

**Semantic feature analysis for word retrieval difficulties in a small  
aphasia-group setting**

**by**

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## Abstract

**Background:** Word retrieval deficits are a common, pervasive feature of aphasia. Semantic feature analysis (SFA) is a popular treatment technique for word retrieval impairment. Preliminary evidence of its use in small aphasia-group settings suggests improved word retrieval in discourse-based tasks with improvements in communicative informativeness (Antonucci, 2009; Falconer & Antonucci, 2012).

**Objective:** The aim of this study was to investigate the training of SFA within discourse during a small (two-member) aphasia group treatment to ascertain if gains would be made in word retrieval abilities and communicative informativeness.

**Method:** Two female participants with chronic aphasia, aged seventy seven and sixty eight, participated weekly in group treatment for five consecutive weeks where stimuli were used to elicit increasingly naturalistic discourse. A multiple-baseline design was used and a case series analysis conducted. Baseline measures, treatment data and data from the six week follow-up (SWFU) session were analysed using the protocols developed by Nicholas and Brookshire (1993) and Mayer and Murray (2003).

**Results:** Both participants demonstrated certain modest gains in overall communicative informativeness but these were not maintained at the SWFU session. Gains in informativeness ranged from 12% to 13.4% for participants, which agree with improvements in other studies (Antonucci, 2009; Boyle & Coelho, 1995; Falconer & Antonucci, 2012). P2 (presented with anomic aphasia) performed better than P1 (presented with Broca's aphasia and a component of apraxia of speech [AOS]) with regards to communicative informativeness (%CIUs) and had greater access to semantic knowledge (i.e. could access lexical forms at an improved rate).

**Conclusion:** The small group setting may offer advantages to facilitate communication skills and increase participation in everyday conversation. Further research is needed to identify benefits for individuals with differing aphasia types and severity, optimal intensity and frequency of group treatment and the role of peer support during group interaction.

## Key Words

Aphasia, stroke rehabilitation, word retrieval, semantic feature analysis, connected speech, discourse, group therapy, communicative informativeness, functional communication.

# CHAPTER 1: LITERATURE REVIEW, PROBLEM STATEMENT AND RATIONALE

## **The aim of the chapter is to:**

Introduce the treatment technique of semantic feature analysis and its relevance to aphasia intervention.

State the research problem.

Provide a rationale for this study.

Pose the research question.

Present a list of terminology as used in the dissertation.

## **1.1 Introduction**

Stroke is the third most common cause of disability worldwide (Lozano et al., 2012). A study conducted in South Africa by the Southern African Stroke Prevention Initiative reported the prevalence of stroke was estimated to be 300/100 000 (Connor & Bryer, 2006). Furthermore, Connor and Bryer (2006) state that the prevalence of stroke survivors requiring assistance with at least one activity of daily living was found to be higher than when compared to more developed countries such as New Zealand. This finding has implications for the affected individual, as well as the burden of care for family, health services and the community. A common sequela of stroke is aphasia.

Aphasia is a language impairment that may occur in up to 38% of stroke survivors (Dickey et al., 2010; Pederson, Jorgensen, Nakayama, Raaschou & Olsen, 1995) and renders those affected with significant difficulty to speak, comprehend, read and/or write language. Therefore, multiple aspects of communication may be impaired, which may have adverse lifestyle implications. Sarno (2004) further notes the lack of an ability to communicate effectively can be isolating and may alter the person's identity and sense of self. Aphasia symptoms may vary across individuals due to differences and severity of neural damage (ASHA, 2014a). The impact of these symptoms may also differ according to speaking situations and the level of ease or difficulty experienced by the individual. Therefore the dynamics of both language deficits, as well as the role the environment plays during communication interaction cannot be ignored. Loss of income, loss of safety, and an increased dependence on others to do the simplest of tasks suggest that one cannot function successfully without the ability to communicate (Holland, Fromm, DeRuyter & Stein, 1996).

A common pervasive feature of aphasia is the inability to name or recall words. Anomia, difficulty retrieving nouns, verbs and other content words, is one of the most common and disabling aspects of aphasia (Kendall et al., 2007). The inability to recall specific words may result in vague and ineffective communication. Word retrieval is a process that consists of multiple stages. The discussion that follows provides a simplified explanation of the processes that occur during word retrieval.

The first stage involves the conceptual system, a formation of a concept that is not formulated into words (Friedmann, Biran & Dotan, 2013). This includes an individual's knowledge about a concept (e.g. the visual image and its function). The next stage activated is at the semantic level and involves a semantic description of a concept, which can be converted into a lexical representation (Nadeau, Gonzalez-Rothi & Crosson, 2000). An example of a semantic description of the word "lion" would be an animal, has four legs, has a mane and roars. These semantic descriptions or semantic features trigger a lexical representation, which is "lion". The following stage entails the conversion of the lexical representation into its phonological form (i.e. the spoken form of the word). In the above example, appropriate stress patterns and selection of the different phonemes in the correct sequence within the context of the word would take place in order to say the word "lion". Word retrieval failures can generally occur at any of the levels of word retrieval. These include the conceptual, semantic or phonological level or, at the level of the connections between them (Friedmann et al., 2013). Impairments at these different levels, therefore, would create word retrieval difficulties with different characteristics. This is clinically significant as Nickels (2002) stresses different types of anomia require different kinds of treatment. Therefore, semantic based treatment approaches focus on word-meaning and phonological based treatment approaches focus on the phonemes of the word.

According to Wiesenburn and Mahoney (2009), numerous treatment methods have been used by speech-language therapists (SLTs) in the remediation of word-finding difficulties. Typical approaches to remediating anomia employ tasks such as confrontation naming, repetition, orthographic and phonologic cueing, and picture matching using auditory or written words. These traditional aphasia therapies have been shown to improve naming performance. However, generalisation is typically limited (Nickels, 2002).

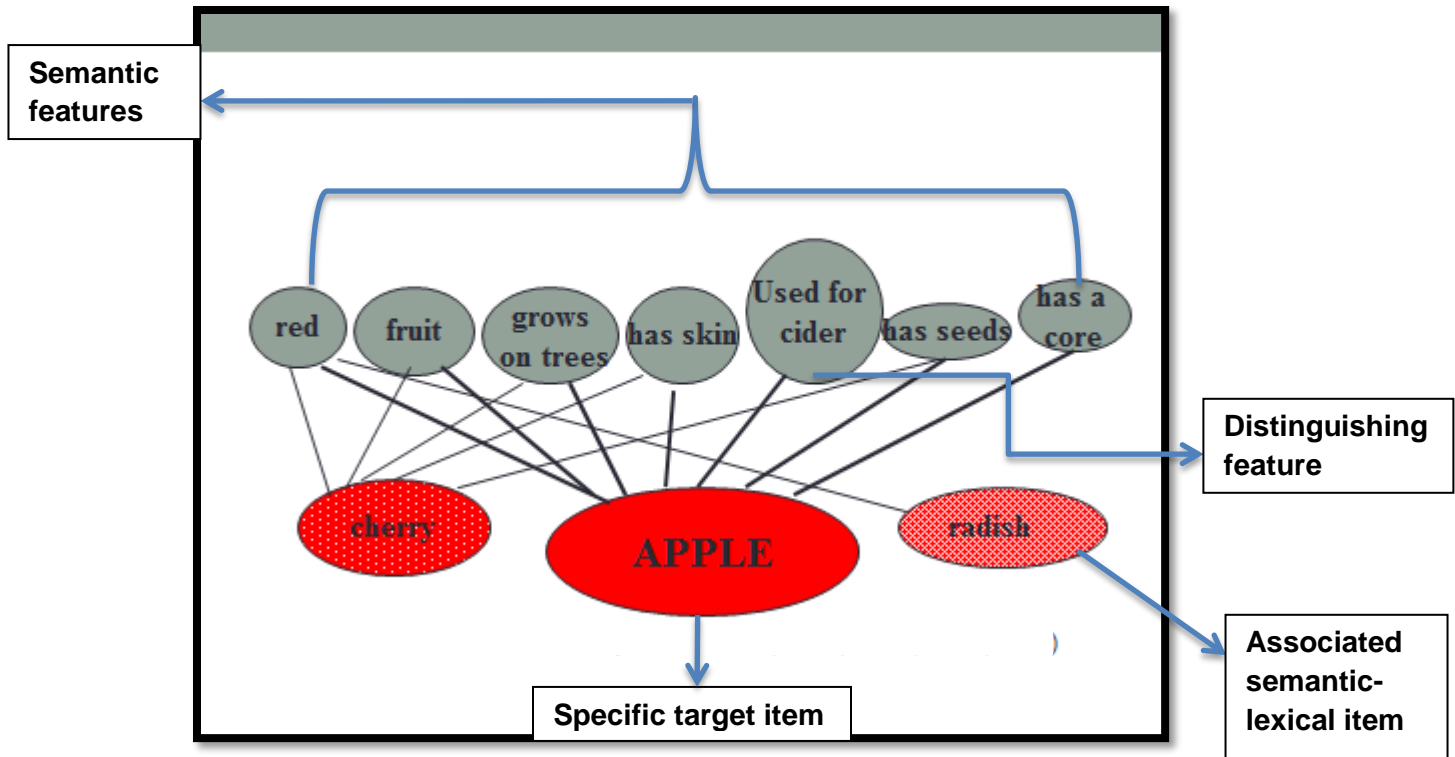
A meta-analysis of studies investigating word-finding treatments used in aphasia management found that there was a wide range of variability in the studies investigated (Wiesenburn & Mahoney, 2009). Seventeen studies evaluated semantic therapy, fifteen

phonological therapy, and sixteen were a combination of both therapy approaches. Gains seen for trained and exposed words were significant with minor gains for untrained or unexposed items. Results suggested that word retrieval therapy, overall, was efficacious, and the success of the treatment provided may vary substantially depending on the individual with aphasia. ASHA (2014b) also conducted a meta-analysis and concurred that semantic, phonological or mixed approaches may be used successfully in word retrieval treatments. However, no conclusions could be drawn to suggest one intervention approach was better than the other.

It appears that although aphasia treatment in general is deemed effective, factors that influence the gains observed in clients remains unclear. Basso (2005) reiterates this point by stating that efficacy mainly depends on what is done in treatment. The focus should be on which treatment is beneficial to which individuals and why, thereby emphasizing the variability of aphasia across individuals (Basso, 2005). Therefore, further investigation is warranted regarding pairing of client's conditions and needs with treatment techniques. It has been suggested that the same treatment task could be used to study many cases (Nickels, 2002). Thereby discerning which treatment technique may be appropriate for which particular naming impairment and in what contexts gains are more likely when treating word retrieval difficulties in individuals with aphasia.

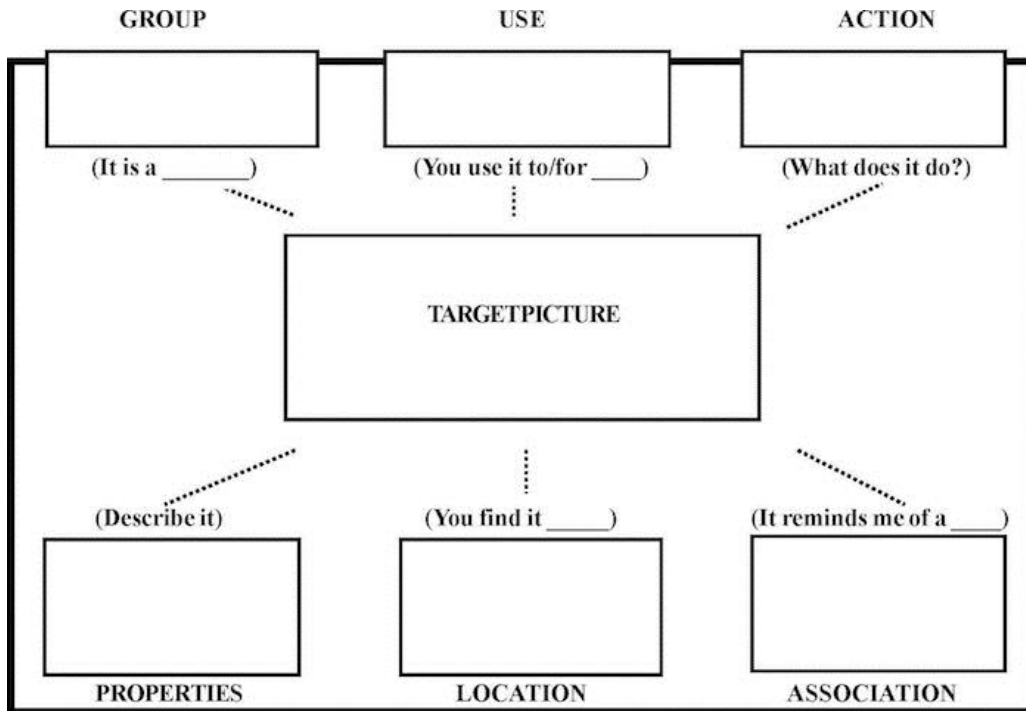
Semantic feature analysis (SFA) is one such technique that appears to be popular amongst therapists, as well as researchers (Boyle, 2010; Nickels, 2002). SFA was first developed by Ylvisaker and Szekeres (1985) to provide an organized method of activating semantic networks to aid word retrieval (Boyle, 2010). As previously discussed, models of lexical retrieval suggest that when attempting to name a pictured object, the features thereof are activated (Collins & Loftus, 1975; Levelt, 2001; Oppenheim, Dell & Schwartz, 2010). This triggers associated concepts, which in turn, trigger associated lexical items. The lexical item (i.e. word) receiving the greatest amount of activation is selected (Boyle, 2010). This activates the associated phonological representation, which results in naming the item.

One semantic feature may be connected to a number of concepts (e.g. 'goes on the road' is connected to 'car', 'truck', 'bus' and 'pedestrian', among others). Semantic features differ in informativeness for a specific target item. Distinguishing features are considered to be more informative than other features (Lombardi & Sartori, 2007) and may best aid recall of the specific target item. Figure 1.1 illustrates this process when naming of the word "apple" occurs.



**Figure 1.1 An example of activation of semantic concepts and features (Boyle, 2011)**

SFA treatment utilizes a feature analysis chart consisting of various feature categories (e.g. group, use, action) as in Figure 1.2. The individual with anomia is asked to self-generate semantic features of the specific target item according to the various feature categories with only guidance from the SLT. Therefore features of a specific target item are discussed in an organised manner in order to aid recall (e.g. a red fruit that grows on plants, has many tiny yellow seeds on the skin, and can be used to make jam = strawberry). Emphasis is placed on the active involvement of the client performing the SFA technique. Raymer et al. (2008) found that clients generating semantic features led to a deep level of semantic processing. An additional benefit of the SFA technique is that it encourages semantic self-cueing and semantic circumlocutions (talking around a word), thus providing cues to listeners even when word retrieval failures occur (Antonucci, 2009).



**Figure 1.2 Semantic Feature Analysis chart (Boyle, 2010)**

Due to the popularity of SFA, there has been variability in its administration. From the literature, it is evident that some SLTs and researchers have followed the protocol as outlined by Ylvisaker and Szekeres (1985). However, others did not require clients or participants with anomia to actively analyse a concept and generate semantic features but rather requested them to choose from options given. Boyle (2010) reports this disparity in treatment tasks as leading to different levels of semantic processing as previously noted (Nickels, 2002). This in turn may be directly related to treatment gains, maintenance and generalisation effects. It thus is imperative to administer the technique accurately. Furthermore, opportunities to practice this activation and generation of features for specific target items are necessary to facilitate increased independence of the use of the SFA technique (Antonucci, 2009).

