

ACQuiring Knowledge in Speech, Language and Hearing

Volume 13, Number 1 2011

Language disorders

In this issue:

Group treatment for people with aphasia

Foster carers' knowledge of speech and language development

Effects of intervention on cluster production

Supporting secondary school students with LI







Darwin Convention Centre Darwin, Northern Territory 26-29 June 2011

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Keynobe Presentation

Dr Anne Lowell Keynote Presentation osing the communication gap in

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Happiness at work...and beyond: Applying the principles of positive

Closing the communication gap in digenous health: Strategies for improving interculture practice



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Back cover

Children at the Fremantle Language **Development Centre**

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From the editors

Marleen Westerveld and Kerry Ttofari Eecen



Marleen Westerveld (left) and Kerry Ttofari Eecen

"Language is the blood of the soul into which thoughts run and out of which they grow." (Oliver Wendell Holmes, American poet)

THE OXFORD DICTIONARY DEFINES LANGUAGE AS "THE METHOD OF human communication, either spoken or written, consisting of the use of words in a structured and conventional way". The definition of *disorder* is "a disruption of normal physical or mental functions; a disease or abnormal condition". Although I am convinced that we, as speech pathologists, could spend days, if not weeks, discussing and disputing these definitions, we would probably all agree that the ability to use language is what defines us as humans; however, visit http://www. youtube.com/watch?v=HZ-40_4chII for some fascinating videos on language use in apes. So instead, perhaps we would all agree that language is vitally important in our daily lives and that a disorder of language would dramatically impact our daily functioning. As you have noticed the topic *language disorders* is close to my heart. It is thus with great pleasure that I introduce this issue of *ACQuiring Knowledge in*

Speech, Language and Hearing. The issue brings a range of peer-reviewed articles that fall under the language disorders umbrella. Howe and colleagues start off by investigating the benefits of group treatment for people with aphasia, who have acquired their language disorder in later life. Miles et al. address the effects of topic familiarity on the expressive language skills in an individual with aphasia following a stroke. Next is an article by Kirk, Gillon and Hide, who compare two types of interventions aimed at improving consonant cluster productions in children with developmental speech and language disorders. Golding, Williams, and Leitão take a different approach, by investigating foster carers' knowledge and experience of speech and language development. This is important as children in foster care, as a group, are at increased risk of delayed speech and language development. Our final topic-related paper deals with secondary-school students with language disorders, a clinical group that is often overlooked. In this article, Starling and colleagues argue the importance of adopting evidence based approaches when supporting adolescent clients with spoken and written language disorders.

Cimoli reminds us about the importance of creating a career and professional development framework and raises issues about ensuring the competency of our speech pathology workforce. One way to ensure competency is to keep informed of the most recent literature. Although this may seem a daunting task, Croot, Taylor, and Nickels present an excellent clinical scenario that highlights how we can seek evidence when deciding on what services to offer to our clients. And, as always, Caroline Bowen's Webwords provides us with a treasure trove of good-quality website links that should assist you in finding recent articles related to child language. I am sure you will enjoy the Top 10 columns and I just want to say a special thanks to Lara and the children at the Fremantle Language Development Centre for their wonderful pictures.

On a slightly different note, I would like to take this opportunity to thank Nicole Watts Pappas for her fantastic work as the co-editor of *ACQ* during 2009–10. At the same time, we welcome Kerry Ttofari Eecen, who has been busy since October to help put together the current issue. Kerry and I are committed to continue to raise the profile and quality of *ACQ*. You will have noticed an increase in the number of peer-reviewed submissions over the past two years, with a greater focus on evidence based practice. At the same time, the emphasis is on clinical implications and applications and we will continue to provide a forum for publications with a clinical focus. As most of you will be aware, *ACQ* has recently been granted a B-ranking by the Australian Research Council, which places our journal at the same level as some well-known international speech pathology publications. Although this is great news, we cannot afford to be complacent, and we welcome feedback from our readers about the content or the layout of *ACQ* at any time.

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Group treatment for people with aphasia

A review of the benefits according to the ICF framework

Tami Howe, Annette Rotherham, Gina Tillard, and Christine Wyles

KEYWORDS APHASIA GROUPS TREATMENT QUALITY OF LIFE

THIS ARTICLE HAS BEEN PEER-**REVIEWED**





Tami Howe (top) and Annette Rotherham

Group treatments are offered by many speech pathologists for their clients with aphasia. Few studies, however, have examined the benefits of these groups. This paper provides a narrative review of those investigations that have identified benefits of group treatments for individuals with aphasia. The World Health Organization's International Classification of Functioning, Disability and Health (ICF) is used to categorise these benefits. The review reveals that most of the benefits in the investigations fall within the Activities and Participation component of the ICF. Speech pathologists can use the findings to help them to deliver evidence-based group treatments for their clients with aphasia.

any speech pathologists (SPs) provide group treatment for their clients with aphasia (Katz et al., .2000; Verna, Davidson, & Rose, 2009). Aphasia groups have focused on a variety of areas, such as reducing activity limitations (Aten, Caligiuri, & Holland, 1982) and improving the psychosocial well-being of individuals with aphasia (Hoen, Thelander, & Worsley, 1997), as well as addressing the needs of individuals' spouses (Johannsen-Horbach, Crone, & Wallesch, 1999). A survey of 91 American Veterans' Administration Medical Centre clinicians found that 80% had multiple goals for their aphasia group treatments, including wide-ranging aims such as language stimulation, emotional support, carryover or generalisation, and socialisation (Kearns & Simmons, 1985). Although there have been a number of clinical reports about aphasia treatment groups (e.g., Avent; 1997, Elman, 2007), relatively few studies have been conducted to determine whether the intended goals or outcomes for a particular treatment have been met and/or whether clients obtain benefits from participating in these groups. This review examines the benefits of aphasia group therapy that have been identified in research reports. The World Health Organization's (WHO; 2001) International Classification of Functioning, Disability and Health (ICF), an internationally recognised framework for describing the impact of a person's health condition on their functioning, is used as a framework to categorise the range of benefits that have been revealed in these investigations. A narrative review was used in this paper. Narrative reviews can be appropriate for discussing data in light of an underlying context (e.g., a framework such as the

ICF) (Cook, Mulrow, & Haynes, 1997). A narrative review, unlike a systematic review, usually does not use an explicit search strategy, making it more appropriate for the scope of this Clinical Forum paper.

The benefits **Definitions**

The key terms used in this article, i.e., "benefit", the components of the ICF, and quality of life (QOL), are defined in this section. For the purposes of this review, a benefit of an aphasia group refers to "a helpful or good effect" (Cambridge University Press, 2010) for an individual with aphasia that can be attributed to participation in a group treatment and that has been documented as part of or as the main findings of a study. A benefit includes statistically significant improvements in post-treatment outcome measures and/or positive effects reported by participants with aphasia during gualitative interviews. Quantitative studies that do not provide information about the statistical significance of the results (e.g., Borenstein, Linell, & Wahrborg, 1987; Marshall, 1993) have not been included. Studies that have focused on a varied range of group therapies for each participant, rather than a specific group treatment, have also been excluded (e.g., van der Gaag et al., 2005).

One approach for better understanding the range of benefits identified in the research is to use an internationally recognised framework such as the ICF to categorise the findings. The ICF is a conceptual framework and classification tool that provides clinicians with a standard language for describing and documenting the impact of a health condition such as aphasia within the context of an individual's life (WHO, 2001). In Australia, the ICF has been used in the Speech Pathology Australia Scope of Practice in Speech Pathology document (Speech Pathology Australia, 2003). Similarly in the United States, the ICF has been used as the framework for the profession in the Scope of Practice for Speech-Language Pathology (American Speech-Language-Hearing Association, 2001). Furthermore, use of the ICF has been recommended for identifying outcomes specifically in relation to aphasia group therapy (Glista & Pollens, 2007). The ICF has four components: (a) Body Functions and Structures, (b) Activities and Participation, (c) Environmental Factors, and (d) Personal Factors. The first two components are part of a grouping called Functioning and Disability, whereas the latter two components are part of a grouping called Contextual Factors. Body Functions involve "the physiological functions of body systems" such as the "expression of spoken

language," whereas Body Structures refer to "the anatomical parts of the body" (WHO, 2001, p. 10). The *ICF* refers to Activities as the "execution of a task or action by an individual," such as "conversing with one person," while Participation is defined as "involvement in a life situation" such as participating in "community life" (WHO, 2001, p. 10). The third ICF component, Environmental Factors, is defined as "the physical, social, and attitudinal environment in which people live and conduct their lives" (WHO, 2001, p. 10). An example of an Environmental Factor would be having "support and relationships" from/with friends. The final component, Personal Factors, involves "features of the individual that are not part of a health condition" such as age, coping styles, and education (WHO, 2001, p. 17).

Although the *ICF* does not address the QOL construct directly, it recognises the importance of establishing links between the classification and QOL (WHO, 2001). The relationship between QOL and Personal Factors and Environmental Factors is thought to be particularly crucial and requires the SP to consider the context of a client's life as being central to therapy (Cruice, 2008). QOL in relationship to the *ICF* refers to what people feel about their health condition or its consequences and is viewed as a construct of subjective well-being (WHO, 2001, p. 251). The remainder of the review describes the benefits of group treatment for people with aphasia in relation to the four components of the *ICF* (i.e., Body Functions and Structures, Activities and Participation, Environmental Factors, and Personal Factors), as well as in relation to QOL.

ICF components

Body Functions and Structures

Benefits for the Body Functions and Structures component have been demonstrated in a number of studies using constraint-induced aphasia therapy (CIAT, also referred to as constraint-induced language therapy) (Pulvermuller, Hauk, Zohsel, Neininger, & Mohr, 2005; Pulvermuller et al., 2001), a treatment that frequently uses groups. The main goal of CIAT is to improve the participants' impaired spoken language using intensive massed practice, responses that are constrained to spoken verbal expression, response shaping, and relevant stimuli (Kirmess & Maher, 2010). In one study that used this approach, 10 individuals with chronic aphasia received 30 hours of group CIAT over 10 consecutive working days (Pulvermuller et al., 2005). The participants demonstrated significant improvements post-treatment on the naming, comprehension, and Token Test subtests of the (Huber et al., 1983) Aachen Aphasia Test, providing evidence of benefits for CIAT within the Body Functions and Structures component.

Body Functions and Structures, and Activities and Participation

Benefits of groups in relation to both Body Functions and Structures, and Activities and Participation have been identified in a few investigations such as one by Wertz et al. (1981) that compared individual with group treatment. The group treatment part of the study involved 16 participants with aphasia who completed 44 weeks of 4 hours/week therapy that focused on improving communication through group interaction and discussion, as well as 4 hours/ week of group recreational activities. Group participants made significant improvements post-treatment on the linguistic measures of the Porch Index of Communicative Ability (PICA; Porch, 1967), the Word Fluency Measure (Borkowski, Benton, & Spreen, 1967), and the Token Test (DeRenzi & Vignolo, 1962), all Body Functions and Structures measures. In addition, participants made significant improvements on two measures of Activities and Participation: a conversational rating to determine the person's conversational ability and an informant's rating in which a family member or friend rated the person's functional language use.

Bollinger, Musson, and Holland (1993) also demonstrated the benefits of a group treatment within the components of Body Functions and Structures and Activities and Participation. The groups involved 10 participants with chronic aphasia who received two blocks of contemporary group treatment (e.g., greetings and socialisation, practising money concepts) and structured television viewing treatment (e.g., viewing a television program segment, recalling the main events of the segment), as well as two periods of treatment withdrawal. Participants' scores on the PICA (Porch, 1981), a linguistic measure that falls within the Body Functions and Structures component, improved significantly after both treatment blocks. The participants also showed significant changes on the Communicative Abilities in Daily Living test (CADL; Holland, 1980) after the first block of treatment, but not after the second period. The CADL is a measure that falls within the Activities and Participation component, assessing an individual's abilities to simulate everyday communication activities.

Body Functions and Structures, Activities and Participation, and Environmental Factors

Elman and Bernstein-Ellis (1999a) conducted one of the key studies in the area, comparing the effects of aphasia treatment groups to social groups. Twenty-four adults with chronic aphasia were randomly assigned to either a 4-month treatment group or a deferred treatment group. The treatment group involved 5 hours/week of communication group treatment with an SP, while the deferred treatment involved participating in 3 hours/week of social activities of the individual's choice prior to receiving the group treatment. The communication treatment group focused on improving the participants' understanding of the communication disorder, their ability to convey a message using any strategy and their self-awareness of personal goals, and encouraging initiation of conversational exchanges and the development of confidence for attempts at personally relevant communicative situations. Post-treatment, the therapy group demonstrated significant changes on a linguistic measure, the Western Aphasia Battery (WAB; Kertesz, 1982), indicating improvements within the Body Functions and Structure component. The treatment group also made significant changes post-treatment on the CADL (Holland, 1980). The deferred treatment group did not make significant changes on any of the measures prior to receiving the treatment.

Elman and Bernstein-Ellis (1999b) also conducted a qualitative study to investigate the participants' perceptions of the positive and negative aspects of the aphasia communication treatment groups. Semi-structured interviews were completed with 12 of the participants with aphasia who participated in the Elman and Bernstein-Ellis (1999a) study two times during the treatment phase, as well as four to six weeks after the treatment had been completed. Participants with aphasia reported three positive aspects of group treatment that related to speech-language and communicative abilities: enjoying conversations, improvement in talking, and improvement in reading/writing, all of which could be categorised within the Activities and Participation component. The participants also identified psychosocial positive aspects of participating in the groups, four of which involved the Activities and Participation component: liking being with others, liking making friends, liking being able to help others, and liking seeing others

improve. A fifth positive psychosocial aspect identified in the study was the participants liking the support of others with aphasia, which can be categorised within the Environmental Factors component of the *ICF*. The sixth positive psychosocial aspect of feeling more confident can be categorised as part of the Body Functions and Structures component. Within the ICF, mental functions such as "confidence" can be coded as a Body Function or be considered to be a Personal Factor by identifying whether the characteristic existed prior to the onset of the health condition such as aphasia (Threats, 2007). If an individual tended to be confident prior to the onset of aphasia and continued to be confident after the onset of the communication disorder, then it may be considered to be a Personal Factor. However, if confidence has been affected by the onset of aphasia such as in the Elman and Bernstein-Ellis (1999b) study, then it is coded as a Body Function.

All the positive aspects identified by the participants in this investigation can be considered to be benefits of the groups. Some of the positive aspects identified by the participants such as liking the support of others and being able to help others were not specifically identified within the intended goals of the therapy. This finding suggests that groups may provide indirect benefits that are not explicitly identified as goals of the treatment. Furthermore, even though there were specific goals for the group such as improving the participants' understanding of the communication disorder, the outcome of some of the treatment goals was not explicitly measured or reported on in the study.

Activities and Participation

At least two studies have demonstrated benefits only within the Activities and Participation component of the *ICF*. For example, Aten et al. (1982) investigated a group treatment for seven participants with chronic aphasia that focused on improving specific functional communication activities such as using social greetings, supplying personal information, and reading signs and directories. The participants demonstrated improvements in the Activities and Participation component with statistically significant improvements in their post-treatment performance on the CADL.

In another study, Ross, Winslow, Marchant, and Brumfitt (2006) investigated an aphasia group treatment for seven participants with chronic aphasia that focused on developing total communication and conversation skills, engaging in social participation, and developing an understanding of disability and rights. Immediately after treatment and at three months post-treatment, the participants demonstrated statistically significant positive changes on the Conversational Analysis Profile for People with Aphasia Part B (CAPPA-B; Whitworth, Perkins, & Lesser, 1997), a measure that requires participants to rate conversation experiences in areas such as conversation situations, conversation topics, and styles of conversations. This finding provides evidence of benefits of the group within the Activities and Participation component. The authors note that the groups did not specifically focus on improving conversation experiences, again suggesting that groups may provide indirect benefits that are not specifically related to the goals of the groups. In addition, although the group reportedly aimed to help the participants develop an understanding of disabilities and rights, the authors did not report how or if the outcome of this goal was assessed.

