

**Communicative accessibility and acceptability of a digital behavioural activation
intervention for people with aphasia**

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Communicative accessibility and acceptability of a digital behavioural activation intervention for aphasia

Abstract

Background: Digital interventions provide a scalable approach to increasing dissemination of empirical mental health treatments such as Behavioural Activation (BA). It is important to consider the ways such interventions can be made accessible and acceptable to individuals with communication disabilities like aphasia after stroke. *Aims:* The aim of this study was to examine the communicative accessibility and acceptability of a digital BA intervention developed for this population. *Methods & Procedures:* A qualitative research design was used, involving semi-structured interviews with 11 people with aphasia caused by stroke. Data was subject to a Reflexive Thematic Analysis framework supported by nVivo software. *Outcomes & Results:* The results suggest that participants found the developed intervention to be both overall accessible and acceptable. Participants suggested improvements that highlighted the importance of considering how an individual's psychosocial and cognitive experience of stroke aphasia may influence their preferences for intervention layout and content. *Conclusions:* Results of our study reiterated the importance of a user-centred design process to ensure the accessibility and acceptability of digital interventions. The continued development of a digital behavioural intervention may provide a framework for future development of accessible and acceptable digital interventions for people living with other acquired language or cognitive disabilities.

Keywords: Aphasia, Digital Intervention, Behavioural Activation, Communicative
Accessibility, Acceptability

Introduction

Aphasia is a condition characterised by an impairment of language and communication skills. Those with aphasia may have impaired speaking, reading, writing, and/or understanding ability (Damasio, 1998). Stroke is the most common cause of aphasia. There is general agreement by experts in the field of aphasiology that:

Aphasia may affect participation and quality of life of the person with aphasia as well as their family and friends. Aphasia masks competence and affects functioning across relationships, life roles and activities, thereby influencing social inclusion, social connectedness, access to information and services, equal rights, and wellbeing in family, community and culture (Berg et al., 2020, p. 396). The psychological impact associated with aphasia has been found to place individuals at increased risk of developing Post Stroke Depression (PSD) (Kauhanen et al., 2000; Thomas & Lincoln, 2008).

PSD is the most investigated emotional consequence of stroke. PSD remains persistent up to 10 years post-stroke (Ayerbe et al., 2013) and is prevalent, exceeding 30% (Hackett & Pickles, 2014). In addition to its emotional impact, PSD has been associated with limited participation in rehabilitation, decreased functional outcomes (Gillen et al., 2001), lowered quality of life (Ayerbe et al., 2013; Bays, 2001), increased healthcare utilisation (Ghose et al., 2005), faster recurrence of stroke, and increased mortality (Ayerbe et al., 2013; Bartoli et al., 2013).

Behavioural Activation

A treatment which has been successful in treating PSD is Behavioural Activation (BA) (Thomas et al., 2012). BA is a treatment which focuses on increasing activity level and frequency of pleasant events to improve mood. Behavioural interventions for depression (i.e., BA) sufficiently improve depressive symptoms, alter unhelpful cognitions maintaining

depression, and improve life functioning without the need of an explicit cognitive component of therapy (Gortner et al., 1998; Jacobson et al., 2000). A Cochrane review indicated behavioural activation for adults may be as effective CBT and psychodynamic therapy (Uphoff et al., 2020). BA is considered particularly suitable for those with aphasia because it does not rely on the use of ‘talk-based’ techniques (Thomas et al., 2012; Baker et al., 2018).

Empirical studies demonstrated BA is effective in treating PSD in the stroke population for those with, and without aphasia (Thomas et al., 2012; Thomas et al., 2019). However, a widely accessible implementation of this intervention has not occurred and an absence of widely disseminated mental health interventions has been identified as a key reason for the lack of improvement in mental health treatment (Prochaska et al., 2020). Implementation of a digital BA intervention may address this dissemination issue.

Digital Interventions

Digital interventions are a well-established treatment for depression and have been used to increase global access to psychotherapies (Renton et al., 2014). Research has found online psychotherapies for depression are highly successful for the general population (Rosso et al., 2016) and self-guided CBT is a recommended treatment for depression (Australian Psychological Society, 2020).

Within the stroke population, the acceptability and feasibility of digital interventions for mental health support has begun to be considered. Shek et al. (2021) conducted a systematic review exploring the acceptability and feasibility of technology-based mental health support after stroke. Across 13 studies, most participants agreed to participate in technology-based therapy, reported high satisfaction, and adhered to completion. Further, dropout rates were low (samples sizes up to 252). These findings suggest that technology-based support is perceived as acceptable and is feasible in stroke populations. Unfortunately,

the studies in this review did not consider ways to modify these programs for use by those with aphasia.