Stimuli generally used in SFA treatment studies are typically nouns and verbs. Results from SFA studies that trained naming suggest that the knowledge gained by participants is typically limited to trained words and, at best, modest improvements in naming of untrained words (Nadeu & Kiran, 2009; Nickels, 2002). SFA has been used in many cases in individual therapy and has been reported to improve naming of targeted items with generalisation to control stimuli (Davis & Stanton, 2005; Wiesenburn & Mahoney, 2009). A recent systematic review of eleven studies using SFA within single-subject experimental designs, revealed that methodologically sound research is being

conducted and that SFA is an effective treatment technique for improving confrontational naming (Maddy, Capilouto & McComas, 2014). SFA has been applied to improve the retrieval of action names. Improvements were noted for untrained items of frequent exposure during treatment probes (Wambaugh & Ferguson, 2007). However, improvements were not observed with untrained items with limited exposure. Studies such as the above mentioned, reiterate that generalisation of treatment effects warrants further research.

An important factor for evaluating the effectiveness of SFA treatment is the generalisation of improved word retrieval on picture naming to connected speech (Peach & Reuter, 2010). Studies that have been conducted on connected speech, as those by Davis and Stanton (2005), reported gains in naming for trained and untrained stimuli. A study by Rider, Wright, Marshall and Page (2008), using SFA in preselected contexts, reported improvements in confrontational naming and suggested possible benefits for word retrieval in discourse production of closed-set contexts. Participants demonstrated an improved ability to use the trained words in associated trained discourse contexts. Kristensson, Behrns and Saldert (2014) investigated intensive training in the use of SFA for confrontation naming of objects and actions, as well as measuring active participation in conversation. Results revealed no improvement in confrontation naming ability but an increased ability to participate in conversation. The authors concluded that SFA might improve the ability to participate in everyday conversation. These findings appear promising with regard to an increased functional approach to using SFA. Mayer and Murray (2003) reiterate this by suggesting incorporation of discourse-level tasks for word retrieval in aphasia treatment protocols. Further research is therefore warranted to examine the effect of SFA on discourse contexts in different communication environments.

A social model of healthcare has evolved and provides a conceptual framework for the provision of treatment in different environments (Byng & Duchan, 2005). Group therapy is an approach that has gained increased attention over the past decade (Elman, 2007; Simmons-Mackie, Elman, Holland & Damico, 2007) where applications of the social model of healthcare have been made. Socially orientated aphasia groups have been described as less structured and more client-centered (Simmons-Mackie et al., 2007) than conventional groups. There is a substantial shortage of health care professionals in South Africa (Mayosi & Benatar, 2014). Along with ongoing problems of poverty and unemployment, group therapy is often the only option of rehabilitation for persons with a disability (Penn, 2007). Group therapy may offer unique opportunities for acceptable and appropriate speech-language intervention in South Africa. Research shows that group therapy has many benefits including promoting interaction among members and

enhancing natural communicative tasks that may increase the likelihood of a transfer of treatment gains to home and community environments (Elman, 2007).

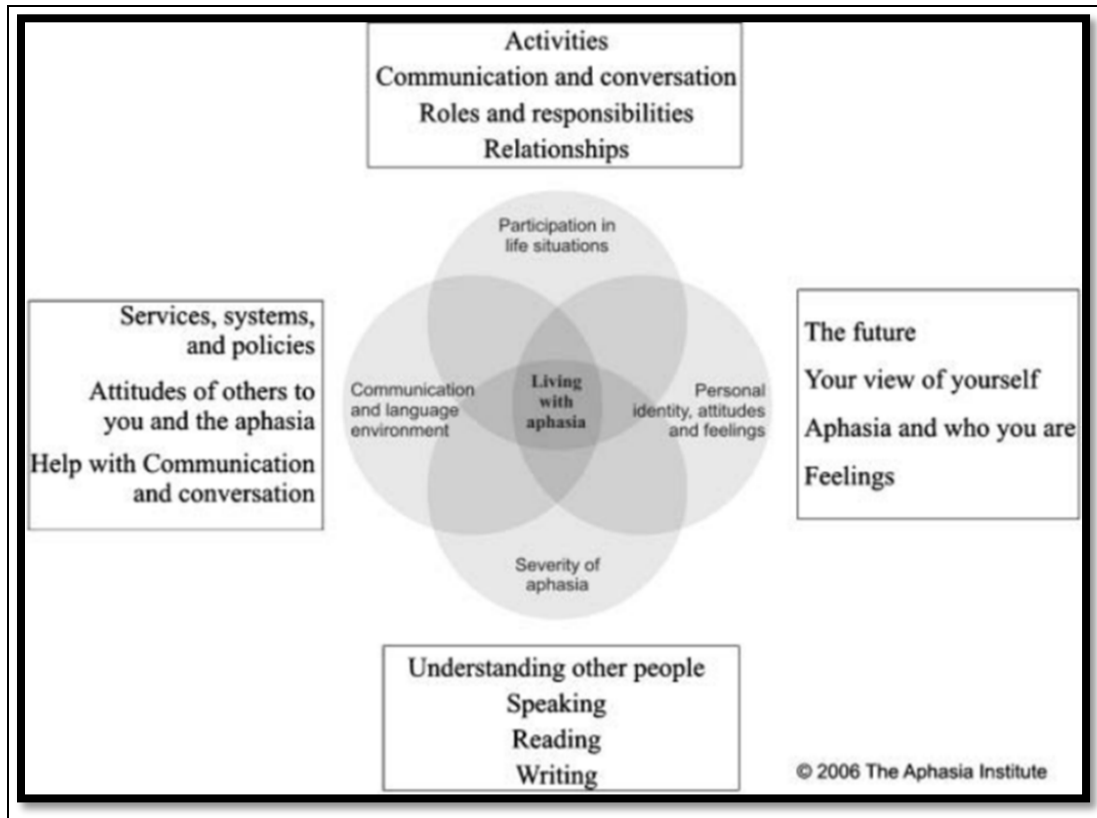
A scaffolded discourse group intervention model, developed by Garrett and Ellis (1994) has been successfully used with individuals who are beyond the acute rehabilitation phase of treatment (i.e. persons with chronic aphasia). The aim of this model is to provide opportunities for individuals with aphasia to practice functional communication and improve communication skills in interactive, naturalistic communication contexts (Garrett, Staltari & Moir, 2007). The group setting is structured in order for participants within the group to use their language and communication skills to accomplish a specific communication goal (e.g. telling a story or explaining a procedure). Garrett et al. (2007) state six essential categories of communication skills targeted for participants during aphasia group treatment sessions. Semantic specificity is one such category included for practice in functional communication tasks. Therefore, word retrieval, as used in SFA, is recognized as a viable intervention target within the group setting.

The Living with Aphasia: Framework for Outcome Measurement (A-FROM) is adapted from the World Health Organisation [WHO], International Classification of Functioning and Disability (ICF) framework (WHO, 2001). It takes into account the impact of aphasia on real life areas and has potential application in research to guide studies on aphasia intervention (Kagan et al., 2008). This framework highlights the interconnectedness of the areas of impairment, activities and life participation as shown in Figure 1.3.

The focus areas that SFA treatment in discourse addresses is not only on the impact of word retrieval difficulties (i.e. on the impairment level), but also on the:

- effectiveness of communication in connected speech (the communication and language environment), and
- evaluation of outcomes in various settings (life participation).

Therefore the A-FROM ensures a holistic view when undertaking research focused on people living with aphasia. Furthermore, applicability of SFA, when viewed within the context of this framework, is promising in South Africa as relationships between environmental constraints and social demands on the individual can be addressed to possibly aid increased functional communication.



**Figure 1.3 Living with Aphasia Model (Kagan et al., 2008)**

Research in SFA treatment within discourse-specific contexts during individual intervention has yielded modest success with generalisation to untreated discourse tasks not frequently demonstrated (Antonucci, 2009). Furthermore, the lack of generalisation effects in SFA has led to a reconsideration of how increased generalisation of treatment effects may be achieved (Peach & Reuter, 2010). In light of clear advantages of group therapy, training in SFA within a group setting may be optimal for improving word retrieval skills in naturalistic conversation (Beeson & Holland, 2007). Antonucci (2009) further states that SFA treatment may also have the additional benefit of improving communicative informativeness (i.e. providing increased context) through the facilitation and practice of semantic circumlocution (i.e. speaking around the specific target item), even if the target word is not achieved. Therefore, SFA treatment within group discourse-based tasks may not only improve lexical access but also facilitate enhanced functional communication skills.

Recent research findings indicate initial success of the use of SFA within a group context. Two studies provide preliminary evidence that SFA treatment can result in improved word retrieval and communicative informativeness when trained as a strategy

in group therapy (Antonucci, 2009; Falconer & Antonucci, 2012). Furthermore, Antonucci (2009) reported individuals with diverse word finding difficulties derived varying benefits from SFA. Thus, functional communication gains are likely to be made when this technique is applied to small group therapy.

The following research question for the present study was thus posed:

**Will gains be made in word retrieval abilities and overall communicative informativeness whilst conducting SFA training within discourse for individuals with aphasia in a small (two-member) group setting?**

The expectation was that the findings will provide further support that SFA training during group aphasia treatment can be used successfully to facilitate improvement of communicative informativeness. The study may potentially contribute to the growing body of evidence that SFA treatment targeted at discourse level within a group setting may result in functional communication gains for individuals with word retrieval difficulties. The study may also contribute to evidence of effective aphasia group therapy in South Africa.

## 1.2 List of terminology as used in the dissertation

**Chronic aphasia:** Aphasia that persists beyond the acute stages. There is no clear time-frame to define acute versus chronic, however for the purpose of statement writing (and research), it can be defined as ongoing language difficulties six months post stroke. ([www.aphasiapathway.com.au/?name=Abbreviations-and-definitions](http://www.aphasiapathway.com.au/?name=Abbreviations-and-definitions))

**Communicative informativeness:** The relevant information shared by a speaker in relation to a specific stimulus (Nicholas & Brookshire, 1993).

**Connected speech:** Spoken language that is used in a continuous sequence as in everyday conversations. The term discourse is also used interchangeably. ([www.teachingenglish.org.uk/article/connected-speech-2](http://www.teachingenglish.org.uk/article/connected-speech-2))

**Confrontation naming:** The selection of a specific label corresponding to a viewed stimulus, usually a picture, of a viewed object or action. Confrontation naming also refers to a type of task used in assessment as part of clinical language testing to detect

impairments of word-finding abilities in individuals with various types of neurologic impairments.

(<http://www.encyclo.co.uk/meaning-of-Confrontational%20Naming%20Task>)

**Discourse-based treatment:** Treatments that focus on naturally occurring (real-life) conversations and those which focus on improving linguistic performance by treating within a structured discourse context (Kempler & Goral, 2011).

**PACE therapy:** Promoting Aphasics' Communication Effectiveness (PACE) is a treatment approach designed to improve conversational skills using any modality to communicate messages. Both the individual with aphasia and the SLT take turns as message sender or receiver, promoting active participation from the individual with aphasia.

([www.asha.org/PRPSpecificTopic.aspx?folderid=8589934663&section=Treatment](http://www.asha.org/PRPSpecificTopic.aspx?folderid=8589934663&section=Treatment))

**Semantic feature analysis (SFA):** Based on the theory that neural connections between related concepts are strengthened within the semantic system so that access to vocabulary (lexicon) becomes more automatic. By the individual with word retrieval difficulties, self-generating words and phrases related to the target item and activating the entire surrounding semantic network, the target is more likely to be accessed and produced. SFA employs the use of multiple forms of input for naming, including written labels of semantically related features, pictures, and functional verbal prompts from the SLT (Davis & Stanton, 2005).

**Word retrieval difficulties:** Temporary difficulty gaining access to and retrieving a known and understood word, therefore difficulties may be present with the storage of a word, retrieval of a word or a combination of both processes (Friedmann, Biran & Dotan, 2013).

### 1.3 List of abbreviations

A-FROM	- Living with Aphasia: Framework for Outcome Measurement
AOS	- Apraxia of speech
ASHA	- American Speech-Language Hearing Association
BNT	- Boston Naming Test
CIU	- Correct Information Unit
CT scan	- Computerised Tomography scan
EBP	- Evidence-based practice
ICF	- International Classification of Health and Disability
MRI	- Magnetic Resonance Imaging
PACE	- Promoting aphasics communication effectiveness
RCPM	- Raven's Coloured Progressive Matrices
SFA	- Semantic feature analysis
SLT	- Speech-Language Therapist
SWFU	- Six week follow-up
WAB	- Western Aphasia Battery
WHO	- World Health Organisation

## CHAPTER 2: METHOD

### **The aim of this chapter is to:**

Outline the research design of this present study.

Describe the participants involved.

Describe the procedures and materials used in the various phases of data collection.

Describe the process of data analysis.

Discuss ethical considerations related to the process of data collection and analysis.

### **2.1 Aim of the study**

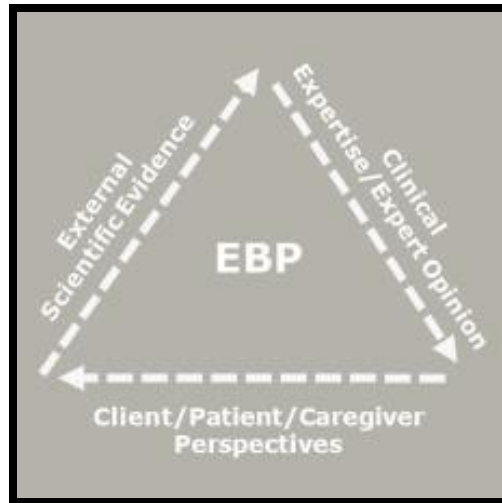
The aim of this study was to investigate the training of SFA within discourse during a small (two-member) aphasia group treatment to ascertain if gains would be made in word retrieval abilities and communicative informativeness.

### **2.2 Research design**

The design employed was quasi-experimental in nature. Participants for this study were purposively selected. In cases where random assignment of participants is neither practical nor possible, quasi-experimental designs are used (Leedy & Ormrod, 2014). This research study is based on the previous work of Antonucci (2009), as well as Falconer and Antonucci (2012), where SFA was trained in a small aphasia-group context. This study employed a case series analysis of two English speaking participants with aphasia within a small group setting using multiple baseline measurements and multiple probes.

A case series involves a series of participants given the same treatment in the same manner, however, the results of each participant is analysed as single case studies (Howard, 2003). Conclusions can thus be drawn regarding treatment effects, and opportunities arise to investigate the possible reasons for differences, if any, among participants. This therefore has implications for evidence-based practice (EBP).

EBP is defined as the integration of the best research evidence with clinical expertise and patient values (Sackett, Strauss, Richardson, Rosenberg & Haynes, 2000). ASHA (2004) further illustrates this as an approach to EBP in figure 2.1 below.



**Figure 2.1 Evidence-based practice**

EBP is an evolving process where there is dynamic integration of clinical expertise and external evidence to guide client/family centered practice. Howard (2003) states that case series designs of therapy can be used to identify which individuals are likely to benefit from a well-specified treatment method. The findings of such studies could contribute to the body of evidence regarding the use of specific treatment methods. Basso (2005) applied this thinking to aphasia research and concluded that a clear need is apparent to indicate which treatment is beneficial to which individuals in order to increase efficacy of aphasia intervention.

Furthermore, Beeson and Robey (2006) discuss a five-phase model of treatment outcome research in single-subject research designs. Phase one entails the investigation of new treatments with a small number of individuals to test the therapeutic effect. In phase two, additional studies should be conducted to optimize procedures, discern most appropriate candidates and explore the potential efficacy of treatment. This should stimulate further group designs that are well-controlled and tested under ideal conditions (phase three). Effectiveness studies in phase four should then take place and cost-benefit analyses can be conducted (phase five). In this manner, rehabilitation research follows a logical progression in growing the body of evidence for various treatment approaches, with single-subject research playing a vital role in phases one and two prior to commencement of large scale research.

