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An exploratory prospective study of the association between communication skills and employment outcomes after severe traumatic brain injury

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Abstract

Primary objective: The aim of this pilot study was to explore possible correlations between measures of functional communication skills in the first year post-injury and later employment outcome.
Design: A preliminary observational study employing a prospective longitudinal design.
Methods: Fourteen adults with traumatic brain injury completed an assessment involving two functional communication measures: an objective test of cognitive communication skills (Functional Assessment of Verbal Reasoning and Executive Strategies, FAVRES) and self-ratings of communication impairment (LaTrobe Communication Questionnaire, LCQ). Follow-up of participants' employment outcome was conducted 9–18 months after the initial assessment.
Results: At follow-up, eight participants had returned to employment (working a similar number of hours to their pre-injury status), five were unemployed and one was lost to follow-up. Employment status at follow-up was strongly correlated with both FAVRES Total Accuracy scores ($r = 0.833$) and Total Rationale scores ($r = 0.837$), but there were no correlations with FAVRES Time and Reasoning scores or with the LCQ.
Conclusions: The FAVRES shows initial promise as an assessment that may be associated with successful employment outcome following traumatic brain injury. Further research with larger samples is required to provide further information on the prognostic utility of measures such as the FAVRES and the LCQ.

Keywords

Communication, language, work, employment, traumatic brain injury

History

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Introduction

Reintegration into previous life routines is one of the most important goals for rehabilitation of individuals after a traumatic brain injury (TBI), including a successful return to employment. A large proportion of people with TBI are of working age [1]. However, the effects of TBI pose significant challenges for those seeking to return to employment. A review of Australian studies reported low rates of return-to-work for people with TBI, ranging between 38–46.5% [2].

The domain of executive functioning is one predictor of successful return-to-work after TBI [3]. Impairments in executive functioning in areas such as sequencing, organizing and prioritizing information and self-regulation have an important effect on communication performance [4]. The negative impact of impairments in executive functioning on communication skills inevitably creates difficulties for individuals as they resume work-related roles.

Evaluating the impact of communication skills on employment success requires assessment tools that sensitively measure the skills required for vocational settings. The communication demands faced in a work situation are much greater than those posed by traditional communication assessments, which generally only assess comprehension and production of language at the word and sentence level. People with TBI typically have minimal linguistic impairment based on performance on traditional language assessments [5]; however, they do present with significant difficulties in everyday communication situations [6]. Despite this issue, prognostic studies of employment outcomes in TBI that have considered communication skills have typically used impairment-based measures designed for assessment of aphasia [7].

The WHO-ICF framework [8] highlights that evaluation of disability must go beyond the level of impairment and also consider a person's activities and participation in life situations. Assessments that evaluate functioning at the level of activities and participation may be more predictive of real-life outcomes such as employment. Hughes and Orange [9] identified three functional communication measures for TBI which mapped to the ICF domains of activity and participation. Of the measures identified, the Functional Assessment of Verbal Reasoning and Executive Strategies (FAVRES) [10] may be the most relevant to employment success, as it uses simulations of complex real-life tasks that may be similar to workplace situations. The assessment tasks in the FAVRES

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are designed to evaluate the subtle cognitive-communication deficits of individuals with TBI, including skills in complex comprehension, complex expression, verbal reasoning, problem-solving and executive functions.

One previous study has used the FAVRES to investigate the impact of communication impairments on successful return-to-work after TBI. Isaki and Turkstra [11] conducted a study in which they identified 10 individuals with TBI who were employed and matched them on pre-injury occupational status to a second group of 10 who were unemployed. They reviewed the results of this sample on a number of communication tests, including two sub-tests of the FAVRES (Task 1: Planning an event, and Task 2: Scheduling). They found that accuracy on the FAVRES Scheduling test made a contribution to discriminating between the employed and unemployed groups. However, prospective studies are required to further investigate the relationship between communication skills and work re-entry. The FAVRES has been expanded and standardized since this early study [10] and therefore there is a need to replicate these results using the complete version.

