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The Contribution of Neurocognition to 18-Month Employment Outcomes in First-Episode Psychosis

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Abstract

Aims: To examine whether baseline neurocognition predicts vocational outcomes over 18 months in patients with first-episode psychosis enrolled in a randomised controlled trial of Individual Placement and Support or treatment as usual.

Methods: 134 first-episode psychosis participants completed an extensive neurocognitive battery. Principal axis factor analysis using PROMAX rotation was used to determine the underlying structure of the battery. Setwise (hierarchical) multiple linear and logistic regressions were used to examine predictors of: (a) total hours employed over 18 months and; (b) employment status respectively. Neurocognition factors were entered in the models after accounting for age, gender, premorbid IQ, negative symptoms, treatment group allocation and employment status at baseline.

Results: Five neurocognitive factors were extracted: (i) Processing Speed; (ii) Verbal Learning and Memory ; (iii) Knowledge and Reasoning; (iv) Attention and Working Memory; and (v) Visual Organisation and Memory. Employment status over 18 months was not significantly predicted by any of the predictors in the final model. Total hours employed over 18 months was significantly predicted by gender (p = .027), negative symptoms (p = .032) and verbal learning and memory (p = .040). Every step of the regression model was a significant predictor of total hours worked overall (Final model: p = .013).

Conclusion: Verbal learning and memory, negative symptoms and gender were implicated in duration of employment in first-episode psychosis. The other neurocognitive domains did not significantly contribute to the prediction of vocational outcomes over 18 months. Interventions targeting verbal memory may improve vocational outcomes in early psychosis.

Key Words: Early Psychosis, Employment Duration, Long-Term Outcomes, Neurocognition, Vocational Outcomes

1. Introduction

Adolescence is a critical developmental life stage and the onset of first-episode psychosis (FEP) significantly impairs daily functioning in areas such as independent living, relationships and particularly, vocational success (Cotton et al., 2017; Rinaldi et al., 2010; Tandberg et al., 2011). One central feature of FEP is neurocognitive impairment that is present before and during the onset of psychosis (Bora & Murray, 2014). Moderate to severe impairments (indicated by medium to large effect sizes) have been reported across neurocognitive domains such as working memory, processing speed, verbal learning and memory and executive functioning (Mesholam-Gately, Giuliano, Goff, Faraone, & Seidman, 2009; Schaefer, Giangrande, Weinberger, & Dickinson, 2013).

Rates of employment for individuals with FEP are low relative to healthy peers, with close to half of those seen at mental health services already unemployed (Neil et al., 2014; Rinaldi et al., 2010). While supported employment programs like Individual Placement and Support (IPS; Bond, Drake, & Luciano, 2015) can moderately increase employment rates in the FEP population (Bond, Drake, & Luciano, 2015; Charzynska, Kucharska, & Mortimer, 2015), there is still a need to identify factors that may limit vocational recovery.

Higher performance on measures of neurocognitive domains such as visual organisation and memory, processing speed and attention and working memory in individuals with FEP or schizophrenia has been associated with better vocational outcomes in follow-up studies ranging from 6 months to 3 years (Allott, Liu, Proffitt, & Killackey, 2011; Allott et al., 2013; Chang et al., 2014; Nuechterlein et al., 2011; Tandberg et al., 2011).

The aim of the current study is to extend the 6-month follow-up findings of Allott et al. (2013) by investigating the contribution of neurocognition at baseline to employment outcomes in FEP over 18 months. It was hypothesised that baseline neurocognitive performance will be positively associated with the number of hours employed and employment status over 18 months.

2. Methods

2.1. Setting and study design

This study involved secondary analysis of data from a randomised controlled trial allocating young people with FEP to treatment as usual (TAU), or TAU plus IPS (full details provided in Killackey et al., 2013). Participants resided in North-West metropolitan Melbourne, Australia, and attended the Early Psychosis Prevention and Intervention Centre (EPPIC) at a public mental health service, Orygen Youth Health (OYH). IPS aims to aid individuals in finding and maintain employment by following eight core principles. These eight core principles place a focus on integrating the individual with a mental illness into a competitive employment environment of the individual's preference, while ensuring that the vocational intervention provided is integrated with a mental health treatment plan. In a pilot study, Killackey et al. (2008) demonstrated the potential for vocational recovery programs like IPS to facilitate an improvement in employment obtainment and retention for youth with FEP when combined with TAU. A larger study was conducted following the pilot study (Killackey et al., 2013). The original dataset from Killackey et al. (2013) was suitable for secondary analysis as it included a wide range of baseline, 6-, 12- and 18-month employment data. Ethics approval was granted from Melbourne Health Human Research and Ethics Committee and written informed consent was obtained from all participants.

