

## **Clinical data illustrating the need for greater involvement of behaviourally-oriented psychologists in the design and delivery of rehabilitation services**

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Post-injury vocational achievement is an important index of successful rehabilitation. This study involved the identification of factors reported to influence (positively or negatively) labour force participation of people with spinal cord injury (SCI). Forty participants were selected from a larger study of 450 based on the most extreme prediction errors from the application of a discriminant function analysis, which aimed to predict vocational achievement (both in and not in the labour force) post-SCI. Participants were interviewed to gain an understanding of their explanations for their labour force status. Factors nominated as most influencing post-injury achievements were family, friends and representatives of pre-injury employers. Implications of these findings for the delivery of rehabilitation services are presented, including the value of having service plans based on a behaviour analysis of the influence of environmental factors.

*Key words:* vocational rehabilitation, social support, spinal cord injury.

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In a previous paper (see Murphy, Young, & Reid, 2003) we proposed that, based on an analysis of the contents of selected contemporary behaviour therapy and rehabilitation journals, behaviourally-oriented psychologists at the start of the 21<sup>st</sup> century are far less involved in rehabilitation service delivery research than they were in previous decades. The current paper presents data from a recent study of vocational achievement following traumatic spinal cord injury that allows an examination of the extent to which behaviour analysis can usefully contribute to enhanced rehabilitation outcomes.

Of all injuries, spinal cord injury (SCI) is arguably one of the most devastating. By definition, SCI implies permanent impairment and is associated with potential disabilities that affect not just mobility and sensation but also, inter alia, such diverse areas as sexual functioning, body temperature regulation, and bowel and bladder function. In addition, chronic pain is highly prevalent within the population. In order for persons with SCI to return to community participation and achieve a good quality of life, much new learning is required and new goals need to be set. In theory, behavioural psychologists are the best placed of the rehabilitation professionals to design environments supportive of identified rehabilitation goals. Because most spinal cord injuries occur to the young adult (see Stover & Fine, 1986), the achievement of vocational goals is especially important, as is a proper understanding of the antecedent and consequent stimuli that prompt and reinforce job-seeking behaviour.

For almost all injury groups, return to work is the gold standard by which to judge the success of the rehabilitation effort (see Britell, 1991). However, in order for rehabilitation services to maximise their success in terms of vocational rehabilitation achievements made by clients, an understanding of the individual and environmental factors that impact on disability employment rates needs to be developed. The current study contributes to that more developed understanding through the examination of the post-injury experiences of a group drawn from a larger study involving the prediction of labour-force participation following spinal cord injury (see Murphy, Young, Brown & King, 2003). In that study, approximately 75% of the cases were able to be correctly classified in terms of their post-injury labour force status.

The original study involved over 450 participants who were assessed on fourteen predictor variables, encompassing demographic, injury and psychological variables. Significantly, all these predictor variables involved "attributes of the individual" and excluded examination of any environmental variables. In an effort to learn more about the range of factors impacting on participants' lives post-injury, a sample was drawn from the most extreme prediction errors from the

original study. The aim was to identify factors beyond those assessed originally which participants perceived to have influenced their post-injury situations and achievements. It was anticipated that emerging factors could usefully guide future research and service in the area of vocational achievement following serious injury. Particularly of interest were the reported post-discharge experiences of those who were “positive surprises” – i.e., those who defied prediction by being at work or actively looking for work even though they possessed higher levels of factors generally negatively correlated with post-injury labour-force participation.

## Method

### Participants

All study participants had received treatment for a traumatic SCI at one of two specialist SCI treatment facilities. These facilities were the sole providers of specialist SCI treatment for people residing in the catchment area of south-eastern Australia, covering the states of Victoria, Tasmania and the majority of New South Wales. There were no significant differences between facilities in terms of key patient characteristics (ratio of males to females; paraplegia vs tetraplegia; age at injury; percentages eligible for compensation). In order to be eligible to participate in the study, individuals needed to: a) have had at least 18 months lapsed since their injury; b) be of workforce age (16-65 years); and c) have experienced a traumatic SCI for which they were admitted to a spinal unit and discharged with persistent neurological damage.

