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## **Aphasia outcome measurement in clinical practice: An international survey**

Chloe Tyler<sup>a</sup>, Emma Finch<sup>a</sup>, Kirstine Shrubsole<sup>abc</sup>, Brooke Ryan<sup>ab</sup>, Eva Soroli<sup>d</sup>, Silvia Martinez-Ferreiro<sup>e</sup>, and Sarah J. Wallace<sup>ab\*</sup>

<sup>a</sup>School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia; <sup>b</sup>Queensland Aphasia Research Centre, The University of Queensland, Brisbane, Australia; <sup>c</sup>Faculty of Health, Southern Cross University, Gold Coast, Australia; <sup>d</sup>Department of Linguistics, Faculty of Human Sciences and CNRS UMR 8163 Lab, University of Lille, Villeneuve d'Ascq, France; <sup>e</sup>Gerontology and Geriatrics Research Group, Department of Physiotherapy, Medicine and Biomedical Sciences, University of A Coruña

\*Correspondence regarding this article should be directed to Dr Sarah J. Wallace, School of Health and Rehabilitation Sciences, The University of Queensland, QLD, Australia 4072.

Email: s.wallace3@uq.edu.au

### **ORCID:**

Chloe Tyler <https://orcid.org/0000-0002-9690-8165>

Emma Finch <https://orcid.org/0000-0002-9690-8165>

Kirstine Shrubsole <https://orcid.org/0000-0002-7805-2447>

Brooke Ryan <https://orcid.org/0000-0002-6053-7614>

Eva Soroli <https://orcid.org/0000-0003-2747-9368>

Silvia Martinez-Ferreiro <https://orcid.org/0000-0003-2393-1214>

Sarah J. Wallace <http://orcid.org/0000-0002-0600-9343>

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### **Abstract**

**Background:** Measuring outcomes is considered best-practice in the clinical management of people with aphasia, to monitor change and guide intervention. Barriers and facilitators to aphasia outcome measurement have been explored in English-speaking populations; however, little is known about the factors influencing clinical practice in non-English-speaking populations.

**Aims:** (1) To explore barriers and facilitators to aphasia outcome measurement from the perspective of international aphasia clinicians. (2) To determine whether barriers and facilitators differ between English- and non-English-speaking countries. (3) To identify preliminary, theory-informed strategies to optimise outcome measurement practice internationally. The primary hypothesis was that clinicians working with people with aphasia from non-English-speaking countries would experience more barriers to measuring outcomes than clinicians from English-speaking countries.

**Methods and Procedures:** International aphasia clinicians completed an online survey that aligned with the Theoretical Domains Framework (TDF) to identify barriers and facilitators to outcome measurement. Quantitative data were analysed using descriptive statistics and a Mann-Whitney U Test to compare English- and non-English-speaking groups. Qualitative data were analysed using content analysis. TDF domains identified as influencing clinician behaviour were mapped to the Behaviour Change Wheel, producing theory-informed strategies to improve practice.

**Outcomes and Results:** A total of 208 clinicians from 25 countries completed the survey. Almost all clinicians (93.7%) reported measuring outcomes to some extent, most commonly to measure client progress. Facilitators to outcome measurement included “social/professional role and identity” (understanding that measuring outcomes is part of the clinicians’ role),

“optimism” (feeling positive about measuring outcomes), and “emotion” (enjoying, and feeling comfortable measuring outcomes). Barriers were “environmental context and resources” regarding time, availability of resources, and other caseload priorities, “behavioural regulation” (having personal and workplace systems to measure outcomes) and “skills” (having sufficient training and experience in outcome measurement). The least facilitating factors Facilitating factors to outcome measurement that received lower scores were commonly experienced by clinicians from English- and non-English-speaking countries; however, they impacted clinical practice to different extents. A set of implementation core strategies for improving clinical practice, informed by Behaviour Change Techniques, is suggested.

**Conclusions:** Internationally, most clinicians reported measuring outcomes with people with clinicians working with people with aphasia measure outcomes and believe that this is part of their role, and a positive aspect of their work. Clinicians believed measuring outcomes is part of their role, and generally felt positively about this aspect of their work. Common barriers to outcome measurement included insufficient time and access to resources, inadequate personal and workplace systems, and insufficient skills necessary for performing outcome measurement. Preliminary, theory-informed strategies (e.g., improving access to culturally appropriate measurement tools; developing protocols, templates or checklists guided by recommended practice; and providing training in outcome measurement) were developed to promote uptake of clinical recommendations to measuring outcomes with people with aphasia.

**Keywords:** outcome measures; international; aphasia; barriers and facilitators; theoretical domains framework

## Introduction

Clinical practice guidelines recommend outcome assessment to inform therapy planning and to assess the benefits of treatment over time. Aphasia management should encompass formal, comprehensive assessment by a specialist clinician to determine the nature and type of communication impairment, as well as the impact of aphasia on functional activities, participation and quality of life (Stroke Foundation, 2022; RCP, 2016). Clinical practice guidelines highlight the importance of measuring change over time, stating that goals should have measurable outcomes and be reassessed at appropriate intervals over time (Stroke Foundation, 2022). For many stroke survivors, aphasia is a chronic condition and outcome data can often have a crucially important role in justifying access to ongoing therapy. This is illustrated by the recommendation that therapy should continue as long as a stroke survivor shows “measurable benefit from treatment” (RCP, 2016, p. xiv). While clinical practice guidelines highlight the importance of outcome measurement, there remains great variability in how this practice is operationalised in clinical settings, and there is limited understanding of the factors that drive clinician behaviour (Arnold *et al.*, 2020; Simmons-Mackie *et al.*, 2005; Tierney-Hendricks *et al.*, 2022).

Across studies investigating clinical outcome measurement in Australia and the USA, there is considerable variability in practice (Arnold *et al.*, 2020; Kiran *et al.*, 2018; Simmons-Mackie *et al.*, 2005; Tierney-Hendricks *et al.*, 2022). Tierney-Hendricks and colleagues (2022) explored outcome measurement with people with aphasia in accordance with the A-FROM, which includes impairment-level, communication environment, personal factors, quality of life and participation. The authors found consistency in outcome measurement of impairment-level domains across clinical settings; however, functional communication, quality of life and participation were less consistent due the dependency of these outcomes on environmental factors. Few studies have examined the factors driving clinician practice using

a theoretical behaviour change framework. Arnold *et al.* (2020) used the Theoretical Domains Framework (TDF) to identify barriers and facilitators perceived and experienced by 74 Australian speech-language-pathologists in measuring outcomes in aphasia rehabilitation. Findings revealed a number of key barriers including poor workplace systems and strategies to support outcome measurement, inadequate clinician skills and knowledge in outcome measurement, limited incentives within the workplace for measuring outcomes and insufficient time and resources. Whilst these studies provide insights into the factors influencing outcome measurement practice, it should be noted that they have focused on English-speaking countries, and it is not known if the same barriers exist across languages.

Examination of barriers and facilitators across English- and non-English- speaking populations, using a theoretical framework, would enable the development of a tailored implementation strategy that could be applied internationally to improve clinical practice. Tailored implementation strategies are strategies that aim to improve clinical practice by addressing prospectively identified barriers to change (Baker *et al.*, 2010). A model frequently used in the development of such tailored implementation strategies is the Behaviour Change Wheel (BCW) (Michie *et al.*, 2011), which has previously been utilised to design behaviour-change interventions in stroke care (Connell *et al.*, 2015; Loft *et al.*, 2017; Shrubsole *et al.*, 2018). The BCW contains three layers. The inner layer incorporates the COM-B theory, in which a behavioural system (B) comprises three conditions essential for identifying behaviour change: capability (C), opportunity (O), and motivation (M). For a visual diagram of the BCW, see figure 1. The first step to developing a tailored implementation strategy is to identify barriers and facilitators in current practice (Baker *et al.*, 2010; Grol & Wensing, 2004). The Theoretical Domains Framework (TDF) is a synthesised framework of behaviour-change theories that can be used to determine factors (i.e., barriers and facilitators) influencing health professionals' behaviour (Cane *et al.*, 2012) that aligns



with the COM-B and BCW. The TDF comprises 14 domains relating to behaviour, including: 1) knowledge (having an awareness of something existing); 2) skills (ability or proficiency developed through practice); 3) social/professional role and identity (a set of behaviours and personal characteristics of a person in a social/work setting); 4) beliefs about capabilities (acceptance of reality, truth or validity about the abilities or talent that a person can utilise); 5) optimism (confidence that a result will be obtained or desired goals will be achieved); 6) beliefs about consequences (acceptance of truth or reality about outcomes of a particular behaviour); 7) reinforcement (arranging a dependent relationship between a response and a given stimulus to increase the probability of that response); 8) intentions (a decision to act a certain way or perform a behaviour); 9) goals (mental representations of outcomes an individual desires to achieve); 10) memory, attention and decision processes (ability to retain information, make choices and focus on aspects of the environment); 11) environmental context and resources (environmental circumstances that encourages or discourages the acquisition of skills, independence and competence); 12) social influences (interpersonal processes resulting in an individual changing their thoughts, behaviours or feelings); 13) emotion (a reaction pattern comprising behavioural, experiential and physiological elements in an attempt to deal with an event); and 14) behavioural regulation (capacity to manage or change objectively measured actions) (Cane et al., 2012). The TDF has been used in quantitative and qualitative studies to explore barriers and facilitators in aspects of aphasia practice, including goal setting, information provision, constraint-induced language therapy, timing of intervention, and intensity of intervention (Shrubsole *et al.*, 2018; Young *et al.*, 2018). Use of a theoretical framework to understand outcome measurement practices across English- and non-English- speaking countries may help to develop an implementation strategy to optimise practice.

Therefore, this study aimed to: 1) explore barriers and facilitators to aphasia outcome measurement from the perspective of international aphasia clinicians; and 2) determine whether there are differences in barriers and facilitators between English- and non-English-speaking countries; and 3) identify preliminary, theory-informed strategies to promote optimisation of outcome measurement practices. No hypothesis was generated for aim 1 due to the exploratory nature and purpose of the aim. With respect to aim 2, given the small number of standardised assessment tools in languages other than English (Fyndanis *et al.*, 2017; Ivanova & Hallowell, 2013), it was hypothesised that clinicians working with people with aphasia from non-English-speaking countries would experience more barriers than clinicians from English-speaking countries, especially due to resource-related reasons (e.g., lack of adapted, adequate and reliable assessment tools).

(Insert Figure 1 about here)

## **Materials and methods**

### ***Study design***

This study used a convergent parallel mixed-methods design in which both qualitative and quantitative data were collected simultaneously (Creswell & Clark, 2011) using survey methodology, followed by a theory-informed mapping process to identify potential implementation strategies to address the identified barriers. An online medium The online mode promoted accessibility of the survey to international participants, as well as time and cost efficiency (Creswell & Clark, 2011; Wright, 2017). The survey was designed in accordance with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) reporting guidelines (Eysenbach, 2004) to ensure the survey was constructed according to for best practice in web-based survey development. The University of Queensland Human Research Ethics committee granted approval for this study (approval number: 2020000318).

### ***Participants***

Participants were recruited internationally through a number of sources including:

1. Dissemination of information about the study through the The Collaboration of Aphasia Trialists (CATS; [www.aphasiatrials.org](http://www.aphasiatrials.org)) email networks.
2. Distribution of information/flyers/advertisements via relevant Social media outlets (Facebook, Twitter, LinkedIn).
3. Snowball sampling – i.e. individuals were encouraged to forward the survey link/email invitation to other eligible individuals in their personal network.