Activities and Participation, and Environmental Factors

As part of a larger study investigating the role of social networks in aphasia groups, Vickers (2010) examined the

impact of attending an aphasia treatment group compared to not attending the group. The group focused on the use of multi-modality communication in natural conversations and the development of new social networks. The aphasia group attendees comprised 28 participants, while the comparison group consisted of 12 individuals with aphasia who were not attending the aphasia group. Group attendees reported significantly higher levels of social participation on the Survey of Communication and Social Participation (Vickers & Threats, 2007) than that reported by the non-attendees, indicating benefits within the Activities and Participation component. In addition, compared to non-attendees, the participants who attended the aphasia group reported significantly greater frequency of contact within their social networks on the Social Networks Communication Inventory (Blackstone & Hunt-Berg, 2003) and less perceived social isolation on the Friendship Scale (Hawthorne, 2006), both findings associated with benefits within the Environmental Factors component of the ICF.

Activities and Participation, and Personal Factors

One study that found aphasia group benefits within the Personal Factors component was conducted by Brumfitt and Sheeran (1997). The investigators evaluated an aphasia group involving six individuals with aphasia in addition to two participants who had stuttering difficulties. The aim of the group was to improve the participants' communicative competence, their attitude to communication, and their self-esteem and well-being. The participants with aphasia demonstrated significant improvements post-treatment on the Functional Communication Profile (Sarno, 1975), a rating scale that includes everyday communication functions (e.g., understanding conversation) and can therefore be considered to rate Activities and Participation. The participants also demonstrated statistically significant improvements after treatment on the Stutterer's Self-Ratings of Reactions to Speech Situations Scale, a measure designed for individuals who stutter that requires self-ratings of reactions to or avoidance of various speaking situations. This scale can be considered to address an individual's behaviour pattern and coping style, a factor within the Personal Factors component of the ICF.

Quality of life

At least one study has shown benefits related to QOL for individuals with aphasia participating in groups. Hoen, Thelander, and Worsley (1997) investigated the impact of a community-based group program that offered long-term support for people with aphasia. The group, led by volunteers under the guidance of SPs, focused on providing the individuals with opportunities to exchange ideas, to make new friends, and to learn to use adaptations such as drawing and gestures to improve communication effectiveness. Thirty-five participants with chronic aphasia, who had enrolled for varying lengths of time in the service, were assessed at two different time periods, six months apart. The participants demonstrated significant positive changes on five of the six psychological well-being scales of a condensed version of the Ryff's Psychological Well-being Scale (Ryff, 1989): Autonomy, Environmental Mastery, Personal Growth, Purpose in Life, and Self-acceptance. This finding suggests that group attendance had a positive impact in the area of QOL. Again, although the group reportedly focused on goals such as improving communication effectiveness using adaptations, the outcome of this aim was not specifically assessed in the study.

4

Table 1. Studies demonstrating benefits of group treatment in terms of ICF components and QOL measures									
Study	ICF components and QOL	ICF components and QOL measures in which benefits were demonstrated							
	Body Functions & Structures	Activities & Participation	Environmental Factors	Personal Factors	Quality Of Life				
Pulvermuller et al. (2005)	Aachen Aphasia Test subtests (naming, comprehension, & Token Test)								
Wertz et al. (1981)	PICA Word Fluency Token Test	Conversation rating Informants' rating							
Bollinger et al. (1993)	PICA	CADL							
Elman & Bernstein-Ellis (1999a; 1999b)	WAB Qualitative interviews	CADL Qualitative interviews	Qualitative interviews						
Aten et al. (1982)		CADL							
Ross et al. (2006)		CAPPA-B							
Vickers (2010)		Survey of Communi- cation and Social Participation	Social network frequency of contact Friendship scale						
Brumfitt & Sheeran (1997)		Functional Communi- cation Profile		Stutterer's Self- Ratings of Reactions to Speech Situations Scale					
Hoen et al. (1997)					5 of the Ryff's psychological well- being scales				

Note. PICA = Porch Index of Communicative Ability (Porch, 1967); CADL = Communicative Abilities in Daily Living test (Holland, 1980); WAB = Western Aphasia Battery (Kertesz, 1982); CAPPA-B = Conversational Analysis Profile for People with Aphasia Part B (Whitworth et al., 1997).

Conclusion

The review has provided evidence that the benefits of aphasia group treatments are varied, spreading across all four components of the ICF, in addition to QOL (see Table 1). Most of the benefits were demonstrated in relation to Activities and Participation, with seven of the nine studies identifying benefits in this area. Clinicians can use these findings to develop evidence-based aphasia group therapy that targets specific types of benefits. The paper has also highlighted that there is not always a congruence between the reported goals of the treatment groups and the outcome measures used to determine the effectiveness of the groups. One factor that may contribute to this problem is the lack of appropriate measures for assessing the wide-ranging goals of aphasia treatment groups (Kearns & Elman, 2008). Garrett and Pimentel (2007) have identified a number of instruments such as the Communication Interaction Rating Scale for Aphasia Group that clinicians may use to overcome this difficulty. This review has also found that groups can provide indirect benefits such as support from other people in the group that might not be explicitly identified within the goals of the treatment. SPs need to be aware of these potential indirect benefits of groups in order to provide better assessment of and treatment in their aphasia groups.

Further research regarding the benefits of groups for people with aphasia is needed. Investigations into the efficacy of group therapy, the types of participants who benefit from different types of groups, and the optimum frequency and intensity of groups is required. One key area that has not been explored is the perceptions of people with aphasia regarding the benefits of being involved in groups (both aphasia treatment and other). Research in these different areas can inform clinical practice so that SPs can provide evidence-based group therapy for their clients with aphasia.

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6

Effects of topic familiarity on discourse in aphasia

A single case study

Adrienne Miles, Natalie Ciccone, and Erin Godecke

This paper presents an investigation into the effect of topic familiarity on discourse production in an individual with chronic post-stroke aphasia. The participant produced procedural narrative discourse samples within a retell context with the topics identified as familiar or unfamiliar by the participant. To establish the level of familiarity the participant ranked 20 topics from most to least familiar. The five most and least familiar topics were then used as discourse sample stimuli. These samples were compared on multiple discourse measures in order to examine the impact of topic familiarity across different levels of the language system. Overall the unfamiliar procedural topics resulted in less successful communicative output. The results of this study lend support to literature suggesting topic familiarity influences discourse production. This study has clinical implications for the assessment and treatment of individuals with aphasia.

Discourse production results from the interplay between social, linguistic, and cognitive elements of a communication setting (Ulatowska & Bond, 1983) and so discourse analyses may investigate interactions between the linguistic and cognitive processes which affect communication in people with aphasia (Armstrong, 2000; McNeil, Doyle, Fosset, Park, & Goda, 2001). Discourse analysis is widely used to examine communication in people with aphasia (Sherratt, 2007). It provides an opportunity for the production and analysis of complex communicative elements that may not be as obvious in standardised assessment tasks requiring single word production or comprehension (Armstrong, 2000).

Due to the interaction between linguistic and cognitive processes, variables external to an individual's language system can significantly influence the efficiency and effectiveness of the system and impact on communicative success (McNeil, Odell, & Tseng, 1991). External variables, such as discourse topic or the method of discourse elicitation, influence the quality and characteristics of the discourse produced (Armstrong, 2000; Li, Williams, & Della Volpe, 1995; Williams, Li, Della Volpe, & Ritterman, 1994). These external variables can potentially be manipulated within a clinical environment to influence the characteristics of the discourse sample produced. One such element is topic familiarity (McNeil et al., 2001).

Limited available research examines the relationship between topic familiarity and discourse production in people with aphasia. Within their study Williams et al. (1994) asked a group of 30 non-brain-damaged individuals to rate a list of 84 topics on a scale of very familiar to completely unfamiliar. From the ratings a list of 10 familiar and 10 unfamiliar topics was generated. Using these topics Williams et al. (1994) investigated the impact of topic familiarity on procedural discourse and story retell production by people with aphasia and non-brain-damaged individuals. The study found familiar and unfamiliar topics affected procedural discourse and story retells differently. The authors reported significant positive effects of familiar topics, such as increased quantity of speech for both procedural discourse and story retell samples, and increased grammatical complexity in story retells. Conversely, unfamiliar topics resulted in the production of more content words in story retells and a greater level of grammatical complexity in procedural discourse samples (Williams et al., 1994).

Using the familiar and unfamiliar topics generated in the Williams et al. (1994) study, Li et al. (1995) analysed procedural discourse and narrative retells produced by people with aphasia and non-brain-damaged individuals. They investigated the production of essential and optional ideas in procedural discourse samples on familiar and unfamiliar topics. Essentials ideas were classified as points that were essential to completion of the procedure. Optional ideas were non-essential points that acted to further clarify or support the essential ideas. The analysis of essential and optional ideas was based on previous research that found, within a structured elicitation context, that people with aphasia convey information that is essential for the completion of a procedure; however, they include less elaborative or optional content when compared to individuals without aphasia (Ulatowska, Freedman-Stern, Doyel, Macaluso-Haynes, & North, 1983). Li et al. (1995) found that the discourse samples on familiar and unfamiliar topics contained the same number of essential ideas but unfamiliar topics elicited fewer optional ideas. Similar results were found in the story retell context in which participants recalled more story details in response to familiar topics (Li et al., 1995). Taken together, the Williams et al. (1994) and Li et al. (1995) studies demonstrated that topic familiar discourse

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Adrienne Miles (top), Natalie Ciccone (centre) and Erin Godecke

resulted in increased quantity and more detailed recall when compared to unfamiliar topics.

To explain the these findings, Li et al. (1995) suggested topic familiar discourse may be more automatic, utilising language networks and connections that are used regularly. McNeil et al. (1991) suggested fewer cognitive resources are required to complete a familiar task and therefore more resources could be allocated to discourse planning and accessing the required syntactic, lexical, and phonological forms providing more effective discourse. When producing discourse related to an unfamiliar topic, individuals may require more cognitive resources to access stored topic-related information and are less efficient when finding information to fill the knowledge gaps (Li et al., 1995). Increased competition for resources may lead to breakdowns in expressive language production resulting in the impairment of language output experienced by people with aphasia such as syntactic, lexical, and phonological paraphasias as well as a decrease in the efficiency and cohesion of information (Murray, Holland, & Beeson, 1998).

Murray et al. (1998) suggested assessing people with aphasia in optimal and suboptimal contexts in order to obtain a more realistic sample of their communicative ability. In a clinical setting, knowledge of the role of topic familiarity in discourse production may provide a variable that could be easily and feasibly manipulated to increase or decrease task difficulty and thereby achieve an optimal and suboptimal assessment in a therapeutic environment.

Connected speech samples in aphasiology research are currently obtained in a variety of contexts ranging from natural everyday conversations to structured picture descriptions in clinical settings. Analyses similarly range from detailed conversation analysis (e.g., Beeke, Maxim, & Wilkinson, 2007) exploring aspects such as turn-taking and repair, to functional grammatical aspects involving overall text macrostructure (e.g., Ulatowska, Allard, & Bond Chapman, 1990; Williams, et al., 1994) as well as cohesion (e.g., Ellis, Rosenbek, Rittaman, & Boylstein, 2005) and analyses focused on measures of content and efficiency such as the Correct Information Unit (e.g., Doyle et al., 1998, 2000; Nicholas & Brookshire, 1993).

The current study combined retell and procedural discourse elicitation techniques to investigate the impact of topic familiarity on discourse production. Controlling the procedural discourse retell topic allows the quantity and content of the elicited sample to be constrained as specific targets are predetermined (Doyle et al., 2000). Constraining the retell topic leads to less ambiguity in discourse production resulting in a more standardised analysis and more reliable sample comparisons (Doyle et al., 2000). Additionally, discourse tasks can be challenging to people with aphasia due to the increased amount and complexity of information required to complete the task (Ulatowska et al., 1983). Individuals with aphasia benefit from the additional structure and prompting provided in a narrative retell. This decreases the cognitive load required in formulating the language required to express the topic (Doyle et al., 1998).

The aim of this study was to investigate the influence of topic familiarity on the quality of discourse samples produced by an individual with aphasia. It was hypothesised that topics rated by the individual as being more familiar would result in a higher level of performance on measures of discourse analysis as compared to those topics rated less familiar. Williams et al. (1994) analysed their procedural and story retell samples by examining the quantity of information communicated and the grammatical complexity of the utterances. The present study included a wider range of measures in order to examine the impact of topic familiarity across different levels of the language system. The analysis of multiple discourse measures provides a broader view of a participant's discourse abilities allowing for the interaction of linguistic processes within the communicative system to be examined (Sherratt, 2007).

Methodology Participant

This single subject study involved a 38-year-old female participant who had experienced a single ischemic left hemisphere stroke following dissection of her left internal carotid artery. At the time of the study she was 26 weeks post stroke. There were no reported pre-morbid neurological or developmental conditions affecting cognition or language. The participant was right handed, spoke English as her first language and reported normal vision and hearing. The participant was assessed on the Boston Diagnostic Aphasia Examination (BDAE; Goodglass & Kaplan, 1983) by a qualified speech pathologist and diagnosed with mild to moderate aphasia, with a severity rating of 4 (mild expressive language impairment and a mild-moderate receptive impairment). Table 1 contains the individual's overall results on the BDAE. Using the procedures of Williams et al. (1994) and Li et al. (1995), the participant passed the Complex Ideation Materials subtest of the BDAE, indicating she had sufficient auditory processing skills to meet the demands of the story retell task (Williams et al., 1994).

Table 1. Boston Diagnostic Aphasia Examination(BDAE) assessment results

Area of Assessment	Score
BDAE expressive language score	80.5
BDAE fluency score	60.0
BDAE auditory comprehension score	93.3
BDAE severity rating ^a	4.0

Note. BDAE (Goodglass & Kaplan, 1983). $^{\rm a}$ Severity rating of 5 = mild, 3 = moderate, 1 = severe.

Stimuli

The procedural samples used in this study were created from 10 familiar and 10 unfamiliar topics based on those used by Williams et al.'s (1994) and Li et al.'s (1995) studies. The complete list of topics is provided in Table 2. To identify personally relevant topics, the participant ranked the list of the 20 topics from most to least familiar after being asked to "put these in order of the one you would know the most about to the one you would know the least about". The five most familiar and five most unfamiliar topics were then used for the retell tasks. The topics ranked as most familiar were: making a sandwich, going shopping, having a shower, going to the doctors, and making a pot of tea. The topics ranked as least familiar were: writing a haiku poem, writing a symphony, saddling a horse, going mountain climbing, and going scuba diving.

The topics created for this study were equivalent in length, average word frequency, and the number of main and optional ideas. This reduced extraneous variables thought to affect discourse production. Main ideas were defined as those ideas that were significant for the completion of the procedure. Optional ideas were those points that clarified the main ideas (Li et al., 1995). Each topic contained an

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Table 2. Complete list of familiar and unfamiliar topics

Familiar topics	Unfamiliar topics
Going grocery shopping	Going mountain climbing
Going out to dinner	Saddling a horse
Clearing the table after dinner	Making a clay bowl
Getting children ready for bed	Making a bean bag
Getting a haircut	Painting a watercolour landscape
Changing bed sheets	Participating in a marathon walk
Making a cup of tea	Writing a haiku poem
Having a shower	Auditioning for a play
Going to the doctors	Conducting a symphony
Making a sandwich	Preparing to scuba dive

average of 6 utterances, with 11 words per utterance, and included an average of 7 main ideas and 3 optional ideas. The number of main and optional ideas were predetermined, consistent with Williams et al.'s study (1994). Average word frequency was calculated for all topics using the word frequency lists from the MRC psycholinguistic database (Wilson, 1998). A t-test showed no statistically significant difference in word frequency between familiar and unfamiliar topics *t* (18, 17.21) = .137, *p* = 0.715.

Procedure

The participant attended two 60-minute data collection sessions conducted by the first author. The first session involved collection of case history information, the completion of BDAE, and the ranking of procedural topics. During the second session, the 10 pre-recorded discourse samples were presented via a laptop computer to the participant in a random order. Presentation of stimuli and instructions was consistent with the retell tasks in Williams et al.'s (1994) and Li et al.'s (1995) studies. After listening to the discourse sample once, the participant retold the procedure in her own words. For each discourse topic, she was prompted to provide as much detail as she could recall. During discourse production nonspecific prompting was used such as "can you tell me anything else?" to encourage as much output as possible for each topic.

Samples were recorded and timed using a JNC USB-350 digital voice recorder with a lapel microphone. Discourse samples were transcribed using Systematic Analysis of Language Transcripts software (SALT; Miller & Chapman, 2002) and analysed by the first author.

