

Building the bond: Predictors of the alliance in neurorehabilitation

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Abstract.

BACKGROUND: Neurorehabilitation services are often delivered through group psycho-education programmes. However, little is known about the therapeutic process at work during such sessions. The present study is the first to gain insight into the *therapeutic alliance*, during a seven-session group programme. In addition, cognitive, emotional, and demographic predictors of the alliance, and participants' feelings towards their group members, were investigated, together with predictors of patient engagement.

METHODS: Forty-five participants with an acquired brain injury completed a series of questionnaires, and neuropsychological assessment, following group psycho-education. The group facilitator completed a parallel therapeutic alliance questionnaire, and rated participants' engagement.

RESULTS: Results demonstrated that a strong alliance can be formed in seven group sessions. Notably, no demographic or cognitive factors appear to pose a barrier to developing a therapeutic alliance, nor to group attraction.

CONCLUSION: High levels of depression, however, may be a challenge, and clinicians may need to tailor their clinical skills to ensure a good therapeutic relationship with such patients. To promote engagement, clinicians may also need to provide additional support to patients with lower levels of education, working memory, and episodic memory impairment.

Keywords: Therapeutic alliance, working alliance, cognitive predictors, neurorehabilitation, group psycho-education, group interventions, acquired brain injury

1. Introduction

Acquired brain injury (ABI) is a leading cause of disability worldwide (WHO, 2000-2012), with survivors experiencing a range of complex cognitive and psycho-social changes that can last a lifetime (Draper, Ponsford & Schönberger, 2007; Ponsford, Draper, & Schönberger, 2008). Post-injury impairments often represent a dramatic change in functioning (Colantonio, Ratcliff, Chase, Kelsey,

et al., 2004; Ponsford et al., 2008), highlighting the importance of neurorehabilitation services in adjustment to the long-term consequences (Coetzer, 2008). Indeed, the chronic nature of impairment is acknowledged by the National Service for Long Term Conditions (Coetzer, Roberts, Turnbull, & Vaughan, 2018; Department of Health, 2005). Successful rehabilitation inevitably depends on the multi-disciplinary professionals within services, with whom survivors interact (Bright, Kayes, Worrall, & McPherson, 2015; Stagg, Douglas, & Iacono, 2019). The collaborative nature of the client-therapist relationship, more commonly described as the *therapeutic* or *working alliance*, appears to act as a vehicle to promote positive rehabilitation outcomes (Stagg et al., 2019). Within the literature on ABI, it is poorly

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understood how specific features of the population might pose unique challenges to developing a strong alliance (Stagg et al., 2019).

The therapeutic alliance (TA) is a term describing the *relational* processes which unfold during clinical interactions, and its roots are well-established in the psychotherapy literature (Horvath & Luborsky, 1993; Horvath & Symonds, 1991). Bordin (1979) provides the most influential theoretical framework to follow, consisting of three underlying dimensions, which are important for the TA. These are: 1) the client and therapist agreement on the *tasks* to be completed as part of therapy; 2) agreement on the *goals* and expected outcomes; and 3) the interpersonal and emotional *bond* between client and therapist (Bordin, 1979). Within psychotherapy, the TA has been shown to be a reliable and moderate predictor of outcome (Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000, for meta-analyses). However, the current literature in the field of *neurorhabilitation* provides only limited insight into this issue.

1.1. The therapeutic alliance in brain injury rehabilitation

More recently, the TA has been identified as having an enhancing effect on outcomes across *rehabilitation* and medical contexts (Hall, Ferreira, Maher, Latimer, & Ferreira, 2010, for a review): For example, improving symptoms in multiple sclerosis (Rosti-Otajärvi, Mäntynen, Koivisto, Huhtala, & Hämäläinen, 2014), a range of outcomes in the physical rehabilitation of cardiac and musculoskeletal conditions (Hall et al., 2010), and in the treatment of chronic pain (Ferreira, Ferreira, Maher, Refshauge, Latimer, & Adams, 2013). In stroke rehabilitation, some patients perceive the quality of the client-therapist partnership to be of primary importance, *above* that of the therapy's content or duration (Peris, Taylor, & Shields, 2012). Despite only limited research into the role of the TA in ABI rehabilitation, the emerging idea is that it shapes outcomes, and is influenced by several factors present in the rehabilitation environment (Stagg et al., 2019, for a review).

The majority of empirical investigations of the role of the TA in rehabilitation *outcomes* have focused on vocational issues (work, work prospects, school), and have demonstrated positive associations (Evans, Sherer, Nakase-Richardson, Mani, & Irby, 2008; Klonoff, Lamb, & Henderson, 2001; Lustig, Strauser, Weems, Donnell, & Smith, 2003;

Schönberger, Humle, Zeeman, & Teasdale, 2006a; Stagg et al., 2019, for a review). Important *clinical* outcomes include improved independence and social interactions, and reduced communication difficulties and somatic problems (on the European Brain Injury Questionnaire) (Schönberger, Humle, & Teasdale, 2006b).

Finally, it has been demonstrated that the TA promotes patient *compliance* with a holistic rehabilitation programme, through its impact on self-awareness (Schönberger, Humle, & Teasdale, 2006c). That is, the TA enhances patient awareness, and those who are aware of their difficulties comply and engage in rehabilitation (Schönberger et al., 2006c). Patient engagement with the rehabilitation process is thought to play an important role in its success and adherence (Bright, Kayes, Worrall, & McPherson, 2015, for a review; Lenze, Munin, Quear, Dew, et al., 2004). The patient-therapist relationship is a potential mechanism to *enhance* engagement, with the majority of evidence from qualitative accounts (Bishop, Kayes, & McPherson, 2019; Bright, Kayes, Cummins, Worrall, & McPherson, 2017; Lawton, Haddock, Conroy, & Sage, 2016). The *direct* role of the TA on engagement, however, remains unclear.