Clinicians who met the following inclusion criteria were eligible to participate in this study:

1. Had worked for at least one year since graduating
2. Were currently working with people with aphasia
3. Had adequate vision to participate in the online survey

### ***Survey design***

Online survey data were collected using Qualtrics (Qualtrics, Provo, UT). Questions used Likert rating scales and multiple-choice response options, some of which allowed multiple selections to be made. Participants could provide open-ended responses in multiple-choice questions using an “other” option. The survey comprised 16 questions, with additional subsections (see appendix 1):

- a) Demographic information (questions 1-9)
- b) Current use of outcome measures (questions 10-15). These questions were drawn from Arnold et al (2020)’s survey of outcome measurement practices in Australia.
- c) Barriers and facilitators to outcome measurement use (question 16). This question comprised 39 statements reflecting the 14 domains of the TDF. Using Huijg et al. (2014)’s validated question structure, participants rated each statement on a five-point Likert scale. The content of each statement was based on Arnold et al. (2020), with additional input from the research team to ensure relevance for an international and multi-lingual audience.

### ***Procedures***

The survey was open for 12 weeks between December 2020 and March 2021. Surveys could be completed in English, French and Spanish. Translations of the survey were produced by the French and Spanish investigators respectively.

### ***Analysis***

All Data were exported to a Microsoft Excel (Version 16.0) spreadsheet and stored anonymized on The University of Queensland Research Data Manager (UQRDM) system to maintain data confidentiality. Response rates (view rates, participation rates and completion rates) were calculated using Eysenbach's (2004) formula, whereby the number of accesses (i.e., the number of times the survey was opened) to the questionnaire page was divided by the number of unique responses. Submissions containing only consent and/or demographic information were removed from the data set and excluded from further analysis. Submissions containing consent and demographic information, as well as partial or total TDF survey responses were included in the data set for analysis. Qualitative data obtained from open-ended questions were analysed using content analysis (Stemler, 2000). Quantitative data were analysed using Version 25.0 of the IBM Statistical Package for the Social Sciences (SPSS; IBM Corp, 2020). Descriptive statistics were used to summarise demographic information and information about the current use of outcome measures. Barriers and facilitators to outcome measurement were explored using the approach of Young et al. (2018). This process involved respondents rating statements pertaining to outcome measurement using a five-point Likert scale ranging from "strongly disagree" to "strongly agree". The frequency of responses in relation to each of the TDF statements was calculated in SPSS. The rate of agreement (frequency of responses for "strongly agree" and "agree") and disagreement (frequency of responses for "neutral", "disagree" and "strongly disagree") was calculated for each of the TDF domains. The mean barrier score for each statement was also calculated. The barrier and

facilitator cut-off scores were based on Young *et al.* (2018), whereby a mean score of  $\leq 3$  was classified as a barrier, and a mean score of  $> 3$  was classified as a facilitator. Statements that contained a negative (e.g., “*I do not know which outcome measures to use*”) were reversed for finding the mean barrier score. Each statement was then grouped into its’ corresponding TDF domain. The total rate of agreement and disagreement and the total mean barrier score for each of the TDF statements were calculated, to determine the perceived barriers and facilitators in relation to the 14 TDF domains. The TDF domains with the three highest and three lowest scores were considered to have the most impact on clinicians’ behaviour. as per Young et al. (2018). The domains with the three lowest scores were then mapped onto the BCW; subsequently, the corresponding Behaviour Change Techniques (BCTs) were identified (Michie et al., 2014).

To compare barriers and facilitators between English- and non-English-speaking countries, each country was grouped according to its’ most widely spoken language (Central Intelligence Agency, n.d.) and then dichotomised into “English” or “non-English” categories. The overall mean scores for each of the TDF domains for English- and non-English-speaking categories were then calculated and compared. Young et al.’s (2018) approach was used to determine whether clinicians from non-English-speaking countries faced more barriers than clinicians from English-speaking countries. The sum of scores from each of the TDF statements was calculated for each participant, resulting in to get 208 total barrier scores. The lower the score for the participant, the more TDF statements that participant rated as barriers. A Mann-Whitney U Test was then used to determine the statistical significance of the mean total barrier score in English- versus non-English-speaking countries.

## **Results**

Three-hundred-and-twelve participants commenced the survey; however, 104 participant responses were excluded from data analysis as they did not complete any

questions beyond the participant demographic section. A dataset from 208 participants was included in the analysis (of these, 134 participants completed the entire survey).

### ***Participant characteristics***

Table 1 depicts participant characteristic details. Participants came from 25 different countries, with the United States the most highly represented. Most participants were female within the 25-34-years age bracket. The majority of participants reported speech-language-pathologist/speech-language-therapist (81.7%) as their discipline background; however, a variety of different disciplines were represented, including : psychologist (9.6%), clinical linguist (5.7%), neurologist (1.7%) and researcher (1.3%). Almost half of the participants had been working clinically with people with aphasia and their significant others for over 10 years. The two most common settings in which participants saw people with aphasia were *Hospital-based Inpatient Rehabilitation* (27.4%) and *Community Rehabilitation* (26.9%). Participants worked with people with aphasia from a variety of post-stroke stages, with the early subacute period (1 week to 3 months) (36.1%) most frequently reported.

(Insert Table 1 about here)

### ***Current practice in aphasia outcome measurement***

The majority of participants reported measuring outcomes with people with aphasia “always” (41.3%, n=86) or “often” (31.7%, n=66). A smaller proportion of respondents reported doing so “sometimes” (20.7%, n=43), or “rarely” (4.8%, n=10). Only three (1.4%) respondents reported “never” measuring outcomes with people with aphasia.

The most common method for selecting outcome measures was for each clinician to choose their own outcome measurement (47.6%, n=99). Some participants also reported having a standard approach to choosing outcome measures within their workplace (19.7%, n=41). The most common time that participants measured outcomes was at the beginning and end of a pre-determined therapy block (33.2%, n=69). Many participants also reported

measuring outcomes on admission and prior to discharge (28.4%, n=59), and at regular time-points in relation to the client's time post-onset (23.6%, n=49). The most commonly reported reason for measuring outcomes with people with aphasia was to “measure progress” (94.5%, n=197 agreement), and to “plan effective rehabilitation” (88.9%, n=185 agreement). The least reported reason for measuring outcomes was to “adhere to workplace requirements” (46.2%, n=96 agreement). The highest rated factors clinicians considered “essential” when choosing outcome measures for people with aphasia were to use a tool that is validated (88.7%, n=181), sensitive or responsive to change (84.9%, n=174), and able to capture outcomes which are important to their clients (82%, n=168).

### ***Barriers and facilitators to outcome measurement***

Overall, participants identified more facilitators than barriers to measuring outcomes with people with aphasia. Out of the 39 TDF statements across all 14 domains, 32 were considered facilitators and seven were considered barriers. Further details for each statement and domain are contained within appendix 2.

There were no TDF domains reported as overall barriers (i.e., with a score  $\leq 3$ ); however, individual statements within some of the TDF domains were classified as barriers, thus resulting in overall low mean scores for some of the TDF domains. The three TDF domains with the lowest scores were “environmental context and resources”, “behavioural regulation” and “skills”. However, The TDF domain with the lowest mean score was “environmental context and resources” (mean score = 3.03). This domain is defined as a situation that influences the development of skills, independence, adaptive behaviour, abilities and social competence (Cane et al., 2012). Within this domain, participants rated their level of agreement with statements relating to accessibility and availability of adequate resources, time and caseload priorities. A barrier identified within the “environmental context and resources” domain was that participants did not have “*sufficient access to outcome measures*

*in languages spoken by [their] clients with aphasia*”, as there was an overall low agreement with this statement amongst participants (mean score = 2.7). The TDF domain with the second and third lowest mean scores were “behavioural regulation” (mean score = 3.07), whereby participants rated their level of agreement with statements relating to workplace strategies and personal systems for measuring outcomes with people with aphasia; and “skills” (mean score = 3.12), by which participants were required to rate their level of agreement with statements pertaining to their own level of training and experience, and having the *“skills necessary to align client goals with outcome measures”*. Two individual statements identified as barriers within the “skills” domain were that participants would *“benefit from more training in outcome measurement with people with aphasia”* (score = 2.07) and that they do not *“have sufficient training in the use of outcome measures with bilingual or multilingual people with aphasia”* (score = 2.23).

The TDF domain with the highest mean score was “social/professional role and identity” (mean score = 4.42). This domain refers to displayed behaviours and personal attributes in a social and/or work setting (Cane et al., 2012), and indicated high levels of agreement that outcome measurement is *“part of my role”* and *“part of my responsibility as a speech pathologist”*. The TDF domains with the second and third highest mean scores were “optimism” (mean score = 4.18), whereby participants agreed to being *“optimistic that [they] will be able to measure outcomes with people with aphasia in the future”*, and “emotion”, by which participants agreed to feeling comfortable, and enjoying, measuring outcomes with people with aphasia.

### ***Comparison between English- and non-English-speaking countries***

A comparison of the mean scores for each of the TDF domains revealed many similarities in the identified barriers and facilitators between participants from English- and non-English-speaking countries. Although no barriers (other than some isolated statements



within certain domains) were identified in the overall results, both English- and non-English-speaking countries experienced one barrier each. English-speaking participants identified “environmental context and resources” (mean score = 2.88), as opposed to non-English-speaking participants, who identified “behavioural regulation” (mean score = 2.93) as the main barrier respectively. Other TDF domains with low mean scores for participants in English-speaking countries were “behavioural regulation” (mean score = 3.07) and “skills” (mean score = 3.12). TDF domains with the second and third lowest mean scores in non-English-speaking countries were “environmental context and resources” (mean score = 3.06) and “skills” (mean score = 3.1). Figure 1 depicts a comparison of mean scores between English- and non-English-speaking countries for each of the TDF domains. A Mann-Whitney U test indicated that the mean total barrier score for participants from non-English-speaking countries (mean rank = 89.04, n=81) was lower than those of participants from English-speaking countries (mean rank = 101.12, n=110); however, the difference was not statistically significant ( $U=3891.5$ ,  $p=0.135$ , two-tailed).

(Insert Figure 2 about here)

The TDF domain with the highest mean score for participants from English-speaking countries was “social/professional role and identity” (mean score = 4.39). Similarly, this domain was identified as the main facilitator in participants from non-English-speaking countries (mean score = 4.55). The TDF domains with the second and third highest mean scores identified by participants from English-speaking countries were “optimism” (mean score = 4.18) and “beliefs about consequences” (mean score = 4.1), whereby participants rated their level of agreement with statements pertaining to the importance of outcome measurement for therapy planning, improving patient motivation, demonstrating the effects of intervention, educating patients and their families and improving patient outcomes. Non-English-speaking participants identified “intentions” (mean score = 4.26), by which clinicians

rated their level of agreement with intending to conduct outcome measures with people with aphasia, and “emotion” (mean score = 4.26) as the TDF domains with the second highest mean scores. The TDF domain with the third highest mean score for non-English-speaking participants was “optimism” (mean score = 4.19).

### ***Impact of COVID-19 on measuring outcomes in aphasia management***

Participants were asked how COVID-19 has impacted their usual clinical practice with people with aphasia using an open text box. Content analysis of this qualitative data indicated that the main impacts included the implementation of telerehabilitation, interruption to treatments and the use of face masks impacting the effectiveness of therapy during sessions. Two participants reported that there were “*less outcome measurements*”; however, little was mentioned about the impact of COVID-19 on outcome measurements specifically.

### **Discussion**

The aims of the study were to investigate international practice in outcome measurement with people with aphasia, to identify the barriers and facilitators to implementing practice recommendations, to compare findings across English- and non-English-speaking countries and to develop a set of preliminary, theory-informed strategies to improve uptake of clinical recommendations. The findings of current clinical practice regarding the frequency and purpose of outcome measurement, as well as the identified barriers and facilitators to measuring outcomes, closely support previous literature about the importance of some core factors (e.g., resources and appropriateness of work spaces). However, differences are evidenced in the extent to which these factors influence clinical practice across countries. English-speaking clinicians consider “environmental context and resources” as the main barrier, whilst clinicians from non-English-speaking countries focus mostly on “behavioural regulation” as the key barrier. Although overall, the least facilitating factors to outcome measurement were commonly experienced by clinicians across English-

and non-English-speaking countries, they were so to different extents. Despite small variations in scores, clinicians across both English- and non-English- speaking countries identified the same three least facilitating factors to outcome measurement practice (XXX).