2.2. Participants

Inclusion criteria for the RCT included meeting the criteria for a psychotic disorder as per the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision [DSM-IV-TR] (American Psychiatric Association,, 2000; APA); a minimum of six months remaining as an EPPIC client; and expressed interest in gaining employment or education or improving their current employment or educational status. Exclusion criteria included intellectual disability, florid psychosis or insufficient English.

One hundred and seventy-one participants were approached to participate in the RCT; 23 declined and 2 were too unwell to consent and 146 participants were randomised. In this study, 12 of the 146 participants in the RCT were excluded due to having a history of acquired brain injury (n = 8), epilepsy (n = 3) or other neurological impairments (n = 1), leaving 134 cases for analysis. These participants were included in the factor analysis detailed below. A reduced subsample (n = 91) of the participants was used for the logistic regression due to a lack of sufficient data necessary for the outcome variable of interest concerning employment status.

2.3. Measures

2.3.1. Vocational outcomes

There were two outcome variables of interest: (1) employment status; and (2) total hours worked over 18 months. A binary categorical variable representing the employment status over 18 months consisted of the following two categories (see Cotton et al., 2017): (1) "stable good/increased employment" (either working at baseline and 18 months, or unemployed at baseline but employed at 18 months); or (2) "stable poor/decreased employment" (either unemployed at baseline and 18 months or employed at baseline but unemployed at 18 months). A continuous variable representing total hours worked over 18 months was also calculated, which was the cumulative total of hours worked in each of the 6-month time points.

2.3.2 Neurocognition

A neurocognitive battery examining those neurocognitive domains commonly impaired in FEP populations (Mesholam-Gately et al., 2009) was administered at baseline (see Allott et al., 2013). The Wide Range Achievement Test Word Reading subtest (4th edition [WRAT-4]; Wilkinson & Robertson, 2006) was used to estimate premorbid IQ. The Wechsler Adult Intelligence Scale – Third Edition (WAIS-III; The Psychological Corporation, 1997) subtests administered were Letter-Number Sequencing, Digit Span, Similarities, Picture Completion and Information. The Trail Making Test A and B (TMT; Reitan, 1955), Rey Auditory Verbal Learning Test (RAVLT; Schmidt, 1996), Rey-Osterrieth Complex Figure Test (RCFT; Osterrieth, 1944; Rey, 1941), Animal Fluency and Controlled Oral Word Association test (COWAT, Strauss et al., 2006) and Symbol Digit Modalities Test (SDMT; Smith, 1982) completed the battery.

2.3.3 Negative Symptoms

The Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1983) was used for the assessment of negative symptoms to determine the clinical characteristics of the sample. Negative symptoms were examined due to the known association with vocational functioning (Tsang, Leung, Chung, Bell, & Cheung, 2010).

2.4 Statistical analysis

Data were screened for normality, and univariate and multivariate outliers using guidelines specified by Tabachnick & Fidell (2013). Anomalies and violations are reported where appropriate. Principal axis factor analysis (PAF) was used to determine the structure of the neurocognitive battery. The PAF included the following neuropsychological assessment scores as used in Allott et al. (2013): scaled scores of Similarities, Letter-Number Sequencing, Information, Digit Span and raw scores of RCFT copy, delayed recall and organisation, the total scores of RAVLT Trials A1 to A5 ("RAVLT Total") and the delayed recall score trial A7 from the RAVLT, TMT A and B, and the SDMT. The Picture Completion, COWAT total and animal fluency tests were removed from the PAF to maintain consistency with the PAF performed in Allott et al., (2013). However, for the purposes of this study, the total score of RAVLT Trials A1 to A5 ("RAVLT Total") were chosen instead of trial A5 alone as it better captures verbal learning over time. For the PAF, extraction of factors was guided by examining Scree Plots and PROMAX rotation technique was used. Composite scores were derived for each factor based on a regression method (M = 0, SD = 1; Tabachnick & Fidell, 2013).