Discourse analyses

The discourse samples were analysed using the measures outlined below.

Mean length of utterance (MLU) measured in words and type token ratio (TTR) were calculated. Mean length of utterance is a measure of syntactic complexity (Miller & Chapman, 2002). TTR is a ratio of the number of different words produced compared to the total number of words produced and reflects diversity in the lexical items produced in response to the discourse topics.

Speech rate was measured by the number of words produced per minute (WPM) which reflects the speed with which the participant was able to formulate and produce the language required for each sample. The amount of pause time compared to the total discourse time was calculated as a percentage figure (%pauses). This percentage reflected the amount of additional time required to formulate the language output. Communicative efficiency was measured by the number of correct information units per minute (CIU/min) relating to how quickly and correctly each topic was produced. The procedure for calculating CIU/min followed Nicholas and Brookshire's (1993) rules for analysis.

Breakdown in language production was investigated at word and utterance levels. The percent of words in mazes (revisions, repetitions, and filler words) (Miller & Chapman, 2002), number of word errors (Word errs) and number of utterance level errors (Utt errs) were measured. The number of dysfluencies as indicated by the percentage of words in mazes may be an indication of the participant attempting to correct difficulties in communication either before speaking, or once she had started speaking (Merlo & Mansur, 2004). Word errors occurred when an incorrect word was produced. Utterance errors included utterances that provided incorrect information, or did not add to the overall flow of the discourse (Ciccone, 2003). These were coded during transcription and calculated as the total number of each type of error contained in each sample.

The amount of content recalled by the participant was measured by the percent of predetermined main ideas (%MI) and optional ideas (%OI) (Li et al., 1995).

Results

Table 3 provides an example of the procedure, for a familiar and an unfamiliar topic, played to the participant as well as the participant's corresponding discourse samples.

For each measure, the results were grouped according to familiarity or unfamiliarity to allow for statistical comparison (see table 4 for the results). Comparisons were undertaken using a paired-samples t- test or a Mann-Whitney U test when assumptions of normality and homogeneity of variance were violated. The alpha level was set at 0.05.

Significant differences in the discourse measures between familiar and unfamiliar topics were noted. The unfamiliar topics resulted in a reduction in the speed and accuracy of discourse production. The slower rate of production was characterised by a decreased number of words per minute, an increase in the total amount of pause time, and a reduced number of correct information units per minute. The samples also contained a larger number of utterances that provided incorrect information or information that was conveyed ineffectively. These utterances had an increased number of filler words, repetitions and revisions. The unfamiliar samples also contained fewer optional ideas.

Discussion

There were statistically significant differences between the discourse samples produced in response to topics rated as familiar and unfamiliar. The more familiar topics resulted in higher quality discourse samples. The number of main ideas recalled was similar for both familiar and unfamiliar samples. This result is consistent with the findings of Li et al. (1995) and when considered in light of the significant difference in the number of optional ideas recalled suggests that the unfamiliar topics had an impact on the participant's ability to recall all procedural details (Williams et al., 1994). It may also be evidence of the individual's lack of previous exposure to the experiences outlined in the unfamiliar procedural topics.

No significant differences were found between familiar and unfamiliar topics on the measures of mean length of utterance (MLU), type token ratio, and the number of word errors. Williams et al. (1994) found the syntactic complexity of the utterances increased when participants produced

Table 3. The original procedure and the participant's retell for familiar and unfamiliar topics					
Procedure provided	Participant procedural retell				
Familiar topic: going grocery shopping					
First you should make a list of items you want to buy. When you get to the shop look for the aisle where the food would be kept. Find the items you need put them into your trolley or basket. Then go to the checkout and pay for your shopping. Your food will be put into plastic or recyclable bags if you have them. Then take your shopping home.	Ok before you start um to go shopping make a list. Um and then ah go to the um Coles or Woolworths or wherever you like to go. Um go down the aisles and find the items that are on your list. When you have everything then go and buy some chocolate. To say yes I've gone do the groceries now I can have some chocolate before going to the um checkout and paying. Put all your items in a um carrier bag. Plastic or recyclable And go home.				
Unfamiliar topic: Going scuba diving					
First you should see your doctor for a health check. Then you need to buy or hire your diving gear including wetsuit, tanks and snorkel. Choose a suitable diving location with good water conditions. Dive with a friend or have someone waiting in the boat. Put up your diver's flag to let others know you are in the water. Enter off a boat by stepping into the water feet first.	 Well first of all go to your doctor and make sure that you've got a medical certificate that your fine that the doctor's said ok y* medically you're fine to go. You're fit and ok. Then go and um rent rent s a suit water suit not watersuit um wetsuit. With some um a s a snorkel and might be some fins but I don't think he said that but I'm just thinking. Um and a tank Um find a platinum a platford platform um to put up a and then put up a flag So that people know that you're in the water. Stay somebody in the boat. Um and uh tenor the ah sit oh or fall backwards into the water. 				

procedural samples on unfamiliar topics. In the present study the difference in MLU between familiar and unfamiliar topics was not significant. The difference between the results of two studies may be due to the different elicitation contexts. In the Williams et al. (1994) study the procedural discourse samples were produced spontaneously while in the current study they were produced in a retell format. The nature of the retell means the words used and the length of the utterances were controlled across both experimental conditions.

Table 4. Mean discourse measures for familiar andunfamiliar topics								
	Familiar topics M SD		Unfamili M	Unfamiliar topics M SD				
MLU ^a	9.7	.20	8.1	1.8	.10			
TTR⁵	.64	.06	.71	.06	.22			
WPM^{b}	114.9	12.3	86.3	17.7	.03*			
%Pauses ^a	3.7	5.7	19.0	11.6	.02*			
CIU/min ^₅	88.9	18.9	43.5	8.6	.008*			
%Mazes ^b	17.4	9.2	28.0	3.0	.04*			
Wd errs ^b	.00	.00	.80	1.0	.13			
Utt errs ^b	.00	.00	.60	.54	.05*			
%MI ^a	55.6	43.7	55.4	17.7	.99			
%0l ^b	66.6	31.1	27.0	21.3	.04*			

Note. ^aStatistical comparison paired samples t- test. ^bStatistical comparison through Mann Whitney U. %MI = percentage of main ideas included. %OI = percentage of optional ideas included. ^{*} p < 0.05.

The discourse measures that were significantly different in this study were not included in the Williams et al. (1994) and Li et al. (1995) studies. The measures that reflect the speed of language processing (WPM and % pausing) and overall communicative efficiency (CIU/min, %mazes, and utterance level errors) were influenced by topic familiarity, with the least familiar topics having a detrimental impact of discourse production. This result highlights the importance of analysing discourse beyond the utterance level to include measures that examine the discourse sample as a whole.

Clinical application of results

This study demonstrated the benefit of using discourse tasks to examine language. In assessing multiple discourse samples one variable was manipulated and the impact of the manipulation examined across the range of measures assessed. These measures provided an overview of the participant's oral narrative abilities while offering insight into the interrelationships between language processes (Sherratt, 2007).

When assessing discourse, varying the level of familiarity in discourse topics provides a feasible method of adjusting task difficulty. By incorporating personally familiar or unfamiliar topics, the clinician is able to assess the individual's language system in optimal and suboptimal contexts (Murray et al., 1998). The potential impact of topic familiarity should be also be considered to ensure reliable and valid representations of a client's language abilities and the accurate interpretation of results (Chen & Whittington, 2006; Williams et al., 1994).

Controlling the familiarity of discourse topics within discourse-based treatment tasks allows one aspect of task difficulty to be controlled (Li et al., 1995). Within a treatment

task more familiar topics may improve communicative success while less familiar topics may be introduced to increase the difficulty of the discourse task.

Conclusions

Collectively, the results indicate slower, less efficient discourse with more errors was produced in response to procedures on unfamiliar topics. The differences in the participant's output when comparing the response to the familiar and unfamiliar topics supports the hypothesis of a greater level of communicative success when discussing procedures that are performed regularly. This result may be due to the interaction between linguistic and cognitive processes during discourse production and the impact of the greater cognitive load created with the unfamiliar topics.

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Speech and language development: Knowledge and experiences of foster carers

Shannon Golding, Cori Williams, and Suze Leitão

KEYWORDS

FOSTER CARERS HOME ENVIRONMENT PARENT TRAINING QUALITATIVE SPEECH AND LANGUAGE DEVELOPMENT

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Shannon Golding (top), Cori Williams (centre) and Suze Leitão

This study aimed to investigate foster carers' knowledge and experience of speech and language development. Foster carers in Western Australia who provided long-term care for children under the age of 5 were contacted through collaboration with the Department of **Child Protection. This paper contains two** parts. Part one reports on data obtained from 20 foster carers using written postal questionnaires. The questionnaire asked foster carers about their daily routine with their foster child, their knowledge of speech and language development and topics related to speech and language development on which they would like further information. Semi-structured interviews were carried out with a subset of 12 foster carers and the results are presented in part two. Results showed that foster carers demonstrated insight into their foster children's speech and language difficulties and were motivated to support the children and seek speech pathology intervention. The findings of this study provide speech pathologists with information regarding the needs of this population in terms of therapy services for children and in terms of educational topics of interest for foster carers.

A large number of Australian children are unable to live with their parents. On June 30 2009, there were 34,069 children reported to be living in outof-home care in Australia. Of these, 47% were living in a foster care placement and 45% in a relative/kinship care plcement (Australian Institute of Health and Welfare, 2010). The foster care system is struggling with a limited supply of foster carers to meet this growing number of children with increasingly complex needs (Bath, 2008; Burry, 1999). In Western Australia, children who are unable to remain in the care of their parents come under the responsibility of the state's Department of Child Protection (DCP; Government of Western Australia Department of Child Protection, 2009). These children remain under the legal responsibility of DCP; however foster carers are responsible for meeting the child's daily needs.

Children in foster care need to be cared for by foster carers who are able to provide a secure relationship that supports the child, particularly in the critical early years of development when cognitive, communication, physical and social-emotional skills are developing rapidly. Appropriate and stimulating input is required to ensure that the child's speech and language skills can develop appropriately (see Owens, 2005; Paul, 2007). Children in foster care and alternative care arrangements may be developmentally delayed in a number of areas, particularly in language (Leslie, Gordon, Ganger, & Gist, 2002; Stock & Fisher, 2006). These children come from a range of different backgrounds and may have experienced abuse, neglect, inconsistent home environments, prenatal exposure to alcohol and drugs, maternal mental illness and a variety of other difficult conditions (Amster, 1999; Craven & Lee, 2006). Limited or harmful communicative exchanges between parents and children in addition to the effects of a less than optimum environment can impair the child's neurological and developmental capabilities (Child Welfare Information Gateway, 2001).

The language skills of children in care can fall from 6 to 9 months behind that of their age matched peers (Culp et al., 1991). A screening study of 122 foster children conducted in New South Wales found that 45% of the children under 5 years of age had speech delay, and 20% of children aged 5 to 10 years had delayed language skills (Nathanson & Tzioumi, 2007). These figures are far greater than the median prevalence rate of speech and language impairment of 5.95% in the wider population [FoHS1] (Law, Boyle, Harris, Harkness, & Nye, 2000) and the prevalence rate of receptive language impairment of 14.7[FoHS2]% in a representative sample of 4,983 Australian children, aged 4 to 5 years (McLeod & Harrison, 2009). Children within the foster care system also show poorer cognitive development and school performance than their age-matched peers (Trickett & McBride-Chang, 1995) and can be expected to demonstrate developmental, behavioural and emotional disorders at 2.5 times the rate of children within the general population (Craven & Lee, 2006).

In summary, previous research highlights that children in foster care are at increased risk for speech and language delay, and subsequent associated cognitive, academic, behavioural and social difficulties (Craven & Lee, 2006; Trickett & McBride-Chang, 1995). It is, therefore, crucial that foster carers are supported so they are able to monitor and promote the speech and language development of children within their care.

Part 1: Questionnaires

In this study, we aimed to investigate foster carers' knowledge and experiences of speech and language development, within the Western Australian context. The following research questions were addressed:

- 1. What are the demographic details of the foster carers?
- 2. What kind of home environment and experiences do the foster carers provide for the children in their care?
- 3. What strategies and techniques do foster carers use with children at home to facilitate their speech and language development?
- 4. What do foster carers know about speech and language development in children?
- 5. What experience have foster carers had with speech pathologists and children receiving services for speech and language difficulties?
- 6. What topics related to speech and language development would foster carers like more information on and how can this be presented most effectively?

Method

Participants and procedure

Following approval for the study from DCP and the Curtin University Human Research Ethics Committee, DCP posted written questionnaires to 140 foster carers. These foster carers were randomly selected from a DCP database of 203 foster carers who met the following selection criteria:

- non-Indigenous foster carers registered with DCP on or before 1 May 2008 (i.e., had been registered for at least one year);
- foster carers who had at least one child currently placed, or a child who had left their placement in the last six months;

- foster carers whose most recent foster child was aged less than 5 years at the time they were placed with the foster carer;
- foster carers who were living in the Perth metropolitan area.

Of the 140 foster carers contacted, 20 returned the written questionnaires. Foster carers were asked to provide their contact details if they were interested in participating in an interview with the researcher, 12 agreed to and participated in this stage (see Part 2).

Materials

The written questionnaire was designed by the first author to collect demographic information about the foster carers who participated in the study. In addition, the questionnaire was designed to obtain information on daily routine, home activities, book reading and experiences with speech pathology, using closed questions, rating scales, and open-ended questions.¹

Results

The questionnaire collected data about the foster carers as well as the home environment they provide, their knowledge of speech and language development and the skills required for school, their experience with speech pathologists and their recommendations for future training initiatives. The quantitative data collected were analysed using descriptive statistics and are presented using frequency tables.

Demographic profile of the foster carers

The foster carers had a range of past experiences caring for children. Ninety percent of foster carers (n = 18) had experience as parents; however, two foster carers had not had children of their own. Sixty percent (n = 12) had between 6 and 15 years experience as a foster carer and 50% (n =

Table T. D	emographic	c details of	participants						
Code	Age range (years)	Gender	Previous highest education	Interview	Relative carer	Number of birth children	Number of current foster children	Years as a foster carer	Total number of foster children cared for
P001	51+	Male	University	Yes	Yes	3	1	2	1
P002	51+	Female	Year 10	No	_	2	2	3	6
P003	51+	Female	Year 10	No	-	3	0	35	165
P004	51+	Female	University	Yes	Yes	3	2	9.5	2
P005	51+	Female	TAFE	Yes	No	2	4	15	12
P006	51+	Female	Year 10	Yes	No	2	3	6.5	18
P007	51+	Female	High school	No	-	0	1	8	1
P008	51+	Female	High school	No	-	2	1	3.5	1
P009	41–50	Female	TAFE	No	-	2	4	9	20
P010	41–50	Female	Year 10	Yes	No	0	2	14	12
P011	31–40	Female	High school	Yes	No	1	1	2	2
P012	51+	Female	Year 10	Yes	No	2	2	20	21
P013	51+	Female	Primary school	Yes	No	3	2	14	60+
P014	51+	Female	University	Yes	Yes	4	1	11	1
P015	41–50	Male	High school	No	-	4	1	6	1
P016	41–50	Female	TAFE	No	-	3	1	1.5	1
P017	51+	Female	TAFE	Yes	Yes	2	2	10	2
P018	41–50	Female	High school	Yes	No	2	3	12	29
P019	51+	Female	TAFE	Yes	No	3	1	25	15–20
P020	51+	Female	TAFE	No	-	1	1	17	3

Note. Relative carer is a relative or close family friend so the child can remain in close contact with their birth family (Government of Western Australia Department of Child Protection, 2009).

Behaviour	ł	requency			
	Occ.	Once a month	Weekly	Several times/ week	Daily
Read books	1	-	_	3	11
Watch TV	1	-	_	4	10
Tell them stories	1	-	-	4	9
Talk about pictures in a book	-	-	1	5	8
Encourage them to draw	-	-	-	7	7
Listen to music	1	-	1	6	7
Ask questions while reading	-	-	1	7	6
Have them tell you stories	1	-	2	6	5
Dance to music	2	-	1	8	4
Play games, puzzles or playdough	1	-	3	7	4
Encourage them to paint	3	-	2	5	4
Craft activities	3	1	2	4	4
Point out signs and words (e.g., McDonald's arches, Pepsi logo)	2	-	1	4	4
Organise playtime with children of a similar age	4	3	1	4	3
Play rhyming games	-	1	2	8	2
Water play	4	1	2	7	1
Involve them in cooking	2	-	4	7	-
Note. Occ. = occasionally					

10) of the foster carers had cared for more than 5 foster children. There was a range of educational backgrounds among the participants. Studies in higher education were completed by 45% (n = 9) of the foster carers. This included 6 foster carers who completed a TAFE qualification and 3 who completed a university degree. One foster carer had completed only primary school. A summary of the participants' demographic information is provided in Table 1.