### ***Current Clinical Practice***

In alignment with Arnold et al.'s (2020) Australian study, the majority (93.7%) of respondents reported measuring outcomes with people with aphasia to some extent. There were also similarities with this study in the factors motivating outcome measurement practice (to measure progress), how outcome measures are chosen (autonomously by each clinician) and the timing of outcome measurement (on admission and prior to discharge, and at the beginning and end of a therapy block). Also supporting the study by Arnold et al. (2020), the factors clinicians considered essential when choosing outcome measures for people with aphasia were to use a tool that is validated, sensitive or responsive to change, and can capture outcomes that are important to their clients. Consistency in clinical practice, as identified in the current study, is also supported by the study by Kiran *et al.* (2018) who found that there were many similarities in outcome measurements used across different clinical settings from six different countries (the United Kingdom, the United States, Canada, Australia, Chile and New Zealand).

### ***Barriers and facilitators to measuring outcomes***

Overall, the TDF domain with the lowest mean score was “environmental context and resources” in relation to time, accessibility and availability of resources, and caseload priorities. This is also consistent with the Australian study by Arnold et al. (2020), which found that clinicians had limited time for conducting outcome measures with people with aphasia. A number of other aphasia studies have also found that environmental factors, including inadequate time, lack of appropriate resources, short-staffing and insufficient facilities, present as key barriers to adhering to current aphasia clinical practice guidelines

(Foster et al., 2014; Klippi et al., 2012; Law et al., 2009; Page & Wallace, 2014; Rose et al., 2014; Shrubsole et al., 2018; Young et al., 2018). Studies that have investigated barriers to outcome measurement in general allied health practice have also identified time and availability of resources to be key barriers (Duncan & Murray, 2012; McCracken et al., 2021; McDonnell et al., 2018). The findings of the current study, in line with previous literature, therefore suggest that clinicians across different countries face environmental and contextual barriers when measuring outcomes with people with aphasia.

The TDF domain with the second lowest score was “behavioural regulation” regarding a lack of workplace and personal systems to measuring outcomes with people with aphasia. Poor organisational logistics have been reported as a barrier in other studies investigating outcome measurement in allied health practice (Duncan & Murray, 2012) and in aphasia practice (Arnold et al., 2020). These results indicate a consistent paucity of workplace and personal systems across countries in outcome measurement with people with aphasia. Clinicians also reported insufficient skills necessary to align client goals with outcome measures, and inadequate experience and training in measuring outcomes with people with aphasia. These results are similar to the findings presented by previous aphasia studies, which have also identified poor skills and training as impeding factors to using outcome measures (Arnold et al., 2020) and general aphasia management (Kippli et al., 2012).

Both English- and non-English-speaking clinicians in the current study identified two individual TDF statements within the “environmental context and resources” domain and the “skills” domain, each relating to poor accessibility of language-appropriate outcome measurement tools and limited training in measuring outcomes with multi-lingual people with aphasia. This closely aligns with studies exploring aphasia management in languages other than English (Fyndanis *et al.*, 2017; Ivanova & Hallowell, 2013), and suggests that there are insufficient resources for outcome measurement across different languages. Similarly, limited

clinician training in outcome measurement with multilingual people with aphasia, as identified in the current study, is supported by American and Norwegian studies (Centeno, 2015; Norvik *et al.*, 2022), in which the majority (77% for American clinicians; 81% for Norwegian clinicians) reported having no to minimal education and training for providing intervention for multilingual people with aphasia. These findings therefore indicate a need for further research in this area to improve outcome measurement practices in aphasia rehabilitation across languages and within the multilingual population.

A number of TDF domains were identified as key facilitators in measuring outcomes with people with aphasia, including “social/professional role and identity”, “optimism” and “emotion”. These domains are considered important in the uptake of aphasia practice guidelines (Young *et al.*, 2018), as understanding ones’ role in measuring outcomes is more likely to result in the uptake of clinical recommendations outlining outcome measurement practice. Similarly, feeling optimistic and comfortable in the use of outcome measures with people with aphasia is more likely to promote adherence to clinical recommendations. Arnold *et al.* (2020) presented similar findings in their study, with a strong level of agreement amongst Australian speech-language-pathologists that, as clinicians working with people with aphasia, measuring outcomes is part of their role and responsibility. “Optimism” and “emotion” also appear to be frequently reported facilitators in aphasia studies (Arnold *et al.*, 2020; Young *et al.*, 2018). These findings reveal a general consensus that clinicians feel optimistic and comfortable in measuring outcomes with people with aphasia, and understand that it is part of their role and responsibility.

### ***Comparison of barriers and facilitators in English- versus non-English-speaking countries***

The primary hypothesis for this study was that clinicians from non-English-speaking countries would face more barriers than clinicians from English-speaking countries in outcome measurement with people with aphasia. However, the findings did not support this

hypothesis and instead revealed parallel results in mean total barrier scores between English- and non-English-speaking groups. Whilst limited, previous literature indicates the presence of additional challenges for clinicians working with people with aphasia in non-English-speaking countries due to poor availability of resources, particularly assessments, in languages other than English (Fyndanis et al., 2017; Ivanova & Hallowell, 2013; Kong, 2011). This was therefore an unexpected finding and was contrary to the hypothesis of the study.

In the present study, similarities were found in the TDF domains with the lowest mean scores identified by clinicians from English- and non-English-speaking countries. Both groups identified “environmental context and resources”, “behavioural regulation”, and “skills” as the three TDF domains with the lowest mean scores. This closely aligns with international literature exploring the barriers to outcome measurement in more general allied health practice in non-English-speaking countries, including the Netherlands and Saudi Arabia, which identify inadequate time and facilities, unavailability and impracticability of outcome measurement tools, and limited skills in performing using outcome measures (Al-Muqiren et al., 2017; Swinkels et al., 2011). Furthermore, aphasia studies conducted in Finland and Sweden have also identified insufficient resources (Persson et al., 2021) and limited training (Kippli et al., 2012) as key challenges to implementing and maintaining current best practice. Studies investigating aphasia practice in English-speaking countries have also identified challenges associated with time constraints and organisational boundaries (Law et al., 2009), as well as insufficient clinical skills, resources, and training needed to implement aphasia practice guidelines (Cruice et al., 2020; Hadely et al., 2014; Trebilcock et al., 2019). More broadly, studies involving other allied health practices have presented similar challenges, including appropriateness of resources, insufficient skills in scoring and interpreting outcome measurement results (Jette et al., 2009), time constraints, poor

organisational systems to determine which measures to use, and poor accessibility of outcome measures (Duncan & Murray, 2012; Kall et al., 2016; Maher & Williams, 2005). Findings from the current study, which support and build on previous literature, indicate that clinicians from English- and non-English-speaking countries face similar challenges in measuring outcomes with people with aphasia, including environmental and contextual constraints, limited skills and insufficient personal and workplace systems in outcome measurement practice.

Common facilitators were also found across English- and non-English-speaking countries in the present study, including “social/professional role and identity” and “optimism”. “Intentions” and “emotion” were also considered as facilitators by clinicians from non-English-speaking countries, indicating that they have strong intentions to conduct outcome measures, and that they feel comfortable and enjoy measuring outcomes with people with aphasia. Similarly, these domains were rated highly by clinicians from English-speaking countries, who also identified “beliefs about consequences” as a key facilitator. The facilitators identified by clinicians from both English- and non-English-speaking countries have been frequently identified in other aphasia studies involving participants from English-speaking countries (Arnold et al., 2020; Trebilcock et al., 2019; Young et al., 2018). However, limited literature exists regarding the facilitators in aphasia practice for clinicians in other languages.

### ***Developing tailored implementation strategies Mapping findings onto the BCW***

From the key barriers identified in this study (i.e., the TDF domains with the lowest mean scores), it is possible to determine potentially relevant implementation strategies. Specifically, Michie and colleagues (2014) describe how the TDF domains relate to the BCW and subsequent BCTs can subsequently guide selection of Behaviour Change Techniques (BCTs). The BCTs corresponding to each of the three lowest-scoring TDF domains with the

lowest mean scores within the current study could then be used to develop tailored implementation strategies to reduce or eliminate identified challenges, in order to facilitate and improve uptake of clinical recommendations for outcome measurement in aphasia practice. Examples of BCTs for challenges associated with “environmental context and resources” challenges in the current study could include restructuring the physical and social environment (such as providing access to culturally appropriate and translated measurement tools, and identifying local champions to promote outcome measurement within services) , reducing exposure to cues for poor outcome measurement practice, and introducing prompts/cues to facilitate recommended outcome measurement practice (such as developing protocols, checklists or assessment reporting templates). To reduce barriers associated with “behavioural regulation”, a method for clinicians to monitor and record consequences of performing appropriate (culture- and language-specific) outcome measures could be established. BCT’s corresponding to the “skills” domain includes behavioural instruction, demonstration and practice opportunities, whereby clinicians could increase their skills through training that encompasses practicing and performing achievable tasks of increasing difficulty. These potential implementation strategies require further development and refinement in future research. clinicians rehearsing and repeating appropriate outcome measurement practice, and performing achievable tasks of increasing difficulty.

### ***Strengths and limitations***

This study filled a large gap in current literature regarding outcome measurement in international aphasia practice. The overall sample size was adequate to control for statistically significant results, and use of the TDF enabled identification of barriers and facilitators in order to promote the development of a tailored intervention strategy to improve uptake of clinical recommendations. However, there were some limitations that may have affected the accuracy and validity of the results. The number of participants from each country varied



greatly, and therefore results may not be equally representative of clinicians from all countries. Additionally, the number of statements per TDF domain differed within the survey. Therefore, some domains may not be as equally represented as domains comprising a larger number of TDF statements. As the countries were dichotomised into English- and non-English-speaking categories, the assumption that there is homogeneity within each of the distinct groups may also be a limitation. There is potential bias resultant from the sampling method chosen, as clinicians who chose to partake in the study about measuring outcomes are likely motivated with positive attitudes and could be more likely to already perform outcome measures in their clinical practice. Similarly, there is limited knowledge about the individual participants and their experience with engaging in professional development activities such as attending conferences on aphasia management and specialised research on outcome measurement practices. Questions were predominantly multiple-choice and rating scales. Acquiescence bias was avoided by: (a) enabling free text entry on questions by selecting an “other” response; and (b) by allowing participants to progress through the survey without answering all questions. It must be acknowledged, however, that the use of multiple-choice questions may have limited the completeness of participant responses and the results of this research should be viewed with this limitation in mind. Whilst there were some questions eliciting open text responses, the survey comprised a majority of multiple-choice selections. This may have limited the detail and accuracy of responses, as selection lists within the questions may not have been exhaustive. Second, by providing options for clinicians to select may have influenced clinicians to select options that they may not have otherwise identified, and may therefore have chosen the answer reflective of their practices, rather than what they think is the correct answer. Third, a set list of potential pre-determined influencing factors (TDF statements) was used in the survey to identify barriers and facilitators, which may have also impacted detail and comprehensiveness of results. Similarly, as the survey was

disseminated in only three languages, it is possible that clinicians who primarily speak another language may have had difficulty comprehending and answering survey questions, thus potentially affecting validity and accuracy of results.