Logistic regression was used to predict employment status and multiple linear regression was used to predict employment duration over 18 months. A setwise (hierarchical) approach was used for model building for both regression analyses as it could account for the influence of potential covariates (Tabachnick & Fidell, 2013). Five sets of variables were added in each regression: (1) age and gender (Lewandowski et al, 2011); (2) premorbid IQ (Fitzgerald et al., 2004); (3) negative symptoms at baseline as measured by the SANS (Tsang, Leung, Chung, Bell, & Cheung, 2010) (4) baseline employment status and treatment group (Allott et al., 2013); and (5) baseline neurocognitive performance scores from the domains identified in the PAF. Statistical analysis was conducted using IBM® SPSS® Statistics Version 22.0.0.

3. Results

3.1. Sample characteristics

3.1.1. Demographics

Table 1 shows the baseline demographics of the 134 participants. The sample is typical of Australian FEP samples, in that it included predominately males in the early twenties who had never been married, were unemployed and had a relatively low level of educational attainment (Allott et al., 2013).

3.1.2. Group differences

Table 2 presents the demographic and employment differences between those participants who had sufficient data to be classified under the binary categorical variable of employment status from baseline to 18 months. Findings demonstrate that completers had significantly higher mean scores on the WRAT-4 reading subtest, $t(132) = -2.73$, $p = .009$.

3.2 Factor analysis

Data screening indicated that normality deviations were minor and no transformations were conducted (Tabachnick & Fidell, 2013; Zanelli, et al., 2010). A few variables at baseline had univariate outliers, based on those standardised cases that had z-scores in excess of ± 3.29 (Tabachnick & Fidell, 2013). It was endeavoured to keep outliers in the analyses to represent the neurocognitive variability present in individuals with FEP; therefore, these data were not transformed (Zanelli, et al., 2010). There was no evidence of multicollinearity (Tabachnick & Fidell, 2013). Factorability of the correlation matrix of the neurocognitive battery was assured as the Kaiser Meyer Olkin (KMO) measure value was 0.80. Bartlett s test was significant, $\chi^2(66) = 768.73$, $p < .001$ and all values on the diagonal of the anti-image correlation matrix exceed 0.5 indicating factorability of the correlation matrix. Five factors were extracted based on Scree Plot examination and were identified as: (i) Processing Speed; (ii) Verbal Learning and Memory ; (iii) Knowledge and Reasoning; (iv) Attention and Working Memory; and (v) Visual Organisation and Memory. These five factors accounted for 39.62%, 8.55%, 6.50%, 5.85% and 4.32% of the variance, respectively (total variance = 64.84%). Factor loadings, communalities (h^2), and percentages of variance are detailed in Table 3. The five factor scores were used in the proceeding regression models.

3.3 Vocational status and duration over 18 months

Only 17.9% of participants (n = 24) held employment at baseline, whereas 26.1% (n = 35) held employment at 18 months (n = 91). Employment was highest at the 6-month interval (n = 117) at 32.8% (n = 44). The average total hours worked over each 6-month period ranged from 251.29 (*SD* = 345.79) at 6 months to 202.89 (SD = 345.11) at 12 months. An average of 226.02 hours (*SD* = 318.62) of employment occurred from 12 to 18 months. Over the entire 18-month period, an average of 520.17 (*SD* = 667.42) hours were worked. From the 91 participants who had sufficient data to be allocated an employment classification over 18 months, 61.5% (n = 56) were in the "Stable Poor/Decreased" vocational category whereas 38.5% (n = 35) were in the "Stable Good/Increased" category. An McNemar's Exact Test revealed there was a significant improvement in the proportion of participants who transitioned from having no employment to having gained employment at 18 months (n = 25), compared to the proportion of participants who had employment at baseline and then lost that employment at 18 months (n = 9), n = 91, p = .009.

