Aphasia and Stroke Therapeutic Alliance Measure (A-STAM): Development and preliminary psychometric evaluation

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Abstract

Purpose: The therapeutic alliance, also known as the therapeutic relationship, may influence treatment process and outcome in aphasia rehabilitation, however we currently lack a reliable tool to measure this relationship. This study aimed to develop a novel measure of the therapeutic alliance applicable to this population and provide preliminary evidence of the measure's psychometric properties.

Methods: Statements were generated from the: 1) therapeutic alliance literature, 2) qualitative interviews with stakeholders, and 3) Q methodological insights with people with aphasia (PWA) (n=455). A representative sample of statements was identified from the data set (n=57) and reviewed by expert panels (professionals and PWA), culminating in a 42-item clinician and patient version of the A-STAM. Reliability and validity of both the clinician and patient versions of A-STAM were investigated with 34 therapist-patient dyads engaging in therapy.

Result: Internal consistency and test-retest reliability were excellent for both clinician (α=92; ICC=0.93) and patient versions of A-STAM (α=0.92; ICC=0.97). In both versions, scores correlated highly with psychotherapeutic measures of therapeutic alliance, indicative of good construct validity (r_s=0.75; r_s=0.77).

Conclusions: The findings establish the preliminary reliability and validity of A-STAM and support further investigation into the measure's psychometric properties in larger samples.

Introduction

The quality of the therapeutic relationship, often referred to as the therapeutic alliance, has been found be a consistent and robust variable of treatment outcome in mental health interventions (Horvath, Del Re, Flückiger, & Symonds, 2011; Martin, Garske, & Davis, 2000). Therapeutic alliance describes the therapist-client interactional and relational processes at play during therapy delivery (Green, 2006). During the last four decades, Bordin's pan-theoretical model of the therapeutic alliance has largely dominated psychotherapeutic conceptualisations. Bordin's tripartite conceptualisation incorporates the: 1) mutual agreement pertaining to the *goals* of therapy; 2) collaborative engagement in the *tasks* required to meet those goals; and 3) development of an interpersonal *bond* (Bordin, 1979). In aphasia rehabilitation, therapeutic alliance development is characterised by a number of therapeutic processes including: instigating readiness, recognising personhood, sharing expectations, encouraging role ownership and therapeutic responsiveness (Lawton, Sage, Haddock, Conroy & Serrant, 2018[a]; Lawton, Haddock, Conroy, Serrant & Sage, 2018[b]). Emergent evidence suggests that the therapeutic alliance may also be a determinant of treatment adherence, patient engagement, satisfaction and treatment outcome in medicine and rehabilitation (Bright, Kayes, McPherson & Worrall, 2018; Ferreira et al., 2013; Schonberger, Humble, & Teasdale, 2006). Likewise, findings indicate that the construct of therapeutic alliance may be highly relevant to aphasia rehabilitation (Bright et al., 2018; Lawton et al., 2018[a]; Lawton et al., 2018[b]). Whilst effective alliances in aphasia rehabilitation have the potential to positively influence: motivation, engagement (Bright, Kayes, McPherson & Worrall, 2018), satisfaction (Tomkins, Siyambalapitiya & Worrall 2013), hope (Lawton et al., 2018[b]; Worrall, Davidson, Hersh, Ferguson, Howe & Sherratt, 2010) and

treatment outcomes (McLellan, McCann, Worrall & Harwood, 2014), negative therapeutic alliances can lead to feelings of hopelessness and disengagement (Lawton et al., 2018[b]). Furthermore, Fourie (2009) contends that it is only possible to effectively manage and navigate the existential consequences associated with the communication disability by developing a therapeutic relationship grounded in a warm and caring empathetic climate, enhanced by positive communication.

These qualitative studies provide valuable insights into the underlying processes and determinants of the therapeutic alliance in aphasia rehabilitation and suggest that we may be able to target future interventions at improving the therapeutic alliance (Crits-Christoph et al., 2006). However, further quantative inquiry is required to determine whether and to what extent the therapeutic alliance influences treatment process and outcome in aphasia rehabilitation. A reliable and theoretically robust measure of the therapeutic alliance is, therefore, required in order to conduct further quantative investigation. To the author's knowledge, no therapeutic alliance measures have been developed or tested with this population.

Measurement of the therapeutic alliance

There are a plethora of alliance measures, many of which have good psychometric properties, largely validated with mental health populations (Elvins & Green, 2008). The most commonly used measure is the Working Alliance Inventory (WAI, Horvath & Greenberg, 1989), which has good internal consistency and construct validity in counselling and psychotherapeutic populations (Elvins & Green, 2008; Horvath & Greenberg, 1989). The original version of the WAI is a 36-item questionnaire which includes items in each of the three domains identified within Bordin's (1979) pan-theoretical model: goals, tasks and

bonds. The WAI has been adapted for applications in physical therapy (Hall et al., 2012), though there were insufficient items to assess the alliance construct in this population and many items needed rewording or re-contextualising in the adapted version of the WAI; Working Alliance Theory of Change Inventory. The authors highlighted the need for future measures to be grounded in qualitative findings from the respective populations, to gain better understanding of what matters to stakeholders. Indeed, aspects of therapeutic alliance, relevant to both rehabilitation (Besley, Kayes, & McPherson, 2011) and aphasia rehabilitation (Lawton et al., 2018[a]; Lawton et al., 2018[b]), such as communication, have been absent from psychotherapeutic constructs and measures.