### ***Future research***

Whilst this study founded the initial stages of developing an implementation plan, future research could further develop and refine the proposed strategies. The unexpected contrast of results with the hypothesis may indicate a need for further investigation into the comparison of challenges identified by English- and non-English speaking-countries. Ideally, future research should focus on comparisons across individual languages and countries. Further analyses of potential correlations between other participant characteristics (i.e., participants' motivation and attitudes, settings in which participants worked and stage post-stroke of their clients with aphasia) and barrier scores could provide additional insight into clinician behaviour in outcome measurement. A qualitative investigation comprising in-depth interviewing may supplement this study and enable a more comprehensive view of perceived influencing factors to measuring outcomes. The current study aimed to explore overall barriers and facilitators to outcome measurement with people with aphasia. Further research could therefore aim to explore international use and access to specific outcome measurement recommendations and protocols, such as the Research Outcome Measurement in Aphasia (ROMA) initiative (Wallace et al., 2019). Additionally, this study identified a number of disciplines outside Speech-Language-Pathology involved in aphasia rehabilitation. The impact of this on international consistency in clinical practice for aphasia rehabilitation should therefore be investigated.

### **Conclusion**

Overall, clinicians are measuring outcomes with people with aphasia in international practice. There is a general consensus amongst clinicians from English- and non-English-

speaking countries that they feel optimistic and comfortable in measuring outcomes with people with aphasia, and understand it is part of their role and responsibility. Clinicians tend to face challenges associated with availability of resources, time constraints, caseload priorities, training, and workplace and personal systems to measuring outcomes. A number of strategies, such as: providing access to culturally appropriate measurement tools, promoting outcome measurement within services, introducing protocols, checklists or templates for outcome measurement, incorporating demonstration and practice opportunities within training sessions for measuring outcomes, restructuring the physical and social environment, reducing exposure to cues for poor outcome measurement practice, introducing cues to facilitate recommended outcome measurement practice, recording consequences of performing outcome measures, rehearsing appropriate outcome measurement practice, and performing achievable tasks of increasing difficulty, can be used by clinicians to reduce these barriers and facilitate uptake of clinical recommendations to measuring outcomes with people with aphasia.

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### **Declaration of statement of interest**

The authors declare no conflicts of interest.

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## **Appendices**

### *Appendix 1: Survey*

## **Aphasia Outcome Measurement in Clinical Practice: An International Survey**

### **About this study**

We would like to invite you to take part in this study. Before you decide it is important for you to understand why the research is being done and what it will involve.

This study aims to explore current outcome measurement practices amongst clinicians who work with people with aphasia. Specifically, we aim to determine:

- (1) when and how clinicians measure outcomes;
- (2) factors which influence the selection of outcome measures; and
- (3) perceived barriers and facilitators to outcome measurement in clinical practice.

To participate in this study, you must work clinically with people with aphasia and/or their significant others.

The survey will take 10-30 minutes to complete. You can complete the survey over several sittings if you need or want to.

This study adheres to the guidelines of the ethical review process of The University of Queensland and the National Statement on Ethical Conduct in Human Research. Participation in this study is entirely voluntary.

Participant responses will be exported to a secure network drive maintained by The University of Queensland, which can only be accessed by the principal researchers. The full participant information sheet can be accessed [here](#)

### **Consent**

PICF attached here, and provided in text.

Q1

Do you consent to take part in the research project titled: “Aphasia outcome measurement in clinical practice”?

☐ Yes (1)

☐ No (2)

If you cannot complete this survey in English, you may request a translated version of the survey. Do you require a translated version of this survey?

☐ Yes (specify language) (4)

☐ No, I can complete it in English (5)

Q2 Please select your age range.

☐ 18-24 (1)

☐ 25-34 (2)

☐ 35-44 (3)

☐ 45-54 (4)

☐ 55-64 (5)

☐ 65+ (6)

Q3 Please select your gender.

☐ Male (1)

☐ Female (2)

☐ Other (3)

☐ Prefer not to say (4)

Q4 Please select the country that you work in.

▼ Afghanistan (1) ... Zimbabwe (196)

Q5 What is your discipline background? (You may select more than one)

- ☐ Speech pathologist / speech therapist / speech language pathologist / speech language therapist (1)
- ☐ pathologist / speech language therapist (2)
- ☐ Clinical linguist (3)
- ☐ Other (please describe) (4)

Q6 Please select the highest level of education you have completed.

- ☐ Bachelor degree (1)
- ☐ Honours degree (2)
- ☐ Graduate certificate/diploma (3)
- ☐ Postgraduate/Masters degree (4)
- ☐ PhD (5)

Q7

Please select the number of years that you have worked clinically with people with aphasia/their significant others

- ☐ Less than 1 year (1)
- ☐ 1-3 years (2)
- ☐ 4-5 years (3)
- ☐ 6-10 years (4)
- ☐ 11-15 years (5)
- ☐ 16-20 years (6)
- ☐ Over 20 years (7)

Q8

Which of the following best describes the setting in which you currently see most of your clients with aphasia?

- ☐ Hospital - Acute service (accepts patients acutely but discharges early, usually within 7 days) (1)
  - ☐ Hospital - Inpatient rehabilitation service (7)
  - ☐ Community rehabilitation - Day hospital or outpatients or community centre or home based care (8)
  - ☐ Residential (aged) care service (11)
  - ☐ TeleHealth/ TeleRehabilitation service (12)
  - ☐ University clinic (13)
  - ☐ Private practice (14)
  - ☐ Other (Please specify below) (15)
- 

Q9 At what stage post-stroke are most of your clients with aphasia?

- ☐ Hyperacute (1)
- ☐ Acute (1 day to 7 days) (2)
- ☐ Early sub-acute (1 week to 3 months) (3)
- ☐ Late subacute (3 months to 6 months) (4)
- ☐ Chronic (>6 months) (5)

Q10 Do you measure outcomes for your clients with aphasia?

- ☐ Always (1)
- ☐ Often (2)
- ☐ Sometimes (3)
- ☐ Rarely (4)
- ☐ Never (5)

Q11

Please rate your agreement with the following statements. I measure outcomes with people with aphasia to:



	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)
Demonstrate the effectiveness of my intervention (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluate the need for ongoing intervention (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Measure progress (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help direct the plan of care (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plan effective rehabilitation intervention (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance communication within multi- disciplinary team/ other health care professionals (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify the patient's strengths (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify the patient's problems (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Focus the intervention (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motivate the patient (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance communication with the patient (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Enhance communication with patient's family (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comply with clinical guidelines (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inform discussions about prognosis (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adhere with workplace requirements (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support my decision making (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify) (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12

What best describes the main approach to selecting outcome measures for clients with aphasia in your workplace?

- ☐ There is a standard approach to outcome measurement in my workplaces (e.g. a specific set of outcome measures is used by all speech pathologists). (1)
- ☐ Each speech pathologists choose their own outcome measures. (2)
- ☐ Some outcome measures are required by my workplace, some are chosen by the treating speech pathologist. (3)
- ☐ Outcome measurement is not routinely performed. (4)
- ☐ Other (please specify) (5)

Q13

What factors are most important when choosing an outcome measure for a client with aphasia? Please rate the importance of the following:

	Essential (1)	Important but not essential (2)	Not important (3)
Can capture change (sensitive or responsive to change). (239)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Measures what it says it measures (valid). (240)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Produces the same results regardless of who administers it (reliable). (241)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy to administer. (242)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quick to administer. (243)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Does not require training. (244)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost (245)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consistent with what other speech pathologists are using. (246)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training is available. (247)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Captures outcomes which are important to my client. (248)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aphasia friendly. (249)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy to score, analyse and interpret. (250)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multimodality of the measure. (251)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify) (252)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14 When do you usually measure outcomes with people with aphasia?

- ☐ On admission and prior to discharge (1)
- ☐ At regular time-points in relation to the client's time post-onset (2)
- ☐ At the beginning and end of a pre-determined therapy block (3)

Q15 Do you measure outcomes for the carers/significant others of your clients with aphasia?

- ☐ Always (1)
- ☐ Often (2)
- ☐ Sometimes (3)
- ☐ Rarely (4)
- ☐ Never (5)

Q16

The next question is the last question in this survey. This question relates to barriers and facilitators to outcome measurement in clinical practice. There are 39 statements to rate. This information will be used to design a framework to guide and support aphasia outcome measurement in clinical practice.

Q17

Please read each statement and then select the response that indicates the extent to which you agree or disagree.

	Strongly agree (1)	Agree (2)	Neither agree not disagree (3)	Disagree (4)	Strongly disagree (5)
Recommendations are readily available for outcome measurement with people with aphasia. (14148)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am familiar with the evidence for outcome measurement with people with aphasia. (14149)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I would benefit from more training in outcome measurement with people with aphasia. (14150)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have prior experience in outcome measurement with people with aphasia. (14151)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia. (14152)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other healthcare professionals within the multidisciplinary stroke team recognise that my role includes outcome measurement with people with aphasia. (14153)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outcome measurement with people with aphasia is not part of my role. (14154)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am confident conducting outcome measurement with people with aphasia. (14155)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have found outcome measurement with people with aphasia difficult. (14156)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find outcome measurement with people with aphasia is challenging. (14157)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please read each statement and then select the response that indicates the extent to which you agree or disagree. (14158)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am doubtful that outcome measurement with people with aphasia will improve patient outcomes. (14159)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families. (14160)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that conducting outcome measurement with people with aphasia will disappoint them. (14161)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I believe that  
conducting  
outcome  
measurement with  
people with aphasia  
is a waste of time  
because they will  
not understand it.  
(14162)

☐ ☐ ☐ ☐ ☐

By conducting  
outcome  
measurement with  
people with aphasia  
more regularly, the  
more often I see  
that patients benefit  
from this  
information.  
(14163)

☐ ☐ ☐ ☐ ☐

There are incentives  
at my workplace for  
conducting  
outcome  
measurement with  
people with  
aphasia. (14164)

☐ ☐ ☐ ☐ ☐

I always intend to  
conduct outcome  
measurement with  
people with  
aphasia. (14165)

☐ ☐ ☐ ☐ ☐

Outcome  
measurement with  
people with aphasia  
is not a priority for  
me. (14166)

☐ ☐ ☐ ☐ ☐

I am working  
towards conducting  
outcome  
measurement with  
all patients with  
aphasia. (14167)

☐ ☐ ☐ ☐ ☐

Outcome  
measurement with  
people with aphasia  
is something I  
always do as part of  
my routine. (14168)

☐ ☐ ☐ ☐ ☐

I have reasons for sometimes not conducting outcome measurement with people with aphasia. (14169)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am consistent in conducting outcome measurement with people with aphasia. (14170)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have inadequate time for developing the resources necessary for outcome measurement with people with (14171)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
aphasia. (14172)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other caseload priorities prevent me from conducting outcome measurement with people with aphasia. (14173)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not have the necessary resources for conducting outcome measurement with people with aphasia. (14174)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outcome measurement is what patients with aphasia want. (14175)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My colleagues are consistently conducting outcome measurement with people with aphasia. (14176)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



My colleagues in the multidisciplinary or speech pathology teams are not supportive of me conducting outcome measurement with people with aphasia. (14177)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like conducting outcome measurement with people with aphasia. (14178)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not feel comfortable conducting outcome measurement with people with aphasia. (14179)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a clear system for checking if I have engaged in outcome measurement for each patient with aphasia. (14180)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My department has strategies for conducting outcome measurement with people with aphasia. (14181)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to align client goals with outcome measures. (14182)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know what factors to consider when choosing an outcome measure for people with aphasia. (14183)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention. (14184)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that conducting outcome measurement with people with aphasia will improve their motivation for therapy. (14185)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that outcome measurement with people with aphasia is important for therapy planning. (14186)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are too many outcome measures for people with aphasia to choose from. (14187)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not know which outcome measures to use. (14188)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have sufficient access to outcome measures in languages spoken by my clients with aphasia. (14189)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not know how to deal/which outcome measures to use with PWA who speak two or more languages". (14190)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I believe that for bilingual or multilingual speakers with aphasia there is no need for outcome measurement of all the languages they speak. (14192)

☐☐☐☐☐

I have sufficient training/information about the resources and outcome measures available in the languages of my clients with aphasia. (14193)

☐☐☐☐☐

I find it difficult to measure outcome in tasks involving open questions, discourse production or narration. (14194)

☐☐☐☐☐

Thank you for your time completing this survey. If you have any questions or comments please contact Dr Sarah Wallace by email at [s.wallace3@uq.edu.au](mailto:s.wallace3@uq.edu.au)

NEW SURVEY LINK HERE TO COLLECT THE FOLLOWING PERSONAL DATA

Q1

If you would like to receive a summary of the outcomes of this research please provide your email address here.