The present study sought to investigate a prominent treatment technique for word retrieval difficulties, namely SFA, applied to a novel setting (namely a small aphasia

group within a discourse-based setting) that has yielded limited research to date. Two studies have been conducted to investigate the use of SFA in a small aphasia-group setting (Antonucci, 2009; Falconer & Antonucci, 2012). Therefore, the present study fits into phase one of the five-phase model proposed by Beeson and Robey (2006).

As previously mentioned, multiple baseline and multiple probes were used during the various phases of this study. Multiple baseline and multiple probe designs are appropriate for answering questions regarding the effects of a single intervention across individuals, behaviours, stimuli or settings (Byiers, Reichle & Symons, 2012). In this design, multiple conditions are selected (in this study – two different research participants and various stimuli of increasing complexity were utilised) and baseline data collected in all conditions. Treatment is then administered, during which intermittent probes are implemented to measure any form of change following treatment (Byiers, et al., 2012).

An advantage of such a design is that a treatment or intervention does not need to be reversed (as seen in studies where purposeful withdrawal occurs of the reinforcement necessary for occurrence of a desired response behaviour). The possible gains made in such a design are retained and a new baseline of performance is thus achieved for each group member. However, Byiers et al. (2012) caution that the potential generalisation effects in the study must be carefully considered and controlled to minimise threats to internal validity. In the present study, all intervention was administered simultaneously and probe measures were put in place to measure performance throughout all phases of the study. In addition, the clock drawing test was implemented as a control measure. Clock-drawing is deemed to be a reliable screening tool for assessing cognitive dysfunction (Eknoyan, Hurley & Taber, 2012). Therefore, the behaviours observed when administering this test would unlikely be influenced by the implementation of SFA in a group conversation setting.

### **2.3 Ethical considerations**

Permission was granted from the Head of Department of Speech-Language Pathology and Audiology at the University of Pretoria to recruit participants from the department's clinic for adult neurogenic communication disorders (See Appendix A). The research proposal was approved by the Research Committee of the Department of Speech-Language Pathology and Audiology at the University of Pretoria. Ethical clearance was obtained from the Research Ethics committee of the Faculty of Humanities at the University of Pretoria (See Appendix B).

The following ethical aspects were taken into account during this research study:

### ***Protection from harm***

According to Leedy and Ormrod (2014), the general rule of thumb with involving human beings in research studies is that the risk involved in participation should not be appreciably greater than that of day-to-day living. The researcher considered the possible factors that could potentially influence participants' level of confidence and ease of communication during interactions. This was achieved by treating participants with respect and informing participants of their contribution to understanding some aspects of the complexities of communication in everyday life as a result of the presence of aphasia.

### ***Voluntary and informed participation***

Any participation with human beings in a research study should be strictly voluntary and informed consent is required (Leedy & Ormrod, 2014). Informed consent refers to the necessity of participants or legal guardians (in the case of children and other specific populations, such as adults with acquired brain injury) being informed with regard to the nature of the study and providing their written permission to participate therein (Leedy & Ormrod, 2014).

The two participants, as well as their legal guardians (i.e. spouses), were informed of the nature of the study procedure and were given the opportunity to withdraw their participation at any given time. An information sheet for the partner or family member of prospective participants were compiled (See Appendix C1). In addition, an information sheet with succinct information and pictorial supports for the participants with aphasia was compiled to further aid understanding of the study (See Appendix D2). Written consent was obtained from the partner or family member of each participant as well as from the participants (See Appendix C2 and D2).

### ***Right to privacy***

According to Leedy and Ormrod (2014), a researcher must keep the nature and quality of individual participants' performance strictly confidential. This entails using a code for participants to ensure confidentiality, ensuring research data is appropriately encoded when electronically sharing information with co-researchers and including specificities of revealing individual responses into the informed consent if required.

In the present research study, each participant was given a code and this was used on all data obtained. No individual, aside from the researcher, was aware of the identity of any of the participants. The second rater involved in the analysis of data did not know the identity of participants. The raw data, as well as subsequent analyses thereof, was securely stored and password protected. Data is now stored in the Department of Speech-Language Pathology and Audiology for the next 15 years.

### ***Honesty with professional colleagues***

It is of paramount importance to convey findings in a comprehensive and honest manner, with due acknowledgement to the contributions of other researchers (Leedy & Ormrod, 2014). It was the intention of the researcher to execute all phases of this research study in an ethical and honest manner. Measures were put in place to ensure data analysis was performed appropriately and findings presented comprehensively and fairly.

## **2.4 Study site for data collection**

As the study involved small group treatment, data was collected at the University of Pretoria, Department of Speech-Language Pathology and Audiology premises for all phases of the study.

## **2.5 Participants**

### ***Criteria for participant selection***

As this study extends on the work by Antonucci (2009) and Falconer and Antonucci (2012), participants were selected based on the above-mentioned studies' selection criteria. Participants with a confirmed diagnosis of aphasia were selected to participate in the present study. The following inclusion and exclusion criteria were used in the participant selection process:

Inclusion criteria:

- The participant must have a confirmed diagnosis of a stroke based on review of their medical records and the findings of an MRI or CT scan.
- The participant must be an adult (i.e.  $\geq 18$  years old).
- The participant must have exposure to English from birth as all assessment and treatment materials were in English. Furthermore, variability in English proficiency would not be a contributing factor to results obtained.

- The participant must have some verbal language skills (i.e. able to produce some speech) as the present study's focus is on connected speech tasks.
- The participant must agree to forfeit any speech-language treatment during all phases of this research study to exclude exposure to other treatment settings as a contributing factor to any observed improvements.

Exclusion criteria:

- Participants who could not attend at least eighty percent of treatment sessions as participants were exposed to different stimuli of increasing complexity at each session.
- Participants with poor auditory verbal comprehension (as seen in severe aphasia) as SFA is a technique actively performed by participants with only guidance from the clinician.

Participants were recruited from the Neurology clinic of the Department of Speech-Language Pathology and Audiology at the University of Pretoria.

### ***Participant description***

Two participants were purposefully selected for the study. Purposive sampling entails non-probability sampling where knowledge of the population and objectives of the study are used to select participants (Palys, 2008). Both female participants (both right-handed) suffered a single left hemisphere stroke that resulted in aphasia confirmed by an MRI or CT scan. Participants had chronic aphasia five and ten years post onset. P1 presented with Broca's aphasia and P2 with Anomic aphasia as determined by the Western Aphasia Battery [WAB]. Both participants passed a hearing screening at the time of data collection. Both participants had tertiary level education, lived in similar socio-economic suburbs and were retired.

Data were collected, by the researcher, in three phases, namely, the pre-treatment, treatment and post-treatment phases. Demographic information of the participants is provided in Table 2.1.

**Table 2.1 Description of participants**

Participant	P1	P2
Age	77	68
Education	Undergraduate degree	Undergraduate diploma
Type of aphasia	Broca's aphasia	Anomic aphasia
Time post onset (years)	10	5

## 2.6 Materials and apparatus used during data collection

Baseline measures included stimuli from the Nicholas and Brookshire (1993) protocol consisting of two picture scenes, two complex picture sequence descriptions, one request for personal information and one request for procedural information. These stimuli were also used as probes during group treatment sessions and at the six week follow-up (SWFU) session.

- The “Cookie theft” picture from the Boston Diagnostic Aphasia Battery [BDAE] (Goodglass & Kaplan, 1983),
- The “Picnic” scene from the WAB (Kertesz, 1982),
- Two single pictures and two picture sequence cards, as well as requests for personal and procedural information (Nicholas & Brookshire, 1993).

Further baseline data was obtained through the use of the following formal assessment instruments:

- The WAB (Kertesz, 1982), which is a test of language abilities,
- The Boston Naming Test [BNT], (Kaplan, Goodglass & Wenraub, 1983), which is a test of naming abilities, and
- The Raven’s Coloured Progressive Matrices [RCPM], (Raven, Raven & Court, 1988), which is a test of visual-spatial problem solving.

Stimuli used during group treatment sessions were commercially available pictures and picture sequence sets designed for adults with aphasia (Descripto-Cards Advanced: For functional language and cognition) as well as generic photographs (standard A5 size, colour pictures and photographs) obtained from the internet. The clock drawing test (Eknoyan et al., 2012) was administered as a control measure as it is deemed to be a reliable screening tool for assessing cognitive dysfunction. The audio recorder function on a Samsung S5 cellular phone and a Samsung digital camcorder (video recorder) was used during data collection.

A SFA chart as seen in Figure 1.2 (Boyle, 2010) was enlarged to an A3 format and an A4 format was also available for use during the treatment phase. Boyle (2010) states that this chart is aimed to assist individuals with word retrieval problems to generate the semantic features of the target concept under the guidance of the SLT, who directs feature generation of the concept to include the most distinguishing semantic features.

## 2.7 Procedures used during data collection

During the pre-treatment phase, discourse was assessed once weekly over three weeks (for P1) and two weeks (for P2) as she was unable to complete the third session. The pre-treatment data were therefore incomplete for the third measure. These measures were conducted in order to obtain multiple baseline data. The baseline establishes a benchmark against which the individual's behavior in subsequent conditions can be compared (Byiers et al., 2012). All discourse samples were audio and video recorded. Stimuli and procedures followed the Nicholas and Brookshire (1993) protocol where participants were requested to talk about the stimulus where no cues from the SLT were provided other than social continuants (e.g. "Okay" or "I see") and prompts for additional information (e.g. "What else do you see?" or "Can you tell me more?").

Seven group therapy treatment sessions were conducted (See Table 2.2). Group sessions (the two participants and the researcher as facilitator) commenced twice weekly for the first two weeks and once weekly for the last three weeks. SFA training was applied during small group discourse tasks. Each treatment session lasted one and a half to two hours in duration.

The SFA chart (A3 & A4 size) as in Figure 1.2 was used to assist participants when naming difficulties arose. Descriptors were also included in each of the six feature categories, for example, "reminds me of" in the association feature category (Antonucci, 2009; Falconer & Antonucci, 2012). Open-ended questions were used to facilitate feature production within each feature category.

**Table 2.2 Procedures during group sessions**

Session	Week	Stimulus materials	Procedures
1 & 2	1	Single pictures (e.g. boat)	Group discussions involved shared pictures. Descriptions followed the SFA chart systematically. Participants discussed one picture together with the group facilitator.
3	2	Single picture scenes (e.g. child watching television)	Subsequent pictures were jointly discussed by the two participants alone (using the SFA chart as a guide) and then explained to the facilitator. Each participant also had an opportunity to independently discuss a picture. A modified format of the PACE treatment approach (Davis & Stanton, 2005) was followed in which a stimulus, hidden from others, is described using words and pictorial supports for P2.
4	2	Single pictures with a problem to identify (e.g. a boy hitting a baseball with a guitar)	

Session	Week	Stimulus materials	Procedures
5	3	Travel theme (picture scenes of various destinations)	Participants chose the theme of travel from three options. Discussions centered around travel in general, destinations participants have visited, and joint descriptions of two pictures following the procedures as outlined above. The SFA chart was used when word finding difficulties arose.
6	4	Travel theme (picture sequences and scenes of various destinations)	Participants described picture scenes jointly (photo of a destination with a well-known landmark e.g. a scene in Paris with the Eiffel tower). Each participant discussed one picture/concept independently. All discussions followed procedures as above and in session 5.
7	5	Travel theme (picture scenes, sequences and scenario to plan a holiday)	Participants described the concept of an ideal holiday, a picture sequence, and planned a holiday with a scenario given (e.g. Ms X wants to take her husband and son on a holiday. She has only been to areas close to her home. She doesn't like boats. Use this information to plan a holiday). Each participant also discussed one picture or concept independently. All discussions followed the procedures described above and in session 5.

All features in the different categories (e.g. use, association) were discussed in sessions one to four. If participants had difficulty with producing a feature, phonemic cueing and sentence completion was facilitated by the researcher. The feature was given if the participant failed to provide it. As participants became more familiar with the SFA chart and the process of generating features, all appropriate features were given by participants until the target was produced. If the participant failed to name the item, a revision of features, as well as phonemic cueing and sentence completion was used by the researcher. Production of the targeted name then followed. A discussion ensued of the said description between all group members and whether any suggestions or alternative descriptions could have resulted in more effective naming of the target. Participants were led through the SFA chart when word-retrieval difficulties occurred in sessions five to seven. Facilitation by the researcher followed the processes stated above. Naturalistic discourse tasks of increasing difficulty (Antonucci, 2009; Falconer & Antonucci, 2012) were used to elicit connected speech (See Table 2.2). Discourse

probes were used every other week, in random order, during treatment sessions, and at the SWFU session.

## **2.8 Data analysis**

Orthographic transcriptions were made of all audio and video recorded discourse samples obtained. Although time consuming, conversational analysis is a more sensitive measure of change of communicative effectiveness over time as compared to standard rating schedules (Crockford & Lesser, 1994).

Analyses of the data, from baseline to SWFU, followed the Nicholas and Brookshire (1993) protocol as in the previous studies by Antonucci (2009) and Falconer and Antonucci (2012). The number of words, correct information units (CIUs), as well as percentage of CIUs was calculated. Words had to be intelligible in context to be included in the word count (See Appendix E). CIUs (Nicholas & Brookshire, 1993) are words relevant and informative relative to the eliciting stimulus. These measures provide a clear view of relevant information imparted by speakers, and an opportunity to make estimations regarding communicative informativeness (i.e. the information shared). Noun and verb retrieval was calculated and quantified (%nouns and %verbs retrieved) following the protocol in Mayer and Murray (2003). The use of easily quantifiable measures is considered an option to extend current methodology and reconcile issues of ecological validity and clinical feasibility (Mayer & Murray, 2003). The respective roles of the participants and their interaction within the group setting were not explicitly measured as the objective of this study was to measure gains in communicative informativeness.

There is a rich body of literature in single-subject studies with potentially useful data. However, Beeson and Robey (2006) note the difficulty present to discern the relative “potency” of these various treatments, as well as to synthesize outcomes in a meaningful manner due to a lack of a common measure of change. They further mention that effect sizes may be used as a means of quantifying results gained from individual participants in research studies.

Descriptive statistics were used and involve organising, displaying and describing data (Shafer & Zhang, 2012). Means and standard deviations were determined for the number of CIUs, %CIUs, as well as %nouns and %verbs for both participants with treatment stimuli and probe stimuli. Effect sizes were calculated for these variables across all discourse measures, providing an indication of the magnitude of change in these variables from baseline to session seven and at the SWFU session. An effect size, in this instance, refers to the magnitude and direction of the difference in the relationship between two variables; that is, how much difference or how strong a

relationship is between variables (Durlack, 2009). Effect size was calculated in both the previous studies (Antonucci, 2009; Falconer & Antonucci, 2012) for all discourse measures. This effect measures the amount of change that occurs from pre-treatment to post-treatment and at SWFU. The a priori benchmark was set at  $\geq 2.74$ , which was determined to be the mean effect size for generalisation to connected speech in word retrieval studies (Beeson & Robey, 2006). Visual analysis of the time series graphs for treatment stimuli and probe stimuli were also carried out to identify trends and variability in scores from baseline to SWFU.

## **2.9 Reliability, validity and trustworthiness**

Reliability is the consistency with which a measuring instrument yields a certain, consistent result when the entity being measured has not changed (Leedy & Ormrod, 2014). They further describe validity as the extent to which the measuring instrument measures what it is intended to measure.

The standardized instruments (i.e. the WAB and the BNT) used in aphasia treatment, mentioned in the data collection section, are recommended for use in comprehensive assessments by ASHA (2014c). They are levels B (recommendations based on well-controlled clinical studies) and C evidence (based on expert opinion) in ASHA's evidence maps and summary of clinical practice guidelines. Furthermore, the commercially available materials used are published materials specifically designed for adults with aphasia. In addition, video recordings and audio recordings were taken to enhance analysis of discourse samples within the respective contexts of the stimuli and the group setting. All orthographic transcripts were scored by the researcher.