The current study, therefore, aimed to: 1) develop a theoretically robust measure of the therapeutic alliance applicable to aphasia rehabilitation (A-STAM), grounded in earlier qualitative findings (Lawton, Haddock, Conroy, & Sage, 2016; Lawton et al., 2018[a]; Lawton et al., 2018[b]; Lawton, Haddock, Conroy, Serrant & Sage, 2019); and, 2) provide preliminary evidence of its psychometric properties.

Preliminary psychometric evaluation included assessing the measure's: internal consistency; test-retest reliability; face validity; construct validity; criterion-related validity; and convergent validity. High internal consistency indicates that scale items are reliably measuring a common underlying construct, whereas test-retest reliability evidences the consistency of participant responses over time. Face validity shows that a test subjectively appears to measure what it purports to measure. Thus, the ASTAM's face validity would be supported if PWA perceive that the tool is a reliable measure of therapeutic alliance. Construct validity provides evidence that the measure does actually measure what it purports to and indexes the extent to which it correlates to measures with a similar

construct. Therefore, a moderate to strong association between scores on the measure and scores on a therapeutic alliance measure utilised in psychotherapy (Working Alliance Inventory (WAI)) supports the hypothesis that A-STAM is measuring a similar but not identical construct (Coaley, 2014). Convergent validity measures how closely the therapist and patient A-STAM scores align. Therapist and patient perspectives of therapeutic alliance are often misaligned (Bachelor, 2013; Ogrodniczuk, Piper, Joyce, & McCallum, 2000), one might therefore expect only a moderate correlation, indicating that the same construct is being measured from two different perspectives. Criterion-related validity shows evidence that the measure correlates to other related criteria or sources. Given that preliminary evidence indicates that the development of a positive therapeutic alliance is associated with adherence, reduced depressive symptoms and satisfaction in rehabilitation (Evans, Sherer, Nakase-Richardson, Mani, & Irby, 2008; Ferreira et al., 2013; Fuertes et al., 2007; Hall, Ferreira, Maher, Latimer, & Ferreira, 2010; Schonberger et al., 2006), one might expect a measure to show moderate negative correlations with measures of depression and moderate positive correlations with adherence and satisfaction ratings.

Method

Phase 1: Development of the A-STAM

Potential items for the A-STAM were extrapolated from: 1) therapeutic alliance literature relating to patient and professionals' experiences of therapeutic alliance development and maintenance in stroke rehabilitation (Lawton et al., 2016); 2) existing therapeutic alliance measures; 3) qualitative data derived from interviews with speech-language pathologists (n=22) and PWA (n=18) (Lawton et al., 2018[a]; Lawton et al., 2018[b]); and 4) data generated from a Q methodology study, exploring perceptions of the therapeutic alliance on the part

of PWA (Lawton et al., 2019). Q methodology involves rank ordering a set of statements (in this case viewpoints about the therapeutic alliance), placing statement cards hierarchically on a grid, shaped in a quasi-normal distribution (Stephenson, 1953). Essentially this forces participants to discriminate between priorities and informed which items to prioritise when developing the therapeutic alliance measure.

An exhaustive item-pool was identified (n=455) using the above methods, representing both patient and therapist viewpoints. Items were grouped into nine key categories: connection, responsiveness, expectations collaboration, congruence, readiness, family, sharing information, and therapeutic competence. Items were reviewed by the authors and overlapping or repetitive items were subsequently removed following discussion. Items were subsequently identified which were representative of the construct under investigation (therapeutic alliance in aphasia rehabilitation) by the research team, resulting in a 57 item-pool. Two versions of the measure were then created (clinician and patient), with 57 items in each version. Items in each version retained their meaning but were applicable to each participant (e.g. My therapist really listens to me, I really listen to my patient), thus each item was represented in both patient and clinician versions of the A-STAM. Modifications were made to items to reduce linguistic and syntactic complexity. Positive and negative items were sought, in order to minimise acquiescent behaviour and reduce the likelihood of agreement rather than disagreement (Barnette, 2000). However, where negative items increased linguistic complexity, alternative accessible items were selected. Key words were emboldened and font size was enlarged (14) to promote accessibility (Rose, Worrall, Hickson, & Hoffmann, 2011). Both clinician and patient versions

of the A-STAM used a 5-point Likert scale (ranging from 'never' to 'all the time'), allowing participants to respond flexibly along a ranked continuum (Coaley, 2010).

Review of items by professionals

Internationally recognised experts in the field of aphasiology, stroke rehabilitation and therapeutic alliance were identified (n=13) and invited to participate in reviewing A-STAM items online. Experts commented on the face validity and content of the measure. Eleven experts participated in scrutinising an initial draft of the A-STAM. Professionals ranked items on a 5-point Likert scale from 'very important' to 'not important'. Items rated as 'slightly/not important' to the construct of therapeutic alliance by ≥50% of experts were removed (n=2). Items identified as potentially redundant or repetitive (where there was no clear consensus among experts) were removed, only following discussion and agreement with the authors, resulting in the removal of a further 13 items.