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Q2

If you would like to receive a translated survey for this research please provide your email address here.

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***Appendix 2:*** *Table representing TDF statements and domains with level of agreement, mean and median scores.*

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
1) Knowledge		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	I am familiar with the evidence for outcome measurement with people with aphasia	34 (16.3%)	83 (39.9 %)	32 (15.4%)	39 (18.8%)	3 (1.4%)	17 (8.2%)	74 (38.7%)	117 (61.3%)	3.55	4
	I do not know which outcome measures to use (R)	6 (2.9%)	33 (15.9 %)	33 (15.9%)	71 (24.1%)	43 (20.7%)	22 (20.5%)	147 (60.7%) *39 (18.8%)	39 (18.8%) *147 (60.7%)	3.6*	4*
	I know what factors to consider when choosing an outcome measure for people with aphasia	42 (20.2%)	99 (47.6 %)	27 (13%)	20 (9.6%)	3 (1.4%)	17 (8.2%)	50 (42.7%)	141 (73.8%)	3.8	4
	Average domain score (n/a removed & R statement scores reversed for overall agreement)							54.3	135	3.65	-
2) Skills	I would benefit from more training in outcome measurement with people with aphasia (R)	48 (23.1%)	93 (44.7 %)	40 (19.2%)	8 (3.8%)	2 (1%)	17 (8.2%)	50 (24%) *141 (67.8%)	141 (67.8%) *50 (24%)	*2.07	2*
	I have prior experience in outcome measurement with people with aphasia	52 (25%)	112 (53.8 %)	11 (5.3%)	11 (5.3%)	2 (1.4%)	20 (9.6%)	24 (12.8%)	164 (87.2%)	4.05	4
	I have sufficient training in the use of outcome measures with bilingual or multilingual people with aphasia	10 (4.8%)	18 (8.7%)	33 (15.9%)	70 (33.7%)	55 (26.4%)	22 (10.58% )	158 (84.9%)	28 (15.1%)	2.23	2
	I have the ski4ls necessary to align client goals with outcome measures	55 (26.4%)	105 (50.5 %)	19 (9.1%)	8 (3.8%)	2 (1%)	19 (9.1%)	29 (13.9%)	160 (84.7%)	4.07	2
	Average domain score (n/a removed & R statement scores reversed for overall agreement)							88	100.5	3.12	-

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median	
3) Social/ professional role and identity	Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia  Outcome measurement with people with aphasia is not part of my role (R)	5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		5	
		91 (43.8%)	82 (39.4%)	13 (6.3%)	2 (1%)	1 (0.5%)	19 (9.1%)	16 (8.47%)	173 (91.5%)	4.37		
		2 (1%)	3 (1.4%)	15 (7.2%)	40 (19.2%)	126 (60.6%)	22 (10.58%)	181 (87%) *5 (2.4%)	5 (2.4%) *181 (87%)	4.46*		5*
		Average domain score (n/a removed & R statement scores reversed for overall agreement)								10.5		177
4) Beliefs about capabilities	I do not have the confidence to select which outcome measures to use with bilingual or multilingual people with aphasia (R)	26 (12.5%)	74 (35.6%)	33 (15.9%)	31 (14.9%)	23 (11.1%)	21 (10.1%)	87 (41.9%) *100 (48.1%)	100 (48.1%) *87 (41.9%)	1.99*	2*	
	I am confident in my ability to conduct outcome measurement with people with aphasia	52 (25%)	98 (47.1%)	24 (11.5%)	15 (7.2%)	0 (0.0%)	19 (9.1%)	39 (18.7%)	150 (72.1%)	3.99	4	
	I have found outcome measurement with people with aphasia difficult (R)	8 (3.8%)	55 (26.4%)	35 (16.8%)	65 (31.3%)	26 (12.5%)	19 (9.1%)	126 (60.4%) *63 (30.2%)	63 (30.2%) *126 (60.4%)	3.24*	4*	
	I have little control over which outcome measures I use with people with aphasia (R)	7 (3.4%)	25 (12%)	34 (16.3%)	63 (30.3%)	56 (26.9%)	22 (10.6%)	153 (73.5%) *32 (15.4%)	32 (15.4%) *153 (73.5%)	3.72*	4*	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								58.5	83	3.25	-

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median	
5) Optimism	I am optimistic that I will be able to conduct outcome measures with people with aphasia in the future	5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		4	
		66 (31.7%)	93 (44.7%)	22 (10.6%)	5 (2.4%)	0 (0.0%)	22 (10.6%)	27 (13%)	159 (76.4%)	4.18		
6) Beliefs about consequences	Average domain score (n/a removed & R statement scores reversed for overall agreement)											
	I believe that outcome measurement with people with aphasia is important for therapy planning	91 (43.8%)	81 (38.9%)	13 (6.3%)	2 (1%)	2 (1%)	19 (9.1%)	17 (16.4%)	172 (82.7%)	4.36	5	
	I believe that conducting measurement with people with aphasia will improve their motivation for therapy	48 (23.1%)	98 (47.1%)	37 (17.8%)	6 (2.9%)	2 (1%)	17 (8.2%)	45 (22.7%)	146 (70.2%)	3.96	4	
	I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention	74 (35.6%)	87 (41.8%)	19 (9.1%)	9 (4.3%)	2 (1%)	17 (8.2%)	30 (14.4%)	161 (77.4%)	4.16	4	
	I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families	56 (26.9%)	97 (46.4%)	29 (13.9%)	5 (2.4%)	3 (1.4%)	18 (8.7%)	37 (17.7%)	153 (73.3%)	4.04	4	
	I am doubtful that outcome measurement with people with aphasia will improve patient outcomes (R)	3 (1.4%)	13 (6.3%)	24 (11.5%)	73 (35.1%)	74 (35.6%)	21 (10.1%)	171 (82.2%) *16 (7.7%)	16 (7.7%) *171 (82.2%)	4.08*	1*	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)											
		29								160.6	4.12	-

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median
7) Reinforcement	There are incentives at my workplace for conducting outcome measurement with people with aphasia  Seeing the benefits of outcome measurement with people with aphasia is rewarding	5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
		5 (2.4%)	19 (9.1%)	40 (19.2%)	60 (28.8%)	47 (22.6%)	37 (17.8%)	147 (70.6%)	24 (11.5%)	2.27	2
		80 (38.5%)	85 (40.9%)	19 (9.1%)	3 (1.4%)	0 (0.0%)	21 (10.1%)	22 (10.5%)	165 (79.4%)	4.30	4
		Average domain score (n/a removed & R statement scores reversed for overall agreement)								84.5	94.5
8) Intentions	I always intend to conduct outcome measurement with people with aphasia	67 (32.2%)	95 (45.7%)	19 (9.1%)	7 (3.4%)	2 (1%)	18 (8.7%)	28 (13.5%)	162 (77.9%)	4.15	4
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								28	162	4.14
9) Goals	I am working towards conducting outcome measures with all patients with aphasia.	54 (26%)	76 (36.5%)	31 (14.9%)	17 (8.2%)	3 (1.4%)	27 (13%)	51 (24.5%)	130 (62.5%)	3.89	4
	There are other aspects of my role that are more urgent than conducting outcome measurement with people with aphasia (R)	20 (9.6%)	47 (22.6%)	52 (25%)	45 (21.6%)	27 (13%)	17 (8.2%)	124 (59.6%) *67	67 (32.2%) *124	3.06*	3
	Outcome measurement with people with aphasia is not part of my role. (R)	2 (1%)	3 (1.4%)	15 (7.2%)	40 (19.2%)	125 (60.1%)	23 (11.1%)	180 (97.3%) *5	5 (2.7%) *180	4.5*	5
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								87.5	98.5	3.48
10) Memory, attention and	I have reasons for sometimes not conducting outcome measurement with people with aphasia	14 (6.7%)	97 (46.6%)	28 (13.5%)	33 (15.9%)	16 (7.7%)	20 (9.6%)	77 (37.1%)	111 (53.3%)	3.31	4



Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median	
decision processes		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A			
	Outcome measurement with people with aphasia is something I always do as part of my routine	47 (22.6%)	73 (35.1 %)	29 (13.9%)	35 (16.8%)	5 (2.4%)	19 (9.1%)	69 (33.1%)	120 (57.7%)	3.64	2	
	I sometimes forget to conduct outcome measurement with people with aphasia (R)	8 (3.8%)	46 (22.1 %)	35 (16.8%)	49 (23.6%)	47 (22.6%)	23 (11%)	131 (63%) *54 (25.9%) *131 (63%)	54 (25.9%) *131 (63%)	3.43*	2*	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)										3.46	-
	11) Environmental context and resources	I have sufficient access to outcome measures in languages spoken by my clients with aphasia	13 (6.3%)	42 (20.2 %)	37 (17.8%)	66 (31.7%)	29 (13.9%)	21 (10.1%)	132 (63.4%)	55 (26.5%)	2.7	2
	In the organization I work, all necessary resources are available for conducting outcome measures with people with aphasia	26 (12.5%)	53 (25.5 %)	37 (17.8%)	42 (20.2%)	23 (11.1%)	27 (13%)	102 (49.1%)	79 (38%)	3.09	3	
	I have insufficient time to conduct outcome measurement with people with aphasia (R)	19 (9.1%)	48 (23.1 %)	38 (18.3%)	58 (27.9%)	26 (12.5%)	19 (9.1%)	122 (58.7%) *67 (32.2%)	67 (32.2%) *122 (58.7%)	3.13*	4*	
	Other caseload priorities prevent me from conducting outcome measurement with people with aphasia (R)	16 (7.7%)	45 (21.6 %)	40 (19.2%)	50 (24%)	33 (15.9%)	24 (11.5%)	123 (59.1%) *61 (29.3%)	61 (29.3%) *123 (59.1%)	3.21*	4*	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)										3.03	-
12) Social influences	My colleagues are consistently conducting outcome measurement with people with aphasia	18 (8.7%)	49 (23.6 %)	43 (20.7%)	55 (26.4%)	17 (8.2%)	26 (12.5%)	115 (55.3%)	67 (32.3%)	2.98	2	

Domain	TDF Survey Statements	Number of participants (%) n=208								Mean	Median	
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A			
	My colleagues in the multidisciplinary or speech pathology team are not supportive of me conducting outcome measurement with people with aphasia (R)	5 (2.4%)	14 (6.7%)	25 (12%)	56 (26.9%)	75 (36.1%)	33 (15.9%)	156 (75%)* 19 (9.1%)	19 (9.1%)* 156 (75%)*	4.04*	5*	
	Outcome measurement is what patients with aphasia want	13 (6.3%)	51 (24.5%)	93 (44.7%)	26 (12.5%)	8 (3.8%)	17 (8.2%)	127 (61%)	64 (30.8)	3.18	3	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								87	95.67	3.4	-
	13) Emotion	I do not feel comfortable conducting outcome measurement with people with aphasia (R)	0 (0.0%)	8 (3.8%)	20 (9.6%)	74 (35.6%)	83 (39.9%)	23 (11%)	177 (95.7%)* 8 (3.8%)* 177 (95.7%)*	8 (3.8%)* 177 (95.7%)*	4.25	1
	I like conducting outcome measurement with people with aphasia	58 (27.9%)	87 (41.8%)	36 (17.3%)	7 (3.4%)	0	20 (9.6%)	43 (20.7%)	145 (69.7%)	4.04	2	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								25.5	161	4.15	-
	14) Behavioural regulation	My workplace has strategies for conducting outcome measurement with people with aphasia	24 (11.5%)	53 (25.5%)	28 (13.5%)	52 (25%)	19 (9.1%)	32 (15.4%)	99 (47.6%)	77 (37%)	3.06	4
	I have a clear system for checking if I have conducted outcome measurement for each patient with aphasia	24 (11.5%)	52 (25%)	36 (17.3%)	59 (28.4%)	14 (6.7%)	23 (11%)	109 (52.4%)	76 (36.5%)	3.07	2	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								104	76.5	3.07	-