Internal validity was ensured by administering all treatment simultaneously and particular probe measures presented randomly every other week. Twenty percent of transcripts were scored by a qualified SLT who was a postgraduate student. Analyses included the Nicholas and Brookshire protocol (1993) as well as that outlined by Mayer and Murray (2003) to calculate word retrieval abilities according to word class. Percentage agreement across transcripts was 81.25% with a range of 79% to 91%. The clock drawing test was administered across group treatment sessions as a control measure and measures remained stable across sessions.

## CHAPTER 3: ARTICLE

This article was submitted to the journal, Communication Disorders Quarterly, in the style and format required by the journal. This article is currently under review.

### **Semantic Feature Analysis for Word Retrieval Difficulties in a Small Aphasia-Group**

#### **Setting**

#### **Abstract**

Word retrieval deficits are a common, pervasive feature of aphasia. Semantic feature analysis (SFA) is a popular treatment technique for word retrieval impairment. Preliminary evidence of its use in small aphasia group settings suggests improved word retrieval in discourse-based tasks with improvements in communicative informativeness (CI). The aim of this study was to further investigate training of SFA during group aphasia treatment (GAT) to ascertain if gains would be made in CI. Two participants with aphasia participated in seven, weekly sessions where SFA was applied to elicit increasingly naturalistic discourse. A case series analysis was conducted. Participants demonstrated certain modest gains in overall CI but were not maintained at the six week follow-up. A group setting may offer advantages to facilitate communication skills and increase conversational participation. Further research needs to identify benefits for individuals with differing aphasia types and severity, optimal GAT and the role of peer support during group interaction.

#### **Key Words**

Aphasia, discourse, group therapy, stroke rehabilitation, word retrieval, semantic feature analysis

## **Introduction**

Stroke is the third most common cause of disability worldwide (Lozano et al., 2012) and also highly prevalent in South Africa. According to the Southern African Stroke Prevention Initiative the prevalence of stroke was estimated to be 300/100 000 (Connor & Bryer, 2006). Aphasia is a language impairment that may occur in up to 38% of stroke survivors (Dickey et al., 2010; Pederson, Jorgensen, Nakayama, Raaschou, & Olsen, 1995) and renders those affected with significant difficulty to speak, comprehend, read and/or write language.

A common pervasive feature of aphasia is the inability to name or recall words. Anomia, difficulty retrieving nouns, verbs and other content words, is one of the most common and disabling aspects of aphasia (Kendall et al., 2008). The inability to recall specific words may result in vague and ineffective communication. According to Wiesenburn and Mahoney (2009), numerous treatment methods have been used by speech-language pathologists in the remediation of word-finding difficulties. Typical approaches to remediating anomia employ tasks such as confrontation naming, repetition, orthographic and phonologic cueing, as well as picture matching using auditory stimuli or written words. These traditional aphasia therapies have been shown to improve naming performance. However, generalization is typically limited (Nickels, 2002).

A meta-analysis of studies investigating word-finding treatments used in aphasia management concluded that using a semantic, phonological or mixed approach are efficacious, however, no conclusions could be drawn to suggest one intervention approach was better than the other (ASHA, 2014). Furthermore, it appears that although aphasia treatment in general is deemed efficacious, factors that influence the gains observed remains unclear. Basso (2005)

reiterates this point by stating that efficacy mainly depends on what is done in treatment; the focus should be on which treatment is beneficial, to which individuals, and why. Therefore, more investigation is warranted regarding pairing of a client's conditions and needs with treatment techniques. It has been suggested that the same treatment task could be used to study many cases when treating word retrieval difficulties in individuals with aphasia (Nickels, 2002), thereby determining which treatment technique may be appropriate for which particular naming impairment and in what contexts gains are more likely.

Semantic feature analysis (SFA) is one such technique that appears to be popular amongst therapists, as well as researchers (Boyle, 2010; Nickels, 2002). SFA was developed to provide an organized method of activating semantic networks to aid word retrieval (Boyle, 2010). Models of lexical retrieval suggest that when attempting to name a pictured object, the features thereof are activated (Levelt, 2001; Oppenheim, Dell & Schwartz, 2010). This triggers associated concepts, which in turn, trigger associated lexical items (i.e. words), for example, a red fruit that grows on plants, is heart-shaped, has tiny yellow seeds on the skin and can be used to make jam = strawberry. The lexical item (i.e. word) receiving the greatest amount of activation is selected (Boyle, 2010). This activates the associated phonological representation, which results in naming the item.

SFA has been used in many cases in individual therapy and has been reported to improve naming of targeted items with generalization limited to control stimuli (Davis & Stanton, 2005). Stimuli generally used are nouns and verbs. The knowledge gained by the participants was limited to trained words and, at best, modest improvements in naming of untrained words (Edmonds, Nadeu & Kiran, 2009; Nickels, 2002). Studies conducted on connected speech, such as that by Davis and Stanton (2005), reported gains in naming for trained and untrained stimuli.

These findings appear promising with regard to an increased functional approach to using this technique. Further research is therefore warranted to examine the effect of SFA on discourse contexts and during connected speech in different environments.

Group therapy is an approach that has gained increased attention over the past decade (Elman, 2007; Simmons-Mackie, Elman, Holland & Damico, 2007) where applications of the social model of healthcare have been made. Research shows that group therapy has many benefits including promoting interaction among members and facilitating a more natural communicative task that may increase the likelihood of a transfer of treatment gains to home and community environments (Elman, 2007). Furthermore, there is a substantial shortage of health care professionals in South Africa (Mayosi & Benatar, 2014). Along with ongoing problems of poverty and unemployment, group therapy is often the only option of rehabilitation for persons with disability (Penn, 2007). Possible reasons may include limited access to transport and clinics or hospitals, and limited opportunities for individual speech-language intervention. Therefore, an additional benefit of group therapy is its cost effectiveness. Kearns and Elman (2001) state that group treatment is a cost-effective way when compared with traditional, individual speech-language therapy and is becoming increasingly important as health care moves towards a mature managed care model.

Research in SFA within discourse-specific contexts during individual treatment has yielded modest success with generalization to untreated discourse tasks less frequently demonstrated (Antonucci, 2009). In light of clear advantages of group therapy, training in SFA within a group setting may be optimal for improving word retrieval skills in naturalistic conversation (Beeson & Holland, 2007). Recent findings indicate initial success of the use of SFA within a group context. Two studies conducted provide preliminary evidence that SFA

treatment can result in improved word retrieval and communicative effectiveness when trained as a strategy in group therapy (Antonucci, 2009; Falconer & Antonucci, 2012). Furthermore, Antonucci (2009) reported individuals with diverse word finding difficulties derived varying benefits from SFA. Thus, functional communication gains are more likely to be made when this technique is applied to small group therapy. The following research question was thus posed: Will gains be made in word retrieval abilities and overall communicative informativeness whilst conducting SFA training for individuals with aphasia in a small group setting? The expectation was that the findings may provide support that SFA training during group aphasia treatment can be used successfully to facilitate improvement of communicative effectiveness.

## **Method**

### *Participants*

This study employed a case series analysis of two English speaking participants with aphasia within a small group setting. Institutional ethical clearance was obtained. Two female participants were recruited from the University's clinic and informed consent was obtained from both participants prior to commencement of this study. Both participants (both right-handed) suffered a single left hemisphere stroke that resulted in aphasia confirmed by an MRI or CT scan. Participants had chronic aphasia five and ten years post onset. Age and educational background were similar in both participants (Table 1). Both participants passed a hearing screening at the time of data collection. They received no other speech-language intervention for the duration of this study. Data were collected, by the first author, in three phases, namely, the pre-treatment, treatment and post-treatment phases. Demographic information, as well as a summary of pre-treatment standardized measures is provided in Tables 1 and 2.

**Table 1. Description of Participants**

Participant	P1	P2
Age	77	68
Education	Undergraduate Degree	Undergraduate Diploma
Time post onset (years)	10	5

P1, was raised with English as her primary language, as well as exposure to two other South African languages from early childhood. P1 experienced a single left-sided stroke resulting in aphasia and acquired apraxia of speech (AOS). Baseline results of the *Western Aphasia Battery* [WAB] (Kertesz, 1982) indicated a classification of non-fluent Broca’s aphasia (Table 2). P1 had fair auditory comprehension abilities with some difficulty in following complex multi-step instructions (e.g. “Point with the pen to the book.”). Attempts at connected speech included a few single nouns, hesitations, long pauses, start-restart behaviours, as well as searching behaviours, characteristic of AOS (Van der Merwe, 2011). Non-specific reactive utterances, such as “I don’t know” were also observed. Phonemic paraphasias (e.g. “clower” for “flower”) and semantic paraphasias (e.g. “pin for “paperclip”) were present. P1’s main mode of communication was responsive speech and ineffective gestural attempts, which were often abandoned if the message was not understood by others. The presence of AOS as well as impaired naming abilities (*Boston Naming Test* in Table 2) contributed greatly to P1’s inability to provide more information. Lack of sufficient content necessitated conversational scaffolding (Falconer & Antonucci, 2012) including yes/no questions, sentence completion and restating the perceived message to confirm accuracy of understanding by the listener. P1’s scores for the *Raven’s Coloured Progressive Matrices* [RCPM] (Raven, Raven, & Court, 1988) were below the normal range (Table 2).

P2, presented with anomic aphasia (Table 2). She was exposed to English, as well as another South African language from birth. German was learned at primary school. P2 demonstrated good auditory comprehension abilities (see WAB in Table 2). Naming abilities were characterized by generalized nouns (e.g. “boat” for “canoe”) as well as certain phonemic (e.g. “harpoon” for “harp”) and semantic paraphasias (e.g. “tweezers” for “tongs”). Naming errors in connected speech were characterized by pauses, hesitations, revisions (e.g. “rode in the, on the, no, in the ...tree”) and self-repetitions (e.g. “dug the ground, and ...he dug, dug, I don’t know”). Performance on the RCPM was below the normal range.

**Table 2. Performance on Standardized Measures**

	P1	P2
Western Aphasia Battery (WAB)		
<i>Information content/Fluency</i>	8/20	15/20
<i>Comprehension</i>	7.5	9
<i>Repetition</i>	3/10	9/10
<i>Naming</i>	3/10	8/10
<i>Aphasia Quotient (AQ)</i>	43	82
Aphasia type	Broca’s	Anomic
Boston Naming Test	18/60	40/60
Raven’s Coloured Progressive Matrices	20/36	22/36

### *Materials and apparatus*

Baseline measures included stimuli from the Nicholas and Brookshire (1993) protocol consisting of two picture scenes, two complex picture sequence descriptions, one request for personal information and one request for procedural information. These stimuli were also used as probes during group treatment and at the six-week follow up. Stimuli used during group treatment sessions were commercially available pictures and picture sequence sets designed for adults with aphasia (Descripto-Cards Advanced: For functional language and cognition) as well as generic photographs (standard A4 size, colour pictures and photographs) obtained from the internet. The audio recorder function on a Samsung S5 cellular phone and a Samsung digital camcorder (video recorder) was used during data collection.

## *Procedures*

During the pre-treatment phase, discourse was assessed once weekly over three weeks (for P1) and two weeks (for P2) as she was unable to complete the third session. The pre-treatment data obtained were therefore incomplete for the third measure. These measures were conducted in order to obtain multiple baseline data. All discourse samples were audio and video recorded. Stimuli and procedures followed the Nicholas and Brookshire (1993) protocol where participants were requested to talk about the stimulus where no clinician cues was provided other than social continuants (e.g. “Okay” or “I see”) and prompts for additional information (e.g. “What else do you see?” or “Can you tell me more?”).

Seven group therapy treatment sessions were conducted (Table 3). Group sessions (two participants and first author as facilitator) commenced twice weekly for the first two weeks and once weekly for the last three weeks. SFA training was applied during small group discourse tasks. The roles of the participants and the facilitator (i.e. the first author) are outlined in Table 3. Each treatment session lasted one and a half to two hours in duration. An SFA chart (A3 & A4 size) was used to assist participants when naming difficulties arose. Descriptors were also included in each of the six feature categories e.g. “reminds me of” in the association feature category (Antonucci, 2009; Falconer & Antonucci, 2012). Open-ended questions were used to facilitate feature production within each feature category. All features were discussed in sessions one to four. If participants had difficulty with producing a feature, phonemic cueing and sentence completion was used. The feature was given if the participant failed to provide it. As participants became more familiar with the SFA chart and the process, all appropriate features were given until the target was produced. If the participant failed to name the item, a revision of features, as well as phonemic cueing and sentence completion was used. Production of the name then

followed with a discussion of the said description and whether any suggestions or alternative descriptions could have resulted in more effective naming of the target. Naturalistic discourse tasks of increasing difficulty (Antonucci, 2009; Falconer & Antonucci, 2012) were used to elicit connected speech (Table 3). Discourse probes were also used every other week, in random order, during treatment sessions, as well as at the six-week follow up (SWFU). The clock drawing test (Eknoyan, Hurley & Taber, 2012) was administered as a control measure as it is deemed to be a reliable screening tool for assessing cognitive dysfunction.

**Table 3. Procedures during Group Sessions**

Session	Week	Stimulus materials	Procedures
1 & 2 3	1 2	Single pictures (e.g. boat) Single picture scenes (e.g. child watching television)	Group discussions involved shared pictures. Descriptions followed the SFA chart systematically. Participants discussed one picture together with the group facilitator.
4	2	Single pictures with a problem to identify (e.g. a boy hitting a baseball with a guitar)	Subsequent pictures were jointly discussed by the two participants alone and then explained to the facilitator. Each participant also had an opportunity to independently discuss a picture. A modified format of the PACE treatment approach (Davis & Stanton, 2005) was followed in which a stimulus, hidden from others, is described using words and pictorial supports for P2.
5	3	Travel theme (picture scenes of various destinations)	Participants chose the theme of travel from three options. Discussions centered around travel in general, destinations participants have visited and joint descriptions of two pictures following the procedures as outlined above. The SFA chart was followed when participants experienced word finding difficulties.
6	4	Travel theme (picture sequences and scenes of various destinations)	Participants described picture scenes jointly (photo of a destination with a well-known landmark e.g. a scene in Paris with the Eiffel tower). Each participant discussed one picture/concept independently. All discussions followed procedures as in session 5.
7	5	Travel theme (picture scenes, sequences and scenario to plan a holiday)	Participants described the concept of an ideal holiday, a picture sequence and planned a holiday with a scenario given (e.g. Ms X wants to take her husband and son on a holiday. She has only been to areas close to her home. She doesn't like boats. Use this information to plan a holiday). Each participant also discussed one picture or concept independently. All discussions followed the procedures described in session 5.

Orthographic transcriptions were made of all audio and video recorded discourse samples obtained. Analyses of the data, from baseline to SWFU, followed the Nicholas and Brookshire (1993) protocol as in the previous studies by Antonucci (2009) and Falconer and Antonucci (2012). The number of words, correct information units (CIUs), as well as percentage of CIUs was calculated. Words had to be intelligible in context to be included in the word count. CIUs (Nicholas & Brookshire, 1993) are words relevant and informative relative to the eliciting stimulus. These measures provide a clear view of relevant information imparted by speakers, and an opportunity to make estimations regarding communicative informativeness (information shared). Noun and verb retrieval was calculated and quantified (%nouns and %verbs retrieved) following the protocol in Mayer and Murray (2003). The use of easily quantifiable measures is considered an option to extend current methodology and reconcile issues of ecological validity and clinical feasibility (Mayer & Murray, 2003). The respective roles of the participants and their interaction during group treatment sessions were not explicitly measured as the objective of this present study was to measure gains in communicative informativeness.