1.2. Predictors of the therapeutic alliance

If the TA is considered a crucial component of rehabilitation by patients and professionals (Lawton et al., 2016), careful attention needs to be paid to the factors which might impede (or facilitate) the development of this process. This is especially relevant in the context of ABI, where the nature of impairment may place unique demands on the TA. For example, a number of interesting interpersonal factors have been identified through qualitative work, including a genuine bond within the therapeutic rapport, and professional collaboration (Bishop, Kayes, & McPherson, 2019; Lawton et al., 2016). Additional insights from qualitative research identify a range of *cognitive* consequences as the most frequently reported challenges in developing an alliance, followed by *emotional* factors, and *behavioural* disinhibition (Judd & Wilson, 2005).

Quantitative research provides modest insight into the factors which promote positive perceptions of the TA, for both patients and professionals (Stagg et al., 2019). For example, studies have demonstrated that younger patient age (Schönberger et al., 2006c) and greater years in education (Sherer, Evans,

Leverenz, Stouter, Irby, et al., 2007) positively influenced the strength of the alliance. In terms of injury-specific factors, the influence of *cognitive* difficulties has been reported to be weak in nature, and differentially associated to therapist and client perceptions (Schönberger, Humle, & Teasdale, 2007). For instance, poor attentional impairment may influence the strength of the alliance *negatively*, whereas poorer performance on a memory task may have a *positive* influence, albeit *weakly* (Schönberger et al., 2007). The authors reported that, out of the several higher cognitive functions explored, *verbal fluency* and IQ (Information sub-test of the Wechsler Adult Intelligence Scale) was found to be positively related to aspects of the TA. It is noteworthy, however, that the findings of these correlational analyses were not subject to an alpha adjustment, and should be interpreted with caution.

Most of the work investigating the TA in neurorehabilitation has focused on holistic (and intense) programmes, and are correlational in nature (Stagg et al., 2019). However, in a recent study Zelencich and colleagues (2019) aimed to address these gaps by using regression analyses to explore the predictors of the TA in the context of cognitive behaviour therapy (CBT) for people with brain injury. In contrast to previous work (Schönberger et al., 2006c; Sherer, Evans, Leverenz, Stouter, et al., 2007) no demographic factors were found to have an influence, however greater *time* since injury was predictive of a stronger TA. Interestingly, no measure of memory or executive function was predictive of the strength of the therapeutic relationship (Zelencich, Kazantzis, Wong, McKenzie, et al., 2019). This robust empirical finding is suggestive that an ABI, and related cognitive impairment, does *not* necessarily pose a barrier to developing an effective TA, at least in the context of CBT.

1.3. Emotional predictors of the therapeutic alliance

One aspect of brain injury that may pose a barrier to the TA, but has not received much attention in the literature, are the emotional consequences. It is widely acknowledged that a brain injury often results in a range of emotional difficulties, most commonly depression and anxiety (Hiott & Labbate, 2002; Jorge, Robinson, Moser, Tateno, et al., 2004; Kreutzer, Seel, & Gourley, 2001). Such difficulties can impact upon many aspects of life (Ponsford et al., 2008), are a significant source of care-

giver burden (Ergh, Rapport, Coleman, & Hanks, 2002), and compromise socio-emotional functioning (Ownsworth & Fleming, 2005). It seems, therefore, possible that emotional factors may also play a role in rehabilitation engagement and the therapeutic *relationship*, especially given that the establishment of an emotional bond is a core component of the TA (Bordin, 1979). Additionally, emotional factors such as depression are known to effect motivation (Smith, 2013), which may in turn influence task and goal agreement (additional dimensions of the TA). Indeed, qualitative evidence points to the limiting effect of emotional consequences on developing a strong patient-therapist bond (Judd & Wilson, 2005). Only two studies have directly explored the influence of emotional distress (Evans et al., 2008; Sherer et al., 2007), with one demonstrating a significant association between higher alliance ratings and lower levels of depression (Evans et al., 2008). The other, however, found no significant role (Sherer et al., 2007). Both studies were limited, in that all measures were collected within the first two weeks of therapy, when sufficient time had not passed to develop the alliance (Schönberger et al., 2006c)

1.4. Therapeutic alliance across rehabilitation settings

Another issue which has not been previously investigated is how the TA, and factors affecting it, might play out in various rehabilitation settings. As previously mentioned, the existing studies have predominantly focused on holistic post-acute services, which are typically intense in nature (e.g. a number of sessions a week for several months). Intensive rehabilitation is not available for everyone, and service provision remains under-developed in many locations (Krug & Cieza, 2019). Many community services, therefore, seek out *cost-effective* theoretically driven models to rehabilitate their patients (Coetzer, et al., 2018). One such component of community services includes *group* psycho-education, to improve ABI consequences and understanding of injury (Backhaus, Ibarra, Klyce, Trexler, & Malec, 2010; Coetzer, 2008; Couchman, McMahon, Kelly, & Ponsford, 2014). Such programmes are common across services (Tyerman & Hucker, 2006), but to our knowledge there has been no previous investigation of the TA (and influencing factors) with the facilitators of group psycho-education programmes.