Number of participants selecting each level of agreement with TDF statements for each domain and associated means and medians. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree; (R)=reversed results; <A = Less than agreement (Strongly disagree, Disagree, neither agree nor disagree); A = Agreement (Agree, Strongly Agree). Barrier =  $\leq 3$ , facilitator =  $> 3$

**Appendix 3: Table representing TDF statements and domains with level of agreement, mean and median scores for participants from English-speaking countries only.**

Domain	TDF Survey Statements	Number of participants (%) n=114									Mean	Median
1) Knowledge	I am familiar with the evidence for outcome measurement with people with aphasia  I do not know which outcome measures to use (R)	5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A	3.45	4	
		16 (14%)	48 (42.1%)	19 (16.7%)	24 (21.1%)	3 (2.6%)	4 (3.5%)	46 (41.8%)	64 (58.2%)			
		3 (2.6%)	24 (21.1%)	19 (16.7%)	42 (36.8%)	20 (17.5%)	6 (5.3%)	81 (75%)*27 (25%)	27 (25%)*81 (75%)			
	I know what factors to consider when choosing an outcome measure for people with aphasia	20 (17.5%)	55 (48.2%)	19 (16.7%)	16 (14%)	0 (0%)	4 (3.5%)	35 (31.8%)	75 (68.2%)	3.72	4	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)							36 (33%)	73.3 (67%)	3.55	-	
2) Skills	I would benefit from more training in outcome measurement with people with aphasia (R)  I have prior experience in outcome measurement with people with aphasia  I have sufficient training in the use of outcome measures with	23 (20.2%)	66 (57.9%)	14 (12.3%)	5 (4.4%)	2 (1.8%)	4 (3.5%)	21 (19.1%)*89 (80.9%)	89 (80.9%)*21 (19.1%)	2.06*	2*	
		29 (25.4%)	72 (63.2%)	3 (2.6%)	6 (5.3%)	0 (0%)	4 (3.5%)	9 (8.2%)	101 (91.8%)			
		6 (5.3%)	7 (6.1%)	16 (14%)	43 (37.7%)	34 (29.8%)	8 (7%)	93 (87.7%)	13 (12.3%)			

Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
	bilingual or multilingual people with aphasia										
	I have the skills necessary to align client goals with outcome measures	32 (28.1%)	66 (57.9%)	7 (6.1%)	5 (4.4%)	0 (0%)	4 (3.5%)	12 (10.9%)	98 (89.1%)	4.14	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>46.56%</b>	<b>53.44%</b>	<b>3.12</b>	
3) Social/ professional role and identity	Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia	47 (41.2%)	51 (44.7%)	8 (7%)	2 (1.8%)	1 (0.9%)	5 (4.4%)	11 (10.1%)	98 (89.9%)	4.29	4
	Outcome measurement with people with aphasia is not part of my role (R)	0 (0%)	2 (1.8%)	9 (7.9%)	31 (27.2%)	65 (57%)	7 (6.1%)	105 (98.1%) *2 (1.9%)	2 (1.9%) *105 (98.1%)	4.49*	5*
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>6.02%</b>	<b>93.98%</b>	<b>4.39</b>	
4) Beliefs about capabilities	I do not have the confidence to select which outcome measures to use with bilingual or multilingual people with aphasia (R)	15 (13.2%)	49 (43%)	20 (17.5%)	15 (13.2%)	7 (6.1%)	8 (7%)	42 (39.6%) *64 (60.4%)	64 (60.4%) *42 (39.6%)	2.52*	2
	I am confident in my ability to conduct outcome measurement with people with aphasia	28 (24.6%)	58 (50.9%)	13 (11.4%)	10 (8.8%)	0 (0%)	5 (4.4%)	23 (21.1%)	86 (78.9%)	3.95	4
	I have found outcome measurement with people with aphasia difficult (R)	4 (3.5%)	38 (33.3%)	20 (17.5%)	37 (32.5%)	11 (9.6%)	4 (3.5%)	68 (61.8%) *42 (38.2%)	42 (38.2%) *68 (61.8%)	3.12*	2
	I have little control over which outcome measures I use with people with aphasia (R)	3 (2.6%)	16 (14%)	22 (19.3%)	39 (34.2%)	29 (25.4%)	5 (4.4%)	90 (82.6%) *19 (17.4%)	19 (17.4%) *90 (82.6%)	3.69*	4
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>34.1%</b>	<b>65.9%</b>	<b>3.32</b>	

Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median
5) Optimism	I am optimistic that I will be able to conduct outcome measures with people with aphasia in the future	5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A		
		38 (33.3%)	52 (45.6%)	15 (13.2%)	2 (1.8%)	0 (0%)	7 (6.1%)	17 (15.9%)	90 (84.1%)	4.18	4
6) Beliefs about consequences	Average domain score (n/a removed & R statement scores reversed for overall agreement)										
	I believe that outcome measurement with people with aphasia is important for therapy planning	48 (42.1%)	51 (44.7%)	9 (7.9%)	1 (0.9%)	1 (0.9%)	4 (3.5%)	11 (10%)	99 (90%)	4.3	4
	I believe that conducting measurement with people with aphasia will improve their motivation for therapy	27 (23.7%)	57 (50%)	21 (18.4%)	3 (2.6%)	2 (1.8%)	4 (3.5%)	26 (23.6%)	84 (76.4%)	3.95	4
	I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention	36 (31.6%)	58 (50.9%)	8 (7%)	7 (6.1%)	1 (0.9%)	4 (3.5%)	16 (14.5%)	94 (85.5%)	4.1	4
	I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families	33 (28.9%)	58 (50.9%)	15 (13.2%)	2 (1.8%)	2 (1.8%)	4 (3.5%)	19 (17.3%)	91 (82.7%)	4.07	4
	I am doubtful that outcome measurement with people with aphasia will improve patient outcomes (R)	1 (0.9%)	8 (7%)	14 (12.3%)	46 (40.4%)	39 (34.2%)	6 (5.3%)	99 (91.7%)* <sub>9</sub> (8.3%)* <sub>99</sub>	9 (8.3%)* <sub>99</sub> (91.7%)* <sub>99</sub>	4.06*	4*
Average domain score (n/a removed & R statement scores reversed for overall agreement)											
	There are incentives at my workplace for conducting	2 (1.8%)	9 (7.9%)	23 (20.2%)	42 (36.8%)	30 (26.3%)	8 (7%)	95 (89.6%)	11 (0.4%)	2.16	2

Domain	TDF Survey Statements	Number of participants (%) n=114										Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A				
7) Reinforcement	outcome measurement with people with aphasia												
	Seeing the benefits of outcome measurement with people with aphasia is rewarding	45 (39.5%)	48 (42.1%)	12 (10.5%)	3 (2.6%)	0 (0%)	6 (5.3%)	15 (13.9%)	93 (86.1%)	4.25	4		
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>51.4</b>	<b>48.6</b>	<b>3.2</b>			
8) Intentions	I always intend to conduct outcome measurement with people with aphasia	31 (27.2%)	63 (55.3%)	10 (8.8%)	4 (3.5%)	2 (1.8%)	4 (3.5%)	16 (14.5%)	94 (85.5%)	4.06	4		
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>14.5</b>	<b>85.5</b>	<b>4.06</b>			
9) Goals	I am working towards conducting outcome measures with all patients with aphasia.	29 (25.4%)	49 (43%)	16 (14%)	8 (7%)	2 (1.8%)	10 (8.8%)	26 (25%)	78 (75%)	3.91	4		
	There are other aspects of my role that are more urgent than conducting outcome measurement with people with aphasia (R)	12 (10.5%)	29 (25.4%)	31 (27.2%)	22 (19.3%)	16 (14%)	4 (3.5%)	69 (62.7%) *41 (37.3%)	41 (37.3%) *69 (62.7%)	3.01*	3		
	Outcome measurement with people with aphasia is not a priority for me. (R)	0 (0%)	9 (7.9%)	11 (9.6%)	42 (36.8%)	45 (39.5%)	7 (6.1%)	98 (91.6%) *9 (8.4%)	9 (8.4%) *98 (91.6%)	4.15*	4*		
	<b>Average domain score (n/a removed &amp; R statement scores reversed for overall agreement)</b>							<b>23.68</b>	<b>76.32</b>	<b>3.69</b>	-		
10) Memory, attention and decision processes	I have reasons for sometimes not conducting outcome measurement with people with aphasia	9 (7.9%)	58 (50.9%)	15 (13.2%)	19 (16.7%)	8 (7%)	5 (4.4%)	42 (38.5%)	67 (61.5%)	3.38	4		
	Outcome measurement with people with aphasia is something I always do as part of my routine	21 (18.4%)	45 (39.5%)	16 (14%)	21 (21.1%)	2 (2.6%)	5 (4.4%)	39 (35.8%)	66 (60.6%)	3.52	4		

Domain	TDF Survey Statements	Number of participants (%) n=114										Mean	Median	
11) Environmental context and resources		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A					
	I sometimes forget to conduct outcome measurement with people with aphasia (R)	6 (5.3%)	31 (27.2%)	20 (17.5%)	30 (26.3%)	19 (16.7%)	8 (7%)	69 (65.1%) *37 (34.9%)	37 (34.9%) *69 (65.1%)	3.24*	2			
	Average domain score (n/a removed & R statement scores reversed for overall agreement)	36.36										63.32	3.38	-
	I have sufficient access to outcome measures in languages spoken by my clients with aphasia	8 (7%)	21 (18.4%)	22 (19.3%)	44 (38.6%)	13 (11.4%)	6 (5.3%)	79 (73.1%)	29 (26.9%)	2.69	2			
	In the organization I work, all necessary resources are available for conducting outcome measures with people with aphasia	13 (11.4%)	40 (35.1%)	20 (17.5%)	26 (22.8%)	9 (7.9%)	6 (5.3%)	55 (50.9%)	53 (49.1%)	3.2	3			
	I have insufficient time to conduct outcome measurement with people with aphasia (R)	15 (13.2%)	26 (22.8%)	20 (17.5%)	34 (29.8%)	14 (12.3%)	5 (4.4%)	68 (62.4%) *41 (37.6%)	41 (37.6%) *68 (62.4%)	3.06*	4*			
	Other caseload priorities prevent me from conducting outcome measurement with people with aphasia (R)	12 (10.5%)	30 (26.3%)	18 (15.8%)	28 (24.6%)	18 (15.8%)	8 (7%)	64 (60.4%) *42 (39.6%)	42 (39.6%) *64 (60.4%)	2.58*	2*			
12) Social influences	Average domain score (n/a removed & R statement scores reversed for overall agreement)	50.35										49.65	2.88	-
	My colleagues are consistently conducting outcome measurement with people with aphasia	10 (8.8%)	33 (28.9%)	24 (21.1%)	32 (28.1%)	11 (9.6%)	4 (3.5%)	67 (60.9%)	43 (39.1%)	2.99	3			
	My colleagues in the multidisciplinary or speech pathology team are not supportive of me conducting outcome measurement with people with aphasia (R)	2 (1.8%)	9 (7.9%)	13 (11.4%)	35 (30.7%)	41 (36%)	14 (12.3%)	89 (89%) *11 (11%)	11 (11%) *89 (89%)	4.04*	5			