Review of items by people with aphasia

15 PWA attending a communication support group in Northern England were invited to participate in evaluating the items of the A-STAM (patient version) in its early form. PWA commented on item accessibility and face validity of the scale. Undergraduate speech and language therapists supported PWA, on a 1:1 basis, to review each item, using supportive conversation techniques (Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001). Twelve items were identified by PWA as difficult to understand and were subsequently revised. This affected several of the more negative items (e.g. 'My therapist and I clash' was revised to 'We get on well'). Following PWAs' advice, prompts were added to items to facilitate

understanding. For example: My therapist is **interested in me** as a person (prompt: my therapist takes **time** to **get to know me** and **who I am**).

These reviews and subsequent discussions between authors, culminated in a 42-item version of the A-STAM clinician and patient version (Figure I). See supplementary data for full version of A-STAM (patient version).

Insert Figure I about here

PWA were also asked to comment on the accessibility of the response format. Alternative response formats were provided for PWA to review: 1) placing a cross on the line; 2) circling numbers; 3) ticking boxes; and, 4) using lexical or symbol supports. Although participants expressed a range of opinions, the authors combined several elements prioritised by the majority of participants to incorporate key words and symbols to maximise accessibility.

Phase 2: Psychometric evaluation

Participant sample

Participants were eligible for inclusion in the psychometric evaluation of the measure's reliability and validity (construct, convergent and criterion-related validity) if they met the following criteria: 1) had a diagnosis of aphasia caused by a stroke (as assessed on the Frenchay Aphasia Screening Test (FAST)(Enderby & Crow, 1996); 2) were currently receiving aphasia therapy (>2 treatment sessions); 3) spoke English as their main language; 4) had a receptive language score of ≥7 on the FAST to be able to self-report (Hilari & Byng, 2001), and; 5) were aged 18 and above. Patients were excluded who had an acute concurrent medical condition, history of a significant neurological deficit other than stroke, deficits in vision, cognition or hearing impacting their ability to self-report and access the measure.

Speech and language therapists (SLT) were eligible for inclusion if they were UK Health and Care Professions Council registered and working in the National Health Service with individuals with aphasia post-stroke. The study was approved for conduct by the Health Research Authority, Research Ethics Committee in the UK, reference , in addition to permissions from research and governance departments at individual clinical sites, prior to the commencement of the study.

Participant recruitment

Participants with aphasia were recruited from seven NHS trusts in Northern England. Sites were diverse, offering acute, community and early supported discharge services in inner city and semi-rural settings. SLTs working in aphasia rehabilitation at each site were given detailed written and verbal information about the study's objectives and provided written informed consent. At identified sites, either SLTs (not involved as participants) or research practitioners screened potential participants for eligibility, using the FAST. Those who met the inclusion criteria were given written and verbal information about the study, which had been adapted pictorially and linguistically (Kagan & Kimelman, 1995). All participants provided written informed consent prior to participating in the study. Only those dyads where both the PWA and SLT had provided consent were eligible for inclusion. Those PWA who scored below 7 on the FAST (and had consented to be contacted) were reassessed by their respective SLT 6-8 weeks later to determine whether there had been any improvement in their aphasia such that they might be able to join the study.

Measures

Measures in Table I were administered to PWA.

Insert Table I about here

Measures in Table II were administered to speech-language pathologists.

Insert Table II about here

Procedure

Data were collected at two distinct time points from participating dyads. At the first time point, patient participants completed the: A-STAM (patient version); modified WAI-SR (client version), VASES; and, satisfaction rating. Measures were administered at any time point during therapy, from session 3 until the final therapy session, depending on when participants were recruited to the study. These measures were completed on a face-to-face basis in the participant's home or inpatient setting, with the support of a field researcher (an experienced SLT), who used supportive communication techniques to facilitate understanding where indicated (Kagan et al., 2001). Any comments relevant to the items were recorded as field notes. Patient participants completed their measures entirely separately and independently from their treating SLT. At the same time point, treating SLTs completed: the A-STAM (clinician's version); WAI-SRT; ADRS; and, engagement and adherence rating electronically with reference to the person with aphasia they were working with. Treating therapists also provided demographical details about the PWA (age, gender, ethnic origin, time post onset, frequency of contact, setting) and diagnostic information about the person they were working with. In addition, they supplied demographical information about themselves (age, gender, ethnic origin, experience). At the second time point, 2 to 4 weeks later, participants, who had completed the above

measures were invited to complete the A-STAM a second time, to investigate the measure's test-retest reliability, to determine how consistent participant's responses were over time.