The La Trobe Communication Questionnaire (LCQ) is another functional communication measure that assesses the real-life communication performance of individuals with TBI through self-report. It is a well-researched assessment tool with established reliability and validity [5, 12, 13]. The LCQ requires individuals to rate their own performance in different areas of communication, taking into account the entire range of different communication situations that they encounter in their lives and, therefore, this tool may be sensitive to the impairments experienced by individuals with TBI. Self-report measures can be problematic for some people with TBI due to reduced insight into their impairments; however, research suggests that self-report on the LCQ can still provide clinically useful information [12, 14]. Performance on the LCQ was significantly related to employment status in one study involving a sample of 22 participants who were at least 1-year post-injury [15], but this finding has not been replicated in a prospective study.

In addressing the timing of such assessments, Nightingale et al.'s [3] review found that few studies had investigated early prognostic factors (i.e. within the first 3–6 months post-injury) for successful return-to-work, despite the clinical utility of doing so. This pilot study therefore aimed to investigate whether performance on the FAVRES or self-ratings on the LCQ during the first year post-injury were prospectively associated with subsequent return-to-work.

Methods

Participants

Fourteen participants were recruited from referrals to the outpatient department of the Liverpool Brain Injury Rehabilitation Unit in Sydney, Australia. To be included in the study, patients must have: (a) sustained a severe TBI as defined as a period of post-traumatic amnesia (PTA) of more than 24 hours; (b) sustained the injury no more than 12 months previously; (c) been employed prior to sustaining a TBI; (d) an estimated pre-morbid intelligence in the average range based on neuropsychological assessment; (e) an ability to complete basic reading and writing tasks; and (f) adequate proficiency in English to be able to complete formal assessment tasks without the aid of an interpreter. Individuals with a past history of a neurological event were excluded.

Measures

Demographic and employment variables

Participants completed a data protocol to provide demographic and employment-related information. The protocol included information on pre-injury demographic and employment variables, injury variables and post-injury demographic and employment variables. The employment variables included job title and number of hours working per week. The dependent variable was employment outcome, which was coded as 'employed' if participants were working either full-time or part-time and 'unemployed' if they were not working. When participants were unable to provide information, the research assistant located the required data from the medical file.

Communication measures

Functional Assessment of Verbal Reasoning and Executive Strategies (FAVRES). The FAVRES is designed to evaluate the subtle cognitive-communication deficits of individuals with TBI [10]. It consists of four complex verbal reasoning tasks that are similar to everyday situations in work or home life. The individual is required to make decisions in relation to the given information and to produce a written response about their choice and the reasons for that choice. Each task involves a functional complex reading text, as follows:

(1) *Planning an event*: Choosing an appropriate event to attend with a child for their birthday from a selection of choices on the entertainment page in a newspaper
(2) *Scheduling*: Completing a written schedule based on a list of tasks and phone messages for attention that day
(3) *Making a decision*: Choosing the most appropriate gift for a couple based on the information that can be gleaned from the couple from a transcript of their conversation
(4) *Building a case*: Formulating a complaint to be presented to a tradesperson based on a transcript of a person's account of their week and their dealings with the tradesperson

Three variables are generated from the individual's written response to each task; namely an Accuracy score (which reflects how well their choice fits the situation based on the given information), a Rationale score (which measures how well they provided reasons for their choice) and a Time score (which is a measure in minutes of how long it took to process the information and complete the written response). Finally, the three variable scores can be summed across the four tasks to provide Total Accuracy, Rationale and Time scores. All variables are converted to standard scores based on a comparison to a normative sample. Study variables comprised the standard scores for Total Accuracy, Rationale and Time, as well as the standard scores for Accuracy and Rationale for the four individual tasks. Higher standard scores for Accuracy and Rationale represent higher quality responses. Higher standard scores for Time represent faster completion of the assessment.

The examiner also asks a standard set of questions which require identifying the most and least important information in the reading text, giving advantages and disadvantages for various options, changing the original decision based on new information, generating alternative choices and predicting the consequences of particular actions. The quality of these spoken responses are rated to produce a Reasoning score, which reflects the accuracy and detail of the individual's answers. Standard scores for Total Reasoning and Reasoning scores for the four tasks were also included in the set of study variables. Higher standard scores for Reasoning represent higher quality responses.

The FAVRES has been psychometrically evaluated on both healthy young adults and adults with TBI and found to have acceptable discriminant validity and reliability [4]. The measure has demonstrated good sensitivity (0.88; probability that people with TBI had scores below the cut-off) and specificity (0.83; probability that people without TBI had scores above the cut-off). The inter-rater reliability was 0.81 for Accuracy scores and 0.85 for Rationale scores.