Ensuring digital interventions for PSD are modified appropriately for aphasia is important for clinical utility as an all-inclusive treatment. Clunne et al. (2018) reviewed 8 current digital interventions for the treatment of depression in the general population against communication standards for stroke aphasia. The study found that none of these programs were suitable for an aphasia population based on low usability ratings. The consideration of communication accessibility and acceptability of digital interventions is necessary to ensure the utility of these interventions for the aphasia population.

Communication Accessibility

People with aphasia need information to be modified to support their understanding of language. Hence, when interacting with digital interventions, it is important to consider how written information is designed to be accessible (Clunne et al., 2018). The concept of communicative accessibility was first introduced by Kagan and Gailey (1993) who considered whether written materials could be modified to increase reading comprehension. Consequently, the development of “aphasia-friendly” written resources has been explored. Rose et al (2003) described “aphasia-friendly principles [as]: (1) use of simple words and short sentences; (2) use of large and standard font; (3) use of white space; and (4) use of relevant pictures.” (p.950). The Stroke Association in the UK has used the patient-centred design process to generate specific guidelines to achieve communication accessibility through aphasia-friendly text, image, and formatting modifications (Herbert et al., 2012). The core underlying concepts of communication accessibility across research is the modification of information with attention to the language processing demands of aphasia. The aim is to remove communication barriers and provide communication facilitators to help improve comprehension of information (Haw, 2017).

Acceptability

Acceptability is a multifaceted construct that is broadly defined as the views and attitudes of individuals on the perceived ease of use, satisfaction, and usefulness of a digital health intervention (Perski & Short, 2021). Referred to as prospective acceptability, perceptions about acceptability can also be formed after learning about a new intervention. (Sekhon et al., 2017).

For successful implementation of digital interventions, consideration of end-users in the early design of interventions is crucial. Prior research in aphasia has highlighted the value of patient-centred design and/or participatory design approaches specific to the development of technology based interventions (Roper & Skeat 2022; Griffel et al 2019; Brandenburg et al 2013). Such design approaches help to ensure that the end product meets the user's needs (Roper & Skeat 2022). Furthermore, the accessibility and acceptability of intervention has been suggested to directly impact user engagement and intervention effectiveness (Perski & Short, 2021). Currently, the development of a communicatively accessible and acceptable digital BA intervention for people with aphasia has not yet been explored. Therefore, the current study aims to explore the perceptions of people with stroke aphasia on the communicative accessibility and acceptability of a proposed digital BA intervention for those with aphasia.

Methods

Study Design

This study used a qualitative design based in a Reflexive Thematic Analysis framework (TA) (Braun & Clarke, 2019). TA is a method that can be adapted for a range of research questions and can help researchers identify patterned meaning (themes) in datasets through exploration of people's opinions based upon research objectives. This study was

informed by the consolidated criteria for reporting qualitative research (COREQ) checklist (Tong, Sainsbury, & Craig, 2007). This research received ethical approval from the University [redacted for blind review] (approval reference XXX-YYYY).

Recruitment

Recruitment occurred through aphasia community groups across Australia. The researchers sent a study recruitment advertisement via email to all group facilitators included on the Aphasia Community page: <https://aphasia.community/current-groups>. Interested groups then disseminated study details through word-of-mouth, digital and physical letters, and on social media. Interested participants either directly emailed or provided their contact details through group facilitators to the principal investigator.

Inclusion Criteria

Inclusion in the study required (1) diagnosis of aphasia because of stroke (presence and severity of aphasia confirmed by a speech language therapist during the consent process); (2) sufficient communication and technological ability to participate in the study (self-reported and judged by a speech pathologist); (3) located in Australia.

Modified Consent Process

Consent was collected through an initial Zoom meeting, with the participant information sheet displayed via share screen. The information sheet had been modified to be communicatively accessible with reference to the Stroke Association UK, Accessibility Information Guidelines (Herbert et al., 2012). As individuals with aphasia may find interacting with written communication modalities difficult, the consent process followed the VERBAL CONSENT SCRIPT created by the [redacted for blind review]. A consent form was also completed by carers which outlined their role in the study.