### *Statistical analysis*

Descriptive statistics, including means and standard deviations were determined for the number of CIUs, %CIUs, as well as %nouns and %verbs for both participants with treatment stimuli and probe stimuli. Effect sizes were calculated for these variables across all discourse measures, providing an indication of the magnitude of change in these variables from baseline to session seven and at SWFU. The a priori benchmark was set at  $\geq 2.74$ , which was determined to be the mean effect size for generalization to connected speech in word retrieval studies (Beeson & Robey, 2006). Visual analysis of the time series graphs for treatment stimuli and probe stimuli were also carried out to identify trends and variability in scores from baseline to SWFU.

### *Reliability*

Video recordings, in addition to audio recordings were taken to enhance analysis of discourse samples within the respective contexts of the stimuli and the group. All orthographic transcripts were scored by the first author. Twenty percent of transcripts were scored by a qualified speech-language pathologist who was a postgraduate student. Analyses included the Nicholas and Brookshire protocol (1993) as well as that outlined by Mayer and Murray (2003) to calculate word retrieval abilities according to word class. Percentage agreement across transcripts was 81.25% with a range of 79% to 91%. The clock drawing test was administered across group treatment sessions as a control measure and measures remained stable across sessions.

## **Results**

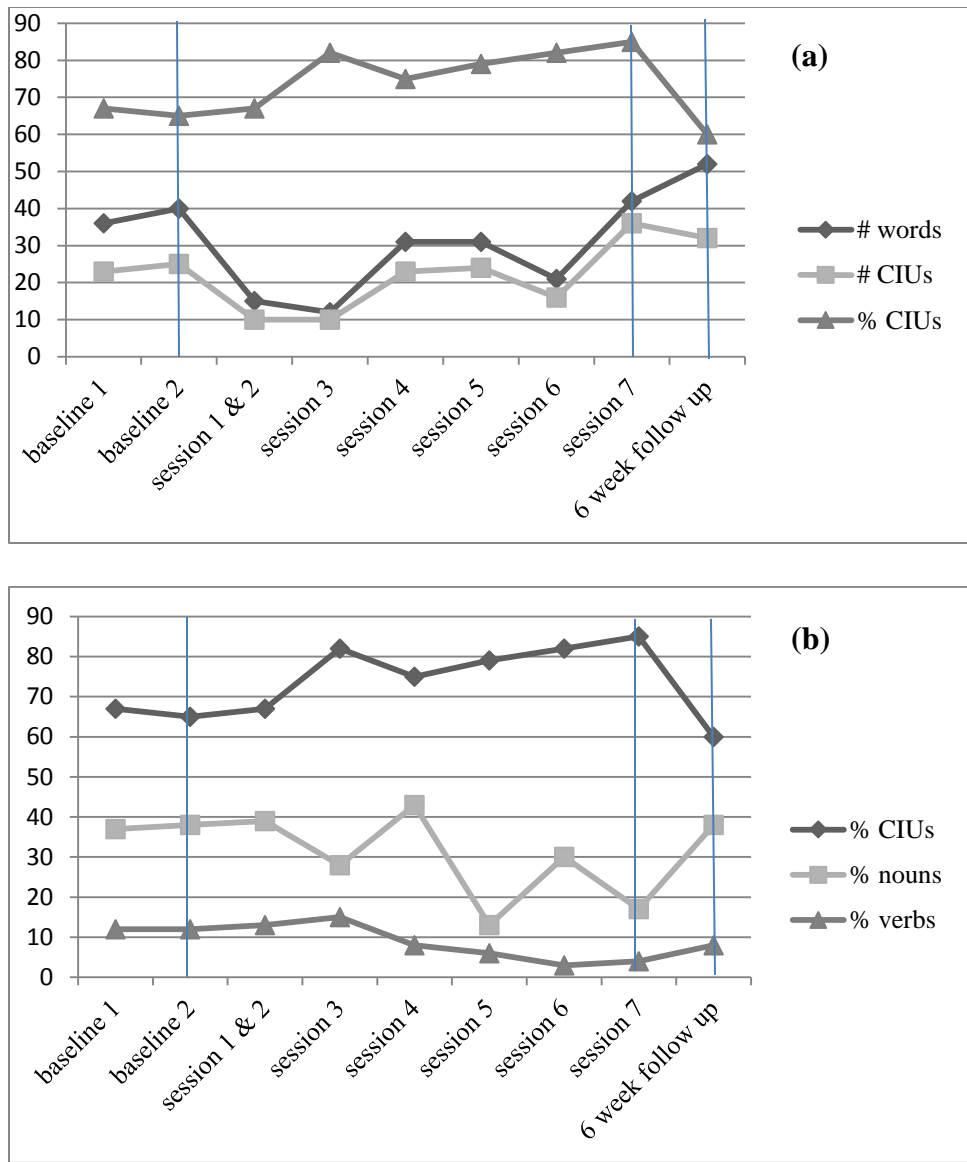
### Participant 1

P1 demonstrated a mean increase of 12.3% in %CIUs from baseline to session seven (Table 4). Therefore, a positive trend was noted. However, %CIUs decreased sharply from session seven to the SWFU. Overall communicative informativeness appeared to improve during treatment with increased use of content words and less scaffolding required from within the group (i.e. P2 or the facilitator). This was, however, not maintained at SWFU (Figure 1a). The SFA technique was still being facilitated by other members of the group and P1 had not reached a level where she was able to use it independently.

**Table 4. Mean Discourse Measures from Baseline to Six week Follow-up for P1**

	Average Baseline Mean (SD)	Average Treatment Mean (SD)	Follow-up Mean (SD)	% change in baseline to follow-up
# Words	38 (12.5)	25.3 (13.7)	52 (15.1)	36.8
# CIUs	24 (6.1)	19.8 (11.9)	32 (11.9)	33.3
% CIUs	66 (16.5)	78.3 (9.7)	60 (6.6)	(9.1)
% Nouns	37.5 (14.8)	28.3 (15.7)	38 (17.4)	1.3
% Verbs	12 (4.1)	8.2 (8.3)	8 (4.6)	(33.3)

With further analysis of word class, a decreasing trend was noted in %verbs used from session three to session seven (Figure 1b). There was variability in the %nouns retrieved, with declines noted in sessions three, five and seven. Increases in %nouns retrieved were noted in sessions four, six and at the SWFU. Stimuli used at session four and six were single picture scenes with problems to identify. This may have provided more context for naming attempts, thereby increasing the likelihood of success. P1 was interested in the theme of travel (session six) and was familiar with the SFA technique at that time. Therefore, P1 made more attempts to describe features of stimuli items. The number of words and CIUs used showed an initial decline during treatment sessions one and two but a steady improvement was noted from session four to SWFU (Figure 1a). This may indicate that P1 was able to retrieve more words than at baseline sessions, therefore, improved productivity of connected speech (number of CIUs) was the primary improvement.



**Figure 1.** (a) P1 discourse measures. (b) P1 lexical retrieval in discourse.

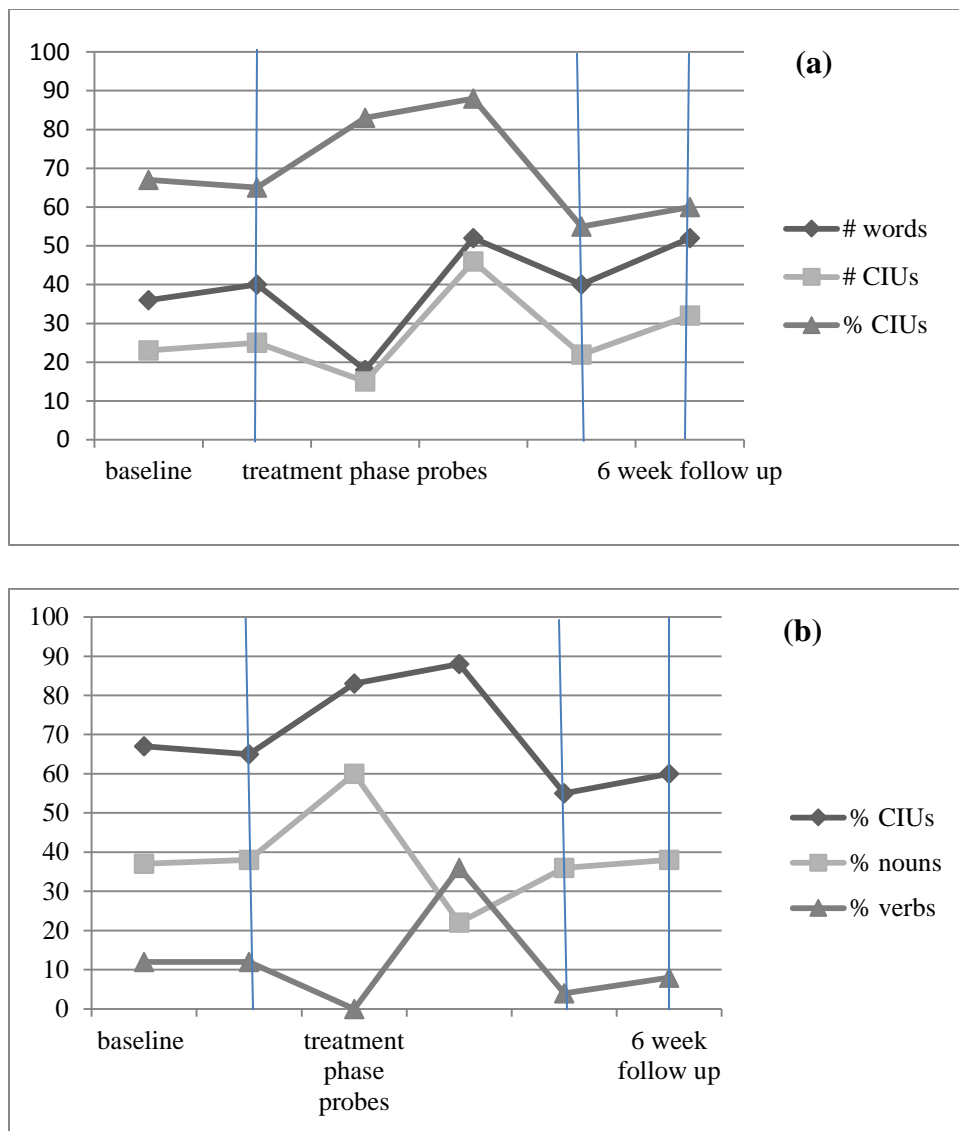
When examining performance using the probes (Figures 2a and b), a noticeable improvement in %CIUs was noted from baseline to session six, indicating possible gains made in the early treatment sessions (14%) by P1. Attempts at using more words increased leading to improvements in informativeness of connected speech. However, a sharp decrease in %CIUs in the final session, with only marginal improvement at the SWFU, may indicate specific difficulties with the stimulus materials and a less structured group session used in session seven

(i.e. describing the ideal holiday and planning a holiday with a specific scenario), as well as no maintenance or retention of skills at SWFU. The variability in Figure 1b indicates that overall informativeness of P1's connected speech was dependent on the stimuli (e.g. picture scene vs. sequence of pictures). The %nouns retrieved improved in the early sessions but leveled out to baseline measures at SWFU. In contrast, %verbs retrieved decreased in the early treatment sessions, increasing sharply in the middle sessions, before dropping to below baseline levels in session seven and at SWFU.

**Table 5. Effect sizes for Discourse Measures and Lexical Retrieval in Discourse**

	P1			P2		
	Average Baseline to Session 7	Average Baseline to Follow Up	Session 7 to Follow Up	Average Baseline to Session 7	Average Baseline to Follow Up	Session 7 to Follow Up
# Words	0.32	1.12	1.40	1.90	-0.03	-0.56
# CIUs	1.95	1.30	-0.59	2.24	0.47	-0.43
% CIUs	1.15	-0.36	-5.55	0.21	1.15	1.34
% Nouns	-1.39	0.03	4.66	-0.69	-0.69	0
% Verbs	-1.95	-0.98	1.53	-1.48	0.74	2.73

No significant improvement in communicative informativeness was noted when comparing effect sizes of average baseline to session seven, as well as baseline to SWFU (Table 5). However, significant effects in %nouns retrieved was observed when comparing session seven to SWFU (ES=4.66). Naming attempts increased at SWFU and more attempts were made to use single words than during the pre-treatment phase. Previous studies have also noted the changes in discourse production may also be attributed to an increased willingness to attempt verbal communication (Antonucci, 2009; Falconer & Antonucci, 2012; Wambaugh & Ferguson, 2007).



**Figure 2.** (a) P1 probes: discourse measures. (b) P1 probes: lexical retrieval in discourse.

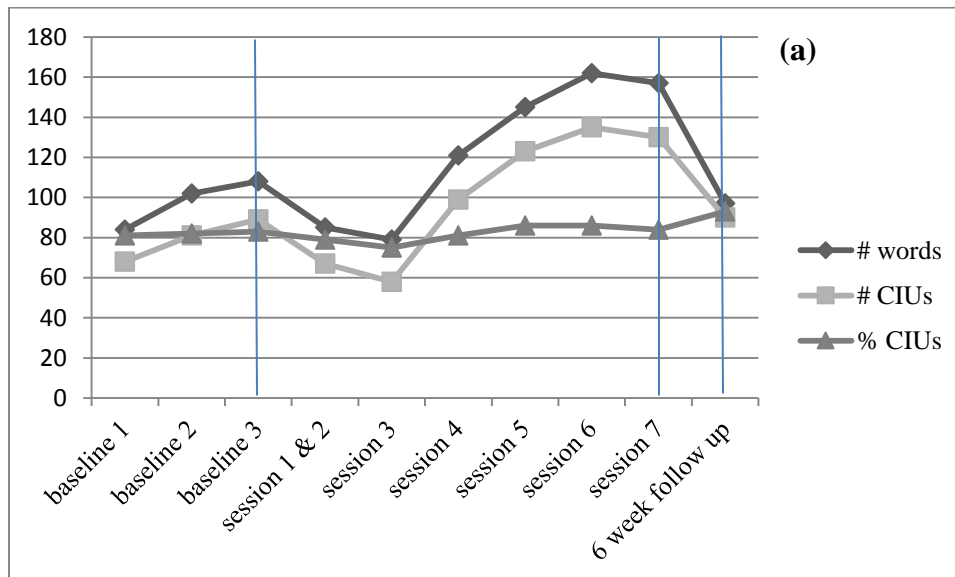
## Participant 2

A decrease in %CIUs was noted from baseline to session three. An increase in %CIUs was noted throughout the remaining sessions, culminating in higher than baseline scores at SWFU (Figure 3a). From baseline to SWFU, P2 demonstrated an overall improvement in %CIUs of 13.4% (Table 6).

**Table 6. Mean Discourse Measures from Baseline to Six week Follow-up for P2**

	Average Baseline Mean (SD)	Average Treatment Mean (SD)	Follow-up Mean (SD)	% change in baseline to follow-up
# Words	98 (31.1)	124.8 (94.9)	97 (36.3)	(0.01)
# CIUs	79.3 (22.7)	102 (78.5)	90 (32.7)	13.5
% CIUs	82 (9.6)	81.8 (6.6)	93 (3.3)	13.4
% Nouns	21.3 (3.4)	22.3 (5.5)	19 (3.3)	(10.8)
% Verbs	15.3 (2.3)	11.5 (3.1)	17 (2.3)	11.1

Although effect sizes were below the a priori benchmark ( $\geq 2.74$ ), a steady increase was noted to 1.34 (Table 5), indicating a possible improvement in communicative informativeness. In a study of anomia in persons with aphasia, Kendall et al. (2008) advise that effect sizes in the range of 1-2 may be meaningful for outcome measures that are not reflective of explicit training. The % nouns used remained constant (Figure 3b). The % verbs retrieved decreased from baseline to treatment phases, however, there was a significant effect from session seven to SWFU (ES=2.73 and ES=2.8 with probes). Action naming, therefore improved upon follow-up.