Target participants were identified empirically in that they were those who were erroneously classified when discriminant function analysis (DFA) was applied to the data from a larger study aimed at identifying predictors of post-injury labour force participation (see Murphy et al., 2003). Participants were those who were the forty most extreme prediction errors from the DFA classification of those predicted to be “in the labour force” vs “not in the labour force”. Participants were chosen from two sub-groups: (a) those who were statistically predicted not to be in the labour force at the follow-up but who were in reality in the labour force (hereafter these people are referred to as “positive surprises”); and (b) those who were statistically predicted to be in the labour force at the follow-up but who were in reality not in the labour force (hereafter these people are referred to as “negative surprises”).

As it was anticipated that some plateauing in the production of novel response elements would occur, it was decided to limit the number of subjects for inclusion in the current investigation to twenty in each group. Persons with the top twenty most extreme scores in each criterion category were identified for further investigation. One person from within the positive surprise group was not able to be interviewed. This person was replaced by the individual with the next most extreme contrary discrimination score. A summary description of the forty persons interviewed is presented in Table 1.

Table 1  
*Characteristics of the Surprise\* Individuals Who Were Interviewed (N = 40)*

Characteristic	Positive Surprise* Group	Negative Surprise* Group
Sex		
Male	18	20
Female	2	-
Compensation entitlement		
Some	11	10
None	9	10
Impairment		
Complete tetraplegia	8	1
Incomplete tetraplegia	4	6
Complete paraplegia	6	8
Incomplete paraplegia	2	5
Age (years)		
Mean	38.1	45.8
Standard Deviation	10.74	13.35

Note. \* 'Positive Surprises' were those predicted not to be in the labour force, but who were; 'Negative Surprises' were the converse.

#### Procedure

Subjects in all cases were interviewed individually and within their own home. The length of interviews ranged from 15 minutes to 90 minutes, with the majority being between 30 and 60 minutes. With the permission of the participants, the interviews were tape recorded and transcribed. In conducting the interviews it was hoped that the researcher's obvious familiarity with the area of SCI rehabilitation would facilitate interview "honesty" but no specific procedures were instituted to test for social bias or misreporting in the conduct of the interview.

#### Instrument

The interviews were semi-structured and involved the use of an interview schedule consisting of a series of pre-determined questions and topic areas. (A copy of the interview schedule is available from the first author, but key interview questions included "Who or what do you think were the most important factors that helped you in your rehabilitation?" and "Do you think there is anything which has held you back?"). Consistent with the approach advocated by Miller and Crabtree (1992), the semi-structured interview process was chosen because it allows "guided, concentrated, focussed and open-ended communication" (p. 16) between the investigator and the interviewee, which suited the current study's aim of generating a range of factors possibly acting as powerful influences on these "exceptional" individuals' post-injury achievements. The salient interview questions were designed to obtain qualitative information about the facilitators of post-injury achievement, over and beyond those individual attributes identified as exerting an influence in the original larger study (Murphy et al., 2003).

#### Data Analysis

The data analysis strategy was essentially one of content analysis (Weber, 1985). The interview responses were examined and coded by the researcher and another judge (a rehabilitation psychologist). Based on commonality between responses, categories of factors facilitating, or interfering with, post-injury employment achievements were developed. These categories included characteristics of the individual; of the job; of the work environment; and, of the non-work environment.

Results

Firstly, in order to gain some understanding of the uniqueness or otherwise of each interviewee’s reported post-injury experience, a cumulative frequency of novel responses produced through the series of interviews was calculated. This information is presented in Figure 1 and Figure 2.