Domain	TDF Survey Statements	Number of participants (%) n=114								Mean	Median	
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A			
	Outcome measurement is what patients with aphasia want	6 (5.3%)	29 (25.4%)	55 (48.2%)	14 (12.3%)	6 (5.3%)	4 (3.5%)	75 (68.2%)	35 (31.8%)	3.14	3	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								47.81	52.19	3.39	-
	13) Emotion	I do not feel comfortable conducting outcome measurement with people with aphasia (R)	0 (0%)	4 (3.5%)	11 (9.6%)	52 (45.6%)	38 (33.3%)	9 (7.9%)	101 (96.2%) *4 (3.8%)	4 (3.8%) *101 (96.2%)	4.18*	4*
	I like conducting outcome measurement with people with aphasia	27 (23.7%)	55 (48.2%)	22 (19.3%)	5 (4.4%)	0 (0%)	5 (4.4%)	27 (24.8%)	82 (75.2%)	3.95	4	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								14.49	85.51	4.07	-
	14) Behavioural regulation	My workplace has strategies for conducting outcome measurement with people with aphasia	14 (12.3%)	33 (28.9%)	20 (17.5%)	33 (28.9%)	8 (7%)	6 (5.3%)	61 (56.5%)	47 (43.5%)	3.11	3
	I have a clear system for checking if I have conducted outcome measurement for each patient with aphasia	10 (8.8%)	32 (28.1%)	23 (20.2%)	36 (31.6%)	7 (6.1%)	6 (5.3%)	66 (61.1%)	42 (38.9%)	3.02	3	
Average domain score (n/a removed & R statement scores reversed for overall agreement)										3.07	-	

Number of participants selecting each level of agreement with TDF statements for each domain and associated means and medians. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree; (R)=reversed results; <A = Less than agreement (Strongly disagree, Disagree, neither agree nor disagree); A = Agreement (Agree, Strongly Agree). Barrier = ≤3, facilitator = >3

**Appendix 4:** Table representing TDF statements and domains with level of agreement, mean and median scores for participants from non-English-speaking countries only

Domain	TDF Survey Statements	Number of participants (%) n=94									Mean	Median	
1) Knowledge		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A				
	I am familiar with the evidence for outcome measurement with people with aphasia	18 (19.1%)	35 (37.2%)	13 (13.8%)	15 (16%)	0 (0%)	13 (13.8%)	28 (34.6%)	53 (65.4%)	3.69	4		
	I do not know which outcome measures to use (R)	3 (3.2%)	9 (9.6%)	14 (14.9%)	29 (30.9%)	23 (24.5%)	16 (17%)	66 (84.6%) *12 (15.4%)	12 (15.4%) *66 (84.6%)	3.77*	3*		
	I know what factors to consider when choosing an outcome measure for people with aphasia	22 (23.4%)	44 (46.8%)	8 (8.5%)	4 (4.3%)	3 (3.2%)	13 (13.8%)	15 (18.5%)	66 (81.5%)	3.96	4		
Average domain score (n/a removed & R statement scores reversed for overall agreement)		22.92									77.08	3.8	-
2) Skills	I would benefit from more training in outcome measurement with people with aphasia (R)	25 (26.6%)	27 (28.7%)	26 (27.7%)	3 (3.2%)	0 (0%)	13 (13.8%)	29 (35.8%) *52 (64.2%)	52 (64.2%) *29 (35.8%)	2.09*	2*		
	I have prior experience in outcome measurement with people with aphasia	23 (24.5%)	40 (42.6%)	8 (8.5%)	5 (5.3%)	3 (3.2%)	15 (16%)	16 (20.3%)	63 (79.7%)	3.94	4		
	I have sufficient training in the use of outcome measures with bilingual or multilingual people with aphasia	4 (4.3%)	11 (11.7%)	17 (18.1%)	27 (28.7%)	21 (22.3%)	14 (14.9%)	65 (81.3%)	15 (18.8%)	2.38	2		

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median			
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A					
	I have the skills necessary to align client goals with outcome measures	23 (24.5%)	39 (41.5%)	12 (12.8%)	3 (3.2%)	2 (2.1%)	15 (16%)	17 (21.5%)	62 (78.5%)	3.99	4			
	Average domain score (n/a removed & R statement scores reversed for overall agreement)										47.02	52.98	3.1	-
	3) Social/ professional role and identity	Part of my responsibility as a speech pathologist includes outcome measurement with people with aphasia	44 (46.8%)	31 (33%)	5 (5.3%)	0 (0%)	0 (0%)	14 (14.9%)	5 (6.3%)	75 (93.8%)	4.5	5		
	Outcome measurement with people with aphasia is not part of my role (R)	2 (2.1%)	1 (1.1%)	6 (6.4%)	9 (9.6%)	61 (64.9%)	15 (16%)	76 (96.2%) *3 (3.8%)	3 (3.8%) *76 (96.2%)	4.6*	4*			
	Average domain score (n/a removed & R statement scores reversed for overall agreement)										5.03	94.97	4.55	-
	4) Beliefs about capabilities	I do not have the confidence to select which outcome measures to use with bilingual or multilingual people with aphasia (R)	11 (11.7%)	25 (26.6%)	13 (13.8%)	16 (17%)	16 (17%)	13 (13.8%)	45 (55.6%) *36 (44.5%)	36 (44.5%) *45 (55.6%)	3.01*	3*		
		I am confident in my ability to conduct outcome measurement with people with aphasia	24 (25.5%)	40 (42.6%)	11 (11.7%)	5 (5.3%)	0 (0%)	14 (14.9%)	16 (20%)	64 (80%)	4.04	4		
	I have found outcome measurement with people with aphasia difficult (R)	4 (4.3%)	17 (81.1%)	15 (16%)	28 (29.8%)	15 (16%)	15 (16%)	58 (73.4%) *21 (26.6%)	21 (26.6%) *58 (73.4%)	3.42*	4*			
	I have little control over which outcome measures I use with people with aphasia (R)	4 (4.3%)	9 (9.6%)	12 (12.8%)	24 (25.5%)	27 (28.7%)	18 (19.1%)	63 (82.9%) *13 (17.1%)	13 (17.1%) *63 (82.9%)	3.66*	5*			
	Average domain score (n/a removed & R statement scores reversed for overall agreement)										27.22	72.78	3.53	-
	5) Optimism	I am optimistic that I will be able to conduct outcome measures	28	41	7 (7.4%)	3 (3.2%)	0 (0%)	15 (16%)	10 (12.7%)	69 (87.3%)	4.19	4		

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median	
		5 strongly agree (29.8%)	4 agree (43.6%)	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A			
	with people with aphasia in the future											
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								12.66	87.34	4.19	-
6) Beliefs about consequences	I believe that outcome measurement with people with aphasia is important for therapy planning	43 (45.7%)	30 (31.9%)	4 (4.3%)	1 (1.1%)	1 (1.1%)	15 (16%)	6 (7.6%)	73 (92.4%)	4.43	5	
	I believe that conducting measurement with people with aphasia will improve their motivation for therapy	21 (22.3%)	41 (43.6%)	16 (17%)	3 (3.2%)	0 (0%)	13 (13.8%)	19 (23.5%)	62 (76.5%)	3.99	4	
	I believe that conducting outcome measurement with people with aphasia allows me to demonstrate the effects of my intervention	38 (40.4%)	29 (30.9%)	11 (11.7%)	2 (2.1%)	1 (1.1%)	13 (13.8%)	14 (17.3%)	67 (82.7%)	4.25	4	
	I believe that outcome measurement with people with aphasia is an effective way to educate patients and their families	23 (24.5%)	39 (41.5%)	14 (14.9%)	3 (3.2%)	1 (1.1%)	14 (14.9%)	18 (22.5%)	62 (77.5%)	4	4	
	I am doubtful that outcome measurement with people with aphasia will improve patient outcomes (R)	2 (2.1%)	5 (5.3%)	10 (10.6%)	27 (28.7%)	35 (37.2%)	15 (16%)	72 (91.4%)* 7 (8.9%)*	7 (8.9%)* 72 (91.4%)*	4.11*	4*	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)								16	84	4.16	-
7) Reinforcemen †	There are incentives at my workplace for conducting outcome measurement with people with aphasia	3 (3.2%)	10 (10.6%)	17 (18.1%)	18 (19.1%)	17 (18.1%)	29 (30.9%)	52 (80%)	13 (20%)	2.45	2	

Domain	TDF Survey Statements	Number of participants (%) n=94									Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A			
	Seeing the benefits of outcome measurement with people with aphasia is rewarding	35 (37.2%)	37 (39.4%)	7 (7.4%)	0 (0%)	0 (0%)	15 (16%)	7 (8.9%)	72 (91.1%)	4.35	4	
	Average domain score (n/a removed & R statement scores reversed for overall agreement)									3.4	-	
	8) Intentions	I always intend to conduct outcome measurement with people with aphasia	36 (38.3%)	32 (34%)	9 (9.6%)	3 (3.2%)	0 (0%)	14 (14.9%)	12 (15%)	68 (85%)	4.26	4
9) Goals	Average domain score (n/a removed & R statement scores reversed for overall agreement)									4.26	-	
	I am working towards conducting outcome measures with all patients with aphasia.	25 (26.6%)	27 (28.7%)	15 (16%)	9 (9.6%)	1 (1.1%)	17 (18.1%)	25 (32.5%)	52 (67.5%)	3.86	4	
	There are other aspects of my role that are more urgent than conducting outcome measurement with people with aphasia (R)	8 (8.5%)	18 (19.1%)	21 (22.3%)	23 (24.5%)	11 (11.7%)	13 (13.8%)	55 (67.9%) *26 (32.1%)	26 (32.1%) *55 (67.9%)	3.14	2	
	Outcome measurement with people with aphasia is not a priority for me. (R)	0 (0%)	4 (4.3%)	13 (13.8%)	22 (23.4%)	41 (43.6%)	14 (14.9%)	76 (95%) *4 (5%)	4 (5%) *76 (95%)	4.25*	5*	
10) Memory, attention and decision processes	Average domain score (n/a removed & R statement scores reversed for overall agreement)									3.75	-	
	I have reasons for sometimes not conducting outcome measurement with people with aphasia	5 (5.3%)	39 (41.5%)	13 (13.8%)	14 (14.9%)	8 (8.5%)	15 (16%)	36 (45.6%)	44 (55.7%)	3.24	4	
	Outcome measurement with people with aphasia is something I always do as part of my routine	26 (27.7%)	28 (29.8%)	13 (13.8%)	11 (11.7%)	2 (2.1%)	14 (14.9%)	26 (32.5%)	54 (67.5%)	3.81	4	

Domain	TDF Survey Statements	Number of participants (%) n=94										Mean	Median
		5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A				
	I sometimes forget to conduct outcome measurement with people with aphasia (R)	2 (2.1%)	15 (16%)	15 (16%)	19 (20.2%)	28 (29.8%)	15 (16%)	62 (78.5%) *17 (21.5%)	17 (21.5%) *62 (78.5%)	3.71*	5*		
	Average domain score (n/a removed & R statement scores reversed for overall agreement)												
		33.19	67.23	3.59	-								
	11) Environmental context and resources	I have sufficient access to outcome measures in languages spoken by my clients with aphasia	5 (5.3%)	21 (22.3%)	15 (16%)	22 (23.4%)	16 (17%)	15 (16%)	53 (67.1%)	26 (32.9%)	2.7	3	
	In the organization I work, all necessary resources are available for conducting outcome measures with people with aphasia	13 (13.8%)	13 (13.8%)	17 (18.1%)	16 (17%)	14 (14.9%)	21 (22.3%)	47 (64.4%)	26 (36.6%)	2.93	3		
	I have insufficient time to conduct outcome measurement with people with aphasia (R)	4 (4.3%)	22 (23.4%)	18 (19.1%)	24 (25.5%)	12 (12.8%)	14 (14.9%)	54 (67.5%) *26 (32.5%)	26 (32.5%) *54 (67.5%)	3.23*	4*		
	Other caseload priorities prevent me from conducting outcome measurement with people with aphasia (R)	4 (4.3%)	15 (16%)	22 (23.4%)	22 (23.4%)	15 (16%)	16 (17%)	59 (75.6%) *19 (24.4%)	19 (24.4%) *59 (75.6%)	3.37*	3		
	Average domain score (n/a removed & R statement scores reversed for overall agreement)												
		46.77	53.23	3.06	-								
12) Social influences	My colleagues are consistently conducting outcome measurement with people with aphasia	8 (8.5%)	16 (17%)	19 (20.2%)	23 (24.5%)	6 (6.4%)	22 (23.4%)	48 (66.7%)	14 (19.4%)	2.96	3		
	My colleagues in the multidisciplinary or speech pathology team are not supportive of me conducting outcome	3 (3.2%)	5 (5.3%)	12 (12.8%)	21 (22.3%)	34 (36.2%)	19 (20.2%)	67 (89.3%) *8 (10.7%)	8 (10.7%) *67 (89.3%)	4.04*	5*		