Statistical analysis

Likert scale responses were inverted for analysis for those items phrased negatively. Prior to investigating the A-STAM's reliability and validity, items from the initial pool (n=42) were further scrutinised:

- with low endorsements (<10% of the sample)
- with low item-total correlations (<0.300) (Field, 2013; Nunnally & Bernstein, 1994)
- with high or low inter-item correlations (>0.900, <0.100)
- with low test-retest scores (<.300)
- which contributed to low internal consistency
- which were identified as problematic by ≥50% of responding participants (PWA)

Items meeting one or more of the above criteria were analysed further by the research team and were only omitted via consensus.

To investigate the reliability of the A-STAM, internal consistency was calculated with Cronbach's alpha for the patient and therapist A-STAM ratings separately (Cronbach, 1951). Test-retest reliability was investigated by calculating the Intra-class correlation coefficients (ICCs) to determine the degree of correlation and agreement between the first and second administration of the A-STAM for each group. ICCs were calculated using a two-way mixed effects model and absolute agreement (Koo & Li, 2016). Spearman's correlation analyses were computed to determine the construct, criterion-related and convergent validity of the A-STAM using SPSS statistics 23. The small sample size and the ordinal level of measurement

indicated using a non-parametric test of correlation, Spearman's rho. Convergent validity was examined by exploring the correlations between patient and clinician A-STAM ratings. PWA's summed scores were multiplied by a factor of 1.105 to align their scores with SLT A-STAM scores for comparisons.

Results

Recruitment yielded 35 participant-dyads. Each dyad consisted of one adult with aphasia attending speech and language therapy (n=34) and their treating speech and language therapist (n=20). Some SLTs saw more than one participating patient and one patient participated in the study twice because he saw two different therapists. Demographical details of the participants are displayed in Table III and IV. The mean, standard deviation and range of scores from all measures are displayed in Table V. There were no missing data for either versions of the A-STAM. However, 34 dyads only completed the additional measures required for investigating the measure's validity. Clinicians' A-STAM scores were more narrowly distributed across the scale in comparison to patient A-STAM scores.

Initial data scrutiny

Insert Table VI about here

Items identified as problematic (either ambiguous or irrelevant) by 50% of the responding participants completing the patient version of the A-STAM were omitted (n=4). No further items were omitted from either versions of the A-STAM since excluding additional items would only have contributed to minimal increases in internal consistency (0.01) and test-retest scores were based on small sample sizes (n=29) (Table VI). Subsequent analyses were

carried out on the remaining 38-item A-STAM measure (patient version) and 42-item A-STAM (clinician's version).

Reliability

Cronbach's alpha values were 0.92 for the patient version of the A-STAM and 0.92 for the clinician version. This suggested the internal consistency of both the patient and therapist A-STAM was very good (Bland & Altman, 1997; Nunnally & Bernstein, 1994). Intra-class coefficients (ICCs) were 0.97, 95% CI [0.90, 0.99] for the patient A-STAM (n=15) and 0.93, 95% CI [0.79, 0.98] for the clinician A-STAM (n=14), indicative of good test-retest reliability (Streiner, Norman, & Cairney, 2015).

Validity of the A-STAM (patient version)

There were significant correlations between the patient A-STAM and WAI (client version) (r_s= 0.67, p<0.01) and the patient A-STAM and CARE (r_s=0.75, p<0.01), indicative of very good to excellent construct validity of the patient version of the A-STAM (Coaley, 2014). Table VII shows the criterion-related validity of the A-STAM with: VASES, ADRS, FAST, satisfaction, engagement and adherence ratings. As expected, the patient A-STAM was moderately correlated with patient-rated satisfaction and showed small positive correlations with ratings of engagement and adherence (r_s=0.24; r_s=0.25 respectively). Although these correlations were not large, they were deemed adequate (Coaley, 2014). As hypothesised, the patient version scores showed small negative correlations to ADRS ratings (r_s=-0.22), suggesting that a reduction in depressive symptoms was associated with higher A-STAM ratings. There were no observed associations between self-reported ratings of self-esteem (VASES) and A-STAM (patient) ratings (r_s=0.13).

Validity of the A-STAM (clinician version)

Construct validity was very good, evidenced by strong associations between the clinician A-STAM scores and WAI scores (clinician version) (r_s=0.77, p<0.01) (Coaley, 2014). Criterion-related validity was variable (Table VII). Whilst not hypothesised, the clinician A-STAM was not correlated with measures of patient self-esteem (r_s=0.06). Similarly, there was no relationship between the clinician A-STAM and changes in patient-rated satisfaction (r_s= -0.03). The clinician A-STAM did, however, show small positive correlations to therapist-rated adherence (r_s=0.26) and was moderately correlated to therapist-rated engagement (r_s=0.49; p<0.01). As predicted, the clinician A-STAM showed moderate negative correlations to ADRS scores. The clinician's and patient's version of the A-STAM showed small non-significant positive correlations (r_s=0.22), providing some evidence of convergent validity.