La Trobe Communication Questionnaire. The La Trobe Communication Questionnaire (LCQ) is designed to measure self-perceptions of communication skills in people who have had a TBI [12]. It is a self-report tool consisting of 30 items that reflect problems that can occur in social communication after brain injury. Individuals rank each item on a four-point scale as occurring, 'Never or Rarely', 'Sometimes', 'Often' or 'Usually or Always'. The current study employed the LCQ Total score, which represents self-perceived communication ability (range of 30–120, higher scores representing greater perceived difficulty). The LCQ has been psychometrically evaluated on both adults with TBI [12] and healthy young adults [13]. The self-report version was found to have high internal consistency for the TBI population (Cronbach's alpha = 0.91) and acceptable test–re-test coefficients across a 2-week interval ($r = 0.81$).

Procedure

The Sydney South West Area Health Service Human Research Ethics Committee provided ethical approval. The speech pathologist (RR) identified potential participants who met eligibility criteria from a consecutive series of referrals to the Brain Injury Rehabilitation Unit Community Team and contacted them via telephone to invite them to participate in the research. At the assessment session, participants provided written consent to participate. Participants then completed the two assessment tools supervised by the speech pathologist in a quiet room at the hospital or their home. Following the assessment, participants continued their usual rehabilitation programme, including speech pathology intervention for six participants and vocational assistance for eight participants. At follow-up, participants' employment outcome was determined by an audit of information in their medical file. This audit was completed a minimum of 9 months (range 9–18 months) after participants had completed their initial assessment. In cases where the employment outcome was unclear from the medical file, a research assistant made contact with participants by telephone and completed a brief interview to obtain information about their employment outcomes.

Data analysis

All data was entered into PASW Statistics 18, Release Version 18.0 [16] for analysis. The sample was divided into two separate groups (employed; unemployed) based on participants' employment outcome at the post-assessment file audit. Descriptive statistics were generated and the baseline demographic and injury data as well as assessment data were inspected for normality. Between-group tests were then conducted on demographic and injury variables to ensure the two groups were statistically equivalent and a point biserial correlation was calculated between post-traumatic amnesia duration and employment status (unemployed *vs.* employed). Point biserial correlations were also conducted to test the strength and significance level of associations between the communication variables and employment status. Finally, Pearson's product-moment correlation coefficients were computed among the communication variables that were significantly correlated with employment status to assist with understanding the relationships between the various assessment domains and tasks.

Results

Vocational outcomes

Fourteen participants completed the assessment protocol. One participant was lost to follow-up at the post-assessment file audit. At follow-up, eight participants were employed, having returned to their pre-injury hours of employment and five participants were unemployed. Six of the eight participants who returned to work and two of the five participants who had not returned to work had received services from a vocational rehabilitation provider. Table I provides an outline of the vocational status of participants at pre-injury and follow-up.

Of those that had returned to paid employment, six participants had returned to work with the same employer and the same working hours as in their pre-injury position. Three of these participants had a reduction or change in responsibilities in their role (e.g. a participant who held a co-ordinator position as a toolmaker pre-injury returned to employment as a toolmaker but not as a co-ordinator). Two participants had commenced a different role with a new employer, at hours comparable to their pre-injury status.

Employed and unemployed groups: Demographic characteristics

Demographic characteristics of employed and unemployed groups are reported in Table II. All demographic variables were normally distributed. The baseline demographic, injury and vocational characteristics of the employed and unemployed groups were compared using Fisher's Exact test for categorical data and *t*-tests. No significant differences between the groups were found.

Examination of the injury severity scores found that the PTA duration for one participant in the unemployed group was almost two standard deviations from the mean for the

Table I. Vocational status of participants.

	Pre-injury		Follow-up		
Participant No.	Role	Hours	Role	Hours	Voc Rehab?
1	Toolmaker, co-ordinator	FT	Toolmaker	FT	Yes
2	Truck driver	FT	Volunteer	N/A	Yes
3	Car detailer	FT	Unemployed	N/A	No
4	IT Manager	FT	Unemployed	N/A	No
5	Farm manager	FT	Farm manager	FT	Yes
6	Baker	FT	Lost to follow-up		No
7	Concreter	FT	Unemployed	N/A	No
8	Electorate officer	PT	Electorate officer	PT	Yes
9	Maintenance specialist	FT	Spare parts	FT	Yes
10	Enrolled nurse	FT	Unemployed	N/A	Yes
11	Restaurant manager	FT	Retail	FT	No
12	Accounts payable/office	PT	Accounts	PT	Yes
13	Kitchen hand	PT	Kitchen hand	PT	Yes
	University student	FT	University student	FT	
14	Imports administrator	FT	Financial planner	FT	No

Voc Rehab?, Received services from a vocational rehabilitation provider; FT, 30 hours or more/week; PT, less than 30 hours.