According to Bordin (1979) the TA is relevant across *all* settings which involve a process of change,

and that each new environment may bring to light factors which could shape its strength. Given the role of the alliance in rehabilitation outcomes (Stagg et al., 2019), and the benefit of group psycho-education programmes within services, it is important to develop an understanding of influencing factors within this context. Additionally, one of the biggest values of group programmes for patients is the quality of the group interaction, and the informal learning which stems from it (Anson & Ponsford, 2006; Lundqvist, Linnros, Orlenius, & Samuelsson, 2010). A member's feelings towards their group contributes to a number of important processes (Yalom & Rand, 1966), including outcome (Crowe & Grenyer, 2008; Marziali, Munroe-Blum, & McCleary, 1997). Factors affecting the strength of the *group* attitude may, therefore, be additional components worthy of investigation.

The present study, to our knowledge, is the first to investigate facilitator and patient perceptions of the strength of the alliance, from a short-term group psycho-education programme. Uniquely, it also aimed to investigate how *emotional* factors, as well as cognitive and demographic factors¹, might influence the formation of both the therapeutic relationship and the group attitude. Finally, the present study aimed to investigate whether the factors of TA, group attitude, and emotional, cognitive, and demographic variables (age and education) were predictive of patient engagement within the group programme. Such data would allow clinicians to identify which patients may be vulnerable to experiencing challenges in forming a strong TA or poor programme engagement, allowing them to tailor their clinical and interpersonal skills accordingly (Bishop et al., 2019).

2. Methods

2.1. Participants

Forty-five participants with an ABI were included in the present study. Each had successfully completed of a seven-week group psycho-education programme (The Brain Injury Solutions and Emotions Programme, BISEP) at a community outpatient rehabilitation unit, the North Wales Brain Injury Service, Betsi Cadwaladr University Health Board (NWBIS, BCUHB). The sample consisted of 11

women and 34 men, ranging from 26 to 86 years old ($M = 52$, $SD = 12$), with mixed pathology, reflective of the rehabilitation environment. It included 21 people who had suffered a cerebrovascular accident (CVA), 17 who had suffered a traumatic brain injury (TBI), four who had an ABI following encephalitis, one following hypoxia during cardiac arrest, one following tumour recession, and one from the effects of radiation therapy. Participants ranged from nine-months following injury to 32 years ($M = 5$ years, $SD = 8$ years, $MDN = 2$ years). Participants were referred to BISEP by a NWBIS clinician, and consisted of those with confirmed ABI (as per NWBIS criteria, Coetzer, Vaughan, Roberts, & Rafal, 2003), duration of at least nine months or greater since injury, and sufficient language ability to benefit from a language-based intervention. Exclusion criteria were inability to give informed consent, and the presence of a neurodegenerative condition (one participant excluded based on this criterion), learning disability, or psychiatric disorder in need of acute care.

2.2. Measures

2.2.1. Therapeutic alliance

The present study used the shortened version of the Working Alliance Inventory (WAI-S) (Tracey & Kokotovic, 1989), originally developed by Horvath and Greenberg (1989). This measure is based upon Bordin's pantheoretical model (1979) of TA and is widely used, including in studies on brain injury (Schönberger et al., 2006c). The measure includes parallel client and therapist versions, with reports of high reliability ($\alpha = 0.95$ for therapist ratings, $\alpha = 0.97$ for therapist ratings) (Tracey & Kokotovic, 1989). The WAI-S scale ranges from 12 (lowest alliance) to 84 (highest alliance), and includes 12 items which are responded to on a seven-point scale. Although this measure includes subscales capturing the three dimensions of the alliance, the aim of the present study was to investigate the *overall* alliance score (considered the most valid way to represent the measure, Tracey & Kokotovic, 1989). Patient and therapist versions were administered, to capture both perceptions. These were completed by all patients, and by the programme facilitator, immediately after the last session of BISEP, to allow sufficient time to develop the alliance over the seven session programme (Schönberger et al., 2006c). It was explained that participants and facilitator ratings would remain confidential, and data were anonymised by a research intern, prior to the analyses. If needed, participants

¹Time since injury was not considered due to the highly skewed and bimodal nature of this variable within the sample.

were assisted in completing the form by a member of the NWBIS clinical team. Participants especially benefitted for an awareness of the two items on the scale that were reverse-scored.

2.2.2. Group attraction

Within psychotherapy, aspects of the group dynamic (e.g. conflict and collaboration) have been shown to predict outcome within group programmes (Crowe & Grenyer, 2008). The present study, therefore aimed to capture members' perceptions and attraction towards their group, and investigate potential barriers. To do this, the Group Attitude Scale was used (Evans & Jarvis, 1986). The Group Attitude Scale is a 20 item measure, scored on a 9-point Likert scale, where higher scores indicate more positive attitude towards their group. It reports high validity and reliability ($\alpha = 0.90\text{--}0.97$), and is considered reliable within the present sample ($\alpha = 0.81$). This measure was chosen as it captures members' desire to identify with, and be accepted by, their group. This element, *relating* to other survivors, is perceived as an important component by brain injury groups (Couchman et al., 2014; Levack, Kayes, & Fady, 2010; Salas, Casassus, Rowlands, Pimm, & Flanagan, 2018).

2.2.3. Engagement

Patient engagement with the programme was defined as "deliberate effort and commitment" to partake in the goals and activities of the programme, demonstrated through active participation in the learning process, intervention activities, and group discussions (Lequerica & Kortte, 2010). Similar to Schönberger et al (2006a), engagement was rated by the BISEP facilitator on a five-point scale: 1) little or no activity, 2) activity when supported, 3) active without participation, 4) active and prepared, and 5) active, independent and spontaneous input.

2.2.4. Emotion symptomology

To measure anxiety and depression symptomology the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was used, which includes two sub-scales. The HADS and has been validated in people with ABI (Dawkins, Cloherty, Gracey, & Evans, 2006; Schönberger & Ponsford, 2010). Participants indicate, on a 4-point scale, agreement with statements such as "I still enjoy the things I used to enjoy".