Domain	TDF Survey Statements	Number of participants (%) n=94								Mean	Median		
	measurement with people with aphasia (R)  Outcome measurement is what patients with aphasia want	5 strongly agree	4 agree	3 neutral	2 disagree	1 strongly disagree	N/a	<A	A				
		7 (7.4%)	22 (23.4%)	38 (40.4%)	12 (12.8%)	2 (2.1%)	13 (13.8%)	52 (64.2%)	29 (35.8%)	3.24	3		
		Average domain score (n/a removed & R statement scores reversed for overall agreement)								47.37	48.25	3.41	-
	13) Emotion	I do not feel comfortable conducting outcome measurement with people with aphasia (R)	0 (0%)	4 (4.3%)	9 (9.6%)	22 (23.4%)	45 (47.9%)	14 (14.9%)	76 (95%) *4 (5%)	4 (5%) *76 (95%)	4.35*	5*	
	I like conducting outcome measurement with people with aphasia	31 (33%)	32 (34%)	14 (14.9%)	2 (2.1%)	0 (0%)	15 (16%)	16 (20.3%)	63 (70.7%)	4.16	4		
		Average domain score (n/a removed & R statement scores reversed for overall agreement)								12.58	87.42	4.26	-
	14) Behavioural regulation	My workplace has strategies for conducting outcome measurement with people with aphasia	10 (10.6%)	20 (21.3%)	8 (8.5%)	19 (20.2%)	11 (11.7%)	26 (27.7%)	38 (55.9%)	30 (44.1%)	2.99	3	
	I have a clear system for checking if I have conducted outcome measurement for each patient with aphasia	14 (14.9%)	20 (21.3%)	13 (13.8%)	23 (24.5%)	7 (7.4%)	17 (18.1%)	43 (55.8%)	34 (44.2%)	2.86*	4*		
		Average domain score (n/a removed & R statement scores reversed for overall agreement)								55.86	44.14	2.93	-

Number of participants selecting each level of agreement with TDF statements for each domain and associated means and medians. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree; (R)=reversed results; <A = Less than agreement (Strongly disagree, Disagree, neither agree nor disagree); A = Agreement (Agree, Strongly Agree).

Barrier = ≤3, facilitator = >3

**Tables and figures****Table 1:** Participant Characteristics

Participant Characteristics	Number of Participants (%)
Age	
18-24	12 (5.8)
25-34	81 (38.9)
35-44	59 (28.4)
45-54	33 (15.9)
55-64	19 (9.1)
65+	4 (1.9)
Gender	
Female	185 (88.9)
Male	18 (8.7)
Prefer not to say	1 (0.5)
Not reported	4 (1.9)
Country	
United States	51 (24.5)
Australia	29 (13.9)
United Kingdom	22 (10.6)
France	15 (7.2)
Spain	13 (6.3)
Switzerland	12 (5.8)
Germany	10 (4.8)
Denmark	9 (4.3)
New Zealand	8 (3.8)
Philippines	5 (2.4)
Lebanon	4 (1.9)
Chile	4 (1.9)
Norway	3 (1.4)
Belgium	3 (1.4)
Canada	3 (1.4)
Greece	3 (1.4)
Italy	2 (1)
Mexico	2 (1)
Finland	2 (1)



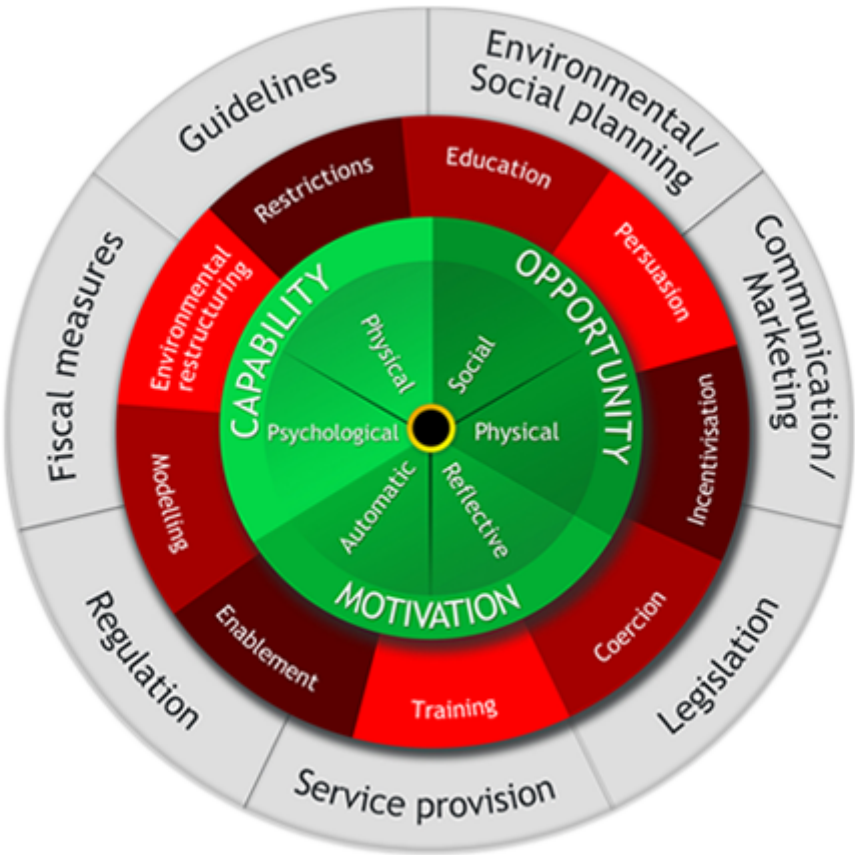
Ghana	2 (1)
Sweden	2 (1)
Austria	1 (0.5)
India	1 (0.5)
Ireland	1 (0.5)
Peru	1 (0.5)
Discipline background*	
Speech-Language Pathologist / Speech-Language Therapist	187 (81.7)
Psychologist/Psychology/Neuropsychologist	22 (9.6)
Clinical Linguist	13 (5.7)
Neurologist/Neurology/Neuroscientist	4 (1.7)
Research	3 (1.3)
Highest level of education completed	
Bachelor degree	43 (20.7)
Graduate certificate / diploma	19 (9.1)
Post-graduate / masters degree	118 (56.7)
PhD	27 (13)
Not reported	1 (0.5)
Number of years worked clinically with people with aphasia / their significant others	
Less than 1 year	4 (1.9)
1-3 years	46 (22.1)
4-10 years	56 (26.9)
More than 10 years	102 (49)
Setting of where clients with aphasia are seen*	
Hospital – inpatient rehabilitation service	58 (27.4)
Community rehabilitation – day hospital / outpatients / community centre / home based care	57(26.9)
Private practice	33 (15.6)
Hospital – acute service	30 (14.2)
University clinic	15 (7.1)
Telehealth / TeleRehabilitation service	6 (2.8)
Residential (aged) care service	4 (1.9)
Neurorehabilitation Centre	2 (0.9)
Aphasia Centre	2 (0.9)
Research	2 (0.9)

National Service	2 (0.9)
Not-for-profit	1 (0.5)
Stage post-stroke of clients with aphasia*	
Hyperacute (<24 hours)	6 (1.4)
Acute (1 day to 7 days)	33 (13.5)
Early sub-acute (1 week to 3 months)	90(36.1)
Late subacute (3 months to 6 months)	41 (13.9)
Chronic (>6 months)	68(26.9)

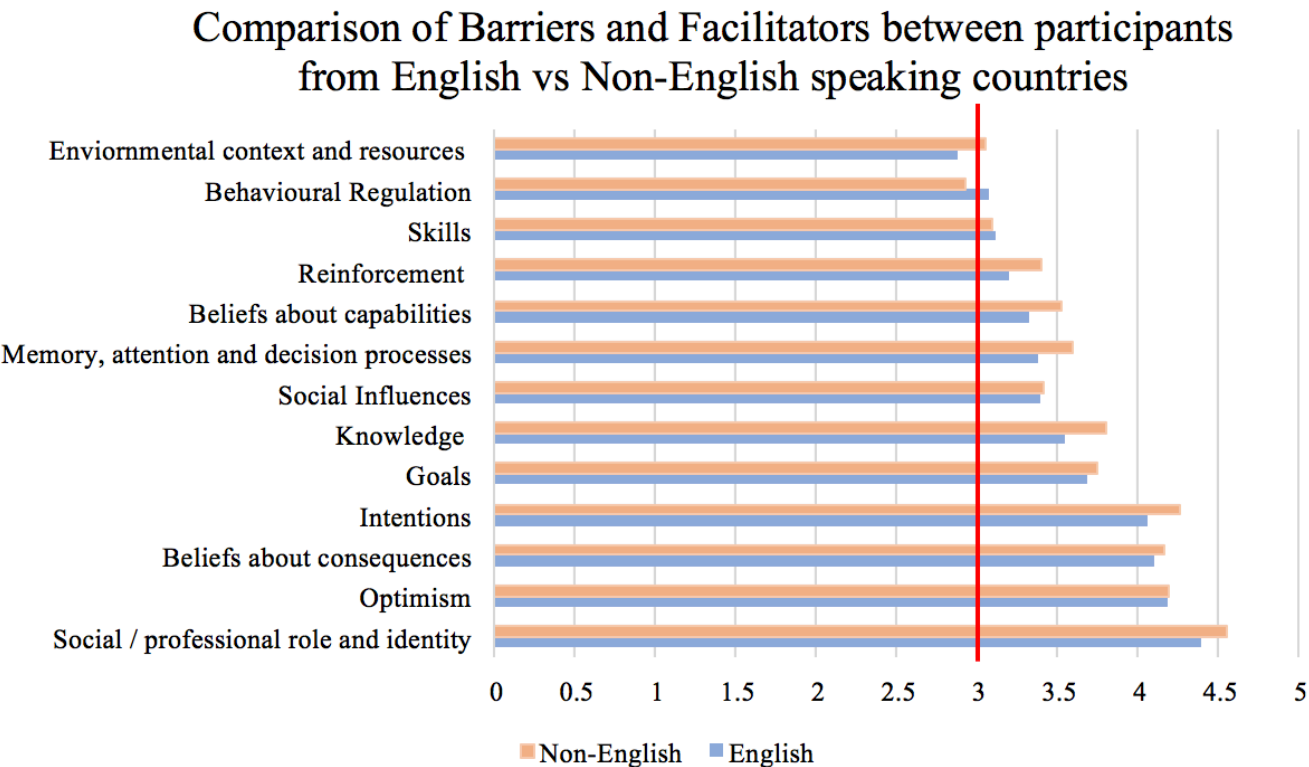
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*Note.* #n=208 unless otherwise specified; \*participants were able to provide more than one response.

**Figure 1:** Behaviour Change Wheel (Michie et al., 2014).



**Figure 2:** Comparison of Barriers and Facilitators between participants from English vs non-English speaking countries.



*Key:* Vertical line indicates cut-off point for barriers versus facilitators. All items above 3 represent facilitators, while all items below 3 represent barriers.