3.4 Prediction of employment status over 18 months

Table 4 presents the results of the logistic regression used to determine the neurocognitive predictors of employment status over 18 months. In step 1, gender and age failed to significantly predict employment status over 18 months, χ^2 (2, n = 91) = 0.58, p = .748. In step 2, the addition of premorbid IQ failed to significantly predict employment status at 18 months, χ^2 (3, n = 91) = 0.69, p = .877 and in step 3, the model failed to significantly predict employment status over 18 months, χ^2 (4, *n* = 91) = 6.54, *p* = .162. However, SANS scores were a significant predictor of employment status over 18 months with an OR of 0.86 (*b* = -0.15, Wald χ^2 (1) = 5.26, 95% CI of OR = .76, .98, *p* = .022). This indicated that participants with higher negative symptoms at baseline were 14% more likely to have the "Stable Poor/Decreased" employment status over 18 months. The addition of employment status at baseline and treatment allocation in Step 4 failed to significantly predict employment status over 18 months, χ^2 (6, *n* = 91) = 7.40, *p* = .285; however, SANS scores remained a significant predictor of employment status over 18 months (OR of 0.87, *b* = -0.14, Wald χ^2 (1) = 4.11, 95% CI of OR = .77, 1, *p* = .043). The final model (Step 5) containing all predictors was not statistically significant, χ^2 (11, *n* = 91) = 11.59, *p* = .395. SANS scores were no longer statistically significant although the odds ratio improved (0.90). The model explained between 12.0% (Cox & Snell R^2) and 16.2% (Nagelkerke R^2) of the variance in employment status. The final model correctly classified 87.5% of Stable Poor/decreased cases, 48.6% of Stable Good/increased cases and the overall classification rate was 72.5%.

3.5 Prediction of total employment duration over 18 months

Table 5 presents the results of the multiple linear regression used to determine the neurocognitive predictors of total hours worked over 18 months. Both step 1 (R^{2}„ = 0.06, $F(2,131) = 3.82$, *p* = .024), and step 2 (R^{2}„ = 0.07, $F(3,130) = 3.23$, *p* = .025) explained a significant proportion of the variability in total hours worked. Age was a significant predictor of total hours worked in both step 1 (^{2} = -0.21. *p* = .019) and step 2 (^{2} = -.20, *p* = .023). In step 3, the addition of SANS scores to the model also explained a significant proportion of the variability in total hours worked (R^{2}„ = 0.12, $F(4,129) = 4.20$, *p* = .003). Age lost its significance in predicting total hours worked, however gender (^{2} = -0.19. *p* = .029) and SANS scores (^{2} = -

0.23. *p* = .011) were significant predictors of total hours worked over 18 months. The model remained a significant predictor of total hours worked over 18 months after the addition of employment status at baseline and treatment allocation in step 4 (R^{2}» = 0.13, *F*(6,127) = 3.02, *p* = .009). However, only SANS scores remained a significant unique predictor of total hours worked over 18 months (² = -0.24. *p* = .009). The addition of the neurocognitive measures in step 5 still explained a significant proportion of the variability in total hours worked over 18 months (R^{2}» = 0.17, *F*(11, 122) = 2.32, *p* = .013). Gender (² = -.20, *p* = .027), SANS scores (² = -.21, *p* = .032) and verbal learning and memory (² = .24, *p* = .040) scores in step 5 were all significantly unique predictors of total hours employed over the 18 months. Specifically, higher verbal learning and memory scores were associated with more hours worked. Additionally, being male and higher negative symptoms were associated with fewer hours worked.

4. Discussion

The aim of the current study was to extend the 6-month follow-up findings of Allott et al. (2013) and examine the contribution of baseline neurocognitive performance to 18 month vocational outcomes in FEP after controlling for premorbid and baseline factors. Our hypothesis that baseline neurocognitive performance would predict vocational outcomes over 18 months was partially supported. Verbal learning and memory was a significant predictor of total hours worked over 18 months, with higher verbal learning and memory predicting greater total hours worked. Additionally, higher negative symptoms were predictive of fewer total hours worked over 18 months. However, while negative symptoms were predictive of employment status over 18 months in the earlier steps of the model, they lost their predictive ability when neurocognition was added to the model. Finally, gender was also a significant predictor of total hours worked over 18 months in the final model, while age was only a significant predictor of total hours worked over 18 months in the first two steps of the model. These findings are discussed below.

The findings regarding verbal learning and memory as significantly predicting total hours worked over 18 months are not entirely consistent with previous studies using employment status as the dependent variable. Allott et al. (2013) did not report a significant relationship between verbal learning and memory and total hours worked in FEP participants over 6 months, whereas Nuechterlein et al. (2011) demonstrated that 52% of the variance in returning to employment over 9 months was attributed to working memory, verbal learning and memory, attention and processing speed. However, our findings differ in that verbal learning and memory predicted total hours worked rather than employment status like that of Nuechterlein et al. (2011). While these findings do suggest the importance of some neurocognitive domains in predicting employment outcomes in FEP, it is possible that employment type may demand different neurocognitive domains more strongly than others. It is possible that the occupations of this sample were more reliant on individuals with verbal learning and memory skills. However this is a purely speculative suggestion and would require further research to understand.