2.2.5. Cognitive measures

Three tasks were chosen to measure *higher* cognitive functions. These include: 1) *Inhibition*, which

was measured with the Hayling sentence completion task from the Hayling and Brixton tests (Burgess & Shallice, 1997). This reports high sensitivity (Burgess & Shallice, 1997), and validity in a sample of brain-injured patients (Odhuba, van den Broek, & Johns, 2005). 2) *Working Memory* was assessed using the Digit Span sub-task from the Wechsler Adult Intelligence Scale (WAIS IV) (Wechsler, 2008), widely used in individuals with ABI (Millis, Rosenthal, Novack, Sherer, et al., 2001). 3) *Verbal Ability* was measured using the Letter Fluency sub-task from the Delis-Kaplan Executive Function system (D-KEFS) (Delis, Kaplan, & Kramer, 2001), which is thought to be one of the strongest predictors of cognitive control (Henry & Crawford, 2004). Finally, memory was assessed using the Logical Memory sub-tasks from the Wechsler Memory Scale (immediate and delayed recall) (WMS-IV, Wechsler, 2009). This is an "industry standard" test of memory widely used in clinical practice and research within the context of ABI.

2.3. Procedure

The study was granted ethical approval by the School of Psychology, Bangor University (2017-16048), and BCUHB (224613). Participants were referred to BISEP by their clinician, and attended the programme in addition to their usual care at the community outpatient service. Approximately two weeks before programme commencement, participants completed the HADS and neuropsychological assessment in random order, as part of a larger research project, and had the opportunity to ask questions about the BISEP. This was done by the first author (LR) at the NWBIS, Bangor University, or patients' homes. Group members had no *therapeutic* contact with the programme facilitator outside BISEP. The psycho-education and skills-based intervention forms a seven session programme, where members meet once a week for two hours. It is run by a main facilitator (the first author, LR) and a co-facilitator (an additional member of the clinical team, which was held constant as much as possible). BISEP topics include an introductory session, and sessions on anatomy and mechanisms of injury, emotional changes, emotion regulation, memory, problem solving, and fatigue. Patients receive handouts to provide structure, and each session involves a mixture of formal learning, compensatory strategies, skill building, and group discussions. The BISEP ends with a party and certificates, which the members help to organise.

Group members and the programme facilitator completed the TA questionnaires (WAI-S) following the last session, and the facilitator rated group members on their overall engagement. To encourage group members to answer honestly, they were informed that the facilitator would not see the data. A research intern anonymised data prior to analysis. Participants completed the Group Attitude Scale independently of their group members soon after (within two-weeks) programme completion.

2.4. Design and data analysis

This non-experimental correlational design study used a series of *robust* multiple linear regressions, given the assumption of residual normality was not met. This was done using ‘R’ software, with the additional packages ‘Robustbase’, ‘Complmrob’, and ‘Stats’. Robust regressions were performed with ‘MM’ method (Salibián-Barrera, Aelst, & Willems, 2008), and bootstrapped coefficients from 999 bootstrapped samples (as a form of model validation) (Babyak, 2004; Efron, 2003). A number of separate regression models were carried out, with 1) demographic predictor variables (age and education), with 2) cognitive predictors (logical memory immediate recall, delayed memory recall, working memory, verbal ability, and inhibition), and with 3) emotional predictors (anxiety and depression scores). These were entered into regression models for 1) patient TA ratings, 2) programme facilitator (therapist) alliance ratings, and 3) group attitude scores as separate outcome variables. Additionally, a number of regression analyses were carried out for the outcome variable of patient engagement, with demographic, cognitive, and emotional predictors (as above), and an additional regression for alliance as predictors (patient ratings, therapist ratings, and group attitude). Missing data for one participant on the Group Attitude Scale was omitted.

3. Results

The present study aimed to increase understanding of patient and facilitator perceptions of the strength of the alliance, in a short-term (seven week) psycho-education group programme, carried out at a community neurorehabilitation service (analysed under “*The therapeutic alliance for group psycho-education*”). A second aim was to investigate demographic, emotional, and cognitive predictors of

Table 1
Descriptive Statistics

Variable	M	SD	Mdn	Range
Age	52.34	11.98	54.00	26–86
Education	13.57	2.14	13.00	10–20
Anxiety (HADS)	11.20	3.46	11.00	4–18
Depression (HADS)	9.14	3.79	8.50	2–16
Inhibition (Hayling task)	4.70	1.83	5.00	1–8
Verbal fluency (D-KEFS)	6.82	3.62	6.00	1–19
Working memory (Digits WAIS)	7.18	2.62	7.50	3–13
Logical memory 1 (WMS)	6.18	2.81	5.00	1–11
Logical memory 2 (WMS)	5.68	2.84	6.00	1–11
Patient TA ratings	73.30	9.36	74.50	52–84
Therapist alliance ratings	67.45	7.63	69.00	46–82
Group attitude ratings	156.05	16.27	157.50	120–180
Engagement	3.41	1.25	4.00	1–5

the alliance and group attitude, as a way to identify potential barriers or facilitating factors (see “*Predictors of the therapeutic alliance and group attitude*”). A final aim was to explore potential predictors of patient engagement with the programme (demographic, emotional, cognitive, and alliance) (see “*Predictors of patient engagement*”). For descriptive statistics see Table 1.