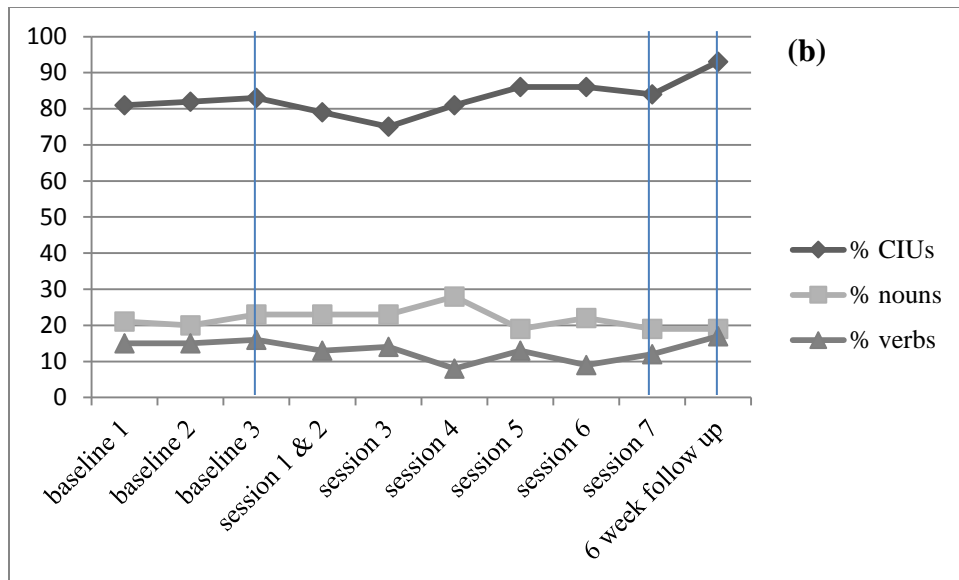
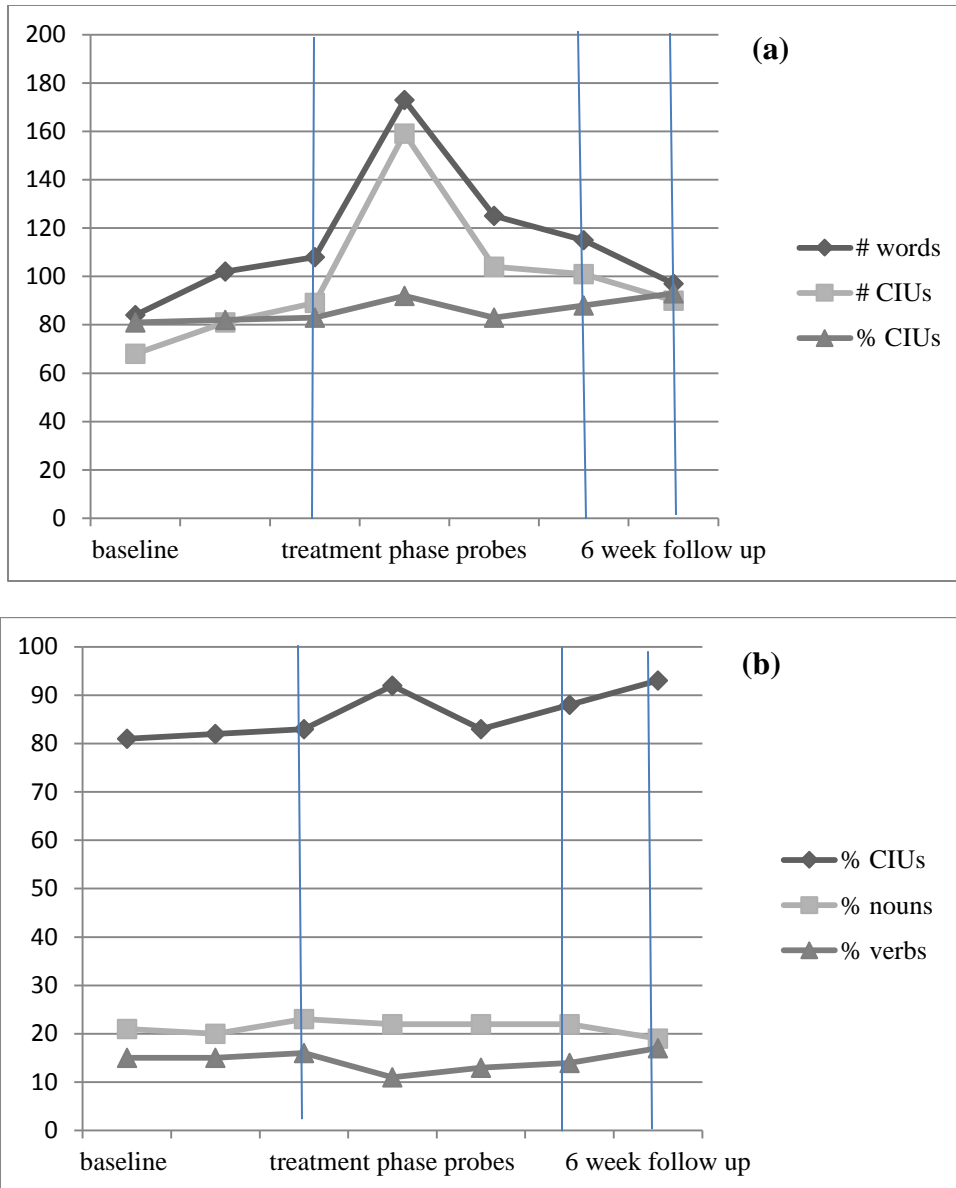


Figure 3. (a) P2 discourse measures. (b) P2 lexical retrieval in discourse.

A sharp improvement in the number of words and CIUs were noted when examining the treatment phase probes (Figure 4a). Although there was a subsequent decrease in number of words and CIUs, %CIUs improved. This is also noted when examining Figure 3a and b from baseline to SWFU sessions. P2 had fewer pauses, self-repetitions and non-specific terms (e.g. “She...uh must drink”) than at baseline measures. Connected speech included increased use of expanded sentences (e.g. “The man is fishing and the boy is playing with the sand, building a sandcastle”) and decreased use of shorter phrases (e.g. “And the uh...boy, he’s playing, and uh raft, uh man is...fishing”), which resulted in less naming than at baseline measures. This suggests an improvement in communicative informativeness and with reduction in pauses noted, P2 may have had improved efficiency in lexical access during discourse treatment as also noted by Antonucci (2009). Wambaugh and Ferguson’s (2007) study of SFA applied to verb retrieval in a participant with anomic aphasia revealed similar findings where increases in verbal productivity and informativeness in discourse production was present.



**Figure 4.** (a) P2 probes: discourse measures. (b) P2 probes: lexical retrieval in discourse.

There was an overall improvement in self-corrections in P2. At times, during group treatment sessions, semantic self-cueing occurred. P2 was able to focus on some features of the SFA procedure during group tasks, however, she remained dependent on the facilitator to guide the use of the SFA procedure when word retrieval difficulties occurred within shared contexts and during spontaneous communication exchange.

## Discussion

The results indicate that certain gains were made when SFA was applied to group aphasia treatment as a technique to assist with word retrieval difficulties. However, the gains were not maintained and therefore, generalization of treatment effects is limited. P1 demonstrated improved communicative informativeness by increased productivity of connected speech (#CIUs) and more object naming attempts (%nouns retrieved). This may suggest an improved ability to access lexical forms (i.e. word forms). P2 demonstrated an overall improvement in communicative informativeness (%CIUs), efficiency of lexical access, and increased action naming (%verbs retrieved). This may suggest that P2 had greater access to semantic knowledge and could access lexical forms at an improved rate that resulted in fewer pauses and self-corrections than P1. These findings resemble that of Antonucci (2009) where persons with aphasia with differing word retrieval difficulties may demonstrate different types of improvement following involvement with the same treatment technique. The effectiveness of this technique appears to be dependent on the ability to reason verbally about concepts and individuals with moderate to severe expressive abilities and those with co-occurring conditions (e.g. AOS) may only benefit marginally. This can be seen by P1 where efforts to produce more verbal output was hindered by the AOS and remained dependent on conversational scaffolding.

Informativeness (CIUs) ranged from 12% to 13.4% for participants, which agree with improvements in other studies (Antonucci, 2009; Boyle & Coelho, 1995; Falconer & Antonucci, 2012). However, familiarity with treatment stimuli (i.e. probes) may have also influenced the results found in this present study.

Both participants showed improvements in overall connected speech within contexts that supported them when word retrieval difficulties occurred. Their success was highly dependent on

following the SFA technique in a structured manner with the visual support of the SFA chart. The properties category (describe according to look, shape, etc.) was the easiest and participants preferred to begin each stimulus description with this category. P1 needed additional communication supports, as well as scaffolding from others. Although P2 demonstrated some semantic self-cueing, most breakdowns in communication necessitated the facilitator's guidance. Kristensson, Behrns and Saldert (2014) mention the clinician as conversation partner could influence conditions for active participation and influence results obtained. An incorporation of a measure of skill, such as The Measure of Skill in Supported Conversation Scales (Kagan et al., 2004), could be considered in future studies.

Seven group therapy sessions were not sufficient for internalization of applying the SFA technique in spontaneous discourse and is a pertinent shortcoming of this present study. Improved stable gains may be possible with increased number and frequency of treatment sessions. Antonucci (2009) and Falconer and Antonucci (2012) conducted seven weeks of group treatment sessions, twice weekly (each session lasted one and half to two hours) that resulted in more stable gains made by participants with regards to communicative informativeness (%CIUs) and efficiency (#CIUs per minute). Intensive aphasia intervention (i.e. increased frequency of sessions) appears to be strongly recommended to yield better results (Basso, 2005; Brady, Kelly, Godwin & Enderby, 2012). An increased number of treatment sessions may offer more practice time and possibly enable participants to become more familiar with the SFA technique.

Future studies should include efficiency measures and main concepts to the analysis of data to gain a holistic understanding of improvements in connected speech. A main concept is described by Nicholas and Brookshire (1995) as the amount of main information conveyed about a topic. This measure was adapted by Capilouto, Wright and Wagovich (2006) and described a

main event as that of sufficient importance to the story, thereby looking at the speaker's ability to extract critical information and convey relationships between characters and events. Main concept measures of discourse analysis has proven to be a reliable means of quantifying discourse abilities in speakers with aphasia (Capilouto et al., 2006; Kong, 2009; Kong & Yeh, 2015).

Failure of the present study to achieve a stable baseline and SWFU measures should be considered in future studies and increased measures should be included at both baseline and SWFU sessions to establish increasingly stable results. Peach and Reuter (2010) suggest that variability and increases in baseline measures may be attributed to heightened familiarity with probe procedures and extended baseline measures are necessitated to establish stability.

Stimuli materials used in this study were also varied and picture scenes with structured group discussions elicited increased discourse than picture sequences, scenarios and less structured group interactions. Different stimuli should therefore be introduced and outcomes measured within shared contexts of group interactions. Alternatively, topics and picture scenes could be chosen by the participants as a group (as seen in the latter part of this study) prior to SFA treatment to personalize the process, ascertain gains made and increase the possible influence on generalization of skills. Rider, Wright, Marshall and Page (2008) suggest the use of closed-set contexts, such as telling someone how to change a flat tyre or describing a plot of a popular movie to improve retrieval of related context-specific target words. Furthermore, there is a precedent for the use of closed-set contexts in studies examining strategies to improve communication between individuals with aphasia and relevant conversational partners (Hopper, Holland & Rewega, 2002; Rayner & Marshall, 2003).

Group interaction and the influence of peer support on functional communication within conversation contexts should be further investigated. It has been documented that treatment within group settings offer an increased naturalistic environment that fosters social skills and helps individuals build relationships through shared experiences (Cermak, 2011; Davis, 1986; Elman & Bernstein-Ellis, 1999; Wilcox, 1983). The present study conducted a two-person group treatment with varying types of aphasia. Investigation of a larger group intervention using SFA within discourse based tasks is warranted to examine group dynamics, and gain understanding of its influence on communicative effectiveness, as well as who may benefit most from this type of treatment.

The current study aimed to answer the question: Will gains be made in word retrieval abilities and in overall communicative informativeness whilst conducting SFA training for individuals with aphasia in a small group setting? Both participants demonstrated certain modest gains in overall communicative informativeness but these were not maintained at the SWFU. However, the findings suggest that with further intensive and frequent group treatment sessions, gains would likely be more stable. This study incorporating group treatment has demonstrated positive results in the connected speech of individuals with aphasia, which shows potential for application in South Africa. This treatment setting may be useful for future investigations examining naturalistic conversation settings and the effect of training of word retrieval difficulties within discourse-based tasks. Therefore, the use of SFA at the discourse level within a group treatment setting may offer many advantages and the applications thereof are far beyond resource-constrained contexts, such as South Africa.

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## CHAPTER 4: DISCUSSION OF RESULTS AND CONCLUSIONS

### **The aim of the chapter is to provide:**

A summary of the results found in this study.

The implications of the findings of the study.

The limitations of the study and future research.

Conclusions drawn from the study.

### **4.1 Discussion**

The results from this study indicate that certain gains were made when SFA was applied to group aphasia treatment as a technique to assist with word retrieval difficulties. However, the gains made during treatment were not maintained for prolonged periods of time and therefore, generalisation of treatment effects is limited. Participant 1 demonstrated improved communicative informativeness by increased productivity of connected speech (#CIUs) and more object naming attempts (%nouns retrieved). This may suggest an improved ability to access lexical forms. Participant 2 demonstrated an overall improvement in communicative informativeness (%CIUs), efficiency of lexical access, and increased action naming (%verbs retrieved). This may suggest that participant 2 had greater access to semantic knowledge and could access lexical forms at an improved rate that resulted in fewer pauses and self-corrections than participant 1. These findings resemble that of Antonucci (2009) where persons with aphasia with differing word retrieval difficulties may demonstrate different types of improvement following involvement with the same treatment technique. Furthermore, the SFA technique could be used in the intended manner with participant 2 where self-generation of features was encouraged with only prompting by the SLT. However, participant 1 required continuous scaffolding and provision of options in the various feature categories. Therefore, a difference in semantic processing resulted, which led to diverse improvements demonstrated.

The effectiveness of the SFA technique appears to be dependent on the ability to reason verbally about concepts. Individuals with moderate to severe expressive abilities and those with co-occurring conditions (e.g. apraxia of speech [AOS]) may only benefit marginally from such a technique. This can be seen in participant 1, where efforts to increase verbal output was hindered by the presence of AOS, and she remained dependent on conversational scaffolding. Boyle (2010) found that SFA treatment might

not be effective for individuals with severe aphasia or for individuals with concomitant nonverbal cognitive impairments.

Communicative informativeness (%CIUs) ranged from 12% to 13.4% for participants, which agree with improvements in other studies (Antonucci, 2009; Boyle & Coelho, 1995; Falconer & Antonucci, 2012). Both participants showed improvements in overall connected speech within contexts that supported them when word retrieval difficulties occurred. Their success was highly dependent on following the SFA technique in a structured manner with the visual support of the SFA chart together with intermittent prompting from the SLT. The properties category (describe according to look, shape, etc.) was the easiest to discuss and participants preferred to begin each stimulus description with this category. Participant 1 needed additional communication supports (Appendix F), as well as scaffolding from others. Although participant 2 demonstrated some semantic self-cueing, most breakdowns in communication necessitated the SLT's guidance. It appears that internalization of the SFA technique and the independent use thereof requires increased intervention with opportunities to practice the SFA procedure in a variety of conversational contexts.