The findings suggest more severe negative symptoms were predictive of decreased total hours worked. This finding is in line with previous research demonstrating negative symptoms to be a consistent independent predictor of employment outcomes (Cotton et al., 2017; Tsang, Leung, Chung, Bell, & Cheung, 2010). Additionally, this finding strengthens the significance of verbal learning and memory acting as a predictor of total hours worked as it indicates that even after controlling for a relatively stable predictor of employment outcomes like negative symptoms, verbal learning and memory still predicted total hours worked. With regards to predicting employment status, was not a useful predictor when neurocognitive outcomes were added to the model. It is important to note, however, that the model only explained between 12-16% of the variance in employment status. This indicates there are other factors not considered in this study that are important for employment duration, including global symptom severity, substance use, social support or labour market factors. It is also possible that the binary classification of employment status was an insensitive measure of variability, contributed to by both stability and change factors in the predictive models used.

Gender was also a significant predictor of total hours worked over 18 months in the final model, which is consistent with previous findings (Allott et al., 2013; Cotton et al., 2009; Tsang, Leung, Chung, Bell, & Cheung, 2010) suggesting that males with FEP are more likely to experience poorer employment outcomes. However, age was only significant in the first two steps of the model and not the final model, which suggests that its relationship with vocational outcomes is not as strong when compared to other factors like neurocognition.

This study has some limitations. First, the variables used to represent employment status were unable to capture the complexity of employment status over 18 months. The employment status outcome measure did not represent employment status at each of the 6-month intervals. This meant that an individual who held employment at 6 and 12 months but not at baseline and 18 months was still considered to have had “stable poor” employment status. This also meant that those individuals with insufficient information to determine employment status had to be excluded from the analysis, reducing the predictive power of the model used. Second, the use of total hours over 18 months did not capture how those hours were distributed over 18 months. Third, the follow-up period was relatively short as for adolescents and young adults still undergoing significant brain and personal developments, 18 months may be a relatively short period of time to reach a stable level of functioning and to uncover robust associations with neurocognitive function (Allott et al., 2011).

Taken together, these findings suggest that those who are unemployed at first episode of psychosis and have neurocognitive impairments in verbal learning and memory are at risk of poor longer-term employment outcomes. If replicated, these findings suggest that early intervention in psychosis could seek to improve vocational outcomes by addressing specific neurocognitive limitations. Current intervention strategies like IPS could be used in conjunction with cognitive remediation or adaptation strategies (Allott, Killackey, Sun, Brewer, & Velligan, in press) to address impairment barriers to employment duration and may be an important area for future research.

Conflict of Interest

None.

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Appendix I

Table 1. Baseline characteristics of participants with first-episode psychosis

Variable	Statistic	Total (N = 134)
Demographics		
Gender (Male)	%(n)	67.2(90)
Age (in years)	M(SD)	20.8(2.4)
Never Married	%(n)	97.8(131)
Education		
Current Study Status		
Not studying	%(n)	80.6(108)
Studying	%(n)	19.4(26)
Highest school year completed		
Years 7-9	%(n)	22.4(30)
Year 10	%(n)	17.2(23)
Year 11	%(n)	17.9(24)
Year 12/ 13	%(n)	42.5(57)
Employment		
Not in paid work	%(n)	82.1(110)
Age at first job (in years)	M(SD)	15.7(2.1)
Months since last in paid work	M(SD)	4.1(3.46)
Looking for paid work (Yes)	%(n)	73.9(99)
Estimated premorbid IQ (WRAT-4)	M(SD)	92.2(13.57)

Note: WRAT-4 —Wide Range Achievement Test, Reading Subtest; M = mean; SD = standard deviation.

Appendix II

Table 2. Group differences between completers and non-completers of 18-month employment data