3.1. The therapeutic alliance for group psycho-education

Patient and facilitator perceptions of the strength of the alliance was high overall, with a *median* rating of 74.50 for patients, and 69 for facilitators (from a maximum of 84). No rating was below 52 (patient ratings) and 46 (facilitator ratings). Importantly, 36% of the patients rated the alliance as 80 or above, with 16% of those as rating the alliance as the highest possible (84/84). The percentage of facilitator ratings above 80 was less high (9%). For patient ratings, over 50% of the sample reported their perceptions of the strength of the alliance to be over 74, and for the facilitator ratings over 50% were higher than 69. Patient ratings of the strength of the TA were significantly higher than facilitator ratings ($Z = -2.787, p = .005$). Importantly, patient and facilitator ratings were strongly correlated ($r = .71, p < .001$, see Fig. 1). The results indicate that a strong alliance can be achieved within the context of a short-term group rehabilitation programme.

3.2. Predictors of the therapeutic alliance and group attitude

3.2.1. Patient perceptions of the alliance

Three robust regression models were carried out (for demographic, cognitive, and emotional predic-

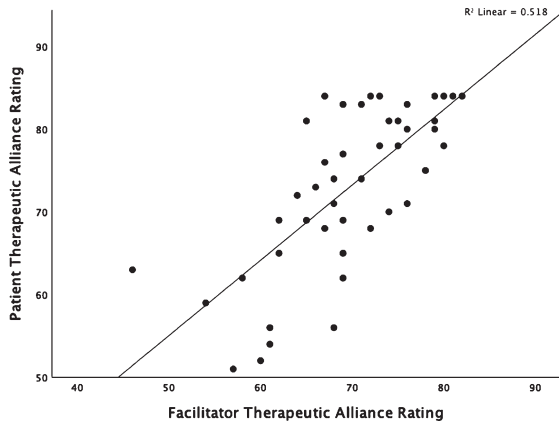


Fig. 1. Scatter plot demonstrating the correlation between patient and facilitator perceptions of the strength of the alliance.

tors), see Table 2 for details. According to these models, demographic variables (age and education), cognitive (inhibition, working memory, verbal fluency, memory 1 and 2), and emotional (anxiety and depression) predictor variables provide a very low explanation of variance of the patient TA ratings, and none significantly improve prediction.

3.2.2. Therapist perceptions of the alliance

For the facilitator's ratings, the model containing *emotional* predictor variables (anxiety and depression) explained 16% of the variance, and significantly improved prediction of the facilitator's perceptions of the strength of the TA ($R^2 = 0.16$, $F(2,44) = 17.11$, $p < .001$). Bootstrapped coefficients demonstrated that depression scores (HADS) were the only significant predictor within the model ($\beta = -0.83$, $p = .002$), and that a unit increase in depression scores would result in a 0.83 decrease in facilitator TA ratings.

The models with demographic, and cognitive, predictor variables did not significantly improve prediction of TA compared to using the mean alone. See Table 3 for further details. The results indicate that cognitive impairment is no barrier to developing a working alliance. This important issue is addressed in the Discussion.

3.2.3. Group attitude

The regression model which explained most variance was that containing the *emotional* predictor variables (anxiety and depression). This model explained 14% of the variance, and significantly improved prediction of group attraction, compared to using the mean alone ($R^2 = 0.14$, $F(2,44) = 9.48$,

$p = .008$). The results suggest that depression scores were the only significant predictor within the model ($\beta = -1.61$, $p = .006$), suggesting that a unit increase in depression scores would result in a 1.61 decrease in participants' 'attraction' to their group (group attitude scale).

No other regression model significantly improved prediction of participants' scores on the group attitude scale (demographic predictor model: $p = .249$; cognitive predictor model: $p = .340$). Verbal fluency was, however, a marginally significant predictor within the cognitive model ($\beta = -1.57$, $p = .049$), suggesting it may play a small role (See Table 4 for details). No demographic predictors and most cognitive factors did not predict group attitude; however, *depression* was a substantial contributor. Again, this issue is raised in the Discussion.

3.3. Predictors of patient engagement

Four robust regression models were carried out to investigate demographic, cognitive, emotional, and alliance predictors of patient engagement with the programme. The results demonstrated that the *demographic* predictor model (containing age and education) explained 14% of the variance (as rated by the facilitator), and significantly improved prediction of patient engagement ($R^2 = 0.14$, $F(2,44) = 7.84$, $p = .020$). Patients' years in education was the only significant predictor within the model ($\beta = 0.22$, $p = .005$), suggesting that a 1 year increase in education would result in a 0.22 increase in (the 5-point) engagement scores.

The regression model containing the cognitive predictors (inhibition, working memory, verbal fluency, immediate memory recall, and delayed memory recall) explained 19% of the variance, and significantly improved prediction of patient engagement ($R^2 = 0.19$, $F(5,44) = 13.49$, $p = .019$). Working memory was a significant predictor within the model ($\beta = 0.18$, $p = 0.018$), suggesting that a unit increase in working memory would again result in a substantial 0.18 increase in engagement. Interestingly, immediate memory recall was a significant *positive* predictor of engagement ($\beta = 0.29$, $p = .033$), whereas delayed recall was a significant *negative* predictor ($\beta = -0.26$, $p = .037$). This suggests that a unit increase in immediate memory recall would result in a 0.29 *increase* in engagement, but a unit increase in delayed memory recall would result in a 0.26 *decrease* in engagement.