Table II. Demographic and injury data.

	Employed ($n=8$)		Unemployed ($n=5$)	
Sex (n, %)				
Male	5	62.5	4	80
Female	3	37.5	1	20
Age (mean, SD)	37.9	14.0	33.4	11.4
Marital status (n, %)				
Married/De Facto	5	62.5	2	40
Divorced/Separated	1	12.5	1	20
Single	2	25	2	40
Pre-injury vocational status				
Professional/Managerial	1	12.5	1	20
Skilled labour	3	37.5	1	20
Clerical/sales	3	37.5	0	0
Unskilled/semi-skilled labour	1	12.5	3	60
Time employed in years pre-injury (mean, SD)	8.8	8.6	4.3	3.2
Education in years (mean, SD)	12.1	1.8	13.6	5.7
PTA duration (mean, SD)	18.8	11	36.4	19.9
Time post-injury in months (mean, SD)	7.4	2.3	8.7	2.6

Note: All between groups tests were non-significant ($p>0.05$).

sample as a whole (PTA = 60 days). Despite the small numbers, the effect of this outlier was limited. Re-running the point biserial correlations between communication variables and employment status without this participant did not change the significance of the correlations and, therefore, this case was retained in the reported analyses.

Correlations between communication variables and employment status

Table III reports the mean scores for communication variables and the correlations between communication variables and employment status at follow-up. The correlation between PTA duration and employment status is also reported. Total scores for Accuracy and Rationale on the FAVRES were positively correlated with employment status with strong levels of association. Total scores for Time and Reasoning on the FAVRES and self-ratings on the La Trobe Communication Questionnaire were not correlated with employment status. The employed group tended to be slower to complete the tasks and have higher Reasoning scores, but these differences did not reach significance (*t*-test). The small standard deviation for the Reasoning scores for the unemployed group is due to a floor effect, in which all participants with a reasoning raw score of 70 or below were assigned a standard score of 76, based on the protocol of the FAVRES.

Table IV shows the total scores for Accuracy and Rationale and employment status at follow-up for individual participants to provide further illustration of the association between the scores and employment status. This table also shows that total scores for Accuracy and Rationale for each participant were both either within normal limits ($n=6$) or outside normal limits ($n=6$), with the exception of one case.

Inter-correlations between communication variables

Given that participants' total scores for Accuracy and Rationale were often similar, this study computed the correlations between the key communication variables, as shown in Table V. Total scores for Accuracy and Rationale on the FAVRES were strongly correlated with each other. There were no other significant correlations found between the communication variables.

Table III. Point biserial correlations between PTA duration assessment scores and employment status.

	Employed group ($n = 8$) *M* (SD)	Unemployed group ($n = 5$) *M* (SD)	Sample ($n = 13$) *M* (SD)	Correlation with employment (*r*)
PTA Duration	18.8 (11.0)	36.4 (19.9)	25.5 (16.8)	−0.532
FAVRES Total Accuracy SS	78.13 (29.85)	10.00 (10.39)	51.23 (42.50)	0.833**
FAVRES Total Rationale SS	89.50 (22.86)	20.50 (31.90)	61.46 (44.13)	0.837**
FAVRES Total Time SS	90.63 (11.95)	102.25 (26.55)	94.08 (17.09)	−0.266
FAVRES Total Reasoning SS	87.88 (17.61)	76.25 (0.50)	83.69 (14.57)	0.357
LCQ Total	40.13 (8.51)	45.00 (20.51)	42.31 (12.52)	0.357

Notes: $^{**}p < 0.01$ (2-tailed).
FAVRES standard scores are computed to have a mean of 100 and a standard deviation of 15. A score of 70 represents 2 SD below the mean.

Table IV. Total accuracy and rationale standard scores for individuals on the FAVRES.