Home environment and foster carers' interactions with children

Data depicting the lifestyle, daily activities and interactions of foster carers and the children in their care are set out in Table 2. Of the 20 foster carers who completed the written questionnaire, 95% responded that they take the foster child with them while completing errands. Foster carers identified a range of outings they participated in with the children in their care. These included visits to the shops, playground, park, zoo, local library, playgroup, music group, and toddler gym. Foster carers also identified activities they completed with their foster children, such as reading books, watching TV, telling stories, listening to music, talking about pictures in a book, encouraging children to draw, and dancing to music. Four foster carers did not respond to this question as they reported that their foster children were older and these activities would not be age appropriate. However, they reported that they completed many of these activities when the children were younger. Reading books and watching TV daily were the most commonly identified behaviours.

Foster carers' knowledge of speech and language development in children

The foster carers' beliefs about (a) the speech and language skills children should have prior to commencing preschool, (b) the skills children should be developing, and (c) the skills that are not required are outlined in Table 3. Ninety percent (n = 18) of foster carers believed that children should know concepts such as colours and shapes and should be able to communicate with other children before commencing school. Seventy-five percent (n = 15) of foster carers

Table 3. Foster carers' knowledge of the skills required for preschool

	Yes	Developing	Not
Knows colours and shapes	18	2	-
Can communicate with children	18	2	-
Understand instructions	17	3	-
Knows alphabet	8	12	-
Can write their name	8	11	1
Produce rhyming words	5	14	1
Can write	-	15	5
Can read	-	13	7

Note. The number of respondents who believed the child should have acquired the skill, should be developing the skill, and should not have acquired the skill are provided.

believed that a child should be developing the ability to write and 65% (n = 13) believed that a child should be developing the ability to read before commencing school.

Foster carers seeking advice from speech pathologists and other professionals

The foster carers were asked to identify a number of professionals that they would access if they were concerned about a foster child's speech and/or language development from a provided list. Seventy-five percent (n = 15) of the foster carers indicated they would consult a child development centre and 65% (n = 13) indicated they would consult a private speech pathologist. Sixty percent (n = 12) indicated they would see a doctor if concerned about a child's speech and language. Fifty percent (n = 10) of the foster carers would seek advice from a government speech pathologist or school teacher and 35% (n = 7) indicated they would contact their community nurse.

Fifty-five percent (n = 11) of the 20 foster carers reported they had previously taken a foster child to see a speech pathologist, and all rated the experience as very positive on a Likert scale. Of these, five had accessed a public service and five had consulted a private speech pathologist. One foster carer did not identify the type of service that was accessed. All 11 foster carers reported that they observed the speech pathologist's assessment session and that the assessment had been explained to them. Of the foster carers who attended speech pathology, 91% (n = 10) reported that they were provided with information sheets and that the therapy goals were clearly explained. All 11 foster carers who had taken a foster child to see a speech pathologist identified the need for ongoing guidance from a speech pathologist and the importance of continuing the therapy at home.

Foster carers' recommendations for future training initiatives

Foster carers were provided with a list of topics related to speech and language development and asked to select multiple topics that were of interest to them. Table 4 outlines responses in order of preference. Forty-five percent (n = 9) of foster carers were interested in receiving information on activities and strategies they could use to promote language at home, the speech and language skills needed for school and the link between disability and language development.

Table 4. Topics that foster carers are interested in developing their knowledge in						
	Yes	Maybe	No			
Things to do to promote language at home	9	4	1			
Speech and language needed for school	9	3	1			
Disability and language development	9	2	3			
Language delay and what to look for	8	5	1			
Language and social development	8	5	1			
Speech pathology services available	8	2	1			
Learning to read	7	5	3			
Learning to write	7	5	3			
Articulation/ speech	7	4	1			
Caring for children with a disability	7	3	4			
Developmental milestones	6	3	4			
Stuttering	3	5	3			

Note. The number of respondents for each topic is presented. There were three foster carers who did not respond to this question.

Discussion

This explorative study provided a unique insight into foster carers' knowledge and experience of speech and language development. Foster carers from a range of different backgrounds participated in the study, as shown by the demographic details of the participant group. Although their experience with foster care children varied, their desire for more knowledge on speech and language development was clear. The results will be discussed in terms of the foster carers' interactions with their children, knowledge of speech and language development in children, their experience with speech pathologists and their recommendations for future initiatives.

Home environment and foster carers' interactions with children

Foster carers provided a range of activities for the children in their care, including reading, watching TV, telling stories and talking about pictures in a book, which provided the child with multiple learning opportunities. The results of this study indicate that foster carers have an understanding of the importance of providing children with opportunities to engage, learn and communicate with others. Involvement in a stimulating environment together with sensitive parenting has been linked to improved language development (Murray & Yingling, 2000). An awareness of the activities that foster carers already complete with their children will allow speech pathologists to provide foster carers with strategies and techniques that enrich these interactions and support the child's speech and language development.

Foster carers' knowledge of speech and language development in children

The results from the questionnaires indicated that foster carers demonstrated a sound understanding of language development and the skills required for children entering into school, including knowing colours and shapes, communicating with other children, re-telling stories, understanding instructions and developing the ability to produce rhyming words and the alphabet (see Paul, 2007). Most foster carers felt that they were able to identify when a child did not have adequate skills for commencing school and when they required intervention. Despite their knowledge, 45% (n = 9) of foster carers requested more information.

Foster carers seeking advice from speech pathologists and other professionals

Foster carers identified a range of professionals they would contact if they were concerned about a child's speech and language development. Child development centres and private speech pathologists were the most common responses. It is essential that services and advice are available to foster carers to ensure they are provided with the appropriate information and support for the children that are placed in their care.

Foster carers demonstrated an understanding of the importance of early intervention. Eleven foster carers had taken a child to see a speech pathologist and one reported that speech pathology was necessary for almost all of the children that she had cared for in the past. The high referral rate for speech pathology among children in foster care was similarly identified in a study in New South Wales where in a sample of 122 foster children, speech pathology was the second most frequently referred to service following dental referrals (Nathanson & Tzioumi, 2007).

Foster carers' recommendations for future training initiatives

Foster carers identified topics from a provided list that were of interest to them and that met their current needs. Topics of greater interest identified by 45% (n = 9) of foster carers were activities to do to promote language at home, speech and language skills needed for school, and disability and language development.

Foster carers reported that training and resources to target speech and language development are often not provided. Foster carers do not necessarily have any formal qualifications or further study that provide them with the skills to care for children with delayed or impaired speech and language. In the current study, only 45% (n = 9) of foster carers had completed further study after school. Training of those involved in children's care in Australia has been identified as a concern. Although training is desirable it is often limited in its availability (Bath, 2008). This need for training and support was identified as a recommendation from an investigation into children in out-of-home care in Australia (The Royal Australasian College of Physicians, 2006).

When training of foster carers has been provided, it has been found to be an effective form of intervention leading to improved outcomes for the children (Silver et al., 1999). A US foster carer training program targeted at managing challenging behaviours reported a high attendance rate and was successful in changing foster carer behaviours. The program provided childcare during the sessions, reimbursed travel, and involved group discussion (Price et al., 2008). The findings of Price et al. (2008) and the current research provide suggested guidelines for the further implementation of training programs in Western Australia. They highlight the importance of knowledge of speech and language development and the need for foster carers to be educated and supported to meet the needs of children in their care.

Limitations

The findings of this study are constrained by the return rate of the written questionnaires. The low return rate (14%) means that results should be interpreted in this context. It may be that foster carers who did not respond were less experienced with supporting children with speech and language difficulties. It is possible that the foster carers who did respond were those who had experience with a foster child with speech and language difficulties, as 55% (n = 11) of the respondents had taken a child to see a speech pathologist. This is a greater percentage than the study in NSW that found 45% of foster children under the age of 5 years had delayed speech, and 20% aged 5 to 10 had delayed language skills (Nathanson & Tzioumi, 2007). Such differences could suggest there is an over representation of foster carers with children with speech and language difficulties in this group of participants.

Some foster carers gave limited responses to the open-ended questions in the written questionnaire. The semi-structured interview elicited detailed responses from the foster carers regarding their experience of speech and language development. These responses, presented in part two, add to the sometimes limited information provided in the written questionnaire.

Part 2: Semi-structured interviews

To clarify the responses from the written questionnaires, semi-structured interviews were conducted with 60% of the original respondents who had indicated on the questionnaire that they were happy to be interviewed. The following research questions were addressed:

- 1. What experience have foster carers had with speech pathologists?
- 2. What do foster carers know about speech and language development?
- 3. What experiences have foster carers had caring for children with complex needs?
- 4. What strategies and techniques do foster carers use with children at home to facilitate their speech and language development?
- 5. What areas would foster carers like more information on and how can this be presented most effectively?

Method

Participants

Participants were asked to provide their contact details on the written questionnaire if they were interested in participating in an interview. Twelve of the 20 foster carers consented to and participated in an interview. The demographic details of the 12 foster carers who participated in the interviews were representative of the group of 20 foster carers who completed the questionnaire (see Table 1, part one).

Procedure and materials

The semi-structured interviews were used as a medium for clarifying the responses provided in the foster carers' written questionnaires. The interview allowed for greater insight into the knowledge, experiences and recommendations of the foster carers. The interview was structured with open-ended questions that addressed the research questions for the researcher to follow to ensure that all participants experienced the same interview format.² These interviews were carried out by the first author, took place predominately in the participants' homes and lasted approximately one hour. All interviews were digitally recorded and then transcribed verbatim on the day they were conducted.

Qualitative data analysis procedure

The semi-structured interviews were transcribed by the first author and emailed to the participant to read, edit and confirm, unless the participant had stated otherwise at the completion of the interview. This procedure provided participants with the opportunity to modify the transcript, if required, to ensure that it was an accurate representation of their thoughts and experiences. This procedure thus endeavoured to verify the validity of the qualitative data collected (Barr, McLeod, & Daniel, 2008). One foster carer made minor revisions to the transcript and two foster carers added further information to their responses. These two foster carers reported that reading the transcript prompted them to recall further experiences and ideas they forgot to mention at the time of the interview.

Phenomenological research explores the lived experiences of individuals in relation to their being in the world (Annells, 1999; Standing, 2009). This study took a phenomenological approach as the participants were asked to describe their experiences which were interpreted with the aim of identifying common and unique themes among their responses (Annells, 1999). The interview transcripts were read by the researcher and the following broad headings were identified using thematic analysis: foster carers and DCP, foster carers and children, foster carers and speech and language, and foster carers' recommendations. Further sub-themes from the participants' interviews were identified and arranged according to these headings. NVivo, a computer software program, was used to assist in the thematic analysis and organisation of the extracted ideas (QSR International, 2009; Richards, 1999). The data and themes were reviewed and discussed with the research team prior to ascertaining the final themes.

Results

The following findings reflect experiences and themes that arose from the transcripts and are relevant to the focus of the research. The three main themes addressed in this article are: foster carers and their experiences with speech pathology intervention; foster carers' experiences with children with complex needs; and foster carers recommendations. Quotes taken from the foster carers' interviews are presented in italics.

Foster carers and their experience with speech pathology intervention

When asked to describe their experience with the speech pathologist, all 10 foster carers who commented on speech pathology services identified the importance of continuing the therapy at home.

P014: The speech pathologist at the time actually taught us how to do it. S would go to speech and of course I

went too and was able to watch how the speech pathologist did it, the sorts of things she did and then we would go away with the homework for the week.

P012: But it is still the carers that need to do it, one speech pathology session a week is not going to make the difference as it's not being reinforced in the home situation.

The foster carers reported on activities that speech pathologists had encouraged them to continue at home, including articulation games, reading with the child and vocabulary development tasks.

P010: We got all these cards and play all different games so they learn the sounds. We'll put them down and learn colours... Even with her spelling, I say "Pick out some words" and she tells me them and I ask her to spell them back.

Five of eight foster carers who reported on public speech pathology service mentioned extensive wait lists. Their concern was that the foster children were only in their care for a limited amount of time and, therefore, were unable to wait for services.

P019: Given that a lot of the children came into my care I knew I only had them for a limited time.

P006: It (waitlist) was at least 8 to 9 months. That is a lot when the child is 18 months or 2 years and they really need it.

Six of the 12 foster carers interviewed were unwilling to wait for public services and so purchased private speech pathology services as they were aware of the significance of early intervention.

P012: I think early intervention is important with all areas... with speech and language if it's dealt with early then a lot of other problems are avoided later.

Foster carers caring for children with complex needs and the foster carers' methods of supporting the children

Foster carers were aware of how a child's ability to learn could be affected by previous experiences.

P012: A lot of them have been affected by their parents' drug and alcohol use which impacts on their ability to learn. Just being taken from one environment to another is an impact enough.

Nine foster carers reported on caring for children with complex needs. Many foster children were reported to have multiple diagnoses including: traumatic brain injury, spina bifida, enteral feeding, intellectual disability, epilepsy, attachment disorders, obsessive compulsive disorder, depression, autism, attention deficit hyperactive disorder, anxiety, and post traumatic stress disorder. These foster carers reported on the challenges of caring for children with complex needs, in particular, the difficulties in caring for children with impaired communication skills.

P019: Certainly children who are language delayed are definitely harder to care for.

Despite these challenges, all 12 foster carers reported an altruistic willingness to support their foster children through a number of different methods. This desire was founded in a strong emotional attachment that many developed with their children. They reported extensive reading and researching for information, purchasing resources for the child and regularly visiting the child's school to support them in the classroom or meet with teachers.

P017. You have to remember that a carer becomes emotionally attached to a child, which you should. You're giving the child an emotional base to attach and develop from... Of course you are going to want the best for the child and want the skills to support them hetter

Eleven of the foster carers identified the role of an engaging learning environment with books, songs and explicitly teaching new words, as well as the innate capacity to learn to be required for speech and language development. They were aware of the need to encourage the children in their development and all 12 foster carers identified the need for more training and support to help them do so.

Foster carers' recommendations for future initiatives

All 12 foster carers gave recommendations on how they could learn and develop skills so that they could be better equipped to support the children in their care.

P005: As a parent we need more training otherwise it's all self taught. Otherwise who is going to teach you?

P014: They (foster carers) are the people who strive to do the best for the child, read as much as they can and take on any advice to effect a difference.

One recommendation that addressed waiting lists was to develop an interim resource that foster carers could use while waiting for speech pathology intervention.

P019: If someone could develop that kind of resource as a bit of an interim kit that can be used before the child is seen by the system. It's something that you could start looking at before you see the speech pathologist... Information on what you should expect, some ideas of what to do at home, half a dozen resources, ideas of things you could purchase or ways you can use the things at home.

Discussion

The foster carers' responses in the interviews provided insight into their knowledge and experience of speech and language development of the children in their care and will be discussed along with findings from the literature.

Foster carers and their experience with speech pathology intervention

Ten foster carers reported engaging their foster children in simple games (for example, labelling picture cards and articulation picture cards) that were provided by speech pathologists. The foster carers reported that they believed these activities would assist the children, however, they were unaware of how these specifically targeted a child's speech and language development. Other than these simple games and worksheets, they had limited resources, techniques and strategies that would benefit children with impaired speech and language skills. This has implications for clinical practice. If foster carers or parents do not understand the goals or purposes of activities then they may be unable to carry on therapy at home beyond playing the games with their children. Further, they will be unable to embed the goals and strategies into their everyday interactions with the child.

Foster carers demonstrated an understanding of the importance of speech pathology intervention for this group of children. Five of eight foster carers reported concerns with the public waitlists for intervention and six were unwilling to wait and therefore purchased private speech

pathology services. All 11 foster carers who visited a speech pathologist with a foster child rated the experience as positive. It is encouraging to know they were satisfied with the service that was provided; however, it is possible that the foster carers who completed the questionnaire were not a representative group and therefore caution must be taken when interpreting these findings.