Participants

Eleven adults with stroke aphasia were recruited from aphasia groups across Australia. The number of participants was based on the Braun & Clarke (2013) recommendation of 6-10 participants for small TA projects and sufficient information power reached during analysis (Malterud et al., 2016). Our study recruited eleven rather than ten participants as one participant was unable to complete a full semi-structured interview due to their difficulties with apraxia in addition to aphasia. This participant provided written feedback via email on the introduction video included in the program. This data was included in analysis to facilitate inclusion of diverse individuals affected by aphasia.

Participants were provided the option to have a support person (professional carer, family member, or friend) present for interviews to help support communication. If the support person provided relevant feedback, that the researcher verified the participant agreed with, this data was also used in analysis. Three participants were supported during the study by someone they nominated. Specific data about the supporters was not recorded as primary focus was on the views of the people with aphasia.

As summarised in Table 1 participant characteristics gathered included age, gender, time post-stroke, aphasia severity as determined by the Aphasia Severity Rating (ASR) (Simmons-Mackie et al., 2018), other physical disabilities, and living arrangements.

Table 1 about here

The Digital Intervention

The digital behavioural activation intervention shown to participants was developed by the principal investigator as a program on the website building service squarespace.com.

The content was adapted from the Black Dog Institute Healthy Minds program created for those with Intellectual Disability (Watfern et al., 2019). Their ‘Having More Fun’ module was modified to create a BA program targeted towards the needs of those with aphasia in line with the Stroke Association UK, Accessibility Information Guidelines (Herbert et al., 2012) and in consideration of acceptability for aphasia. The program was on one webpage which could be scrolled through, and it was separated into an introduction video and three parts (Supplemental document 1). A description of the program is contained in Table 2.

Table 2 about here

Procedure

Semi-structured interviews were conducted by the principal researcher who was trained in Supported Communication with Aphasia™. All interviews were conducted over Zoom due to Covid-19 restrictions.

The principal investigator share-screened and navigated through the program as participants provided their feedback throughout. Open-ended questions were used to guide qualitative data collection after participants had been introduced to what the content of each module would be like (see Appendix). After going through the program, participants were also shown options of various images and layouts for program content and asked for their preferences (Supplemental document 2). This was done to support communication and to elicit richer data from those with more severe aphasia impairments.

Participants were asked to complete a satisfaction questionnaire (adapted with permission from Clunne et al., 2018) which was emailed to them after the interview. Six participants completed this. The results matched themes identified in the semi-structured interviews. The questionnaire results did not significantly extend findings and have not been included in the

results due to the low completion rate. The questionnaire and results table can be found as supplemental documents (Supplemental documents 3 & 4).

Data Analysis

All interviews were audio and video recorded. Recordings were 34:47 to 99:56 minutes and averaged 66:08 minutes long. Audio was transcribed verbatim. Verifiable from recordings, the transcriptions also included observational notes and indications of when participants used gesture, drawing, or writing to communicate.

This study used an inductive approach within the TA framework to analyse data as codes were generated directly from the text, rather than predetermined. This facilitates generation of themes which describe and summarise participants' perspectives, rather than deconstructing or critiquing participant feedback (Braun & Clarke, 2014; Braun & Clarke, 2019).

Transcripts were initially read consecutively and, in their entirety, to gain a sense of the data set as a whole. Meaning units (words, phrases, and sentences) of relevant content were then coded using descriptions from the participants' own words. Codes with similar meanings were sorted and grouped into categories under the larger themes of communicative accessibility and acceptability. Data was coded for opinions/experiences and suggestions for improvements regarding communicative accessibility and acceptability. This analytic strategy was performed by the principal investigator (SR). NVivo, a qualitative data analysis computer software, was used for this analysis. Research rigor was established via prolonged engagement with the subject matter, maintaining an audit trail, and reflexivity achieved through discussion within the research team about generated themes.

Results

In this study, 2 Key themes were identified, with 8 subthemes. The first key theme, Communicative Accessibility, comprised subthemes Text readability, Images, Multimodal components, Support from other, and Memory. The second key theme, Acceptability, comprised subthemes Relatability to examples, Wording choices, and Interactive components. These themes are presented in a thematic map (see Figure 1).

Figure 1 about here

Communicative Accessibility

Participants reported positive overall feedback about the communicative accessibility of the program. They could identify the ways in which the text, images, formatting, and video throughout the program had been used to make the program accessible to those with aphasia.

“I think your program is excellent It's easy to understand and use.” Participant 8

Whilst those with less severe aphasia found the program at times too simple, they reported understanding why such simplicity was necessary and preferred simplicity to facilitate various severities of aphasia.