ID	FAVRES Total Accuracy SS	WNL?	FAVRES Total Rationale SS	WNL?	Employed at follow-up
1	19	No	39	No	Yes
2	1	No	1	No	No
3	19	No	1	No	No
4	1	No	3	No	No
5	111	Yes	104	Yes	Yes
7	1	No	10	No	No
8	91	Yes	97	Yes	Yes
9	50	No	82	Yes	Yes
10	19	No	68	No	No
11	81	Yes	97	Yes	Yes
12	81	Yes	82	Yes	Yes
13	101	Yes	111	Yes	Yes
14	91	Yes	104	Yes	Yes

Note: WNL, Within normal limits, within 2 SD of the mean.

Table V. Pearson correlations (*r*) between total assessment scores ($n = 13$).

	FAVRES Total Accuracy SS	FAVRES Total Rationale SS	FAVRES Total Time SS	FAVRES Total Reasoning SS	LCQ Total
FAVRES Total Accuracy SS	1.0				
FAVRES Total Rationale SS	0.921**	1.0			
FAVRES Total Time SS	−0.255	−0.478	1.0		
FAVRES Total Reasoning SS	0.508	0.504	−0.169	1.0	
LCQ Total	−0.135	−0.355	0.256	−0.42	1.0

$^{**}p < 0.01$ (2-tailed).

Table VI. Pearson correlations (*r*) between individual task accuracy scores ($n = 13$).

	FAVRES Task 1 Accuracy SS	FAVRES Task 2 Accuracy SS	FAVRES Task 3 Accuracy SS	FAVRES Task 4 Accuracy SS
FAVRES Task 1 Accuracy SS	1.0			
FAVRES Task 2 Accuracy SS	0.730**	1.0		
FAVRES Task 3 Accuracy SS	0.301	0.618*	1.0	
FAVRES Task 4 Accuracy SS	0.305	0.635*	0.644*	1.0

Note: $^{*}p < 0.05$ (2-tailed), $^{**}p < 0.01$ (2-tailed).

Table VII. Pearson's correlations (*r*) between individual task rationale scores ($n = 13$).

	FAVRES Task 1 Rationale SS	FAVRES Task 2 Rationale SS	FAVRES Task 3 Rationale SS	FAVRES Task 4 Rationale SS
FAVRES Task 1 Rationale SS	1.0			
FAVRES Task 2 Rationale SS	0.455	1.0		
FAVRES Task 3 Rationale SS	0.606*	0.857**	1.0	
FAVRES Task 4 Rationale SS	0.545	0.925**	0.828**	1.0

Note: $^{*}p < 0.05$ (2-tailed), $^{**}p < 0.01$ (2-tailed).

Table VIII. Point biserial correlations between individual task accuracy and rationale scores and employment status.

	Employed Group ($n = 8$) *M* (SD)	Unemployed Group ($n = 5$) *M* (SD)	Sample ($n = 13$) *M* (SD)	Correlation with employment (*r*)
Task 1 Accuracy SS	93.75 (16.84)	84.25 (28.50)	86.08 (24.55)	0.395
Task 2 Accuracy SS	85.50 (24.34)	44.25 (13.50)	68.08 (30.73)	0.746**
Task 3 Accuracy SS	97.25 (19.35)	28.00 (31.18)	72.69 (39.44)	0.820**
Task 4 Accuracy SS	65.63 (33.57)	13.00 (19.04)	47.54 (36.98)	0.644**
Task 1 Rationale SS	92.13 (19.15)	78.25 (35.43)	83.23 (28.41)	0.412
Task 2 Rationale SS	101.13 (0.87)	63.00 (10.00)	86.08 (22.09)	0.897**
Task 3 Rationale SS	90.25 (36.06)	20.00 (38.00)	61.77 (50.49)	0.743**
Task 4 Rationale SS	84.50 (12.73)	39.00 (27.56)	65.23 (31.04)	0.817**

Note: $^{**}p < 0.01$ (2-tailed).

The observation that Accuracy and Rationale scores tended to be either high or low could be explained by participants' performing either relatively well or relatively poorly across all of the four tasks. To investigate this further, correlations were computed between Accuracy and Rationale scores on the four individual tasks as shown in Tables VI and VII. Accuracy scores were positively correlated between Tasks 2, 3 and 4. For Task 1, there was a significant correlation with Task 2 only. Rationale scores were also positively correlated between Tasks 2, 3 and 4. For Task 1, there was a significant correlation with Task 3 only.