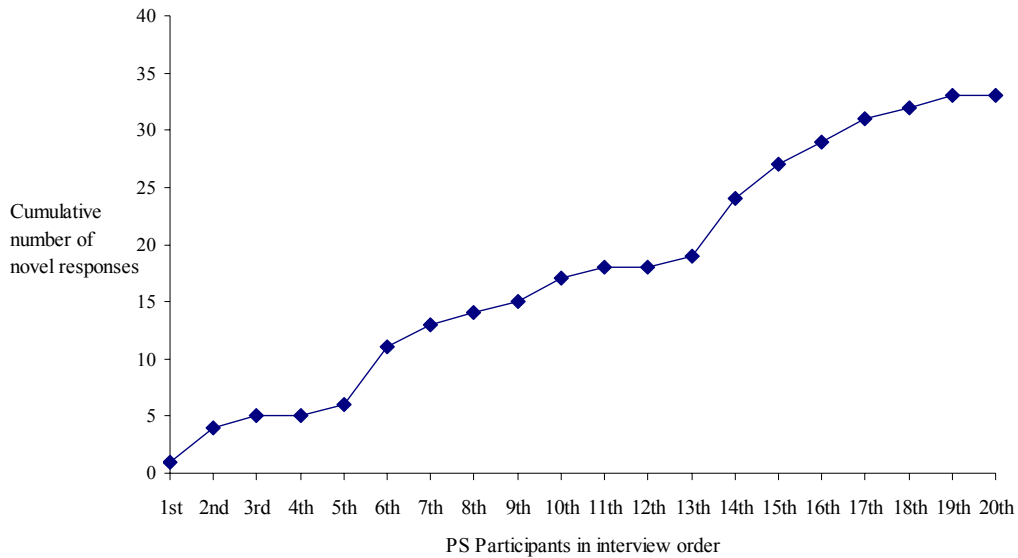


Figure 1. Cumulative frequency of novel responses given by ‘positive surprise’ (PS) interviewees

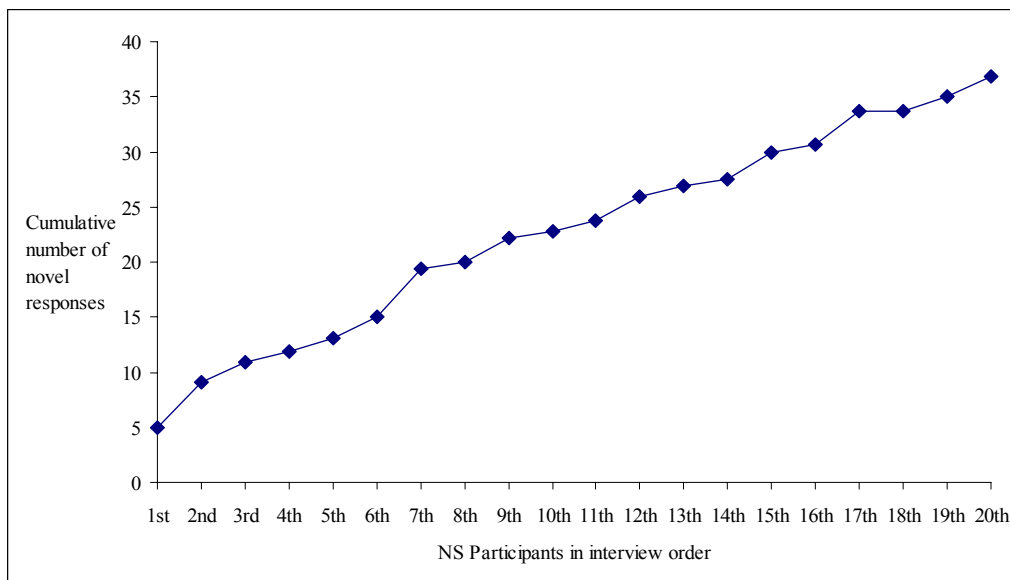


Figure 2. Cumulative frequency of novel responses given by ‘negative surprise’ (NS) interviewees

Contrary to the researchers' expectations, the information in the figures suggests that there was no absolute plateauing in the production of novel responses; however, with the positive surprise group, there was some levelling off around interview 17. Of the forty interviewees, only four mentioned no new factors. The fairly constant rise in the graphs suggests the essential uniqueness of most interviewees' explanations for their employment status at follow-up (not withstanding much partial corroboration of post-injury experience). From a behavioural psychology perspective, separate behavioural assessments of each individual are expected to be undertaken prior to the development of any service plan because it is accepted that each individual's situation is unique in terms of environmental stimuli encountered.