#### **4.2 Limitations of the study and future research**

The influence of practice effects must be considered as participants were exposed to the probe stimuli at pre-treatment, randomly during group treatment sessions and at the SWFU session. Various authors caution that data should be interpreted with caution as effects may be attributed, in part, to frequent exposure to stimuli (Peach & Reuter, 2010; Wambaugh & Ferguson, 2007). The increased familiarity of stimuli could therefore have influenced results obtained for both participants. Future research should incorporate probe stimuli that are novel in order for results to be less influenced by practice effects.

Seven group therapy sessions, over a five-week period, were not sufficient for internalization of applying the SFA technique in spontaneous discourse. Further stable gains may be possible with an increased number and frequency of treatment sessions. Antonucci (2009) and Falconer and Antonucci (2012) conducted seven weeks of group treatment sessions, twice weekly (each session lasted one and a half to two hours) that resulted in more stable gains made by participants with regards to communicative informativeness (%CIUs) and efficiency (#CIUs per minute). Intensive aphasia intervention (i.e. increased frequency of sessions) appears to be strongly recommended to yield enhanced results (Basso, 2005; Brady, Kelly, Godwin & Enderby, 2012). An increased number of treatment sessions may offer additional practice time and possibly enable participants to become increasingly familiar with the SFA technique.

The present study conducted a two-person group treatment with varying types of aphasia. Limitations were not only regarding communication and the findings obtained, but consistency of participant attendance for longer periods (greater than five weeks) was not possible. Reasons included participants' own schedules and planned events prior to the commencement of the study, as well as illness and an increased demand on two people to keep the conversation going during group interaction. Investigation of a larger group intervention using SFA within discourse based tasks is warranted to counter such challenges during the research process, to examine the group dynamics, and gain an increased understanding of who may benefit most from this type of treatment.

Standardized measures (such as the WAB) included in this study were designed for the English native-speaking population. Participants were therefore required to have exposure to English from birth as an essential aspect of inclusion in this study for accurate scoring and interpretation of these standardized measures. Forty three percent of individuals globally are bilingual ([www.ilanguages.org](http://www.ilanguages.org)) with an increasing prevalence of bilingual aphasia (Ansaldo & Saidi, 2014). The majority of the South African population are bilingual or even multilingual (Penn, 2007), which necessitates further research of bilingual individuals with aphasia. Thus, future research should assess the applicability of the SFA technique in individuals with bilingual aphasia. Ansaldo and Saidi (2014) emphasise the need for further investigation in this population as the interaction between two (or more) languages is complex and has implications for overall communication effectiveness in the context of the linguistic community and the individual's given culture.

Future studies should include error types in addition to percentage calculations of lexical classes (e.g. the number of semantic and/or phonemic paraphasias, pauses and circumlocutions). These measures are included in the protocol by Mayer and Murray (2003), who state that there is a significant effect of the context on word retrieval. Connected speech may facilitate not only general word retrieval, but the efficiency of strategies to correct word retrieval failures (Mayer & Murray, 2003). Efficiency measures and main concepts should further be included in the analysis of data to gain a holistic understanding of improvements in connected speech. A main concept is described by Nicholas and Brookshire (1995) as the amount of main information conveyed about a topic. This measure was adapted by Capilouto, Wright and Wagovich (2006) and described a main event as that of sufficient importance to the story, thereby looking at the speaker's ability to extract critical information and convey relationships between characters and events. Main concept measures of discourse analysis has proven to be

a reliable means of quantifying discourse abilities in speakers with aphasia (Capilouto et al., 2006; Kong, 2009; Kong & Yeh, 2015).

Generalisation measures were referred to in the introductory chapter. Kristensson, et al. (2014) noted that it is greatly desirable for treatment outcomes to include generalisation to non-trained items, and to everyday conversation for intervention to make a substantial difference. Future studies should include generalisation measures to daily conversational contexts, as well as functional communication measures as perceived by the participants. Using appropriate tools with increased objective measures of functional communication is imperative to capture the subtle changes made by people with aphasia who have word retrieval difficulties (Antonucci, 2009). The Measure of Participation in Conversation (MPC) (Kagan et al., 2004) is a validated tool that can be used to measure generalisation to conversational contexts. This measure consists of two subscales assessing the willingness to participate in social interaction, and the ability to understand and exchange information. Information gained from participation measures could provide a holistic view of the applicability of SFA within group discourse-based tasks and everyday conversation. Consequently, this may create ecologically valid change for individuals with anomia in daily interactions with conversation partners (Hopper, Holland & Rewega, 2002).

Failure of the present study to achieve a stable baseline and SWFU measures should be considered in future studies and increased measures should be included at both baseline and SWFU sessions to establish increasingly stable results. Peach and Reuter (2010) suggest that variability and increases in baseline measures may be attributed to heightened familiarity with probe procedures and extended baseline measures are necessitated to establish stability.

Stimuli materials used in this study were also varied. Picture scenes with structured group discussions elicited increased discourse than picture sequences, scenarios and less structured group interactions. Different stimuli should therefore be introduced and outcomes measured within shared contexts of group interactions. Alternatively, topics and picture scenes could be chosen by the participants as a group (as seen in the latter part of this study) prior to SFA treatment to personalise the process, ascertain gains made and increase the possible influence on generalisation of skills. Rider et al. (2008) suggest the use of closed-set contexts, such as telling someone how to change a flat tyre or describing a plot of a popular movie to improve retrieval of related context-specific target words. Furthermore, there is a precedent for the use of closed-set contexts in studies examining strategies to improve communication between individuals

with aphasia and relevant conversational partners (Hopper et al., 2002; Rayner & Marshall, 2003).

Group interaction and the influence of peer support on functional communication within conversation contexts should be further investigated. It has been documented that treatment within group settings offer an increased naturalistic environment that fosters social skills and helps individuals build relationships through shared experiences (Cermak, 2011; Davis, 1986; Elman & Bernstein-Ellis, 1999; Wilcox, 1983). Falconer and Antonucci (2012) report that a supportive group environment may be one of the beneficial factors associated with communicative effectiveness. Encouragement by group members, praising each other and modeling certain aspects of the SFA technique to assist another member were a few findings noted in the present study. Similar findings of shared positive reinforcement and engaging in problem solving were also noted in previous studies (Antonucci, 2009; Falconer & Antonucci, 2012; Simmons-Mackie et al., 2007). These aspects clearly warrant further investigation of a group setting in future research.

There is a rising demand for group intervention services. Furthermore, the presence of accumulating evidence for their efficacy indicates future speech-language therapy graduates could be required to facilitate group therapy with adult clients who have acquired neurogenic communication disorders, such as aphasia, on a regular basis (Cubrika, Barnes, & Ferguson, 2015). As previously mentioned, SFA is a prominent semantic-based treatment technique for people with aphasia experiencing word retrieval difficulties. The present study has demonstrated that SFA is a viable technique to use in group aphasia treatment. Thus, implications for student training at an undergraduate level using the SFA technique in discourse-based tasks should be considered.

### **4.3 Conclusion**

The current study aimed to answer the question: Will gains be made in word retrieval abilities and in overall communicative informativeness whilst conducting SFA training for individuals with aphasia in a small (two-member) group setting? Both participants demonstrated certain modest gains in overall communicative informativeness but these were not maintained at the SWFU session. However, the findings suggest that with further intensive and frequent group treatment sessions, gains would likely be more stable.

This study incorporating group treatment has demonstrated positive results in the connected speech of individuals with aphasia, which shows potential for application in South Africa. This treatment setting may be useful for future investigations examining naturalistic conversation settings and the effect of training of word retrieval difficulties within discourse-based tasks.

The benefits of group treatment settings were highlighted and should be further investigated, not only with regards to SFA treatment but also other treatment techniques where facilitation of functional communication skills have not been explored.

Replication and revision of the present study and the like (Antonucci, 2009; Falconer & Antonucci, 2012; Peach & Reuter, 2010) will further contribute to the growing body of evidence. Therefore, the use of SFA at the discourse level within a group treatment setting may offer many advantages and the applications thereof are far beyond resource-constrained contexts, such as South Africa.

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## List of Appendices

**Appendix A:** Request for permission for use of facility and to recruit clients attending the Aphasia Conversation Group

**Appendix B:** Ethical clearance from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria

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**Appendix C:** Informed consent

- **Appendix C1:** Partner/Family Member information sheet
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**Appendix D:** Pictorial support for informed consent and information giving for person with aphasia

- **Appendix D1:** Information document for person with Aphasia
- **Appendix D2:** Certificate of Consent

**Appendix E:** An example of data analysis using the Nicholas and Brookshire (1993) and the Mayer and Murray (2003) protocol

**Appendix F:** An example of a support for P1

**Appendix A:** Request for permission for use of facility and to recruit clients attending the Aphasia Conversation Group

June 2015

Dear Professor Vinck

**Request for permission to use the group therapy facility and recruit clients from the Aphasia conversation group at the Department of Speech-Language Pathology and Audiology for research**

I, Bhavani Pillay, am undertaking my Master's degree. The research study is titled "*The use of semantic feature analysis in group discourse treatment for people with Aphasia.*" My research study entails the use of a specific word retrieval technique for people with aphasia and observing the effects of this technique. The technique is called semantic feature analysis and has recently been applied to conversation within a group setting. The research therefore will investigate its effects on word retrieval within a group setting.

I therefore, wish to request permission to recruit clients from the Aphasia conversation group at the Department of Speech-Language Pathology and Audiology at the University of Pretoria. Clients that agree to participate in the study will be required to participate in:

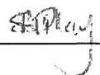
- Once weekly assessments for three consecutive weeks to gain baseline data
- Twice weekly group therapy sessions for seven consecutive weeks
- Assessments immediately after the conclusion of group therapy
- A six-week follow-up assessment to determine generalisation effects of the treatment technique

I will be using standardized tests, as well as commercially available materials used with adults that have neurological impairments.

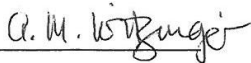
As mentioned above, group therapy sessions will occur twice weekly and last one and a half to two hours in duration. I therefore request permission to utilise the group therapy facility at the Department of Speech-Language Pathology and Audiology at the University of Pretoria for the duration of data collection for this study.

Your assistance in this regard will be greatly appreciated.

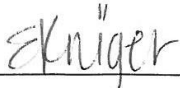
Yours sincerely



Researcher: Mrs. Bhavani S. Pillay



Supervisor: Prof. Alta Kritzinger



Co-Supervisor: Mrs. E Krüger



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Humanities  
Department of Speech-Language Pathology and Audiology

I, Prof. B. Vinck, grant permission to Mrs Bhavani S. Pillay to recruit clients form the Aphasia conversation group and for the use of the group therapy facility at the Department of Speech-Language Pathology and Audiology for the purposes of data collection for the study titled: "The use of semantic feature analysis in group discourse treatment for people with Aphasia."

Prof. BHME Vinck

Date: 17/6/2015

Head: Department of Speech-Language Pathology and Audiology

**Appendix B:** Ethical clearance from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria

**Appendix B1:** Initial ethical clearance



9 May 2016

Dear Prof Vinck

**Project:** Application of Semantic Feature Analysis for word retrieval  
in aphasia group discourse treatment  
**Researcher:** SB Pillay  
**Supervisor:** Prof A Kritzinger  
**Department:** Speech-Language Pathology and Audiology  
**Reference:** 21087718 (GW20160417HS)

Thank you for the well-written application that was submitted for ethical consideration.

I am pleased to inform you that the above application was **approved** by the **Research Ethics Committee** on 5 May 2016, conditional to written permission being granted by:

- The Summit Rehab, Meulmed.

Please note that data collection may not commence prior to the organisation giving permission and subject to final approval by this committee. To facilitate the administrative process, please respond to Ms Tracey Andrew at [tracey.andrew@up.ac.za](mailto:tracey.andrew@up.ac.za) or Room HB 7-27, at your earliest possible convenience.

Sincerely

**Prof Maxi Schoeman**  
**Deputy Dean: Postgraduate Studies and Ethics**  
**Faculty of Humanities**  
**UNIVERSITY OF PRETORIA**  
**e-mail:tracey.andrew@up.ac.za**

Kindly note that your original signed approval certificate will be sent to your supervisor via the Head of Department. Please liaise with your supervisor.

## Appendix B2: Final ethical clearance



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Humanities  
Research Ethics Committee

21 September 2016

Dear Prof Vinck

**Project:** Application of Semantic Feature Analysis for word retrieval  
in aphasia group discourse treatment  
**Researcher:** SB Pillay  
**Supervisor:** Prof A Kritzinger  
**Department:** Speech-Language Pathology and Audiology  
**Reference numbers:** 21087718 (GW20160417HS)

Thank you for the your response to the Committee's correspondence 2015.

I have pleasure in informing you that the Research Ethics Committee formally **approved** the above study at an *ad hoc* meeting held on 2016. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should your actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

The Committee requests you to convey this approval to the researcher.

We wish you success with the project.

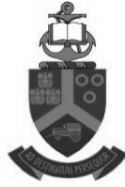
Sincerely

**Prof Karen Harris**  
**Acting Chair: Research Ethics Committee**  
**Faculty of Humanities**  
**UNIVERSITY OF PRETORIA**  
**e-mail: tracey.andrew@up.ac.za**

Research Ethics Committee Members: Prof MME Schoeman (Deputy Dean); Prof KL Harris; Dr L Blokland; Dr R Fasselt; Ms KT Govinder; Dr E Johnson; Dr C Panebianco; Dr C Puttergill; Dr D Reyburn; Prof GM Spies; Prof E Taljard; Ms B Tsebe; Dr E van der Klashorst; Mr V Sithole

## **Appendix C: Informed consent**

- **Appendix C1:** Partner/Family Member information sheet



### **Part 1: Information Sheet**

**Study Title:** The Use of Semantic Feature Analysis in Group Discourse Treatment for People with Aphasia

**Principal Investigator:** Mrs. Bhavani Pillay

**Degree:** Masters in Communication Pathology

**Institution:** University of Pretoria

**Contact number:** 082 552 0643/ 012 420 2357

Dear Partner or Family Member of Participant

#### **1. Introduction**

Your partner/family member is invited to participate in a research study. This information leaflet is to help you and your partner/family member decide if you would like to participate. Before you and your partner/family member agree to take part in this study, you should fully understand what is involved. If you have any further questions, do not hesitate to ask the investigator. You and your partner/family member should not agree to take part unless you are satisfied with all the procedures involved.

#### **2. Nature and Purpose of the Study**

The aim of the study is to train your partner/family member using a specific therapy technique (Semantic feature analysis) designed to help access the intended words he/she wants to communicate during conversation in a three-member group. By using this technique in group tasks, we wish to learn more about the benefits of this treatment within group conversation and the implications for everyday communication.

#### **3. Explanation of Procedures to be Followed**

- I will first assess your partner/family member using standard tests used in aphasia treatment, as well as picture cards and general questions to determine your partner's/family member's current level of communication functioning. This will take place once weekly for 3 weeks before the group therapy sessions begin at the Department of Speech-Language Pathology and Audiology (University of Pretoria).

- Thereafter, group training will commence. The group will consist of three members and will run twice weekly for a period of 5 consecutive weeks. Each group session will last 1 ½ - 2 hours.
- I will train all participants on how to use the technique when they encounter difficulties finding the intended word they want to say. This will occur during the first week.
- I will use a number of stimulus materials of increasing difficulty each week (e.g. pictures, picture sequences, storytelling, etc.) to facilitate conversation within the group. When participants have difficulty accessing the word they intended to say (i.e. “gets stuck”), I will guide the participant to think of features about that particular concept, using a semantic feature analysis chart. For example, if the word is ‘apple’, I will assist the participant by asking questions about what group it belongs to, what does it look like, what colour is it, where is it found, etc.
- After the group therapy sessions of 7 weeks, I will assess your partner’s/family member’s communication functioning once again 6 weeks thereafter.
- It is important to note that your partner/family member must forfeit any other speech-language therapy during the duration of the research project (i.e. cannot attend individual or any other group therapy).