Discussion

This study reports on the preliminary psychometric evaluation of the A-STAM with a pilot group of PWA engaging in aphasia rehabilitation and their treating SLT. Initial evaluations of reliability, in the form of internal consistency, were significant and demonstrated good reliability for both versions of the A-STAM. Similarly, test-retest scores showed very good reliability for patient and therapist versions of the A-STAM, though sample size was limited (n=29). Although internal consistency of the measure was deemed to be acceptable, caution should be applied to the interpretation of alpha, precisely because its value may be artificially inflated due to the large number of items in the measure (Cortina, 1993). Likewise, alpha may not accurately reflect the measure's reliability since alpha is affected by dimensionality (Cortina, 1993) and for this reason analysis should be applied separately to the measure's subscales (Field, 2013). Factor analysis was contraindicated in the current

study due to the small sample size (Field, 2013) and therefore we were unable to establish whether the scale is uni- or multi-dimensional. Therefore the current measure's internal consistency should be interpreted with caution. However, given the explorative nature of the study, the preliminary psychometric findings support further investigation of the psychometric properties of A-STAM with larger sample sizes.

Construct validity differed across groups; however, all correlations were moderate to strong and significant for both versions of the A-STAM. Particularly noteworthy is the strong positive correlation between the A-STAM and empathy scale (CARE). This may reflect the fact that some items on the CARE, such as taking control, explaining things, and making a plan together, align more closely with the construct of therapeutic alliance rather than empathy. This suggests that the conclusions may be tautologous since the CARE measure includes items relevant to therapeutic alliance. However, these preliminary findings provide evidence that the A-STAM is measuring the construct of therapeutic alliance.

Although satisfaction scores were correlated to patient-rated A-STAM scores moderately, there was no relationship between clinician-rated A-STAM and satisfaction scores. Earlier findings have been limited to establishing the relationship between the therapeutic alliance and satisfaction ratings with patients rather than clinicians (Beattie, Turner, Dowda, Michener, & Nelson, 2005), which may explain why this relationship was not observed between clinician-rated therapeutic alliance and patient satisfaction.

It is difficult to reliably predict the strength of the relationship one would expect to see between therapeutic alliance and outcome, given that there is no evidence of a relationship between outcome and therapeutic alliance ratings in aphasia rehabilitation. Therefore, any hypothesised relationship is merely based on data from healthcare-related disciplines.

Although the correlations between patient-rated A-STAM scores and satisfaction, engagement and adherence ratings were not large, it may be that these are reflective of the relationship between therapeutic alliance and outcome in aphasia rehabilitation. Small positive correlations were observed between clinician and patient ratings on the A-STAM, which is consistent with findings from mental health settings (ranging from r=0.29-0.43)(Hatcher et al., 1995). These differences may stem from conflicting priorities, for example SLTs want to focus on delineating roles and encouraging goal ownership (Lawton et al., 2018[a]), whilst PWA want to hand over responsibility to their therapist and receive guidance (Lawton et al., 2018[b]). It may be that clients and therapists assume a different frame of reference when evaluating the alliance, in which their own set of ideals informs their judgement, hence the lack of divergence in scores. Given the lack of agreement between scores this may suggest that therapeutic alliance measurement should focus on patient measurement alone, rather than both dyadic members, however, the level of agreement between the dyad may represent an important predictor of treatment success and engagement and therefore remains an important variable to measure.

Coefficients are also likely to be influenced by both sample size and range of scores. It is possible that if there was a greater variation in the range of scores, correlation coefficients may have been higher (Coaley, 2014). The small sample size may also have contributed to increased amount of error (Coaley, 2014). In effect, this means that lower coefficients can be generated from smaller sample sizes, precisely because the probability of producing considerably different results is increased in smaller samples (Coaley, 2014). Therefore, it is possible to postulate that coefficients in the sample may have been underestimated. In

larger sample sizes, it may be possible to observe stronger correlations between the A-STAM and measures of related criteria, such as satisfaction or engagement.

Overall, preliminary psychometric evaluation of the A-STAM supports further investigation and use of the measure. Future work should evaluate its psychometric properties with larger sample sizes, in order to establish robust data evidencing the measure's reliability and validity. It is only then that it will be possible to determine whether the therapeutic alliance has a variable impact on treatment efficacy and engagement. The development of the A-STAM will also allow the separation of common effects, such as therapeutic alliance, from specific treatment effects in research trials. If, as hypothesised, the therapeutic alliance is a variable in treatment outcome, then it will be important to target interventions aimed at improving therapeutic alliance development and maintenance (Crits-Christoph et al., 2006; Summers & Barber, 2003) in order to optimise therapeutic outcomes. The A-STAM will not only be a valuable measure for research and clinical outcomes, but it can also be used reflexively in both training and clinical practice to identify areas of difficulty or breakdown in the alliance, thereby facilitating awareness and potentially improving outcomes.

Implications for practice

In order to establish a positive alliance the skills of the therapist need to be extended beyond the linguistic to not only consider but address the impact of aphasia on the person's psycho-social wellbeing. Whilst professional guidelines provide specific direction to speech and language therapists, requiring them to play an active role in managing emotional well-being in aphasia rehabilitation (American Speech-Language-Hearing Association, 2016; Royal College of Speech and Language Therapists, 2005), many speech and language therapists lack the confidence and competence to address people with aphasia's emotional issues,

lacking counselling skills (Sekhon, Douglas & Rose, 2015) and training in psychosocial support (Northcott, Simpson, Moss, Ahmed & Hilari, 2018). There is a need to consider legitimising the multi-faceted role of the speech and language therapist, allowing therapists to embed relational processes into clinical practice. In this sense, relational practices, required to establish positive therapeutic alliances, are valued as processes in and of themselves, rather than an idealised adjunct to therapy.