Table 2
Robust Multiple Linear Regression results for the patient therapeutic alliance ratings (outcome variable)

Model	R ²	F	p (sig.)	β coefficients (bootstrapped)	p (sig.)	95% CIs
Demographic predictor variables	0.05	2.28	0.321			
Age				-0.01	0.475	-0.25 – 0.24
Education				1.07	0.083	-0.63 – 2.49
Cognitive predictor variables	0.14	5.96	0.310			
Inhibition				-0.83	0.174	-2.59 – 1.05
Working memory				-0.42	0.313	-1.82 – 1.17
Verbal fluency				-0.44	0.167	-1.38 – 0.56
Memory 1				-1.58	0.153	-3.91 – 1.55
Memory 2				1.77	0.144	-1.44 – 4.30
Emotional predictor variables	0.06	2.42	0.300			
Anxiety				-0.02	0.501	-1.01 – 1.04
Depression				-0.65	0.076	-1.63 – 0.23

Data is presented for three regression models containing 1) demographic predictor variables, 2) cognitive predictor variables, and 3) emotional predictor variables. * < .05 ** < .001.

Table 3
Robust Multiple Linear Regression results for the facilitator therapeutic alliance ratings (outcome variable)

Model	R ²	F	p (sig.)	β coefficients (bootstrapped)	p (sig.)	95% CIs
Demographic predictor variables	0.00	0.17	0.921			
Age				-0.02	0.413	-0.19 – 0.22
Education				0.24	0.381	-0.09 – 1.38
Cognitive predictor variables	0.11	4.16	0.526			
Inhibition				0.22	0.442	-1.18 – 1.47
Working memory				-0.76	0.074	-1.29 – 0.37
Verbal fluency				-0.27	0.261	-0.27 – 0.64
Memory 1				-0.53	0.285	-0.53 – 1.39
Memory 2				0.58	0.284	0.58 – 2.24
Emotional predictor variables	0.16	17.11	<.001**			
Anxiety				0.24	0.176	0.24 – 0.82
Depression				-0.83	0.002*	-0.83 – -0.33

Data is presented for three regression models containing 1) demographic predictor variables, 2) cognitive predictor variables, and 3) emotional predictor variables. * < .05 ** < .001.

Table 4
Robust Multiple Linear Regression results for patients' scores on the Group Attitude Scale (outcome variable)

Model	R ²	F	p (sig.)	β coefficients (bootstrapped)	p (sig.)	95% CIs
Demographic predictor variables	0.03	2.78	0.249			
Age				0.26	0.269	-0.50 – 0.26
Education				1.43	0.061	-0.65 – 3.21
Cognitive predictor variables	0.11	5.66	0.340			
Inhibition				-0.03	0.425	-4.40 – 3.57
Working memory				0.27	0.456	-2.79 – 4.30
Verbal fluency				-1.57	0.049*	-3.25 – 0.33
Memory 1				-0.44	0.428	-5.16 – 5.00
Memory 2				1.31	0.344	-5.34 – 6.93
Emotional predictor variables	0.14	9.48	0.008*			
Anxiety				-0.06	0.515	-1.14 – 1.31
Depression				-1.61	0.006*	-2.76 – -0.54

Data is presented for three regression models containing 1) demographic predictor variables, 2) cognitive predictor variables, and 3) emotional predictor variables. * < .05 ** < .001.

The model containing emotional and alliance predictors did not significantly improve prediction of engagement, and had low explanation of variance

(See Table 5). These results are clearly both clinically useful and complex, and are interpreted in the Discussion.

Table 5
Robust Multiple Linear Regression results for patient engagement (outcome variable)

Model	R ²	F	p (sig.)	β coefficients (bootstrapped)	p (sig.)	95% CIs
Demographic predictor variables	0.14	7.84	0.020*			
Age				-0.02	0.189	-0.05 – 0.02
Education				0.22	0.005*	0.06 – 0.39
Cognitive predictor variables	0.19	13.49	0.019*			
Inhibition				-0.11	0.127	1.42 – 4.36
Working memory				0.18	0.018*	0.02 – 0.33
Verbal fluency				-0.07	0.121	-0.20 – 0.05
Memory 1				0.29	0.033*	-0.01 – 0.49
Memory 2				-0.26	0.037*	-0.48 – 0.03
Emotional predictor variables	0.02	1.00	0.610			
Anxiety				0.04	0.302	-0.09 – 0.16
Depression				-0.04	0.196	-0.16 – 0.06
Alliance and group attitude predictor variables	0.21	5.90	0.116			
Patient alliance ratings				0.01	0.407	-0.07 – 0.08
Facilitator alliance ratings				0.05	0.108	-0.03 – 0.12
Group attitude scores				0.01	0.206	-0.02 – 0.04

Data is presented for four regression models containing 1) demographic predictor variables, 2) cognitive predictor variables, 3) emotional predictor variables, and 4) therapeutic alliance and group attitude predictor variables. * < .05 ** < .001.

4. Discussion

4.1. A strong alliance can be developed surprisingly quickly

Importantly, these findings suggest that a strong TA can be achieved in a short-term group psycho-education programme. This conclusion stems from the observation that 50% of alliance ratings were over 74 (patient ratings) and 69 (therapist ratings). As discussed above, previous work has focused mainly on intense holistic rehabilitation (Stagg et al., 2019, for a review). This finding, in a short-term group programme, is consistent with the idea that the alliance is relevant across settings involving a process of change (Bordin, 1979), especially for patient perceptions.

Previous work has suggested that the strength of alliance is dependent upon the quantity of therapeutic contact, and develops over time (Schönberger et al., 2006c). The present study's findings suggest that a strong TA can be developed over 7 short sessions. It may, therefore, be the *quality* of the therapeutic contact that is most important (Bishop et al., 2019; Lawton et al., 2016). In addition, an essential component of the therapeutic relationship is person-centredness (Bishop et al., 2019; Lawton et al., 2016), something which may have been considered difficult to achieve in a *group* setting. These findings suggest that this is *not* the case, and providing rehabilitation in a group setting is not necessarily a barrier to developing an alliance with the members. It has been suggested that this effect is due to a clinician's skill

in recognising variability among patients, and tailoring their approach accordingly (Bishop et al., 2019; McCormack, Karlsson, Dewing, & Lerdal, 2010). These results should be encouraging for all those who engage in short-term group rehabilitation programmes.