Foster carers caring for children with complex needs and the foster carers' methods of supporting the children

The results from this study indicate that foster carers were aware of the role of nature and nurture on the development of a child's speech and language. They understood that a child was able to develop their skills when opportunities were presented for them to do so. They were aware of the neural consequences of harmful experiences such as abuse and/or neglect (Culp et al., 1991).

Foster carers demonstrated an understanding of children's need to communicate their experiences, particularly those that lead the child into care. This was evident in six of the foster carers' interviews where they mentioned the importance of a child being able to communicate how they felt so that the child could process their experience and relate to the foster carer. Leslie et al., 2002 reported there is increasing evidence of a correlation between language delay and behaviour problems and that these can affect the foster carer - child relationship. The responses of foster carers supported this contention. They associated communication difficulties with behavioural problems and the child being more difficult to care for and linked the child's communication abilities with the success of the placement. Despite this, all 12 foster carers had an altruistic willingness and attachment to the child that saw them go to great lengths to ensure that they were well informed as carers and that their children were well supported at school.

Foster carers' recommendations for future initiatives

Three foster carers reported the need for children entering foster care to have a full medical, developmental and psychological assessment. The Royal Australasian College of Physicians recommended that is was important to ensure "that physical, developmental and mental health assessments are performed on all children who enter into out-of-home care" (The Royal Australasian College of Physicians, 2006, p. 5). However, this does not currently occur in Western Australia.

There is evidence of successful assessment services provided in the US; however, these services vary and are not provided in all child welfare agencies (Stahmer, Leslie, Landsverk, Zhang, & Rolls, 2006). In one clinic, children are assessed within 60 days of placement by a multidisciplinary team. The assessment involves an interview with the foster parent, a full medical examination and an assessment of the child's development, psychological state, speech and language development and motor abilities. When children in foster care receive formal assessment, those who present with delay or impairment are identified and directed to the required services (Bruhn, Duval, & Louderman, 2008; McCue Horowitz, Owens, & Simms, 2000). Examples of successful multidisciplinary service delivery models could be used to structure and develop similar services for children in care in Australia

Eight foster carers reported the need for more information to be available, and identified an online resource as the most useful modality for accessing information and support. Three foster carers suggested that an online discussion forum would allow foster carers with similar children and issues to network and share ideas. A website would provide readily available and easily accessed information on speech. language and disability, downloadable resources, links to further information and access to support groups. A resource of this type could provide foster carers with simple strategies to implement at home and therefore, reduce their concern and frustration while attempting to access services, and to deal with the increasing number of children who are difficult to care for (Bath. 2008). An online resource would help reduce the strain on the available services by providing foster carers with information and advice on what and when services are required. The needs of foster carers are dynamic and ongoing and would therefore be well serviced with such technology that could be regularly updated.

Limitations

Of the 20 foster carers who participated in the study reported in part one, only 12 participated in the interview phase of the study. This may have had an impact on the themes that emerged. These themes may be unique to these foster carers and their experience and therefore results must be interpreted in this context.

Future directions

This study could by extended by the inclusion of a greater number of participants and of Aboriginal and Torres Strait Island kinship foster carers. There are a large number of children in this form of care (Bath, 2008) and there is a need to identify the experiences and address the recommendations of this population of foster carers. The recommendations from this study could be used to pilot the development of resources and/or training to support foster carers in the assessment and treatment of speech and language of the children in their care. The involvement of other health professionals would be valuable in determining if there are similar issues present across the disciplines. For example, Nathanson and Tzioumi (2007) found that children in foster care required dental, counselling and paediatric referrals. Having a range of health professionals involved would allow for greater co-ordination of services across disciplines to ensure that the holistic needs of the children in care are met.

Implications of this research

This research has provided a unique and valuable insight into Western Australian foster carers and their knowledge, beliefs and experience of speech and language development. The findings were provided to DCP to increase its awareness of the specific needs and recommendations of its foster carers.

As speech pathologists with an increasing number of children in foster care on our caseloads, we need to ensure that we are involving foster carers and guardians in the sessions, that they are aware of how therapy is targeting the development of a child's skills and that they are well equipped to continue therapy at home. We need to offer training and support to ensure that they are providing the best levels of care for their children. We need to consider the unique needs of those who are involved in the care of a particularly vulnerable group of children, albeit often for only a short yet critical period of time in their development.

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1. Interested readers are able to contact the first author for a copy of the questionnaire used in the study.

 Interested readers are also able to contact the first author for a copy of the interview questions used in the study.

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Australia

The effect of two different types of intervention on cluster production in children with speech and language impairment

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KEYWORDS

PRESCHOOLERS SPEECH AND LANGUAGE IMPAIRMENT CONSONANT CLUSTERS PHONEME AWARENESS INTERVENTION MORPHOSYNTAX INTERVENTION

THIS ARTICLE HAS BEEN PEER-REVIEWED



Cecilia Kirk

This small-scale study examined the effectiveness of two different goal attack strategies on four children with speech and language impairments. Of particular interest was the effect of the two types of intervention on the production of consonant clusters. It was hypothesised that the two children who received instruction in phonological awareness skills integrated with speech production practice would show greatest improvement in word-initial clusters. It was further hypothesised that the two children who received intervention that focused primarily on morphological structures at the ends of words, alternating with sessions focusing on speech targets would show greatest improvement in word-final clusters. The participants who received phonological awareness and speech intervention made the

greatest improvement in cluster production, although this difference was most noticeable in clusters not directly targeted by either intervention. These results suggest that integrating speech production practice with phonological awareness instruction may lead to better generalisation to non-target phonological structures.

Any preschoolers who receive clinical services from speech pathologists (SPs) have co-occurring speech and language impairments. Estimates of the co-morbidity of speech and language deficits in this population are as high as 60–75% (e.g., Paul & Shriberg, 1982). However, surprisingly little is known about how to best treat children who have impairments in both speech and language.

Research by Tyler, Lewis, Haskill, and Tolbert (2003) investigated the efficacy of different goal attack strategies for children with both speech and language impairments. These researchers addressed the question of whether it is more effective for intervention to alternate between the domains of phonology and morphosyntax or whether a single domain should be selected as the focus of intervention, with the expectation that cross-domain generalisation will occur. Tyler et al. (2003) found that phonological performance was facilitated equally by three types of goal attack strategy: phonological intervention alone, morphosyntax intervention alone, and intervention that alternated weekly between the domains of phonology and morphosyntax. In addition, morphosyntax intervention alone and intervention that alternated between phonological and morphosyntactic goals led to better morphosyntactic performance than phonological intervention alone.

The current study takes two of the goal attack strategies investigated by Tyler et al. (2003) and assesses their effect on the production of consonant clusters by children with co-occurring speech and language impairments. One intervention program focused on sounds at the beginnings of words using therapy that integrated speech production practice with instruction in phonological awareness skills and letter knowledge (phonological awareness and speech [PAS] intervention). The other intervention program focused predominantly on morphological structures at the ends of words, alternating weekly with sessions that focused on the children's speech targets. The purpose of the study was to determine whether the two intervention programs differentially impacted the production accuracy of three different types of consonant clusters: word-initial clusters that had been directly targeted by the PAS intervention, word-final clusters that had been indirectly targeted by the morphosyntax and speech (MS) intervention, and word-initial clusters that had been neither directly or indirectly targeted by either intervention. Although it would also be of great interest to compare the effect of the two intervention types on the development of morphological structures, this is outside the scope of the current article.

The acquisition of consonant clusters is one of the most protracted aspects of children's speech development. Preschool children with a speech sound disorder are very likely to struggle with the correct production of consonant clusters (McLeod, van Doorn, & Reed, 1997). In addition, consonant clusters occur with high frequency in English words. One-third of monosyllabic words in English begin with a consonant cluster and an even higher proportion end with a consonant cluster (Locke, 1983). Because of their high frequency, the mispronunciation of consonant clusters has potential to negatively impact speech intelligibility. Therefore, it is critical to investigate the most effective way of improving the production of consonant clusters in children with speech impairment.

Table 1. Performance of participants on pre-intervention measures							
Participant type	Age	Intervention	SPELT-P2	PPVT	PCC	Clusters	
Aaron	4;7	PAS	65	89	33	0	
Mike	4;6	PAS	80	99	30	4	
Matt	4;7	MS	63	120	28	0	
Ben	4;8	MS	65	97	42	19	

Notes: PAS = phonological awareness intervention with integrated speech targets; MS = morphosyntax intervention alternating with intervention for speech production; SPELT-P2 = Structured Photographic Expressive Language Test-Preschool 2 shown as a standard score (<math>M = 100; SD = 15); PPVT-3 = Peabody Picture Vocabulary Test – Third Edition shown as a standard score (M = 100; SD = 15); PCC = percentage of consonants correct of single word items from the Goldman-Fristoe Test of Articulation and the Inconsistency Test from the Diagnostic Evaluation of Articulation and Phonology shown as percentage; Clusters = percentage of correctly produced consonant clusters from the 26-word cluster probe.

Method Participants

Four boys with speech and language impairment, who were between the ages of 4;6 and 4;8 at the start of the study, took part. They were of Caucasian descent, were monolingual speakers of standard New Zealand English, and attended preschools that drew upon a population with a mid to high socioeconomic status. Participants all scored at least 1 SD below the mean on a standardised test of expressive language as determined by the Structured Expressive Language Test-Preschool 2 (SPELT-P2; Dawson, Stout, Eyer, Tattersall, Fonkalsrud, & Croley, 2005). A comparison of individual means on this test and all other preintervention tests is presented in Table 1. The participants demonstrated receptive vocabulary that was within or above the normal range (standard score > 85) on the Peabody Picture Vocabulary Test - Third Edition (PPVT-III; Dunn & Dunn, 1997). All four participants passed a hearing screening consisting of a play audiometry assessment, tympanometry, and visual inspection of the ear canal. All participants passed the oral motor screening from the Diagnostic Evaluation of Articulation and Phonology (DEAP; Dodd, Hua, Crosbie, Holm, & Ozanne, 2002).

Articulation severity ratings for all participants were judged to be severe as measured by the percentage of consonants being correctly articulated (PCC) on a single-word elicitation task, consisting of 35 items from the Goldman-Fristoe Test of Articulation (GFTA; Goldman & Fristoe, 1986) and the first trial (25 words) of the Word Inconsistency subtest of the DEAP.

All four participants had considerable difficulty with the accurate production of consonant clusters as measured by a 26-word consonant cluster probe (i.e., all scored below 20% accuracy). The items in the cluster probe are listed in the Appendix and include 18 words with word-initial clusters and 8 words with word-final clusters. A response to the cluster probe was scored as either incorrect or correct/ acceptable when it matched the adult target form. In addition, mismatches in voicing were counted as acceptable productions (e.g., *crab* pronounced as

/græb/) and substitution errors that were predictable from a participant's production of singleton consonants were considered acceptable (e.g., crab pronounced as /dræb/ when that child pronounces goose as /dus/). Table 2 lists the types of errors made by each of the four participants on the cluster probe when it was administered pre-intervention. Error productions included cluster reduction (e.g., snow pronounced as /nou/, cluster substitution which involved the production of two consonants but where production of at least one of these consonants could not be predicted from production of the component singletons (e.g., fly pronounced as /glai/ where phone is pronounced as /foun/), and cluster deletion (e.g., paint pronounced as /pei/). For all four participants, cluster reduction was the prominent error pattern for word-initial clusters. However, the two children who deleted singleton consonants in word-final position also deleted the majority of word-final clusters.

Word-initial /s/-clusters were selected as appropriate targets for the first intervention block for Aaron and Mike, the two children who received the PAS intervention (see Hodson, 2007). Hodson argues that for children who have difficulty accurately producing singleton /s/ as well as /s/ in clusters, it is more efficient to target /s/ clusters (also see Kent, 1982). We chose a variety of place and manner features as the second consonant in the cluster (labial, alveolar, stop, lateral liquid) but avoided clusters with velars as two of the study participants fronted velars. Note that none of the children in our study had a problem with singleton /l/ and the error distributions provided by Smit (1993) show acceptable use of /sl/ clusters by 4- to 5-year-olds with typical development to be around 50%. Gliding of /r/ was not selected as a target because this error pattern is relatively common in the speech of 4-year-olds with typical development.

In addition to cluster reduction, a number of other phonological error patterns were present in the speech of the four participants. Those error patterns for which the percentage of occurrence was greater than 40% were as follows: Aaron – final consonant deletion, palatalisation of /s/; Mike – velar fronting, /r/ produced as /l/; Matt – final consonant deletion, gliding of /r/, palatalisation of /s/; Ben

Table 2. Classification of errors on pre-intervention cluster probe by participant							
	Word-initial clusters (n = 18)			Word-final clusters (n = 8)			
Participant	CR	CS	correct	CD	CR	correct	
Aaron	18	0	0	6	2	0	
Mike	12	5	1	0	7	1	
Matt	18	0	0	8	0	0	
Ben	8	3	7	0	8	0	

Note: CR = cluster reduction; CS = (unpredictable) cluster substitution; CD = cluster deletion

– velar fronting, gliding of /r/. From these phonological error patterns, one additional intervention target was selected for each child: final consonant deletion for Aaron and Matt, and velar fronting for Mike and Ben.

General procedure

Participants attended a total of 24 therapy sessions (of at least 45 minutes), two sessions a week, in groups of four children in a university clinic setting. Four children who participated in a larger study that investigated the efficacy of two types of treatment for children with speech and language disorder (Gillon & Tyler, 2007) were also involved in the therapy sessions but were not included in this study as they did not have difficulty producing consonant clusters. Therapy was provided in two 6-week blocks, with a 6-week break between treatment blocks. In the period between the immediate post-intervention testing and the testing 3 months post-intervention, participants did not receive any direct intervention for the production of speech sounds but continued with their regular early education program at kindergarten or play centre. Intervention was implemented by the third author and speech pathology students under the supervision of a certified speech pathologist.

Intervention

Participants were randomly assigned to take part in one of the two types of intervention: (1) integrated phonological awareness and speech (PAS) intervention, or (2) a morphosyntax and speech (MS) intervention. The PAS intervention program (Gillon & McNeill, 2007) targeted speech production, phonological awareness, and letter knowledge, but not expressive language. The MS intervention program (Haskill, Tyler, & Tolbert, 2001) targeted various morphosyntactic structures and speech production, but not phonological awareness. Both programs provided therapy for the same frequency, length, and number of sessions. A similar number of target words were introduced for each speech target for both types of intervention. At least 10 attempts of the target phonological or morphological structure were elicited from each child during each intervention session. Parents, siblings, and/or caregivers observed both types of intervention from observation rooms behind one-way mirrors. Although there was no specific home practice provided for either intervention program, parents were not discouraged from practising target sounds or activities at home. It should be noted, however, that the children in the MS group received only 8 sessions that included coda clusters (the target morpheme for four sessions was the copula) whereas the children in the PAS group received 12 sessions that targeted onset clusters.

Phonological awareness and speech intervention

The aim of the PAS intervention program was to facilitate letter knowledge, and early phoneme awareness development, and to decrease target speech error patterns. (See www.education.canterbury.ac.nz/people/gillon/ integrated_phonological_awareness.shtml for a detailed discussion of the rationale and implementation of this approach.) The phonological error pattern of reducing word initial /s/ clusters was targeted for the first 6 weeks of intervention. During the second 6-week block of therapy, participants received individualised targets: final consonant deletion for Aaron and velar fronting for Mike. Phonological awareness instruction was incorporated into the speech production activities in many of the session activities. For example, within the same activity, participants were encouraged to identify the target phoneme in the context of one of the target words, to identify and label the sounds and names for the target phoneme, as well as to practise accurate production of the target phoneme in words. For the PA activities that incorporated word-initial /s/ cluster speech targets, participants were requested only to identify the /s/. The developmental appropriateness of this task is supported by the work of Stahl and Murray (1994) who report that kindergarteners and first graders were able to identify the initial phoneme in CCVC words with a mean accuracy of 72%.