Limitations

The sample size prevents both factor or rasch analysis, currently considered the gold standard (Nunnally & Bernstein 1994; Streiner & Norman, 2015). Additionally, the timeliness of measurement was variable. Although SLTs were requested to return their measures within a given timeframe, many did so days later and some required e-mail reminders. This may have differentially affected the accuracy of the data recorded, particularly the test-retest data, since episodic memory and perception may change over time (Schacter, 1995). Linguistic adaptions made to the working alliance inventory (WAI-SR) will have invalidated the measure's psychometric properties, which although necessary, may have negatively or positively affected patients' scores and subsequent correlation coefficients. Participants' responses may also have been affected by social desirability, given the field researcher's presence when completing the measures. Participants were reassured throughout that their responses would be confidential and that the facilitator was acting as an independent researcher rather than a speech and language therapist.

Although data collection varied in terms of the sites involved, the study sample may not be representative of the population in general. The sample consisted of more men than women, consistent with the stroke population (Royal College of Physicians Sentinel Stroke

National Audit Programme 2017). However ethnic minorities were not represented in the sample, indicative of further limitations in the generalisation of the findings. A further limitation of the A-STAM relates to the preclusion of people with more severe receptive language skills. The question remains as to whether proxy ratings should be utilised given that self-reported and proxy measures are often mismatched (Bachelor, 2013; Ogrodniczuk et al., 2000). Likewise, the current findings also showed low correlations between patient- and clinician-rated A-STAM scores (r_s =0.22), highlighting marked differences in perspectives.

Patients' families perceptions' were not included when developing the measure because family did not feature as central to the alliance in the qualitative findings or Q methodology for PWA (Lawton et al., 2018[b]; Lawton et al, 2019), which suggests that this dynamic is likely to be dyadic (therapist-caregiver) rather than a triadic (therapist-caregiver-patient) in nature. This is not to suggest that the alliance between the caregiver and speech and language therapist is not important but rather that it is likely to be inherently different to that of the patient-therapist alliance since family members needs pertain to: support; respite; information; establishing an effective mode of communication; and, improving interpersonal relationships (Le Dorze & Signori, 2010). Future research should therefore consider developing a family-caregiver version of the A-STAM grounded in qualitative findings.

Conclusion

In conclusion, this is the first accessible and theoretically robust measure of therapeutic alliance applicable to aphasia rehabilitation. Our findings establish preliminary evidence of the validity and reliability of the A-STAM. This highlights the need to conduct further

psychometric testing with larger samples, to address the methodological shortcomings identified by the authors. Although this research has focused on exploring the therapeutic alliance with reference to aphasia rehabilitation, there are wider implications for the findings. Not only will the A-STAM be relevant to all healthcare professionals working with people with aphasia, but it may also be applicable to professionals working with people with a range of acquired communication disorders and indeed, neurological conditions.

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Figure I: Development of the A-STAM (phase 1)