4.2. Cognitive and demographic variables are not predictors of alliance

Another important finding is that demographic and cognitive variables do *not* appear to influence the strength of the alliance (for facilitator or patient perceptions), or the patients' 'attraction' towards their group. Similar to previous studies, this finding suggests that *age* (Sherer et al., 2007) and *education* (Zelencich et al., 2019), do not pose a barrier to developing a strong therapeutic relationship with ABI survivors. This can only be seen as a positive for rehabilitation, because of the wide range of brain injury demography: young adults and the elderly, and all levels of education.

Surprisingly, no *cognitive* factors were identified as having an influence on patient or therapist perceptions of the TA, in contrast to *qualitative* accounts (Judd & Wilson, 2005). This particular finding contributes to an emerging picture in the quantitative literature, that cognitive impairments in the ABI population do *not* necessarily pose a challenge in developing a therapeutic relationship (Stagg et al., 2019; Zelencich et al., 2019). Of particular relevance for this idea is a

recent detailed description of the inter-personal psychotherapeutic process, which remains intact with a profoundly amnesic patient (Moore, Salas, Dockree, & Turnbull, 2017). The facilitator's skills in circumventing cognitive difficulties (Judd & Wilson, 2005; Schönberger et al., 2007), and specific elements of BISEP (e.g. handouts and prompts) (Judd & Wilson, 2005), may also play a part.

Additionally, no cognitive factor was found to play a role in participants' 'attraction' towards their group. It is important to note that this specific measure captures important elements of the group interaction, such as relating to the experiences of other group members, and a feeling of unity (Evans & Jarvis, 1986). One may have expected cognitive difficulties to negatively impact this group element, given their substantial role in social skills (Muscara, Catroppa, & Anderson, 2008; Salas, Casassus, Rowlands, Pimm, & Flanagan, 2018), and psycho-social outcomes (Draper, Ponsford, & Schönberger, 2007). However, given that cognitive impairment is often a feature of a brain injury, and an element which unites the group members, participants likely did not see this as a barrier (Salas et al., 2018). The high scores on this measure indicate that participants are not only able to relate to one another, but that they also *enjoyed* the group experience, regardless of age, education, and cognitive abilities.

It is noteworthy that a number of qualitative factors, not investigated in the present study, might play a part in the alliance (Lawton et al., 2016 for review), and group 'attraction'. For example, the fostering of a personal connection, humour, empathy (Bishop et al., 2019), trust, and being treated as an individual (Lawton et al., 2016 for review). Considered together, it is possible that a number of personal and professional characteristics, independent of injury-related factors, underlie these complex therapeutic processes. Again, these findings are encouraging for those who work with patients from a range of demographic backgrounds, with cognitive impairment.

4.3. *Depression is a significant predictor, but not in all cases*

A key finding is that depression scores negatively predicted firstly, the *facilitator* perceptions of the *alliance*, and may, therefore, be a *barrier* to developing a strong therapeutic relationship. This idea is consistent with previous findings (Evans et al., 2008), and qualitative evidence, which suggests that 'emotional difficulties' are often a challenge to devel-

oping an alliance (Judd & Wilson, 2005). It is widely acknowledged that emotional distress can impact on processes important in rehabilitation (Coetzer et al., 2018), such as motivation (Siegert & Taylor, 2004) and appraisals of impairment (Byrne, Coetzer, & Addy, 2017). The present study's findings extend this idea, by providing direct evidence that depression also negatively impacts the development of the TA.

What might explain this effect? Referring back to Bordin's pantheoretical framework (1979), it is possible that depression may have affected the dimensions of the TA differentially. For instance, depression may have influenced the more *active* components of the TA, such as agreement on tasks and goals. Notably, depression symptomology may decrease motivation and self-efficacy (Maddux & Meier, 1995; Smith, 2013), and in turn may make participants more passive in task agreement (Gibbon, 2004; Lawton et al., 2016 for a review; Rhode, Townley-O'Neill, Trendall, Worrall, & Cornwell, 2012). Interestingly, depression was not predictive of *patients'* perceptions of the alliance, possibly due to poor awareness (Prigatano, 2005), or general positive perceptions leading to high ratings within a *narrow* range.

A second finding on this topic is that depression also negatively predicted participants' 'attraction' towards their group. It has been long acknowledged that emotional distress can play a role in social functioning (Gainotti, 1993; Morton & Wehman, 1995; Weddel, Oddy, & Jenkins, 1980). Within the context of rehabilitation programmes, depression may impact upon the group dynamic in a number of ways. Firstly, high depression symptomology may lead to a negative bias (Peckham, McHugh, & Otto, 2010; Watkins, Vache, Verney, Muller, & Mathews, 1996), whereby participants' overall views of the group experience may be influenced by a preoccupation with instances of negative interactions. Secondly, as previously mentioned, depression may lead to poor motivation (Smith, 2013) to connect with the group. A final issue is how depression might compromise a person's sense of identity (Cruwys, Haslam, Dingle, Haslam, & Jetten, 2014). Due to a sense of threat to the self, a person might use maladaptive strategies, such as avoidance, as a way of coping (Riley, Brennan, & Powell, 2004). That is, they may stay on the outskirts of the group, and avoid becoming actively involved in relational elements that are important for developing a strong group bond (e.g. discussions, activities, sharing their own stories). This has important clinical implications as discussed below.