The factors mentioned in response to the salient open-ended interview questions are summarised in Tables 2-8. As a set, the information presented in Tables 2-8 highlights the prominent role of environmental factors (as opposed to individual attributes) in facilitating interviewees' un-predicted post-injury labour force participation. With respect to the responses of the positive surprise group, individual characteristics represented less than a quarter of the factors specified as facilitating post-injury labour force participation (11 of 48 reported explanations). With respect to the negative surprises group, the role of environmental factors was less pronounced.

Table 2.

*Characteristics of the Individual Which Were Reported as Facilitating Post-Injury Labour Force Participation*

Characteristic of the individual	Participants involved	Frequency
Self-employed trades person pre-injury.	P8, P12, P19, P20, P21	5
Self-employed farmer pre-injury.	P7, P15	2
Above average general intelligence enabled an individual with little formal education to undertake post-injury clerical work.	P11	1
Above average general intelligence enabled a former truck driver to complete computer training to prepare him for available office work.	P16	1
"Own will" (determination, action-oriented individual).	P17	1
High rate of active job seeking (approached 24 employers in two years).	P18	1

Table 3.

*Characteristics of the Job Which Were Reported as Facilitating Post-Injury Labour Force Participation*

Characteristic of the job	Participants involved	Frequency
Availability of flexible, part-time hours.	P2, P5, P6, P8, P20, P21	6
Job was redesigned to suit the capabilities of the particular SCI individual.	P7, P10, P12	3
Position as "Advocate" for those with severe physical disabilities ideal for this wheelchair-bound participant.	P9	1
Job was created (as a purchasing officer) to suit the limitations of a former truck driver who suffered an incomplete paraplegia.	P16	1

Table 4.  
*Characteristics of the Work Environment Which Were Reported as Facilitating Post-Injury Labour Force Participation*

Characteristic of the work environment	Participants involved	Frequency
Family business allowed suitable occupation to be pursued (book-keeper, estimator, manager).	P7, P8, P12	3
Employer happy to accommodate non-standard hours as part of employment conditions.	P2, P5	2
Strong "bond" between individual and workplace members facilitates return to work.	P2, P5	2
Employer facilitates return to work by approaching the injured individual and organizing different (suitable) position of employment to be made available.	P10	1
Large national employer involved in the construction industry had the range of jobs available, and the motivation, to identify an office-based job (purchasing officer) for which the injured employee could be trained.	P16	1
Family and friends looked after the business when injured individual was hospitalized and recovering physical capability.	P19	1

Table 5.  
*Characteristics of the Non-Work Environment Which Were Reported as Facilitating Post-Injury Labour Force Participation*

Characteristic of the non-work environment	Participants involved	Frequency
Family and friends give practical support to return to work efforts.	P1, P2, P7, P14, P15, P16, P17, P18	8
Community organizations provide helpful information or financial support (wheel-chair sporting organizations, peer support organization, service club).	P16 <sup>a</sup> , P18, P20	4
Rural setting facilitates return to work (community social support).	P7, P20	2
Friends identified suitable job opening and communicated this to the individual ('tangible' social support).	P2	1
Availability of special equipment (assistive technology in the form of a four-wheel motor-bike which enabled a rural-based interviewee to work at a farm house).	P15	1

Note. <sup>a</sup>This participant mentioned two community organisations.

Table 6.

*Characteristics of the Individual which were Reported as Interfering with Post-Injury Labour Force Participation*

Characteristics of the individual	Participants involved	Frequency
Chronic health problems (bladder, burns, temperature control, urinary tract infections, “pain”, pressure sores).	N1, N2, N10 <sup>a</sup> , N12, N15, N17, N19, N20	9
Financial independence obviates need to work (private income, third-party insurance compensation, superannuation benefits).	N3, N6, N7, N8, N9, N20	6
General health concerns (heart condition, osteoporosis, hip replacement).	N15, N19, N20	3
Personal development, not vocational development, focus post-injury.	N5	1
Poverty precludes acquisition of modified car which would have facilitated travel to job interviews and work.	N11	1

Note: <sup>a</sup>This participant mentioned two individual characteristics (pain, and bladder problems)

Table 7.