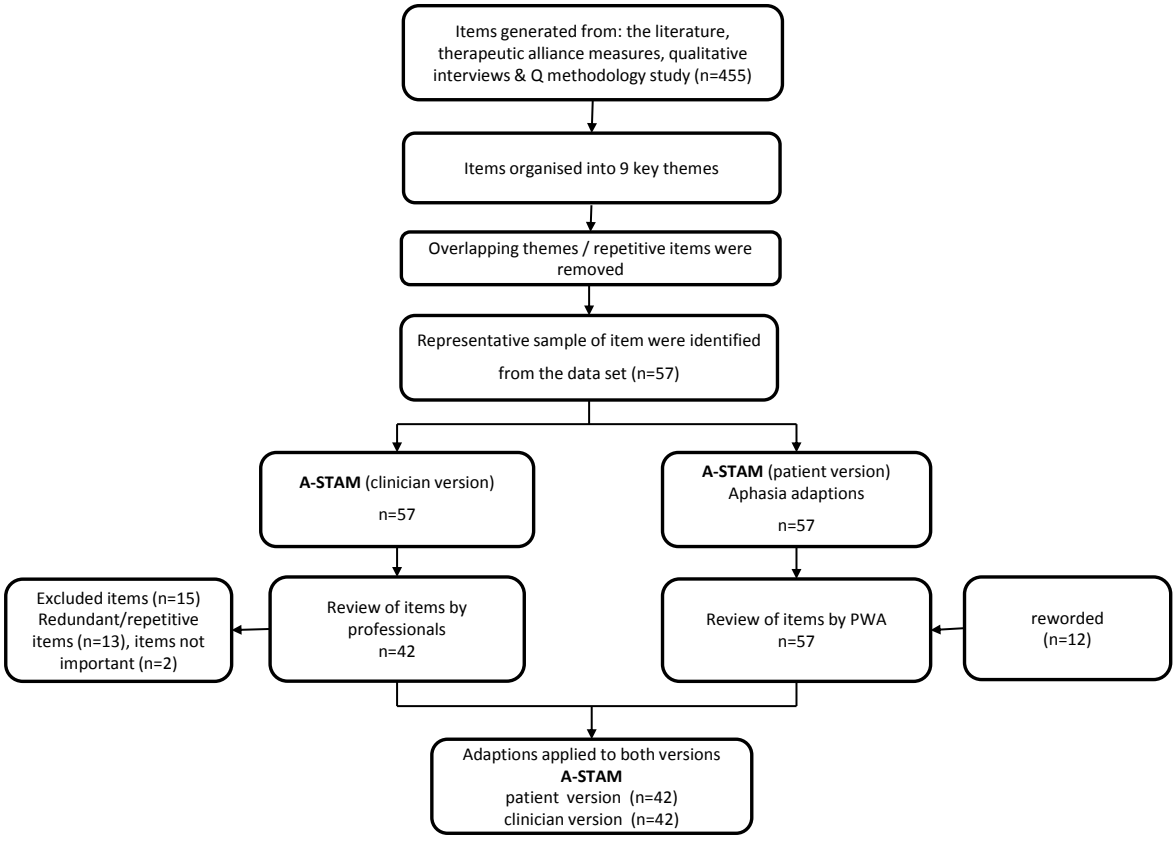

Table I: Patient-reported measures

Instrument	Instrument description	Type of validity under investigation
Consultation and Relational Empathy scale (CARE) (Mercer, Maxwell, Heaney, & Watt, 2004)	Respondents rate 10 items on a 5 point Likert scale from 'poor' to 'excellent'. For example: in 'How was your doctor at: being positive', 'doctor' was replaced by 'speech therapist'. The CARE has good validity and reliability in general practice populations (Mercer & Murphy, 2008; Mercer et al., 2004; Mercer, McConnachie, Maxwell, Heaney, & Watt, 2005) and is accessible for PWA.	construct
Working Alliance Inventory-short revised client version (WAI-SR)	The WAI-SR client version comprises 12 items, divided into 3 subscales, which contain 4 items each, on a 5 point Likert scale (Hatcher & Gillaspy, 2006). The WAI-SR has good psychometric properties in psychotherapeutic	construct

(Hatcher & Gillaspy, 2006)	populations (Hatcher & Gillaspy, 2006). Items on the WAI-SR client version were adapted linguistically and syntactically for PWA. Seven of the twelve items were modified to reduce linguistic and syntactic complexity, ensuring item meaning was retained. For example: 'As a result of these sessions I am clearer as to how I might change' was modified to 'Therapy helps me to see how I might change'.	
Patient-rated satisfaction	Satisfaction with therapy was assessed using a simple patient-reported rating question: 'How satisfied are you with speech and language therapy?' Respondents rated satisfaction on a 5 point Likert scale from not at all to completely.	Criterion-related
Visual Analogue Self Esteem Scale (VASES) (Brumfitt & Sheeran, 1999).	The VASES consists of 10 pairs of simple line drawings of polar opposites depicting constructs deemed to be important to the perception of self (e.g. confident/not confident). Participants identify whether the picture is "very true of me" or "true of me", or provide a neutral response. A higher score indicates a more positive view of the self. The VASES has good psychometric properties with non-clinical populations and with PWA (Brumfitt & Sheeran, 1999).	Crierion-related

Table II: Therapist-reported measures

Instrument	Instrument description	Type of validity under investigation
Working Alliance Inventory revised short therapist version (WAI-SRT) (Hatcher & Gillaspy, 2006)	The WAI-SRT comprises 10 items based on Bordin's working alliance theory (goals, tasks and bond). Items are rated on a 5 point Likert scale, from 'always' to 'seldom'. The WAI-SRT has good psychometric properties in psychotherapeutic populations (Hatcher & Gillaspy, 2006).	Construct
Aphasia Depression Rating Scale (ADRS) (Benaim, Cailly, Perennou, & Pelissier, 2004)	Patient depression was measured using a 9 item-external assessment, which has good reliability and validity in participants with people with aphasia (Benaim et al., 2004; Laures-Gore, Farina, Moore, & Russell, 2017). Observable behaviour is rated on an ordinal scale from 0-6. A score of ≥9/32 suggests the presence of depression.	Criterion-related
Therapist-rated patient engagement	Patient engagement was investigated using a therapist-rated 5 point Likert scale, ranging from little or no engagement to independently engaged, with spontaneous output.	Criterion-related
Therapist-rated patient adherence	Adherence was assessed by asking SLTs to rate whether patients followed their advice, on a 5 point Likert scale, from not at all to a lot.	Criterion-related