In some areas improvements were suggested to make the program more aphasia-friendly, especially for those with more severe aphasia. Table 3 provides examples of quotations from participants which demonstrate subthemes.

Text Readability

Text size. A variety of text sizes were used to gauge feedback on what is most accessible to those with aphasia. The font used was the default choice of Poppin on squarespace. The smallest text size used was 0.9rem which translates to 11pt and the largest was 4rem which translates to 48pt. Most participants reported that text 1rem (12pt) or smaller

was too small. Participants didn't report a preference for any size text above 12pt, but one participant reported 48pt was too large.

Bolding. Participants reported in majority liking bolding on key words throughout the program to highlight key concepts. This was reported to help increase comprehension of key ideas in a sentence.

Complexity of chosen vocabulary. Throughout the program and specifically during part one of the program, the term and related explanation of the concept of 'Behavioural Activation' was reported to be too complex because it is "science-y". The program aimed to make this concept and term more accessible by adding images to aid explanation. However, many participants found the term 'Behavioural Activation' inaccessible. Psychoeducation about the concept required additional explanation by the researcher to clarify comprehension. Use of a more lay term and simplified explanation of the concept was hence suggested.

Sentence length. Regarding text, participants preferred shorter sentences. The program included areas with longer and shorter sentences. In areas with short sentences participants were observed easily understanding concepts and giving feedback such as "good" "yeah" "easy". In areas with longer sentences, feedback was to shorten sentences from those with more severe aphasia.

Images

Many participants reported positive feedback on images used in the program. Specifically, they reported that having images helped increase their comprehension of concepts discussed in the program as the "words talk with the photo". Participants also reported a preference for images which had a clear image topic and detailed features of the topic displayed. To further improve the program's accessibility, participants with more severe aphasia suggested including more images in the few sections with text only.

Multimodal Components

Video feedback. All participants reported positive feedback about the introduction video. Specifically, participants reported liking the pace, and its succinct nature. Minor accessibility improvements were suggested such as inclusion of subtitles. Acceptability suggestions such as the inclusion of the testimony of a person with aphasia was suggested by one participant.

Audio support. To help improve accessibility of the program, a noteworthy suggestion made was to include audio support. Participants suggested either having a read-aloud button for each sentence or the ability to highlight and have sections read aloud to them. Participants with more severe aphasia required the researcher to read the program to them at times due to difficulty with sustained reading. Others had carers support their reading when they were stuck or misread sections. Support required with reading for some also suggests the importance of having audio throughout the program to facilitate self-guided use.

Support from other

Most participants stated a preference to complete the program with a personal support person. Despite the modifications to promote accessibility, those with more severe aphasia reported that without this support they would be unlikely to engage in the program. Participants reported that whilst they understood the information in the program, they would want to refer to another person to clarify their understanding of some concepts. It was also highlighted that having to read and comprehend a program is already difficult for those with aphasia, and in addition, having depression will likely reduce motivation to engage in a reading-based program without others available to aid the process.

Only a few participants reported that they would do this program independently. It was highlighted that having the choice to complete the program alone was important both from an

accessibility and acceptability standpoint. One participant reported having to “fight for my independence” through rehabilitation and hence wanted the option to engage in programs that were self-guided. Another participant reported that whilst they would prefer to complete the program with another’s support, many individuals don’t have this assistance readily available and so ensuring the program is accessible to complete independently is important to avoid discouragement.

Memory

Participants commented that stroke often causes diminished short-term memory. Hence, repeating concepts throughout the program, and reminding individuals of topics covered earlier using repeated photos or examples was helpful. However, some commented that repetitiveness could be boring in the program, while also acknowledging the benefit of this for those with worse memory and recall. Suggestion to balance these two perspectives was to include short reminders rather than a complete repeat of a previous section.

It was also reported that providing leading questions and examples for people to pick from rather than open ended questions was helpful in reducing strain on memory/recall for those with aphasia.

Part 2 of the program was significantly longer than the other parts as it included an introduction and examples of activities, a section on breaking down activities, and multiple questions throughout to engage the participants to think about activities they enjoy. Many participants commented the length of this section impacted their ability to sustain focus. Being able to read through and remember all the information in this section in one sitting was noted as difficult for some. Hence, separating this section into sub-parts was suggested to increase likelihood for engagement and information recall.

Table 3 about here

Acceptability

All participants indicated that they liked the program overall and believed it would be acceptable to those with aphasia and experiencing PSD.