Morphosyntax and speech intervention

The MS intervention program alternated between two sessions targeting a morphological structure followed by two sessions of speech intervention the week after. The three morphological structures that were targeted during intervention were: the regular third person singular form of verbs (e.g., blows, makes, eats); the regular past tense of verbs (e.g., looked, washed, talked); and the copula form of the verb 'to be' (e.g., I am tired, They are mine, It is empty). Each morphological structure was targeted for four intervention sessions in total, two during each cycle of therapy. Within the session, participants were encouraged to attempt a range of words that used the target morpheme, but no specific vocabulary list was prescribed for these sessions. The purpose of the sessions that focused on morphological structure was not to teach specific clusters but to create a greater awareness of word endings and the copula through exposure to a variety of words that included the target morpheme. The morphosyntax sessions began with auditory bombardment of the target morphological structure in the context of a picture book. Focused stimulation and elicited production activities were then conducted in the context of group play activities. Feedback included explicit modeling of the correct production of words containing the target morpheme as is typical in languagebased approaches.

During the speech sessions, participants received individualised targets: final consonant deletion for Matt and velar fronting for Ben. No consonant clusters were targeted during these sessions. The speech sessions followed a similar format to the morphosyntax sessions with auditory bombardment of the target sounds for the session in the context of a picture book. This was followed by activities that maximised opportunities for production practice of the speech targets.

Main measures

Measure of cluster development

The 26-word cluster probe (see Appendix) was administered at three different points in time: pre-intervention, immediately post-intervention, and 3 months post-intervention. The cluster probe that was administered immediately postintervention took place approximately 4½ months after administration of the pre-intervention cluster probe.

Measure of additional target phonological error pattern

Each participant was administered one of two 16-word production probes at two different points in time: preintervention, and immediately post-intervention. One production probe measured accuracy of final consonants and the other production probe measured accuracy of velar stops in both word-initial position (n = 11) and word-final position (n = 5). Pre-intervention accuracy on these additional production probes was 0%, except for Aaron who produced final consonants with 12.5% accuracy.

Reliability

Treatment fidelity was measured by asking an independent observer to observe videotapes of a random selection of 25% of the total intervention sessions implemented. These sessions were reviewed to ensure inclusion of important treatment elements. Treatment fidelity for all PAS and MS intervention sessions was 100%. Reliability of phonetic transcription was measured by asking a second person experienced in transcribing children's speech to independently transcribe a random selection of 25% of the total consonant cluster probes administered. Inter-judge agreement for broad phonetic transcription of the consonant clusters was 94%.

Results

Accuracy on consonant cluster probe

In order to investigate the effect of the two different types of intervention on the production of consonant clusters, accuracy on the cluster probe was calculated for each of the four participants at three different points in time (preintervention, immediately post-intervention, and 3 months post-intervention). Figure 1 shows the percent correct for the word-initial clusters that were directly targeted in the first intervention block by participants who received PAS intervention. None of the participants in either intervention group could produce this cluster type, pre-intervention. Immediately post-intervention, one participant from each intervention group had reached 30% accuracy on this cluster type, so there was no difference between the groups on this measure. Thus, Ben, who received MS intervention, improved in his production of word-initial /sp/, /st/, and /sl/ clusters over the course of the intervention, even though the intervention he received did not target this particular error pattern. Both these children show continued improvement in their production of /sp/, /st/, and /sl/ clusters when tested 3 months after the end of the intervention. It should be noted that Aaron, who received PAS intervention, did not improve in his production of word-initial consonant clusters when tested immediately post-intervention even though he had received intervention that directly targeted this cluster type.

Target word-initial clusters 100 pre-intervention 90 post-intervention 80 3 months post 70 Percent correct 60 50 40 30 20 10 0 Mike Matt Ben Aaron PAS intervention MS intervention

Figure 1. Percent correct for word-initial clusters that were directly targeted by participants who received PAS intervention. Scores are shown for the two children who received PAS intervention and for the two children who received MS intervention.

Figure 2 shows the percent correct for word-initial clusters that were not directly targeted by participants in either intervention group. The two children who received PAS intervention made some improvement on the non-target word-initial clusters, but this was evident only when tested 3 months post-intervention. Neither child who received the MS intervention program improved in their production of the non-target word-initial clusters between the pre-intervention testing and the 3-month post-intervention follow-up. However, it should be noted that Ben, who received MS intervention, could accurately produce word-initial labial+/l/ clusters and /s/+nasal clusters pre-intervention. His preintervention accuracy on /s/+nasal clusters may account for his improvement in the production of /sp/, /st/ and /sl/ clusters even though he did not receive intervention that directly targeted these clusters.



Figure 2. Percent correct for word-initial clusters that were not directly targeted by either intervention

Figure 3 reports the percent correct for word-final clusters that were not directly targeted by participants in either intervention group. Because participants in the MS group had received indirect instruction on a variety of consonant clusters at the ends of words as part of the instruction they received in word-final morphology, it was predicted that they would make greater improvement than children in the PAS group in their production accuracy of word-final clusters. Surprisingly, only the participants that received the PAS intervention (Aaron and Mike) improved in their accuracy of word-final clusters. Both children in this intervention group showed improved accuracy on final clusters when tested immediately post-intervention. However, this improvement was not maintained when Aaron was tested at the 3-month follow-up. Mike, on the other hand, continued to improve in his production of word-final clusters. When tested 3 months post-intervention, he accurately produced 6 out of 8 final clusters with the remaining two clusters being produced as 2-element clusters where previously they had been reduced to a single consonant. The only errors in Mike's production of word-final clusters were in place of articulation (desk produced as /dɛst/ and wings produced as /wimz/).

Accuracy on singleton target phonological error pattern

All participants received six sessions of intervention on a target phonological error pattern that did not involve consonant clusters (final consonant deletion for Aaron and



Figure 3. Percent correct for word-final clusters that were not directly targeted by participants in either intervention group

Matt; velar fronting for Mike and Ben). Figure 4 illustrates the pre- and post-intervention accuracy on these error patterns as measured by a 16-word probe. The amount of improvement on these processes was very similar across the two types of intervention. For all participants, the production accuracy on their specific target phonological pattern improved by between 20% and 30% between pre-intervention testing and testing immediately post-intervention. It should be noted that only 5 of the 16 probe items measured production of word-final velar stops. When tested immediately post-intervention, Mike produced 60% of the word-final velar probe items correctly but produced none of the word-initial probe items correctly.



Figure 4. Percent correct for singleton target error pattern (final consonant deletion for Aaron and Matt; velar fronting for Mike and Ben)

Discussion

It is difficult to interpret the results for word-initial clusters that were specifically targeted by the PAS intervention program. Mike, who received the PAS intervention, learned to accurately produce both /sp/ and /st/ clusters over the course of the intervention. It is not possible to conclude that this improvement in cluster production accuracy was due to the intervention Mike received because one of the participants who received the MS intervention, Ben, made similar gains in the production accuracy of this cluster type. The two participants who received the PAS intervention made greater improvement only on clusters that were not directly targeted by the PAS intervention program. The two children who received the PAS intervention improved in their production of both non-target word-initial clusters and nontarget word-final clusters. However, Aaron's improvement was restricted to correctly producing word-final /ts/ and /mp/ immediately post-intervention and word-initial /br/ and /bl/ at the testing 3-months post-intervention. The two children who received the MS intervention showed no improvement on non-target word-initial clusters and non-target word-final clusters at either of the post-intervention tests.

Although the current study found that intervention that alternated between the domains of morphosyntax and phonology facilitated the production of speech sounds targeted in intervention, there was little carry-over to phonological structures that were not directly targeted. Thus, in the current study, the production of word-final clusters did not improve as a result of implicit treatment through intervention for word-final morphemes. The production of word-final clusters did improve, however, for those participants who received explicit intervention in phonological awareness of clusters at the beginning of words. It is likely that the focus on identification of phonemes in word-initial consonant clusters together with production practice of these sounds carried over to improvements in the production of clusters at the ends of words.

It is noteworthy that the only participant who made no gains in the production of consonant clusters (Matt) also had great difficulty accurately producing singleton consonants in word-final position. Testing immediately post-intervention revealed that the only consonant that Matt could accurately produce in word-final position was the alveolar nasal /n/. This finding provides support for developmental approaches to target selection, which indicate that the ability to produce singleton word-final consonants should be in place before it is beneficial to begin working on more complex syllable structure in word-final position.

Clinical implications

The findings from this study suggest that intervention that focuses on integrating phonological awareness skills with speech production may lead to better generalisation to nontarget structures than an intervention goal attack strategy that alternates weekly between the domains of phonology and morphosyntax, at least when measured by accuracy on consonant clusters.

Limitations of the study

This study has some very obvious limitations, most notably the very small sample size and the lack of a control condition. Replication of these results with a much larger set of participants would make it possible to make more robust recommendations regarding the most efficient interventions for children with speech and language disorders. Although the participants in the two intervention conditions in our study were closely matched in age, gender, and level of phonological development, we cannot be sure that postintervention differences between the two groups in phonological development were entirely due to differences in the intervention they received. Some form of experimental control is essential to rule out the possibility that these differences were due to maturation. One way to ensure an experimental control would be to take repeated baseline measures over a period of time that matches the duration of the intervention. Unfortunately, withholding intervention for

several months is difficult to justify on ethical grounds. A more ethical form of experimental control would have been to select of a phonological error pattern for each child but withhold this error pattern from intervention. Despite these shortcomings, this study underscores the need for clinicians to consider interactions between the domains of phonology and morphology when selecting intervention targets.

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Appendix. Consonant cluster probe			
Target onset clusters	Non-target onset clusters	Non-target coda clusters	
spot	brush	lips	
spoon	frog	boots	
spin	train	paint	
star	crab	lamp	
stir	block	nest	
slow	flag	desk	
sleep	fly	beans	
	cloud	wings	
	smoke		
	snail		
	SNOW		

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Julia Starling, Natalie Munro, Leanne Togher, and Joanne Arciuli

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From top: Julia Starling, Natalie Munro, Leanne Togher, and Joanne Arciuli

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When language impairment (LI) persists into adolescence, speech pathologists are often challenged by how to best support this clinical population. Adolescents with LI require functional and sustainable services. This may necessitate creativity on behalf of the speech pathologist, and the adoption of a range of intervention approaches. This article provides an overview of strategy-based approaches that may be adopted by speech pathologists when supporting adolescent clients' oral and written language. Specific examples are provided, and a caseload management approach that involves inter-professional collaboration and consultancy is also discussed.

he partnership between speech pathologists (SPs) and adolescent clients with language impairment (LI) can be as challenging as it is rewarding. Despite our awareness that there is a prevalence rate of up to 16% (McLeod & McKinnon, 2007), providing effective services to this clinical group can be hampered by a lack of adequate resources, client resistance, and other service delivery constraints. Mental health literature informs us that positive achievements at school, the development of social competencies and a sense of belonging and connectedness with adults and peers are known to be primary protective factors in the development of positive mental health and well-being during adolescence (Fuller, 2001). However, young people with LI are known to be at risk for academic, social, emotional, and behavioural problems (Law, Rush, Schoon, & Parsons, 2009). Secondary school students with LI have particular difficulties with vocabulary development, written expression and reading comprehension (Montgomery & Levine, 1995), highlighting the need for active speech pathology support for these adolescents. As a clinical group, though, adolescents with LI continue to be significantly under-serviced (Hollands, van Kraayenoord, & McMahon, 2005).

Drawing on a body of literature describing effective interventions for supporting secondary school students with LI, this paper will discuss how SPs can make informed decisions about client management approaches, in order to provide functional and sustainable services to their adolescent clients. First we present an overview of the literature on strategy-based interventions aimed at enhancing vocabulary development, written expression, and reading comprehension, with some examples of practical applications. This is followed by a discussion of case-management approaches involving inter-professional collaborations and consultations.

Strategy-based language interventions

From an intervention perspective, a strategy-based approach involves explicit guidance in planning and performing a task and evaluating that performance (Lenz, Ellis, & Scanlon, 1996). Strategy-based approaches may incorporate the development of metacognitive skills (thinking about thinking) and metalinguistic skills (understanding and reflecting about language), both of which are important at the secondary school academic level. Strategy-based interventions for supporting secondary school students with additional learning needs, including those with LI, have traditionally been described within both speech pathology and learning disabilities literature. In order to research the evidence-base for such approaches, we recently carried out a systematic review to identify randomised controlled trials (RCTs) for language interventions that specifically targeted adolescents with spoken and/or written LI (Starling, Munro, & Togher, 2008). Only 20 randomised control studies matching the search criteria were evident within the speech pathology and learning disabilities literature.

While it is beyond the scope of the current paper to provide a full overview of the results of this systematic review, the use of strategy-based approaches for supporting adolescents' written expression and reading comprehension was consistently identified within these 20 RCTs. Therefore, the current paper will present an overview of strategy-based approaches for these two areas. In addition, we provide a summary of strategy-based approaches for supporting vocabulary development. While no RCTs were found within our systematic review for supporting vocabulary development during the adolescent years, we contend that targeting vocabulary during adolescence is important for two reasons. First, it is well known that vocabulary knowledge is crucial for reading comprehension and written expression and second, adolescents with LI present with vocabulary deficits in terms of both the number of words known and the depth of their vocabulary knowledge (Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998). We therefore present an overview of strategy-based approaches for vocabulary development, written expression, and reading comprehension that SPs may use to assist their work with adolescent clients.

Enhancing adolescents' vocabulary development

Adolescents with LI require vocabulary enrichment that has a functional and curriculum-specific purpose (Ehren, 2002). There is continuous introduction of domain-specific academic vocabulary across the secondary school curriculum (Baumann & Graves, 2010). This creates a persistent challenge for adolescents with LI, as the amount and complexity of the unfamiliar vocabulary can interfere with their access to curricular information across subjects. To illustrate, Anderson and Nagy (1991) reported that secondary school students encounter up to 55 previously unknown words in a typical 1000-word text. It is of course unrealistic to target all new words in a therapeutic intervention. However, education researchers have advised teachers that directly teaching students 10 new words a week could make a significant contribution to all students' language and literacy abilities (Beck, McKeown, & Lucan, 2002). This recommendation also provides useful guidance for SPs in their approach to addressing the vocabulary needs of secondary school students with LI.

To facilitate direct vocabulary instruction, Beck and colleagues (2002) introduced the "three tier" organisational structure for prioritising vocabulary. Tier 1 words consist of basic, everyday words that rarely have to be taught directly, such as "fish" and "eat". Tier 2 words are relatively high frequency words that are found across a variety of knowledge domains, such as "inhabitants" and "circular". These are words that are "less likely to be learned independently" (Beck et al., p. 9) but have an important role in the development of literacy. Tier 3 words have a low frequency use and are limited to specific knowledge domains, such as "photosynthesis" and "lachrymose".

Beck et al. (2002) recommended that supportive interventions at the secondary education level should prioritise Tier 2 words. Vocabulary instruction at this level would then be directed at the words and terminology that teachers have identified as being of the highest importance for understanding newly introduced topics. SPs could utilise this approach to vocabulary instruction during professional collaborations with secondary school teachers. In this way, the students with poor language skills will have increased opportunities to access across-subject curriculum content and improve their overall receptive and expressive language abilities. SPs can also draw teachers' attention to the need for developing students' literate lexicon (Nippold, 2002). This involves the direct teaching of technical terminology, meta-linguistic and meta-cognitive vocabulary (such as instructional terminology, figures of speech and definition formulation) and the ability to use morphological deconstruction and contextual abstraction to infer word meanings from written texts.

Complementing direct vocabulary instruction, Marzano and Pickering (2006) suggested that the development of vocabulary knowledge operates along a continuum from no knowledge, through context-bound knowledge to, ultimately, a "rich knowledge" of a word. These authors outline a step-by-step program guiding students' exposure to, and learning of, key vocabulary, to a point where students can demonstrate sound knowledge and use of the words in their oral and written expression. In combination, direct vocabulary instruction and vocabulary knowledge development provide SPs with practical guidance on the selection of relevant vocabulary for inclusion in interventions, as well as offering a structured framework to guide lexical instruction. Encouragingly, there are studies

currently underway in the field of speech pathology that are demonstrating the effectiveness of direct vocabulary instruction for students with LI at the secondary education level (e.g., Joffe, 2006; Wilson, Nash, & Earl, 2010).

Enhancing adolescents' written expression

Written language is central to all aspects of secondary classroom learning, with secondary school students needing to show particular competence in both written expression and reading comprehension. Writing is the functional medium that students are most often expected to use in order to convey their ideas and knowledge. Adolescents with LI struggle with both the form and content of their written expression (Stothard et al., 1998).