*Characteristics of the Work Environment Factors Which Were Reported as Interfering with Post-Injury Labour Force Participation*

Characteristic of the work environment	Participants involved	Frequency
Employer wants only 100% return to work, will not allow a graded return to work to be commenced.	N1	1
Employer reduces staff members, and retrenches SCI employee, aged 51 years, but who had worked for more than 13 years post injury.	N2	1
Negative attitude of employer leads to 52 year old managerial worker “retiring” even though he had worked for more than 4 years post injury.	N6	1
Employer uses superannuation scheme to “block” the return of injured employee to previous work.	N9	1

Table 8.

*Characteristics of the Non-Work Environment Which Were Reported as Interfering with Post-Injury Labour Force Participation*

Characteristic of the non-work environment	Participants involved	Frequency
High regional unemployment rate (rural Tasmania).	N1	1
Adverse terrain (non capital city resident).	N1	1
Imminent government policy changes re superannuation entitlements precipitated decision to ‘retire’.	N7	1
‘Negative’ social support. Family members “retire” the SCI individual by suggesting that he was too old to keep working. Cultural factors led to son seeking to be the responsible bread winner.	N13	1

In terms of the environmental factors which were reported as facilitative, job-design and employer characteristics were equally reported (11 and 10 reports, respectively), but the largest number of facilitative environmental factors reported were those to do with the non-work environment (16 of 48 reports). The assistance of family, friends and community organisations were involved in 15 of the 16 reports in this category.

### Discussion

The current study was designed to assist in better understanding the main influences on post-injury labour force participation over and beyond previously-studied factors associated with the injured individual. A wide range of individual, job, work environment and other environmental factors were mentioned. At the individual level, having been self-employed pre-injury seemed to have been a powerful influence on more than a third of the “positive surprise” group. The pre-injury self-employed status seems to be associated with certain attitudes or behaviours not well assessed by psychological measures usually used by vocational rehabilitation researchers. Certainly the role of pre-injury self-employment has been largely ignored in the SCI rehabilitation literature, and indeed in the wider vocational rehabilitation literature (see Arnold, Seekins, Ipsen, & Colling, 2003). As researchers such as Arnold and colleagues have explained, self-employment is of particular relevance to disadvantaged groups or communities.

Flexibility of work conditions (either with respect to hours of work or tasks allocated) is obviously facilitative of return to work and was mentioned by approximately half of the positive surprise group. The implications of this finding for future job opportunities for persons with SCI are however unclear. On the one hand, more flexible hours and work arrangements are increasingly a feature of the current job market (see Mashaw & Reno, 1996). This suggests that there may be, more so than in the past, an increase in fractional employment, which suits many persons with SCI whose energy expenditure pattern suggests that they are not well suited to traditional working hours, particularly as their a.m. self-care needs are extensive and time-consuming. On the other hand, the current findings may merely reflect the fact that many employers will create “special” arrangements for individuals with whom they have a previously established good working relationship (the “occupational bond” in the terminology of Shrey and Lacerte, 1995). For the behavioural psychologist, this finding emphasises the importance of identifying within the work environment those organisational members whose attitudes and behaviours can appropriately prompt and reinforce any behaviours associated with an attempted return to work post injury.

The central role of the employer in facilitating post-injury work is suggested by the interviews with the positive surprise group. In all but one case (and that case involved a business owned by the injured person) the work environment features mentioned were a function of the employer having a supportive attitude to the return-to-work attempt. Thus the employer approached the individual or responded well to requests for non-standard hours or tasks etc. This employer-focussed set of work environment factors mentioned suggests that it is not the physical work environment per se, but the attitudes and behaviours of key organisational members which may be the main work-related factor influencing the extent of post-injury employment. If this is so, it would imply that employer education programs may be an important mechanism for increasing work opportunities for those with a serious physical impairment such as a SCI. Effective employer education would involve communicating to employers and management representatives the importance of setting positive expectations regarding return to work, and reinforcing appropriately any initial attempts at return to work. In the general work disability literature addressing injuries other than spinal cord injury, the role of employer attitudes and practices (though relatively rarely studied) has been shown to have an influence on return-to-work rates achieved (see, for example, Schultz, Crook, Berkowitz, Milner, & Meloche, 2005). Behavioural psychologists skilled in gaining the cooperation of employers would seem to be well placed to increase employment opportunities available to those living with SCI by reinforcing appropriate employer behaviours relevant to return to work of those with serious injuries.