“Carer: Yeah, I just think you're doing a great job. And it's very needed. And I think what uh what you're doing is a brilliant start, because you're obviously understanding the needs of aphasia.

Participant 2: - nodding and giving thumbs up to indicate agreement-”

Table 4 provides examples of quotations from participants which demonstrate subthemes.

Relatability to examples

Many participants commented on the relatability of examples used in the program. The more personally relatable an example/image was, the more participants reacted positively towards it orally and through facial expression/body language.

Participants indicated acceptability towards images which were more “gender neutral” and suggested inclusion of “Australian sports”. One participant also suggested the inclusion of images which included people with aphasia. Many participants talked about how they engaged in activities suggested in the program with the help of carers and hence inclusion of others in images is likely to increase acceptability.

The importance of including disability friendly activities was also highlighted by one participant. Another participant suggested inclusion of passive activities like listening to music. These activities are likely to help facilitate acceptable activities for a wider population of physical disabilities also resultant of stroke.

Wording Choices

A theme arose regarding use of the word “depression” in the program. Some participants commented that the use of this word may evoke feelings of demotivation and suggested using a more universally relatable term such as “feeling sad” or “low mood”.

Interactive Components

Activity Usability. The program included sections in which participants would answer questions by typing out answers or picking from a list of suggestions. When asked how to best facilitate to engagement in these activities, most participants reported they liked the option of having lists (made up of either just words or words and accompanying images) for them to pick from and then having a section after in which they could type/draw any other ideas they had.

To help increase usability of typing activities, inclusion of autosuggest and autocorrect was suggested. One participant reported that they could not type at all and hence a voice to word feature would be helpful. This is important to increase accessibility and acceptability of activity use.

A section for breaking down activities was included in the program which did not include any images and relied only on participants typing their answers in boxes to facilitate breaking down of a difficult task. Most participants acknowledged how this task was helpful to get the participant “involved” in the program and reported liking the concept of breaking down a task. They reported this part was “fine” and “good”. Some participants reported feeling this section was redundant and reported they would be unlikely to use this section. Others reported that the current layout was difficult to follow as there were no images and the reliance on typing alone was strenuous.

Activity Diary. There was significant variability between participants in relation to the type of diary they reported they were likely to use if they completed the program. Four participants preferred a hard copy diary that was either a printout of a planner the program had suggested or a planner they already owned. Five participants preferred an electronic diary, such as a phone calendar app, or incorporation of an online diary that can be completed through the program. A participant also highlighted that an electronic option allows use of voice to word and hence reduces difficulties faced with writing/typing.

There was also variation between participants about preference about how to fill in diaries. Some liked the option of filling out a diary with words only and others preferred when an image could be inserted/drawn to support written information.

Most participants suggested that having options available so individuals can pick a diary most beneficial for them is ideal.

Suggestions for the inclusion of a completed example of how to fill out a diary in the program and “adding an extra column for who will you do it with” were made. One participant suggested changing the colour scheme of the current diary included in the program to black and white rather than brown and white to increase ease of readability. These were minor but important suggestions to help increase usability.

Table 4 about here

Discussion

The present study aimed to explore the perceptions of those with stroke aphasia on the communicative accessibility and acceptability of a digital BA intervention. Results from the study revealed that most participants perceived the intervention to be overall both communicationally accessible and acceptable. Some improvements across both constructs were suggested to further increase accessibility and acceptability. This research has highlighted that the continued development of a digital behavioural intervention is warranted.

Communicative Accessibility

In our study participants reported liking the use of images, modified text, formatting, and video to support communicative accessibility. Including more images (in the few sections without images), video subtitles, audio support, improvements to readability of text in some areas, support from others, shortening of sections, and repetition of concepts was suggested. The elements individuals liked and suggested improvement for regarding written materials with still graphics were in line with the Stroke Association UK, Accessibility Information Guidelines (Herbert et al., 2012). Below we consider suggestions of improvements which beyond these guidelines and those which capture the digital nature of the intervention.

Multimodal components. Our study demonstrates that individuals with aphasia appreciate video and audio support. This may be due to the less active nature and focussed attention required when using multimodal supports (Chen & Wu, 2015; Richardson et al., 2020). Whilst some individuals may prefer only reading, having both written and multimodal options available were suggested to increase accessibility for all individuals with aphasia. This finding is consistent with the recommendations made by Brandenburg et al (2013) that identified that mobile technology may be made more accessible when supplemented by pictures, symbols or spoken words.