4.4. Education is the biggest predictor of engagement

Within neurorehabilitation, a person's level of *education* has been identified as a factor which positively influences outcome (Ponsford, Draper, & Schönberger 2008), including employment and fewer depressive symptoms (Whelan-Goodinson, Ponsford, Schönberger, & Johnston, 2010). It is, therefore, not surprising that the findings suggest that higher levels of education are also predictive of *engagement*, consistent with previous research in acute inpatient rehabilitation (Ramanathan-Elion, McWhorter, Wegener, & Bechtold, 2016).

The majority of studies of rehabilitation engagement have investigated the role of psychological variables, such as hope and denial (Ramanathan-Elion et al., 2016), but factors contributing to this process remain poorly understood. Lequerica and Kortte (2010) provide a useful model, whereby engagement is dependent upon interacting personal and environmental factors. The present study's findings suggest that the level of education may also play a part in the underlying factors, possibly through perceived self-efficacy (Lequerica & Kortte, 2010). It is, therefore, important for clinicians to actively promote engagement in group members with lower levels of education.

4.5. Some cognitive abilities are important for engagement

Another key finding is that aspects of *cognition* are important for engagement. Though this area of research is in its infancy, these findings are in line with previous research on *participation* in rehabilitation, a related and overlapping construct to engagement (Skidmore, Whyte, Holm, Becker, et al., 2010). This presumably relates to the idea that cognitive impairment presents a hindrance to engaging in every-day life, and in social adjustment (Salas et al., 2018).

Of the cognitive factors explored, the present study is the first to demonstrate that good *working memory* significantly predicted higher levels of engagement (c.f. Skidmore et al., 2010). One can see why intact levels of this limited-capacity ability would be beneficial within the context of a group psycho-education programme, where one must follow the content, listen to the group members' accounts, take part in programme activities, all the while keeping track of the overall narrative of each session (McAllister, Flash-

man, Sparling, & Saykin, 2004, for a review). When this system becomes overloaded, participants may well disengage from the sessions, as a way to avoid a catastrophic reaction (Goldstein, 1965; Salas, 2012). The findings suggest that those with marked working memory difficulties might need additional support to maintain engagement.

A peculiar finding is related to episodic memory (Logical Memory, WAIS). The present study suggests that poorer *immediate* memory recall is predictive of *lower* engagement, but poorer *delayed* memory recall is predictive of *higher* engagement. For the former, it is likely that those who cannot remember the content as it progresses during each session may disengage. A possible explanation for the latter is that patients who are aware of delayed memory impairment may engage more during future sessions in an attempt to compensate. Previous work by Schönberger et al (2007) found that poorer memory was associated with better patient perceptions of the alliance. It is possible that this too was due to increased engagement with the therapeutic process. It is not easy to interpret these complex findings, but encouraging patients to take notes, and providing information in 'bite sized' chunks, would be practical suggestions to promote engagement.

4.6. Therapeutic alliance may not predict engagement

The therapeutic *alliance* was not a predictor of engagement in the present study. However, this stands in sharp contrast to previous qualitative work, which have described the therapists as having a 'pivotal' role in encouraging patient engagement, and that the alliance might be a mechanism by which to promote participation (Bright et al., 2015; Lawton et al., 2016, for reviews). It is likely that, in a group setting, engagement is dependent on personal characteristics (e.g. education), psychological factors, and the programme itself, more so than the therapeutic relationship. Engagement is a complex phenomenon. To better understand the process it is important to use both quantitative and qualitative approaches from the same data set. This seems to be the most sensible way forwards, because at the moment these methods seem to be producing different results. In addition, future work may benefit from following more closely a model of therapeutic engagement (e.g. Lequerica & Kortte, 2010).

4.7. Future directions

A possible limitation of the present study is that the focus upon the *overall* alliance prevents more detailed analysis of the three underlying dimensions, especially as these develop over multiple time points. As regards cognitive skills, a variable which may be important to consider in future studies is sustained attention (Leclercq, Deloche, & Rousseaux, 2002). This impairment, commonly described as *distractibility*, might play a role in participants' engagement with rehabilitation programmes and with the therapeutic relationship (Schönberger et al., 2007). Finally, future work will benefit from investigating the importance of the alliance for the *outcomes* of group rehabilitation programmes.

4.8. Implications for neurorehabilitation

The present study has several implications for rehabilitation professionals, of which the most important may be that cognitive impairment following ABI does not pose a barrier to developing an alliance with their clients. The relevance of depression symptomology is also a clinically important finding, and suggests that rehabilitation professionals should identify those vulnerable to poorer alliance and group connection. Facilitators can then pay extra attention to participants with high levels of depression, and provide scaffolding and encouragement to help them with tasks and activities. Additionally, clinicians may need to actively help such patients to bond with the group, by drawing them into group discussions, and help them move past maladaptive ways of coping (e.g. avoidance, as discussed above) (Riley et al., 2004). Professionals may wish to tailor their approach according to known factors contributing to engagement, especially lower levels of education, poorer working memory skills, and poorer episodic memory.

4.9. Conclusion

The findings demonstrate that a good alliance can be achieved despite short duration, demographic variation, and cognitive impairment. Some barriers to the alliance, patient engagement, and group 'attraction' have, however, been identified. The present study provides direct evidence that *depression* negatively influences the strength of the alliance, and participants' 'attraction' towards their group. To promote engagement, clinicians may need to provide additional support to patients with lower levels of

education, working memory, and episodic memory impairment. We have suggested practical solutions which can address these challenges. Given the financial and workload advantages of short-term group interventions, these positive findings encourage the continued use of group programmes for neurorehabilitation services.

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Conflict of interest

The authors have no conflict of interest to disclose.

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