Finally, the interviews highlighted social support as an important extraneous factor enhancing post-injury vocational achievement. On all but one occasion when non-work environmental factors were mentioned, there was reference to the way that family, friends and the local community (for rural-based individuals, particularly) supported the return-to-work effort. Typically this social support was specific (e.g. job-focussed) rather than general (i.e. emotional support) and suggests the positive contribution to rehabilitation outcome of certain types of social support (see Murphy & Young, 1998). The most effective social support presumably involved supporters behaving in ways that communicated confidence that the former patient could return to work successfully (job-seeking self efficacy).

The obtained results discussed above need to be interpreted in the light of the adequacy of the study methodology. As conducted, the study had three main strengths and one major limitation. The study's strengths derive from (a) the comprehensive nature of the original set of individual demographic, injury and psychological variables (14 such predictor variables were assessed) and the representativeness and size of the original sample (see Murphy et al., 2003); (b) the complete capture of a single geographical area which assured the essential homogeneity of treatment received by participants who attended one of two specialist Spinal Units offering almost identical treatment; and (c) the fact that the sample was empirically-defined, limiting the influence of selection bias among study participants. The major design weakness of the study was that only twenty interviews were conducted within each group. As the expected plateauing of novel elements was not observed, the failure to schedule more than twenty interviews in each group may have precluded the identification of additional important facilitators of, or barriers to, post-injury employment.

Accepting the reliability of the results from the present study, they contain a number of implications for both rehabilitation researchers and those involved in the delivery of services to those living with permanent impairments. For the rehabilitation researcher, the results clearly indicate the need to design studies of rehabilitation outcomes which take account, simultaneously, of both individual and environmental aspects. To date, studies of the prediction of rehabilitation outcome have been dominated by studies that include assessments of a large number of individual attributes (such as degree of impairment, level of functional independence, pre-injury education, and, occasionally, certain personality attributes), while assessment of relevant environmental variables has rarely been made. When environmental attributes have been included in study designs, they have usually been specified as dependent or criterion variables, rather than predictor variables (see for example, Whiteneck, Tate, & Charlifue, 1999). One recent study that did incorporate organisational characteristics as predictor variables in the study of return to work post-injury was that of Seland, Cherry and Beach (2006). In that study, the employer's preparedness for making alternative work available for injured workers was associated with higher return-to-work rates.

The results of this present study are important in strengthening the call for increased study of environmental factors as they impact on the post-injury achievements of those suffering disabling injury. Certainly, the need to balance study of personal versus environmental variables is consistent with the World Health Organisation's latest framework for the International Classification of Function (World Health Organization, 2002).

For those involved in the delivery of services to those suffering disabling injury, the present study's results call for a change of role for many service delivery personnel. If environmental factors are to be assessed, then health professionals involved in rehabilitation will need to spend more time away from the hospital setting. A proper assessment of environmental reinforcers and punishers is essential. If more effective use is to be made of "significant others" and community resources to enhance the post-injury achievements of those undergoing rehabilitation, then health professionals involved in rehabilitation will have to be knowledgeable in such areas of behavioural psychology as social learning theory (Goldstein, 1973).

The results from the positive surprise group were particularly clear. The explanations provided by the twenty exceptional individuals who achieved employment "against the odds"

suggests that for the fullest realisation of vocational potential following serious injury, rehabilitation service delivery needs to expand its focus from a concentration on the individual to include the allocation of resources to the establishment of links with parties external to the clinical setting – particularly enlisting the co-operation of families and friends and of pre-injury employer representatives. Behavioural psychologists are ideally placed to work effectively with such parties as they encourage and reinforce job-seeking behaviour.

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