To address deficits in written expression, Wong (1997) suggested the use of interactive verbal scaffolding and genre-specific visual organisational structures. The foci of three RCTs reported by Wong involved training secondary students with written LI in strategies that targeted planning, writing and revision across different genre-specific written compositions. Specific strategies included think-aloud planning, visual planners (graphic organisers) and editing conferences (students and teachers working together on text editing). Students who had received these written language supports showed significant improvements in the quality of their written compositions, including improved clarity and thematic salience. SPs may also like to consider the work of Schumaker and Deshler (2003). These authors describe a series of non-randomised comparison trials involving strategy-based instructional programs for sentence and paragraph writing, error monitoring, spell checking and theme writing. Results indicated that the students receiving instruction in these writing strategies were able to master the strategies, as well as generalise the use of the strategies to novel tasks.

Enhancing adolescents' reading comprehension

Another important aspect of written language in the secondary school environment is reading comprehension. It is known that adolescents with LI can present with ongoing reading comprehension difficulties (Snowling, Bishop, & Stothard, 2000). Secondary students need to be able to interpret, analyse and act on the content of a wide range of printed and electronic texts, such as text books, topic information sheets, worksheets, assignment instructions and test papers. The challenge for SPs working with these young people is how to target reading comprehension in a functional way, with the potential for newly learned strategies to be directly applicable to students' academic needs.

Strategy-based interventions may offer some direction for supporting reading comprehension (Gersten, Fuchs, Williams, & Baker, 2001). For example, there is evidence to support the use of summarisation techniques and visual organisation strategies for reading comprehension interventions at the secondary education level. Gajira and Salvia (1992) used text summarisation strategies in an RCT involving mainstream secondary school students with language-based learning difficulties. Strategies cited included moving from micro- (facts and details) to macro-("big picture") structuring of texts, deletion of unnecessary information, and the formulation of topic sentences. Similarly Malone and Mastropieri (1991) utilised text summarising strategies in an RCT, and found merit in the addition of a student self-monitoring component involving the use of a step-by-step visual checklist. Results from both of these studies indicated significant improvements in reading

comprehension for students who received these types of strategy-based interventions.

Reading comprehension also involves understanding inferential and non-literal information. Secondary students with LI often have difficulties with the comprehension of inferred meaning in both oral and written language (Mastropieri, Scruggs, & Graetz, 2003). Strategies for explicit instruction on inferential written text comprehension were found to be effective in an RCT comparing two questionand-answer instructional approaches for supporting upperprimary students with poor reading comprehension abilities (Graham & Wong, 1993). Future research could look at adapting these strategies for use with secondary student populations, including those with LI, in order to address this gap in the literature.

In summary, these strategy-based interventions for vocabulary development, written expression and reading comprehension provide opportunities for the adolescent client to learn personally and academically useful skills that can also facilitate independent learning across different academic disciplines and curriculum content. To consolidate this learning, SPs could share these strategy-based approaches with the parents and teachers of adolescents with LI as well as coach them in their use. This would support the generalisation of targeted strategy-based approaches for individuals with LI. This next section now discusses how SPs can support whole populations of adolescents with LI, through inter-professional collaborations and consultations.

Collaborations and consultations

Classroom collaborations

There is growing support for SPs to take on collaborative and consultative roles as key aspects of managing caseloads of adolescents with LI (Ehren, 2002; Law et al., 2002). Providing more traditional one-on-one services for individual students both within and outside of mainstream secondary schools is often not a feasible option for SPs. Apart from time and resource challenges, there may be a disinclination to adopt traditional intervention approaches with secondary school students for such reasons as fear of peer group stigmatisation, client indifference, timetabling and funding constraints, or a perceived intractability of communication impairments in this population (Dohan & Schulz, 1998). As an alternate approach, cross-professional collaboration on an ongoing basis is consistently identified as a critical feature of effective interagency service delivery by SPs (Gascoigne, 2008).

Secondary school classrooms provide a languagerich environment for students' learning. The concept of universal curriculum accessibility is based on the notion that curriculum content should be presented in such a way that all students have the potential for success (NSW Department of Education & Training, 2003). As previously suggested, secondary school students with LI are likely to be disadvantaged by the degree and complexity of the language presented in classrooms. Making acrosssubject curricular content more accessible to students with LI has the potential to reduce the negative effects of disengagement and failure for these students, thereby increasing the opportunities for their academic engagement and achievement.

Collaborations between teachers and SPs are reported to increase the exchange of ideas and mutual acknowledgement of expertise between the two professions, resulting in strong inter-professional relationships (Throneburg, Calvert, Sturm, Paramboukas, & Paul, 2000). Secondary school teachers are the experts in acquiring and disseminating curricular information; they can provide topical information regarding curricular goals and content, ensuring an intervention has immediate academic relevance and providing opportunities for practice and generalisation. SPs, on the other hand, have expertise in the expression and reception of information through the use of language. They can provide specific information regarding students' communication and learning support needs, as well as training in general language skills strategies and accommodations that are applicable to whole class teaching, across different teaching approaches, academic levels and subject content. This inclusive approach to supporting secondary school students with LI has particular value in situations where secondary teachers are challenged in finding the extra time needed to support students individually.

There are many language modifications and accommodations that SPs can include in their collaborations with secondary teachers. Examples are: reducing the complexity of teacher-generated texts, such as assignment instructions, into more accessible language forms; the creation of a range of visual planners, organisers and text deconstruction aids for ready reference; assisting students with identifying appropriate key words for internet research tasks; and the development of memory and active study and revision strategies (Simon, 1998). For further information about these types of language modifications, accommodations and strategy-based approaches, readers are referred to Brent and Millgate-Smith (2008), Brent, Gough, and Robinson (2001), Larson and McKinley (2003), and Tattershall (2002), who have collectively provided comprehensive descriptive overviews of secondary curriculum-based SP interventions.

Inter-professional consultancy

Due to the impact of LI on adolescents' social, behavioural and emotional states, SPs may need to consult with other professionals and services within, or associated with, the secondary school environment. These may be welfare teachers, adolescent counsellors, behaviour support teams, social services and juvenile justice organisations. Intervention approaches can include information sessions for professional groups, as well as the development of awareness-raising resources. For example, there are recent resource developments in the United Kingdom, accessible on-line, that focus on raising the awareness of education and mental health professionals in the identification and impact of LI during adolescence (AFASIC Scotland, 2007; Joffe, 2010; The Communication Trust, 2009). In addition, SPs can refer to a suite of resources developed to inform those working with young people with communication needs in the youth justice system (The Communication Trust, 2010). As well as identifying the population of adolescents with LI, these resources provide valuable guidance on ways to accommodate their communication needs. Examples include simplifying complex language, speaking more slowly with repetition and rephrasing, and providing alerts for the need to process and retain important information.

Another consultative approach for SPs could be assisting in the development and/or modification of health and education resources that are produced for adolescent populations. For example, SPs can provide suggestions about how to modify information presented via websites and leaflets, such as the increased use of graphics and headings, audio clips to supplement written text and the simplification of language and definitions of complex terminology. In this way important resources such as mental health information leaflets can be made more accessible to young people with LI. Other types of language modifications can also be offered for group and individual program materials, such as breaking down instructions, and the increased use of demonstrations and "hands-on" interactive activities. These types of initiatives directly address the information processing needs of many young people with language and literacy difficulties and how they access resources across education, health, mental health and social service contexts. Language accommodations will also increase the possibility that these young people will engage with essential services and programs, such as mental health and vocational counselling.

Meeting the challenge

In summary, adolescents with LI are significantly at risk of having negative and challenging life experiences. As part of a professional duty of care to this clinical population, SPs need to provide supports and services across a range of contexts. However, there are many obstacles to effective service delivery, thereby necessitating creativity and flexibility in clinical approaches. This paper has described some of the ways in which SPs can provide proactive, functional and sustainable services to adolescent clients. These include approaches incorporating strategy-based interventions for supporting adolescents with LI on an individual client basis, as well as whole population approaches through interprofessional collaborations and consultations.

There is a clear need for further intervention research in all aspects of service delivery addressing the clinical needs of this population. To provide evidence to support professional collaborations between SPs and secondary school teachers as a best-practice model of service delivery, an RCT is currently underway at the University of Sydney (Starling, Munro, Togher, & Arciuli, 2010). The trialled intervention, the Language in Classrooms (LINCS) Program, provides coaching and information dissemination by SPs to mainstream secondary school teachers, in the use of a range of classroom-based language modification and accommodation techniques. The aim of the program is to create more "language-accessible" environments in secondary school classrooms, so that students with LI are actively supported by their classroom teachers across subjects and grades. Results to date are demonstrating a high level of teachers' uptake of the techniques presented in the program, and a sustained use of these techniques over a period of time (Starling et al., 2010). It is hoped that further evidence-based research on models of service delivery will continue to improve the prospective outcomes of young people with LI.

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Ensuring the competency of the speech pathology workforce

The need for a career and professional development framework

Michelle Cimoli

The National Registration and Accreditation Scheme for the Health Professions commenced in July 2010. Unfortunately, the speech pathology profession's submission for inclusion in to the National Registration and Accreditation Scheme was unsuccessful. The submission prepared jointly by Speech Pathology Australia (SPA) and the Speech Pathologists Board of Queensland argued that existing governance and regulatory mechanisms directed at establishing and monitoring clinical practice standards, competency and professional conduct failed to provide integrated protection to the public. The advancement and expansion of the profession's scope of practice was also discussed, including the risks to the public where these roles are performed without the competency to do so.

In light of the profession's unsuccessful application to be included in the National Accreditation and Registration Scheme, the speech pathology profession needs to determine processes for practice regulation such that the public can be assured of the competency of the entire speech pathology workforce, from entry-level practice, to more advanced and specialised roles. This paper discusses the current inadequacies in the profession's governance and regulatory mechanisms, and suggests that a career and professional development framework could be implemented as a quality assurance mechanism to address these issues.

Regulation of practice to ensure public safety

Occupational regulation of health professions is a mechanism through which the public accessing health care services is protected through effective monitoring of the safety and quality of care delivered by health professionals (Carlton, 2008). The National Registration and Accreditation Scheme for the Health Professions was introduced in July 2010 and provides a framework for occupational regulation that is enabled through statutory registration. Statutory registration supports regulatory functions through legislated scopes of practice, codes of conduct and restriction of profession titles. These functions are achieved by controlling entry to a profession, maintaining a register of qualified health professionals, accrediting programs of study, setting standards of clinical practice and codes of conduct, investigating and dealing with complaints, and managing issues regarding practitioner ill-health (Carlton, 2008).

Ten professions are currently included in the scheme, including chiropractors, dentists, medical practitioners, nurses and midwives, optometrists, osteopaths, pharmacists, physiotherapists and podiatrists. These professions were included on the basis that they already operated within a statutory registration framework in most jurisdictions in Australia. In July 2008, the Australian Health Ministers' Advisory Council (AHMAC) called for submissions from partially regulated professions wishing to be considered for inclusion in the scheme. Speech pathology is considered to be a partially regulated profession given that it is a registered profession only in the state of Queensland. Speech Pathology Australia (SPA) in conjunction with the Speech Pathologists Board of Queensland, on behalf of the speech pathology profession in Australia, lodged a submission to be included in the National Registration and Accreditation Scheme. The submission conveyed the profession's intent that statutory registration of the speech pathology profession across all jurisdictions would provide a quality assurance and risk management framework to safeguard public safety, thereby addressing the risks of physical, social and emotional harm posed by speech pathology practice. Sound evidence was provided of the disjointed nature of existing regulatory and governance mechanisms that are unable to apply sufficient powers across the entire profession to enable the public to be effectively protected. Mechanisms provided by the National Registration and Accreditation Scheme including establishing and instating a professional board, would enable the public to identify those speech pathologists (SPs) who possess the necessary competencies and qualifications to deliver speech pathology services, and provide the public with an avenue for addressing complaints about services or professionals (SPA & The Speech Pathologists Board of Queensland, 2008). This is in contrast to functions undertaken by SPA,

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THIS ARTICLE HAS BEEN PEER-REVIEWED



Michelle Cimoli

which as outlined in the objectives of the Association's Constitution (SPA, 2008), are primarily aimed at protecting and advocating for the profession (Carlton, 2008).

Unfortunately, the Australian Health Workforce Ministerial Council, which comprises the health ministers from the Commonwealth government and all state and territory governments, decided that SPs, dental technicians, optical dispensers and occupational therapists would not be included in the National Scheme. (The health ministers subsequently reviewed their decision, and agreed to include occupational therapists in the scheme.) For speech pathology, it is understood that this decision was made primarily on the basis that the evidence presented in the submission did not support a finding of increased adverse effects to the public in jurisdictions where the profession is not regulated (i.e., states and territories other than Queensland). Appeals for this decision to be reviewed were unsuccessful.

The unsuccessful submission for inclusion in the scheme detailed a number of legitimate risks to public safety posed by speech pathology practice, particularly where individuals practise without the competencies to do so. The profession has a duty of care to address and mitigate these risks to public safety. This paper explores approaches adopted by other health professions, both in Australia and internationally, that aim to ensure that health professionals have the competencies to work within their individual scopes of practice, in order to deliver quality health care that minimises harm to the public. This paper proposes that a career and professional development framework for the speech pathology profession in Australia may provide a quality assurance mechanism to assure the public of the competency of the speech pathology workforce, while also offering benefits to the profession.

Competency and scope of practice

The scope of practice of a health profession serves to guide qualified individuals of that health profession about the types of clinical activities that they can undertake, given the appropriate training and competency. A scope of practice also informs other parties, such as the public, other professionals, consumers, insurers and lawyers, about the services that they can expect a specific health profession to provide.

The Australian speech pathology Scope of Practice document published by SPA (2003) is intended to be read in conjunction with other core Association documents including Code of Ethics (SPA, 2010), Parameters of Practice (SPA, 2007a), Competency-Based Occupational Standards (C-BOS) – Entry level (SPA, 2001a), Principles of Practice (SPA, 2001b) and other Association position papers and statements. Together, this suite of documents aims to define the competencies and professional conduct expected to enable individuals to operate within their scope of practice.

Speech pathology is likely to continue to enhance and expand its scope of practice to enable suitably qualified individuals to be involved in a range of activities that are physically invasive, utilise technology in the assessment and treatment of patients, and further develop roles as primary health practitioners with specific patient groups whose clinical status indicates that regular management by a medical practitioner or other health professionals is no longer required (SPA & Speech Pathologists Board of Queensland, 2008).

SPA has acknowledged that levels of professional practice beyond entry-level practice exist within the

profession, and these are referred to in the Association's Credentialling Position Statement (SPA, 2009a). The Credentialing Position suggests that the following levels of practice currently operate within the profession: "entrylevel", "advanced practice", "specialisation" and "extended skills". The Credentialing Position Statement provides possible interpretations for which clinical activities might be categorised under these levels of professional practice. However, the statement does not categorically identify the various activities and roles of current speech pathology practice. To this end, the statement does not provide specific guidelines for training to enable individuals to achieve these various levels of professional practice.

A number of the existing SPA position papers also refer to levels of professional practice beyond entry-level practice (SPA, 2004a; 2005a; 2007b). The SPA position papers aim to present a summary of evidence and approaches to clinical practice relevant to that area. In some instances these papers also provide examples of how the various levels of professional practice might be verified. However, the papers do not define measurable competency standards, nor specific content or methods for training. With only nine current position papers, there are many other areas of speech pathology competency and practice outlined within the profession's Scope of Practice (SPA, 2003) that are without clearly defined standards regarding practice and training (Table 1).

Table 1. Speech Pathology Australia position papers

Dysphagia: General (2004b)

Dysphagia: Modified barium swallow (2005b)

Fibreoptic endoscopic evaluation of swallowing (FEES): An advanced practice for speech pathologists (2007b)

Tracheostomy management (2005a)

Speech pathology in child and adolescent mental health (2001c)

Speech pathology services in schools (2004a)

Working in a culturally and linguistically diverse society (2009b)

Augmentative and alternative communication (2004c)

Evidence-based speech pathology practice for individuals with autism spectrum disorders (2009c)

Retrieved from http://www.speechpathologyaustralia.org.au/ publications/position-papers

Failure to clearly and specifically define the competencies required to perform the activities and roles undertaken across the breadth of contemporary speech pathology practice affects the consistency and quality of services provided. When SPs do not possess appropriate skills and knowledge, and/or fail to perform within an agreed scope of practice, the likelihood of causing harm to patients increases significantly. Given that the profession's title is not protected through registration or existing legislative instruments (except in Queensland), the public is currently unable to be guaranteed of the quality and safety of services provided by individuals claiming to be SPs. Other than the entry-level competency standards defined in C-BOS (SPA, 2001a), it is not clear what competencies and training are required to undertake these various levels of professional activities that are performed as part of contemporary speech pathology practice.