Table III: People with aphasia respondent characteristics

Variable	n (%)
Sex	
male	20 [58.8]
female	14 [41.2]
Age	
Mean [SD], y	63.21[13.3]
Range, y	36-86
21-45	4 [11.8]
46-65	13 [38.2]
>65	17 [50]
Time since stroke	
Mean [SD], m	4.34 [5.00]
Range, m	0.5-24
Marital status	
married	20 [58.8]
single	4 [11.8]
partner	9 [26.5]
widowed	1 [2.9]
Ethnic group	
white	34 [100]
Aphasia severity (FAST score)	
Severe (1-10)	1 [2.9]
Moderate (11-20)	9 [26.5]
Mild (21-30)	24 [70.6]
Number of therapy sessions	
mean [SD]	10.71 [9.0]
Range	2-40
Additional diagnosis	
apraxia of speech	9[26.5]
dysarthria	4[11.8]
hemiplegia	17[50.1]
hemianopia	2[5.9]

m:months, y:years

Table IV: Speech and language therapist respondent characteristics

Variable	n (%)
Sex	
Male	2 [10]
Female	18 [90]
Age	

mean (SD)	37.05 [10.7]
Range	22-57
Clinical experience	
Mean, y	10.3 [10.5]
range, y	0.25-31
Ethnicity	
White	18 [90]
Black	1[5]
Asian	1[5]
Clinical setting	
Inpatient	5[25]
Outpatients	4[20]
Community	8[40]
Early supported discharge	3[15]

Table V: Descriptive statistics of measures

Instrument	Mean (standard deviation)	Range
A-STAM (patient version)	171.51 (15.93)	117-190
A-STAM (clinician's version)	188.03 (12.08)	164-208
WAI (patient's version)	50.31 (7.42)	33-60
WAI (clinician's version)	43.76 (7.76)	10-50
CARE	45.91 (6.34)	25-57
VASES	35.23 (9.21)	11-50
ADRS	4.82 (4.39)	0-19
FAST	21.77 (5.4)	10-29
Satisfaction	4.66 (0.64)	3-5
Engagement	4.32 (0.95)	2-5
Adherence	4.47 (0.83)	2-5

A-STAM = Aphasia and Stroke Therapeutic Alliance Measure; WAI = Working Alliance Inventory; CARE= Consultation and Relational Empathy scale; VASES= Visual Analogue Self Esteem Scale; ADRS= Aphasia Depression Rating Scale; FAST= Frenchay Aphasia Screening Test

Table VI: Initial data scrutiny

Criteria	A-STAM (patient version)	A-STAM (clinician version)
Items with low endorsements	×	×

(<10% of the sample)		
Items with low item-total correlations (<0.300) (Field, 2013; Nunnally & Bernstein, 1994)	√[§]	√[§]
Items with high (>0.900)	×	×
low inter item correlations (<0.100)	√[§]	√[§]
Items with low test-retest scores (<.300)	√[§]	√[§]
Items which contributed to low internal consistency	√[§]*	√[§]*
Items which were identified as problematic by ≥50% of responding participants (PWA)	√ 4 items excluded (Q2, Q15, Q33, Q36)	n/a[§]

× no items fitting criteria; √ items meeting criteria; [§] nil items excluded; n/a not applicable; * minimal increases in internal consistency (0.01)

Table VII: Criterion-related validity of the A-STAM (n=34)

Instrument	Criterion-related Validity	
	A-STAM (patient version) n=34	A-STAM (Clinician's version) n=34
VASES	0.13	0.06
ADRS	-0.22	-0.30
Patient-rated satisfaction	0.33	-0.03
Therapist-rated engagement	0.24	**0.49**[*]
Therapist-rated adherence	0.25	0.26

[*]Correlation significant at 0.01

Supplementary data

Items for the patient's version of the A-STAM

1. My therapist **really listens** to me
2. My therapist is **business-like**
3. **I like** my therapist
4. My therapist is **interested in me** as a **person**
5. We **get on** well
6. My therapist is **honest** with me
7. My therapist **recognises** that **I am still a capable** person
8. My therapist and I **want different things** from therapy
9. My therapist **gives me the choice** to **involve** my **family**
10. We **work on things** that **are important to me**
11. I **depend on** my therapist
12. My therapist and I can **talk openly**
13. My therapist **gives me** the **support I need**
14. I **feel comfortable** with my therapist
15. My therapist is **there if I need her**/him
16. **My therapist shows** me **concern**
17. My therapist **understands what I am going through**
18. My therapist **values what I say**
19. We **disagree about how far I will get** in therapy
20. I **trust** my therapist
21. My therapist makes **therapy too difficult**
22. My therapist **makes me feel** that **things will get better**
23. My therapist **rushes me**
24. My therapist **really wants to help** me
25. My therapist **gives me confidence** to communicate
26. My therapist **sees me as a whole person**
27. My therapist **understands my concerns**
28. My therapist and I **can laugh together**
29. My therapist and I **respect each other**
30. My therapist gives me the **choice** to be **involved in making decisions**
31. My therapist **makes me feel there is no hope**
32. My therapist **knows when to make therapy challenging**
33. My therapist **accepts me for who I am**
34. My therapist **gives me encouragement**
35. My therapist **knows what they are doing**
36. My therapist **encourages me to give therapy a go**
37. I **look forward** to therapy
38. My therapist **explains things clearly**
39. We both **put the same effort** into therapy
40. The things we are doing in therapy **help me**
41. My therapist and I **work** as a **team**
42. My therapist **offers me guidance** when I need it