^2 = .19$. 95% CI = .00, .34. d $R^2 = .26$. 95% CI = .04, .41.

* $p < .05$. ** $p < .01$. *** $p < .001$.2 Three variables were found to be significantly skewed; namely, downward comparison, $z = −9.39$, $p < .001$; anxiety, $z = 3.33$, $p < .001$; and time since stroke, $z = 4.06$, $p < .001$. Re-running the correlation and regression analyses with the transformed variables produced a virtually identical pattern of results. Therefore, only the analyses with the nontransformed variables are reported here to aid interpretation of the findings. The results of correlation and regression analyses are reported in line with the recommendations of Hoyt, Imel, and Chan (2008).
Discussion

The present findings indicate that many participants reported growth after stroke, thereby adding to the literature charting PTG after a range of traumatic events, including medical events/conditions (Helgeson et al., 2006; Linley & Joseph, 2004). However, the mean score of 50.93 (SD = 19.92) on the PTGI is lower than that reported in previous studies examining PTG after various traumas (Calhoun et al., 2000; M = 76.5, SD = 22.0), including breast cancer (Weiss, 2004; M = 57.9, SD = 24.5) and amputation (Phelps et al., 2008; M = 61.7, SD = 24.4). The relatively low level of growth found in the present study may be due to a number of factors. First, the present sample was considerably older (M = 71.67) than most previous studies examining PTG. Previous research has indicated a small inverse relationship between PTG and age (Helgeson et al., 2006). Second, time since stroke in the present study was relatively short (M = 32.03 months), whereas...

Figure 1. Conditional regression of Posttraumatic Growth Inventory (PTGI) scores on anxiety at three levels (−1 SD, mean, and 1 SD) of time since stroke.

Figure 2. Conditional regression of Posttraumatic Growth Inventory (PTGI) scores on depression at three levels (−1 SD, mean, and 1 SD) of time since stroke.

Figure 3. Conditional regression of Posttraumatic Growth Inventory (PTGI) scores on downward comparison at three levels (−1 SD, mean, and 1 SD) of time since stroke.

Figure 4. Conditional regression of Posttraumatic Growth Inventory (PTGI) scores on resolution at three levels (−1 SD, mean, and 1 SD) of time since stroke.
Tedeschi and Calhoun (1995) have argued that PTG may take time to develop. A number of indicators of cognitive processing were found to correlate with PTG. In particular, higher levels of growth were associated with positive cognitive restructuring, downward comparisons, resolution, and denial. Such findings are consistent with previous research that has found positive relationships between a number of indicators of cognitive processing (e.g., positive reappraisal, acceptance, denial) and PTG (Helgeson et al., 2006). Thus, the present findings support the notion that cognitive processing of the traumatic event is an important process for engendering PTG as detailed in models of PTG (Tedeschi & Calhoun, 2004). In addition, depression was found to have a negative relationship with PTG, which is consistent with previous research (Helgeson et al., 2006), suggesting that positive psychological well-being may promote PTG. Finally, of the sociodemographic variables, only education was associated with PTG, so that higher levels of growth were associated with leaving full-time education at a later age. Previous research has tended to report relatively weak effects for sociodemographic variables (Helgeson et al., 2006). When entered together in a regression analysis, the significant correlates of PTG explained 49% of the variance in PTGI scores.

Several researchers have suggested that reports of growth may be illusory, inasmuch as individuals may manufacture (the perception of) positive change as a way of coping with trauma-related psychological distress (Park & Helgeson, 2006). One approach to this question is to examine relationships between reports of PTG and psychological distress over time (Helgeson et al., 2006). In particular, to the extent that psychological distress may stimulate the use of benefit finding as a coping response, positive associations may be expected between psychological distress and reports of PTG. However, over time, reports of PTG may reflect significant life changes and/or reprioritization of life values and, as a result, negative associations may be expected between psychological distress and reports of PTG. The results of the moderated regression analyses provide partial support for such an argument in that the relationship between anxiety and PTG was positive (but nonsignificant) when a small amount of time had elapsed since the stroke, but became negative and significant as time since stroke increased. Similar results were found for the relationship between depression and PTG which became more negative and significant as time since stroke increased. These findings are broadly in line with the moderator analyses presented by Helgeson et al. (2006) in their meta-analysis of relations between PTG and psychological distress and suggest that, over time, reports of growth are related to better psychological health and, by implication, are more likely to reflect authentic growth. In addition, time since stroke was also found to interact with downward comparisons and resolution so that the relationships between these cognitive-processing variables and PTG became more positive and significant as time since stroke increased. Such findings are consistent with the idea that PTG takes time to develop and that cognitive processing is important for engendering such growth (Tedeschi & Calhoun, 1995).

The present study has a number of limitations that should be noted. First, the sample size was relatively small, and although the analyses were sufficiently powered to detect significant effects that were broadly in line with previous studies (Helgeson et al., 2006), it is important for future work to replicate the present findings with larger sample sizes. Second, all participants categorized themselves as White British. Given the restricted ethnic range of the sample, the generalizability of the present findings can be questioned. In addition, the low response rate to the postal questionnaire further limits the generalizability of the findings. For example, it may be the case that only those coping well with their stroke responded to the questionnaire. Third, the study used a cross-sectional design and, as a result, the direction of the relationships can be questioned. For example, low levels of psychological distress may promote PTG or, alternatively, PTG may lead to reduced psychological distress (Park & Helgeson, 2006). Further longitudinal studies are required to disentangle the direction of relationships between PTG, psychological distress and cognitive processing, especially given the interactions with time since stroke observed in the present study.

Considering the practical implications that can be drawn from the present study, encouragingly, the findings indicate the possibility of PTG after stroke. In addition, the significant relationships between cognitive processing and PTG suggest that interventions focusing on meaning-making may encourage such growth. For example, Lee, Cohen, Edga, Laizner, and Gagnon (2006) reported that a meaning-making psychological intervention increased levels of optimism among persons with breast and colorectal cancer. However, Park and Helgeson (2006) have cautioned against the rapid development of large-scale growth interventions among individuals who have experienced a traumatic life event before a number of key conceptual and empirical questions are answered. In particular, the veridicality of reports of growth, especially in the initial stages of adjustment, needs to be established. If initial reports of growth are illusory, this could compromise the rehabilitation process as, for example, stroke survivors reporting such growth may be less likely to engage with rehabilitation services.

References


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