Variable	Statistic	18-Month Employment Data		Ç^2 or *t*	Test statistic (*df*)	*p*
		Completed (*n* = 91)	Did not complete (*n* = 43)			
Demographics						
Gender (Male)	%(*n*)	61.5(56)	79.1(34)	Ç^2	3.31(1)	.069[cc]
Age (in years)	*M*(*SD)*	20.14(2.5)	20.74(2.4)	*t*	1.35(132)	.179
Never Married	%(*n*)	97.8(89)	97.7(42)	Ç^2	.00(1)	.963
Education						
Current Study Status				Ç^2	.09(1)	.759
Not studying	%(*n*)	81.3(74)	79.1(34)			
Highest school year completed				Ç^2	3.02	.388
Years 7-9	%(*n*)	18.7(17)	30.2(13)			
Year 10	%(*n*)	19.8(18)	11.6(5)			
Year 11	%(*n*)	17.6(16)	18.6(8)			
Year 12/ 13	%(*n*)	44(40)	39.5(17)			
Employment						
Not in paid work	%(*n*)	79.1(72)	88.4(38)	Ç^2	1.7(1)	.192
Age at first job (in years)	*M*(*SD)*	15.72(.24)	15.81(2.02)	*t*	.22(122)	.824
Months since last in paid work	*M*(*SD)*	3.64(3.66)	4.76(3.03)	*t*	1.57(98)	.119
Looking for paid work (Yes)	%(*n*)	73.9(65)	82.9(34)	Ç^2	.83(1)	.362[cc]
Estimated premorbid IQ (WRAT-4)	*M*(*SD)*	94.36(13.22)	87.67(13.34)	*t*	-2.73(132)	.007

Note: Ç^2 = Chi-square test; t = t-test statistic; *M* = mean; *SD* = standard deviation; [cc] = Yates' Continuity for Correction; *df* = degrees of freedom; WRAT-4 —Wide Range Achievement Test, Reading Subtest

Appendix III

Table 3. Factor loadings, communalities (h^2) and percent of variance for principal axis factor analysis with PROMAX rotation for the neurocognitive variables

Item	F_1	F_2	F_3	F_4	F_5	h^2
TMT A (raw)	-.79					.52
SDMT (raw)	.79					.65
TMT B (raw)	-.58					.55
RAVLT Total (raw)		.98				.95
RAVLT A7 (raw)		.88				.83
Similarities (SS)			.94			.83
Information (SS)			.73			.64
Letter-Number Sequencing (SS)				.85		.86
Digit Span Total (SS)				.79		.64
RCFT Delay (raw)					.71	.65
RCFT Copy (raw)					.62	.46
RCFT Organisation					.51	.22
Percent of variance	39.62	8.55	6.50	5.85	4.32	

Note: SS = Scaled Score; SDMT = Symbol Digit Modalities Test; TMT = Trail Making Test; RCFT = Rey–Osterrieth Complex Figure Test; RAVLT = Rey Auditory Verbal Learning Test; F_1 processing speed; F_2 verbal learning and memory; F_3 knowledge and reasoning; F_4 attention and working memory; F_5 visual organisation and memory.

Appendix IV

Table 4. Results from final setwise logistic regression model examining predictors of employment status aover 18 months

Model	*b*	SE	Wald	*df*	*p*	CI	Odds Ratio
Step 1							
Gender	-0.20	.46	0.18	1	.669	.33, 2.03	0.82
Age	0.07	.09	0.52	1	.471	.89, 1.29	1.07
Step 2							
Gender	-0.20	.46	0.19	1	.664	.33, 2.02	0.81
Age	0.07	.09	0.52	1	.470	.89, 1.29	1.07
WRAT-4	0.01	.02	0.11	1	.745	.97, 1.04	1.01
Step 3							
Gender	-0.11	.48	0.05	1	.826	.35, 2.30	0.90
Age	0.11	.10	1.27	1	.259	.92, 1.36	1.12
WRAT-4	-0.00	.02	0.03	1	.870	.96, 1.03	0.99
SANS	-0.15	.07	5.25	1	.022*	.76, .98	0.86
Step 4							
Gender	-0.20	.51	0.16	1	.689	.30, 2.20	0.82
Age	0.12	.10	1.33	1	.249	.92, 1.36	1.12
WRAT-4	-0.00	.018	0.52	1	.820	.96, 1.03	0.99
SANS	-0.14	.07	4.11	1	.043*	.77, 1.00	0.87
Employment Status Baseline	-0.53	.57	0.87	1	.352	.19, 1.79	0.59
Treatment Allocation	-0.05	.48	0.01	1	.924	.37, 2.45	.96
Step 5							
Gender	-0.15	.55	0.07	1	.787	.30, 2.52	0.86
Age	0.09	.11	0.60	1	.439	.88, 1.34	1.09
WRAT-4	-0.01	.03	0.18	1	.673	.94, 1.04	0.99
SANS	-0.10	.07	2.04	1	.154	.78, 1.04	0.90
Employment Status Baseline	-0.33	.60	0.30	1	.583	.22, 2.32	0.72
Treatment Allocation	0.02	.51	0.00	1	.977	.37, 2.65	0.99
Processing Speed	-0.22	.41	0.29	1	.591	.37, 1.79	0.80
Verbal Learning and Memory	0.14	.41	0.13	1	.724	.52, 2.57	1.16
Knowledge and Reasoning	-0.20	.37	0.30	1	.583	.39, 1.69	0.82
Attention and Working Memory	0.24	.40	0.36	1	.549	.59, 2.73	1.27
Visual Organisation and Memory	0.64	.41	2.43	1	.119	.85, 4.29	1.91