#### **4. What are the possible benefits of the study?**

No remuneration is offered for participation in this study. However, previous studies of this nature have reported improved abilities (to varying degrees) of participants to communicate their overall messages during group tasks and in everyday communication (i.e. maintained at their 6 week follow up assessment). There is no risk of harm or other disadvantages when participating in this study.

#### **5. What are you and your partner’s rights if you take part?**

Your partner/family member does not have to take part in this study. You and your partner/family member decide if he/she wants to participate or not. You and your partner/family member can stop participating at any point during the study without giving any reason for doing so. Your partner/family member can still continue receiving services at the Department of Speech-Language Pathology and Audiology if he/she chooses not to participate in this study. The results of this study will be explained to you and your partner/family member.

#### **6. Has this study received ethical approval?**

This study’s research protocol has been submitted to the Research Ethics Committee of the Faculty of Humanities and has received ethical approval.

## 7. Information

If you have any questions concerning this study, you may contact:

Mrs Bhavani Pillay: 082 552 0643/ [bhavani.pillay@up.ac.za](mailto:bhavani.pillay@up.ac.za)

Prof. Alta Kritzinger: 012 420 2949/ [alta.kritzinger@up.ac.za](mailto:alta.kritzinger@up.ac.za)

## 8. Confidentiality

All information gathered from this study will be kept confidential. The results of this study will be stored at the Department of Speech-Language Pathology and Audiology for 15 years as per policy of the University of Pretoria. The data will be locked away and stored on a password protected computer in the form of MS Word documents, as well as MS Excel spread sheets. A percentage of the data will be shared with a colleague for purposes of establishing validity. Data will also be made available in a research report and may be reported in scientific journals, but will not identify you or your partner as participants in this study.

If you have any questions, you are welcome to phone me, Mrs Bhavani Pillay at 082 552 0643.

**Thank you for taking the time to read this Information Sheet**

**Please indicate whether you want to participate or not in the *Certificate of Consent* form attached.**

## Appendix C2: Certificate of Consent

## **PART 2: CERTIFICATE OF CONSENT**

1. I agree for my partner or family member to take part in the above mentioned research project.

YES

NO

### **ONLY TICK QUESTIONS 2-9 IF YOU ANSWERED YES IN QUESTION 1**

2. I confirm that I have read and understood the form entitled *Information Sheet* for the above research project. Any questions or concerns about the study have been addressed and dealt with adequately.

3. I understand that my partner's/family member's participation in the research is entirely voluntary. I acknowledge the fact that my partner/family member and I am allowed to withdraw from the research at any time and that this decision will not be held against me or my partner/family member in any way.

4. I understand that my partner/family member will have to participate in tests once weekly for 3 weeks, group therapy twice weekly for 7 weeks, and a 6 week follow-up if my partner/family member chooses to participate in this study.

5. I understand that my partner/family member will have to forfeit all speech-language therapy (both individual and group therapy) for the duration of the data collection process of this research study if my partner/family member chooses to participate in this study.

6. I understand that the researcher will not identify me or my partner/family member by name in any reports, and that all information about me and my partner/family member will be kept confidential.

7. I understand that there are no financial benefits involved with participating in the study.

8. I understand all my partner's/ family member's rights as a research participant.

9. I know whom to contact about any concerns regarding the research project.

10. I would like to receive a summary of the results of the research project, once completed.

YES

NO

\_\_\_\_\_

Print your Name

\_\_\_\_\_

Signature

\_\_\_\_\_

Date

Bhavani Pillay:

Tel: 0825520643

**Appendix D:** Pictorial support for informed consent and information giving for person with aphasia

- **Appendix D1:** Information document for person with Aphasia

## Research



We are doing **research**.

It is about **aphasia** and **getting stuck on words**.

Research helps us **learn**.

We need to **know** more about **how to help**.

## Why me?



You **have had a stroke** .



Your stroke affected your **communication**.



You find it **hard to speak**.  
To find the **right words**  
and put ideas into  
**sentences**.

## Why this research?



Research can **test new** ways to give **therapy**.

We can find out **what works** best.

This study uses **a way to help** when you **get stuck on words**.

It takes place in a **group of 3 people**.

## Who is doing the research?



The **supervisor** of this research is **Alta Kritzing**.

The **main researcher** is **Bhavani Pillay**.

The research is run from the **University of Pretoria**.



## What happens in the research?



You will have **some tests**.

You will have **the treatment in a group**.

This will last **for 7 weeks**.

Then you will have **more tests 6 weeks later**.

The researcher will **look at the results**.

We will **learn** about the treatment.

## What will I have to do?



In the research you will:

have **tests**

**answer** some **questions**

**share** your **opinions** and **ideas**

learn a **new way** to **find** the **right words**



We will take **sound recordings**.

This helps us to **remember** what you **said**.

This helps us to **measure** any **change**.

**Only** the **researchers** will **see** the **recordings**.

They will be kept **safe**.

## How long will the research last?



The **whole research** will last for **2 years**.

**Your part** will last for **4 months**.

You will have **tests, once** a week, for **3 weeks**.

You will have the **treatment** in a **group, twice** a week for **7 weeks**.

You will have **tests** again after **6 weeks**.

## Will I get paid?



You will **not get paid** for taking part in the research.

## Do I have to take part?



**You can decide.**

**You don't have to.**

**You can take your time.**

**You can read the information again.**

**You can talk to your family to help you decide.**



**If you change your mind, you can stop at any time.**

**You don't have to give a reason.**

## Who will see the information about me?



We will keep the **information** about you **safe**.

**Only** the **researchers** will see the **information** about you.

We may **share** your information with **other researchers** in this **country**.

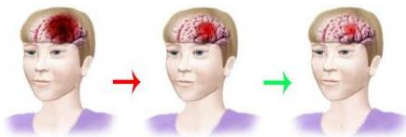
We may **share** your information with **researchers** in **other countries**.

This **helps** with **other research** about **stroke**.

We will **take out** your **name** and **personal details**.








## What might be good about taking part?





You **may be helped** by the therapy/treatment.

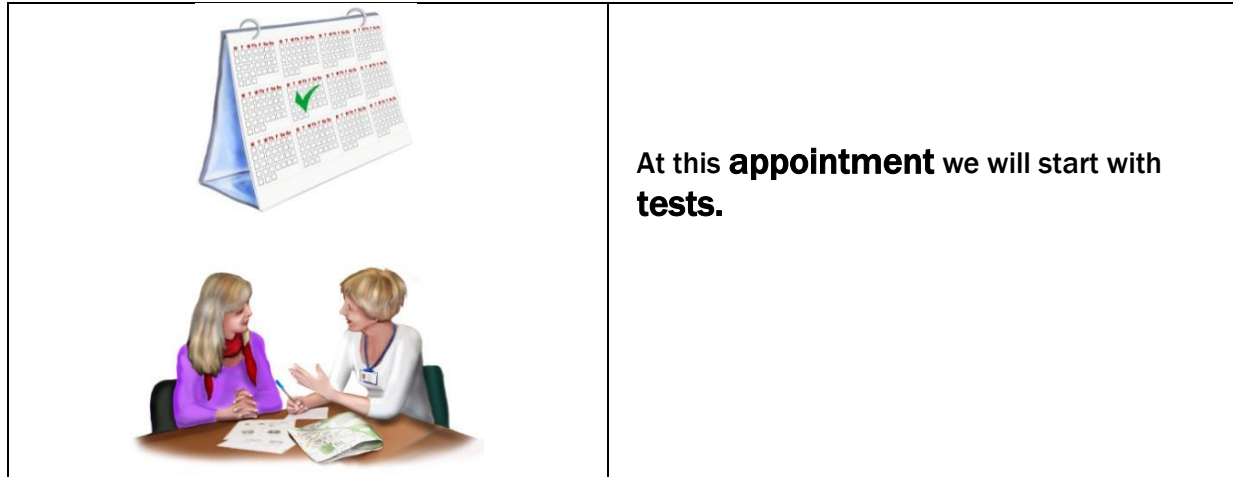
You may **enjoy** taking part.

You will help us to **learn**.

 <p><b>What might be difficult about taking part?</b></p>  	<p>We <b>don't think</b> it is <b>dangerous</b> but the <b>therapy may not help</b> you.</p> <p>It will <b>take</b> up <b>your time</b>. You may get <b>tired</b>.</p>
<p><b>What will happen after the research?</b></p>  	<p>The <b>researchers</b> will <b>look</b> at the <b>results</b>.</p> <p>They will <b>learn more</b> about this <b>therapy</b>.</p>
<p><b>What will happen to the results?</b></p> 	<p>We will share the <b>results</b> with <b>other researchers</b> at <b>conferences</b> and <b>meetings</b></p>

 <p>American Journal of SPEECH-LANGUAGE PATHOLOGY AJSLP</p> <p>JSLHR</p> <p>J. Smith</p> <p>Mr X said "I spent 4 weeks in the stroke ward"</p>	<p>through <b>newsletters</b> and <b>magazines</b> in academic journals.</p> <p>The results will <b>not use your name</b>.</p> <p>The results may include <b>what you said</b> but <b>not who said it</b>.</p>
<p><b>What next?</b></p>  <p>yes? no?</p> <p>?</p>	<p>Do you <b>want to take part?</b></p> <p><b>You need to decide.</b></p> <p>You may want <b>more information.</b></p> <p>Contact <b>me</b> on <b>082 552 0643.</b></p> <p><b>Let us know</b> if you want to take part You can <b>contact us</b> at <b>082 552 0643.</b></p>

 <p>The image contains several illustrations: a hand signing a document with a blue pen; a man in a purple shirt talking to a woman in an orange shirt who is holding a document; a man in a purple shirt talking on a mobile phone; a man in a purple shirt holding a document; a man in a blue shirt thinking, with two thought bubbles above him labeled 'yes?' and 'no?'; a thumbs up gesture; and a thumbs down gesture.</p>	<p>If you decide to take part you will need to <b>sign a consent form</b></p> <p>This says that <b>you understand</b> the research and <b>you agree</b> to take part.</p> <p>We will <b>contact you</b>.</p> <p>We will ask for <b>your decision</b>.</p> <p><b>Yes</b> I want to.</p> <p><b>No</b> I don't want to.</p>
 <p>The image shows a single thumbs up gesture.</p>	<p>If you decide to take part you will have <b>an appointment</b>.</p> <p>This <b>appointment</b> will be in <b>October</b>.</p>



At this **appointment** we will start with **tests.**

Adapted from: Pearl, G. (2014). *Engaging people who have aphasia: A set of resources for stroke researchers.*

Available at: [http://www.crn.nihr.ac.uk/wp-content/uploads/stroke/sites/Aphasia/Aphasia%20resources%20project%20v2-2.3%20in%20sections%20-%20whole%20doc%20\(1\).pdf](http://www.crn.nihr.ac.uk/wp-content/uploads/stroke/sites/Aphasia/Aphasia%20resources%20project%20v2-2.3%20in%20sections%20-%20whole%20doc%20(1).pdf).

[Accessed 4 May 2015]

## Appendix D2: Certificate of Consent

**Taking part in the research about  
using a **therapy technique** to help with **word finding** difficulties in a  
**group setting****





Please mark   **yes**   **no** for each statement

I have read the information about the research.

 <input type="checkbox"/>	 <input type="checkbox"/>
<b>yes</b>	<b>no</b>

I have had the chance to ask questions

I am happy with the answers to my questions.

 <input type="checkbox"/>	 <input type="checkbox"/>
<b>yes</b>	<b>no</b>

I understand that information about me will be kept safe  
and not shared with anyone outside the research.

 <input type="checkbox"/>	 <input type="checkbox"/>
<b>yes</b>	<b>no</b>

I know that when results are shared the  
researcher will not use my name.

 <input type="checkbox"/>	 <input type="checkbox"/>
<b>yes</b>	<b>no</b>

**I understand that I can stop being in the research  
at any time. If I stop I don't have to give a reason  
and I will still get normal care.**

 <b>yes</b> <input type="checkbox"/>	 <b>no</b> <input type="checkbox"/>
--	---

**I agree to take part in the research.**

 <b>yes</b> <input type="checkbox"/>	 <b>no</b> <input type="checkbox"/>
--	---

<b>Name:</b>	<b>Name of person taking consent:</b>
<b>Signature:</b>	<b>Signature:</b>
<b>Date:</b>	<b>Date:</b>

Adapted from: Pearl, G. (2014). *Engaging people who have aphasia: A set of resources for stroke researchers.*

Available at: [http://www.crn.nihr.ac.uk/wp-content/uploads/stroke/sites/Aphasia/Aphasia%20resources%20project%20v2-2.3%20in%20sections%20-%20whole%20doc%20\(1\).pdf](http://www.crn.nihr.ac.uk/wp-content/uploads/stroke/sites/Aphasia/Aphasia%20resources%20project%20v2-2.3%20in%20sections%20-%20whole%20doc%20(1).pdf)

[Accessed 4 May 2015]

**Appendix E:** An example of data analysis using the Nicholas and Brookshire (1993) and the Mayer and Murray (2003) protocol

F: Okay, today we are going to do similar tasks to last week but you must describe the whole picture. Let's try this one.

R: alright

L: yes

(child watching TV)

**Key:**

 CIUs

 hesitations & non-words

F: let's look at the chart. Shall we start with the look category?

R: yes

L: what?

F: We are going to describe what we see by using the different.

L: ~~yes alright~~

F: okay (gestures to the chart). What does it look like?

R: A child

F: (Smiles) Okay but remember we are describing them not naming it as yet.

R: (laughs) okay

F: what is the child doing?

R: looking at something

L: yes

F: okay describe it

R: shape is, uhm, is a square

L: square, yes

F: okay, what else L?

L: (shrugs, a little confused)

F: what else can you tell us about this (pointing to the TV)

L: ~~uhm~~ ~~uhm~~ ...

R: It has a screen (nods)

F: Yes, but let's see if we can give L clues instead of the words.



R: yes, okay (nods)

F: okay, it's square and has a screen.

R: yes

L: yes (nods)

F: what do we do with it?

L: u , , (shows eyes)

F: yes,

R: (smiles) ya, (giggles)

F: yes, we watch it

R: watch it (smiles)

F: okay, (gestures to chart)

R: location

F: yes, where do we find it?

R: (smiles) in the house

F: (smiles) yes, in the house, where?

R: uhm, a room in the house... in the lounge

F: okay

L: yes

F: Does it remind you of anything

R and L look at each other

R: a TV (laughs)

F: okay, (smiles also) but if we didn't say TV, what does it remind you of?

(think for a few seconds)

R: (shakes her head) reminds me of news, and sevendee laan (laughs)

F: okay good, reminds you of news and some shows.

L: (looks and nods)

F: so if you could describe the whole picture. You see a ..

L: (searches for a word)

F: a ..b..

R: a boy (looks at L)

L: boy

R: Yes, a boy (smiles)

F: a boy....and he's

L: he's, u [X] [X]

R: watching TV

L: TV, s [X] (shakes her head)

F: yes, L you are doing well.

R: yes (looks at L)

**# words = 12**

**# CIUs = 8**

**% CIUs = 67%**

**% nouns = 38**

**% verbs = 0**

## Appendix F: An example of a support for P1

**People describer**



Who?



friends

family

helper

other?



What is their name?



a b c d e f g h i j k l m  
n o p q r s t u v w x y z

What do they do?

What do they look like?

man or woman

hair colour

old or young

tall or short

big or thin

glasses