Correlations between individual tasks and employment status

Given the positive correlations between individual tasks on the FAVRES, it was relevant to investigate whether performance on individual tasks was correlated to employment status. As seen in Table VIII, Accuracy and Rationale scores for Tasks 2 (Scheduling), 3 (Making a decision) and 4 (Building a case) were all positively correlated with employment status. Performance on Task 1 (Planning an event) was not significantly correlated with employment status.

Discussion

The findings of this study add to the results of two previous exploratory studies [11, 15] that have suggested functional communication is an important component of work re-entry following brain injury. This study found a strong positive correlation between performance on complex cognitive communication tasks and later return to employment within a small sample. A major limitation of this study was the small number of participants in each group. Given the small sample size, the results of this study may not be representative. Replication of this study with a larger number of participants would assist with confirming the results and assist in identifying whether communication skills make a unique contribution to return-to-work success, once it is tested in a multivariate analysis with other known predictors of return-to-work.

Other measures of communication performance in this study, including time taken to complete the tasks, verbal reasoning skill and self-reported communication skill, were not correlated with later employment status. The employed group took somewhat longer to complete the assessment, but this was not statistically significant. There was also no correlation between employment status and performance on the FAVRES reasoning task. This is somewhat surprising, given that executive functioning has been shown to be a significant predictor of return-to-work after TBI, comprising skills such as reasoning and mental flexibility [3]. Comparing the items on the Reasoning tasks to the Accuracy and Rationale tasks reveals some possible reasons for the absence of correlation for Reasoning. The Accuracy and Rationale scores are obtained from written responses requiring sustained attention for 10–20 minutes per task, whereas the Reasoning score is obtained from brief spoken responses. This suggests difficulties may be more apparent in complex written communication than in complex spoken communication and in tasks requiring longer periods of sustained attention and greater independence in task completion. Similarly, a workplace environment may require longer periods of attention to one task, with little supervision from others. Future studies might explore the contribution of attentional skills to task performance by including neuropsychological performance data in the analysis.

There was also no correlation between employment status and self-perceptions of communication difficulty, as measured by the LaTrobe Communication Questionnaire. This is inconsistent with the findings of Struchen and Rosas [15], however the difference may simply reflect differences in the sample sizes of the two studies. An alternative explanation lies in the time post-injury of the two samples. Participants in Struchen and Rosas' study were at least 1 year post-injury. In contrast, the participants in the present study were under 1 year post-injury. It is possible that the responses of people with TBI on the LCQ become more accurate over time as awareness of deficits increases. An alternative form of the LCQ, which is completed by a close other, may be more strongly correlated with employment outcome.

The findings of this study also provided some information about the structure of the FAVRES assessment. The high correlations (>0.90) between the FAVRES Accuracy and Rationale scores suggest that both scores measure a single construct. Furthermore, the high correlations between Tasks 2, 3 and 4 on the FAVRES suggests that sufficient information about cognitive communication skills may be obtained using only one of these tasks. The usefulness of Tasks 2, 3 and 4 as individual assessment tools is further supported by the strong correlations between individual task scores and later employment status. However, performance on Task 1 was not strongly correlated with scores on the other tasks or with employment status, which was a similar finding to Isaki and Turkstra's [11] study. The normative data for the FAVRES

suggest that Task 1 is the easiest of the four tasks, as people without a brain injury generally completed it the fastest out of the four tasks. Tasks that require longer periods of sustained attention seem to provide more useful clinical information.

Implications for research and practice

This pilot study suggests that complex communication skills are related to a successful return-to-work for people who have had a severe TBI. This finding adds to the body of research into predictors of return-to-work outcome and provides a starting point for studies with larger sample sizes. The FAVRES may meet the need for an assessment for evaluating the high-level communication deficits that can affect return-to-work [6].

Other research directions could include follow-up interviews with people who returned to work successfully and those that did not to determine the communication barriers that made return-to-work difficult. Repeat assessment with the FAVRES and the LCQ at that time would also provide valuable insight into the rate of individual improvement in communication difficulties, which may be a factor in determining the speed of return-to-work. Further research is needed to investigate the effectiveness of cognitive-communication interventions at facilitating return-to-work [17], as only a case study [18] and descriptive information [19] have been published to date.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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