Support from other. Many of the participants in this study reported preference to complete the program with a support person. However, other participants reported it was important for them to be able to complete this program alone. Research highlights the lack of accessible information to facilitate people living independently accessing treatment (Brown et al., 2010; Hilari & Northcott, 2006; Hinckley et al., 2013; Parr, 2007). There is also evidence carer strain, from having to support people with aphasia, can lead to poorer mental-health outcomes for both the individual with stroke, and carers (Cameron et al., 2011). Hence, whilst a recommendation for completion of this program with another may facilitate motivation (if carers aren't already strained) and augment accessibility, it is also important to ensure the program can be completed independently where possible. Implementing the suggested changes from this study and including professionals contactable through the program (e.g., phone/email/chat help line) may diminish necessity of a support person. This then provides individuals with the choice to complete the intervention alone or with support.

Repetition of concepts to support poor memory. The current digital intervention considered language impairment in influencing accessibility for those with aphasia, however, impairments to other cognitive functions, such as short-term memory (Kalbe et al., 2005) and attention (Heuer & Hallowell, 2015), also co-occur with stroke and affect language comprehension and production. The suggestions from participants to include repetition of concepts throughout the program demonstrates the need to further consider the cognitive impacts of stroke upon aphasia when developing communicatively accessible interventions.

Acceptability

Participants overall reported prospective acceptability towards the intervention as they recognised its usefulness. To further increase acceptability, participants suggested use of additional relatable examples (e.g., through disability inclusive images/examples), broader

terminology to describe depression, and improvement of interactive components through the incorporation of options supporting aphasia preferences (e.g. autocorrect option and multiple diary options). These results reinforce the importance of a user-centred design process for this population (Roper & Skeat, 2022).

Our research has primarily considered the communication accessibility and initial acceptability of an online BA program. Beyond this, consideration of how an individual interacts with an intervention is necessary (Griffel et al., 2019; Roper & Skeat, 2022). It is important for people working with digital tool developers to be cognisant of Web Content Accessibility Guidelines including the existing and developing standards from the W3C Web Accessibility Initiative (n.d.) that consider aspects of cognitive accessibility. Additionally, consideration of other factors that relate to digital inclusion (e.g., age, proxy use, education, experience (Menger et al., 2020) and gender (Johansson et al., 2021) may also be needed. The complexity of this issue with respect to people with aphasia has been explored in detail by Menger et al. (2016).

Limitations

Participants in this study were 'self-selected' and hence may differ to those individuals who did not volunteer to participate. Those who volunteered had experience using a computer since current aphasia groups had in majority been moved to Zoom since the Covid-19 pandemic. Thus, it is possible that the participants' higher level of experience with technology may have influenced their perspectives on the digital intervention. However, research has found that those with aphasia commonly use computers for email, entertainment, and speech therapy and hence it is not uncommon for this population to use digital tools (Finch & Hill, 2014). We did not recruit people with aphasia and depression, the principal target population for the BA. Potentially this may have altered our findings, though we

believe they are still highly relevant and note BA is also proposed as a preventative intervention after stroke (Kneebone, 2016).

Conclusion and Future Directions

The present study provides preliminary perspectives on the communicative accessibility and acceptability requirements for a digital BA intervention for people with aphasia. As a starting point, our research has captured the communicative accessibility and acceptability perspectives of this population. Future research that addresses the potential improvements suggested by participants will likely have a substantial pragmatic benefit for the delivery of not only BA but other psychological digital interventions for this population. Preliminary studies are also needed in the future to trial the feasibility and efficacy of this program with those who have PSD and aphasia. We hope this study highlights the importance of considering communication accessibility in the development of digital interventions for other populations with language and/or cognitive disability.

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Disclosure statement

The authors report there are no competing interests to declare.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author, [IK]. The data are not publicly available due to containing information that could compromise the privacy of research participants.

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Appendix

Semi-structured interview open-ended questions

Open ended initial question

1. What do you think about this program?

In order to facilitate further dialogue, the following prompts may be used, as appropriate:

- Is the program easy to use?
- Would you use this program?
- What parts are easy to understand?
- What parts are hard to understand?
- Which sections did you find the easiest to understand?
- Was there any instructions or text you thought was difficult to understand?
- Are there any improvements to the program you could suggest?
- What did you find was helpful in using the program?
- Did you find the text easy to read?
- Did you find the text hard to read?
- Did you find the images helpful?
- How comfortable would you feel using this program?
- How could we improve this program to make it easier to use/understand for those with Aphasia?

- Do you think you would need a family member or friend to help you complete this program?