Note: *b* = Unstandardized regression coefficient; CI = 95% Confidence intervals; SE = Standard error, *df* = degrees of freedom; * = $p < .05$; ** = $p < .01$; SANS = The Scale for Assessment of Negative Symptoms; WRAT-4 —Wide Range Achievement Test, Reading Subtest

Appendix V

Table 5. Results from the final setwise multiple regression model examining predictors of total hours worked over 18 months

Predictor	*b*	95% CI of *b* LL, UL	^{2}	*T*	*p*	Semi-Part	” R 2	Adjusted R^2	R^2 Change
Step 1							.06	.04	.06
Gender	-238.67	-483.50, 6.16	-0.17	-1.93	.056	-0.16			
Age	-57.58	-105.42, -9.73	-0.21	-2.38	.019*	-0.20			
Step 2							.07	.05	.01
Gender	-242.39	-486.38, 1.61	-0.17	-1.97	.052	-0.17			
Age	-55.65	-103.40, -7.90	-0.20	-2.31	.023*	-0.20			
WRAT-4	5.87	-2.38, 14.12	0.12	1.41	.162	0.12			
Step 3							.12	.09	.05
Gender	-267.82	-507.45, -28.19	-0.19	-2.21	.029*	-0.18			
Age	-45.19	-92.61, 2.22	-0.16	-1.89	.062	-0.16			
WRAT-4	3.52	-4.75, 11.79	0.07	0.84	.401	0.07			
SANS	-37.33	-65.87, -8.78	-0.23	-2.59	.011*	-0.21			
Step 4							.13	.08	.01
Gender	-228.81	-481.69, 24.07	-0.16	-1.79	.076	-0.15			
Age	-43.38	-91.02, 4.26	-0.16	-1.80	.074	-0.15			
WRAT-4	3.64	-4.76, 11.99	0.7	0.86	.391	0.07			
SANS	-39.95	-69.79, -10.09	-0.24	-2.65	.009**	-0.22			
Treatment Allocation	-137.62	-370.32, 95.07	0.01	0.06	.244	-0.10			
Employment Status Baseline	9.49	-295.55, 314.52	-0.10	-1.17	.951	0.01			
Step 5							.17	.10	.05
Gender	-288.16	-543.72, -32.61	-0.20	-2.23	.027*	-0.18			
Age	-33.31	-81.88, 15.27	-0.12	-1.36	.177	-0.11			
WRAT-4	7.53	-3.93, 18.99	0.15	1.30	.196	0.11			
SANS	-34.85	-66.66, -3.04	-0.21	-2.17	.032*	-0.18			
Treatment Allocation	-173.74	-409.81, 62.33	-0.13	-1.46	.148	-0.12			
Employment Status Baseline	-15.16	-323.64, 293.31	-0.01	-0.10	.923	-0.01			
Processing Speed	78.52	-109.84, 266.88	0.11	0.83	.411	0.07			
Verbal Learning and Memory	160.13	7.44, 312.83	0.24	2.08	.040*	0.17			
Knowledge and Reasoning	-9.30	-192.92, 174.32	-0.13	-0.10	.920	-0.01			

Attention and Working Memory	-161.15	-354.28, 31.97	-0.23	-1.65	.101	-0.14
Visual Organisation and Memory	-111.72	-281.78, 58.34	0.15	-1.30	.196	0.11

Note*:* *b* = Unstandardized regression coefficient; CI = 95% Confidence intervals; SE = Standard error; ² = Standardized regression coefficient; * = *p* < .05; ** = *p* <.01; ” R^2 = Proportion of variance explained; Semi-Part = Semi-Partial Correlation; SS = Scaled Score; SANS = The Scale for Assessment of Negative Symptoms; WRAT-4 —Wide Range Achievement Test, Reading Subtest.