Education, training, and continuing professional development

For the many clinical areas not addressed in entry-level training, SPs often extend and maintain their competency to perform various roles through "on-the-job" training, or participation in continuing professional development. The content and methods applied in "on-the-job" training can be varied. Some employers set specific standards and provide robust training to facilitate the acquisition of locally defined competencies. However, this is at each employer's own discretion. Without defined standards of practice and guidelines for training, the sustainability of these roles is threatened (Kelly, Piper & Nightingale, 2008), and the potential for public harm is increased.

Even if more formalised postgraduate training programs existed in the areas of practice that are beyond entry-level practice, there is currently little incentive, or expectation for SPs to complete such training. Without practice or training standards to regulate professional practice, workplaces will continue to claim that they can provide the training "inhouse" that is comparable with formalised training programs.

Continuing professional development (CPD) provides another mechanism for health professionals to maintain and extend their competency. The existing SPA model of CPD, the Professional Self Regulation program (SPA, 2009d), requires participants to provide evidence that they have participated in a specific number of professional development hours annually, within a 3-year period. However, given the voluntary nature of the program, and the fact that it is only available to members of SPA, it is unable to assure the public of the currency of practice or competency of SPs working across the entire health care workforce, and therefore, does not satisfactorily perform a regulatory function.

A career and professional development framework

In the absence of statutory registration across all jurisdictions, perhaps the speech pathology profession in Australia needs to explore the development and implementation of a career and professional development framework as a strategy to optimise protection of the public. Such a framework could provide a structure for recognising levels of professional practice by defining the competencies across the continuum of professional practice, and providing a pathway for education and training to enable the relevant competencies to be attained, and maintained.

In preparing this paper, a limited review of the relevant literature was conducted to examine the approaches adopted by other health professions in Australia and internationally for recognising different levels of professional practice. A large proportion of the articles reviewed were written by researchers and clinicians from the nursing and radiography professions, as these frequently featured in recent journal publications and select database searches conducted.

Many health professions already have well defined and established levels of professional practice that enable the career framework to be easily understood and identified from within and outside of the profession. These levels of practice have commensurate levels of training and educational requirements that must be satisfied in order for individuals to be recognised as operating at a specified level of practice, from entry-level to advanced and specialised levels of practice.

Recognising levels of professional practice

Terms commonly used in the literature to describe levels of professional practice including entry-level, advanced scope of practice, extended scope of practice, expanded scope of practice, consultant and expert practice, and specialisation, all of which are often used with varied interpretations of what defines these roles (Casteldine, 1998; Department of Human Services, 2005; Frost, 1998; Fulbrook, 1998; Hardy & Snaith, 2006; Hardy, Legg, Smith, Ween, Williams & Motto, 2008; Manley, 1997; Nightingale, 2008; Price & Edwards, 2008; Snaith & Hardy, 2007). A number of articles reviewed for this paper focused on making the distinction between advanced practice and specialisation. Some perceive advanced practice to be unidimensional, relating to the provision of direct clinical services, where specialisation is multidimensional and implies a level of practice that involves broader goals of improving patient care, through direct and indirect clinical activities (Manley, 1997; Rolfe, 1998) Specialisation can also be associated with advanced or higher levels of knowledge and practice specific to a particular disease, anatomical region or modality (Nightingale & Hogg, 2003). Models of learning theory have also proposed a number of terms to describe levels of professional practice and skill acquisition (Dreyfus & Dreyfus, 1996).

The National Registration and Accreditation Scheme, operationalised through the Health Practitioner Regulation National Law (Australian Health Practitioner Regulation Agency, 2010a) enacted in participating jurisdictions and monitored by the Australian Health Practitioner Regulation Agency, acknowledges that various levels of professional practice exist within health professions. This is demonstrated through recognition of registration categories, such as general practice versus specialist registration (Australian Health Practitioner Regulation Agency, 2010b). Specialist registration, and/or specific areas of practice endorsement are recognised through a number of professional boards including the Dental Board of Australia, Medical Board of Australia, Nursing and Midwifery Board of Australia, Podiatry Board of Australia and Psychology Board of Australia. Clinical psychology, neuropsychology, and forensic psychology are areas of practice endorsement for psychology. Orthodontics, periodontics, oral and maxillofacial surgery are examples of specialty fields in dentistry (Australian Health Practitioner Regulation Agency, 2010c

Defining competencies across the continuum of professional practice

Aggregating the themes discussed in the literature regarding levels of practice and career and professional development, the following elements appear to be important for identifying and discriminating between different levels of professional practice:

- levels of education (Hardy et al, 2008; Nightingale, 2008; Price & Edwards, 2008)
- knowledge and skills (Casteldine, 1998; Fulbrook, 1998);
- scope of practice and clinical experience (Casteldine, 1998, Frost, 1998; Fulbrook, 1998; Goodman, 1998; Nightingale & Hogg, 2003);
- involvement in research (Casteldine, 1998; Hardy et al, 2008; Snaith & Hardy, 2007);
- role in education, supervision and mentoring (Hardy et al, 2008);
- leadership qualities and activities (Casteldine, 1998; Frost, 1998; Fulbrook, 1998; Snaith & Hardy, 2007);

• critical thinking, analysis and reflection (Frost, 1998; Fulbrook, 1998; Rolfe, 1998).

With the C-BOS document (SPA, 2001a) currently under review, it may be timely to consider whether these themes and elements of professional practice are of any relevance for defining levels of practice for the speech pathology profession from entry-level to more advanced and specialised levels of professional practice.

Defining a pathway for education and training

A number of health professions believe that new graduates do not necessarily possess entry-level competencies (Department of Human Services, 2005). Some professions require individuals to complete up to two years of workplace experience in addition to a base qualification. Formalised graduate training, or internships, aim to ensure that provisional health professionals participate in generalist-type training in order to achieve competency in the profession's core competency areas. These training programs often specify requirements such as duration, location, supervision, and methods for evaluating competency upon completion of the program (American Speech-Language-Hearing Association, 2008; Psychology Board of Australia, 2010).

There is agreement among the select literature reviewed that clinicians who are performing at an advanced or specialised level have done so by way of dedicated steps in career development, through setting goals and undertaking activities that will result in personal and professional development over time. For many professions, such as nursing, medicine, dentistry, and radiography in the UK, advanced practice or specialisation is associated with postgraduate education (Australian Nursing and Midwifery Council, 2009; Dental Board of Australia, 2010; Hardy & Snaith, 2007; Hardy et al., 2008; Medical Board of Australia, 2010; Price & Edwards, 2008; 2006).

Some professions require individuals to substantiate their advanced or specialised competency by submitting a portfolio that satisfies the defined criteria (Australian Physiotherapy Association, n.d; Specialty Board on Child Language, n.d.; Specialty Board on Fluency Disorders, 2010), and in some cases applicants are also required to sit and pass an examination (Specialty Board on Swallowing and Swallowing Disorders, 2010).

Advantages of a career and professional development framework

In addition to providing a quality assurance mechanism that could protect the public by defining the level of competency expected of SPs working across the breadth of contemporary health care practice, a career and professional development framework could also offer the profession a number of other benefits. It could:

• Facilitate collection of data about contemporary speech pathology practice: The expansion of the profession's scope through the creation of advanced practice and specialisation has the potential to contribute to improved patient care, build capacity and flexibility in the health care workforce, and can also improve workforce retention. Where roles are clearly defined, this may enable the profession to collect and examine data regarding the impact of these roles on patient outcomes, and associated costs. This type of information may be valuable for particular sectors lobbying for improved award structures, fiscal and industrial conditions.

- Provide a more consistent way of remunerating different levels of practice: A structure for recognising different levels of practice may provide incentive and formalised means to support appropriate remuneration for performance that may improve job satisfaction and workforce retention. For those clinicians working in private practice, the absence of an industrial award to provide clearly defined criteria for levels of professional practice means that there is a great deal of subjectivity, and potentially unfair pay and conditions imposed on those working in that sector. A career and professional development framework could potentially address these issues, and foster the development of performancebased recognition of expertise.
- Provide a more objective method of identifying experts within the profession: As with other health professions without formal career structures, expertise can be self-proclaimed (Robertson, Oldmeadow, Cromie, & Grant, 2003). A career and professional development framework could assist in the identification of specialists where there is consistency in how these individuals are recognised.
- Enhance the career structure to positively affect career progression and retention: It is important for the profession to develop a strategy for how to effectively contribute to the challenges faced by contemporary and future health care demands, and actively explore the barriers that might inhibit the growth of the profession. A career and professional development framework would facilitate the mobility of the speech pathology workforce to enable clinicians with specialised skills to change jobs, move from one state to another, using a more transparent credentialling mechanism to validate expertise and experience.

Furthering a career and professional development framework for speech pathology in Australia

Further exploration of the idea of a career and professional development framework for the speech pathology profession is required. Ideally, this should be undertaken with representation from all sectors of the profession to ensure dynamic debate among clinicians working in established roles in speech pathology, as well as those who are at the cutting edge of clinical care, and forging ahead into new territory for the profession. The issue of who should be charged with implementing and monitoring such a framework would be a key point of discussion. Could SPA broaden its functions to include some level of practice regulation, for example, credentialling procedures for areas of advanced practice and specialisation? Or should an independent council be established to undertake governance of such a framework, aligned more with the functions of a practice regulation board?

Conclusion

It is imperative that the public has confidence in the competency of individuals providing speech pathology services. By clearly defining the levels of practice from entry-level and beyond, the relevant competencies, as well as training requirements to perform at these levels through a well-defined career and professional development framework, there will be a means for the public, employers, and SPs to confirm whether individuals are performing within their individual scopes of practice. Establishing a professional and career development framework for the speech pathology profession in Australia may contribute to continued growth of the profession, to attract and retain people to the profession, while ensuring the safety of the community. It may also place the profession in a more favourable position for future inclusion in the National Registration and Accreditation Scheme having already developed processes for validating and verifying the various levels of practice that can be identified by the public.

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What's the evidence?

Evidence for speech, language, and communication interventions in progressive aphasia

Karen Croot, Cathleen Taylor, and Lyndsey Nickels

Clinical scenario

You are the manager of the speech pathology department in a large metropolitan hospital with an outpatient rehabilitation service. A local geriatrician refers a 52-year-old man with a diagnosis of progressive aphasia. You see him for initial interview and he reports a gradually worsening problem with talking that he first began to notice about 2 years ago. He has recently decided to take early retirement from his professional life as an architect because of the impact of these speech and language changes. His word finding difficulties and articulatory errors are readily apparent in conversation. He reports anxiety and frustration in speaking situations, and withdraws from communicative situations for fear of making errors. He speaks of wanting to be able to communicate, and is seeking treatment due to the distress and frustration caused by his communication impairment. Apart from his difficulties in speaking, he is in excellent physical health with no reported changes to his behaviour and personality or in his activities of daily living. He keeps up his hobby of kayaking, and has plans to travel with his wife. At the conclusion of the initial interview, you wonder what services you can offer to this client.

Response to this scenario

Your speech pathology team has previously assessed clients with progressive aphasia, provided education to clients and their families about the speech, language and communication changes that can be seen with the disease, and suggested ways to reduce associated activity limitations and participation restrictions. However, you have seen a small but steady increase in the number of referrals for various progressive language impairments over the last few years, and have been thinking for a while that you would like to develop a management pathway that includes a more systematic approach to intervention. You are not sure what evidence is available to guide your decision-making.

Some health care providers question whether there is a place for interventions with this population, since there is currently no cure for the underlying neuropathological changes that cause progressive aphasia, and because the person's communication and cognitive abilities can only be expected to decline with disease progression. However, you disagree with these views. You agree instead with McNeil and Duffy (2001), who advise that since a person with progressive aphasia has impairments similar to those seen in other adult neurogenic populations (including some with neurodegenerative disease), intervention is appropriate, guided by the same general philosophical, clinical, theoretical and practical considerations about treatment that you would apply in other neurogenic populations. You also reflect that because there is an expectation of decline without treatment, the question about what intervention outcomes to expect in this client group is not straightforward. Although improvement above the level seen at initial assessment is one possible outcome if therapy is effective, it is not the only one. There might also be an outcome of no change (i.e., the client maintains his or her current level of ability), or a slowing of deterioration that allows the individual to continue in desired activities for a longer period of time than would have been possible without the intervention (Rapp & Glucroft, 2009). Education of the significant communicative interactions both immediately and in the future.

Developing an answerable clinical question

To respond to this scenario you first develop an answerable clinical question using guidelines provided on a website promoting evidence-based practice in speech pathology (http://www.ciap.health.nsw.gov.au/specialties/ebp_sp_path/ resources.html) and within a previous "What's the evidence?" column (O'Halloran & Rose, 2010). These guidelines suggest you should first define the *patient or problem*, the *intervention*, the *comparison intervention*, and the *outcome*.

Patient or problem

"Primary progressive aphasia" is a broad diagnostic category in the sense that people with this diagnosis can have a diverse range of progressive language difficulties, sometimes accompanied by speech motor impairments (apraxia of speech, various types of dysarthria) and/or by other more or less severe cognitive impairments (e.g., memory problems). You realise that other diagnostic labels are used for people with progressive language impairments, such as semantic dementia, nonfluent progressive aphasia and frontotemporal dementia (and others, see Croot, 2009). To ensure that you pick up all of the relevant studies about intervention in this population you will have to search the scientific literature on a range of syndrome names and combine the results.

Intervention

Here you are willing to look broadly at what evidence there is for speech, language and communication interventions across this population, so you do not specify a particular type of intervention.

Comparison intervention

This is not relevant at this stage, because you're not yet trying to weigh up the effectiveness of one intervention against another,







Karen Croot (top), Cathleen Taylor (centre) and Lyndsey Nickels

Table 1. Search terms			
PICO	Search terms	Notes	
Patient or problem	"progressive aphasia" "progressive non fluent aphasia or progressive non-fluent aphasia" and "semantic dementia" and "fronto-temporal dementia or frontotemporal dementia or frontotemporal lobar degeneration"	Multiple search terms were required given the different labels for progressive aphasia that exist in the literature.	
Intervention	"intervention or treatment\$ or therap\$"	\$ indicates that the search term is truncated. The search engine will pick up any words starting with that letter string (e.g. therapy, therapies, therapeutic).	
Comparison intervention	No search terms	You are interested in any interventions done with this clinical population.	
Outcomes	No search terms	You are interested in any treatment outcomes.	

but rather to identify what the evidence is for any relevant interventions in order to decide what your service should offer.

Outcomes

The outcome (increased intelligibility, word retrieval, sentence comprehension, social participation, etc.) would be determined by the type of therapy, and you are keeping your options open on the type of therapy for the time being.

Clinical question

The final clinical question you formulate is, "What evidence is there to include speech, language or communication interventions in the speech pathology services provided for people referred with one of the types of progressive aphasia?"

Searching for the evidence

The first databases you search are Medline, PreMedline, and PsychINFO and the database of Cochrane Reviews. These are all available via the Ovid SP gateway, which means they can be searched at the same time. Because the search engine can remove duplicates if you select this option, this is more efficient than searching the 4 databases serially. Table 1 outlines the keywords that were generated and searched to find any relevant literature. You limit your search to English language papers and human studies (in order to exclude research on drug therapies tested in animal models). Because you have designed your search to be exhaustive in identifying possible evidence-based treatments, it retrieves 457 studies. Many of these, however, describe experimental pharmacological interventions or pathological mechanisms, rather than speech, language or communication interventions. By listing the results by title, 100 per page, it is possible to scroll through to identify only the speech-language pathology interventions. You find a critical review of all intervention studies published to mid-2007 (Croot, Nickels, Laurence, & Manning, 2009), a review of anomia treatment in semantic dementia (Henry, Beeson, & Rapcsak, 2008a), and 6 of the further studies in Table 2.

Next you search the SpeechBITE[™] database that catalogues published speech pathology interventions, searching on the term "progressive aphasia" and scanning articles listed for the client subgroup "Alzheimer's and other dementias", which yields one additional study, not yet pre-appraised. Search results are summarised in Table 2, and rated for level of evidence according to the NHMRC Levels of Evidence Hierarchy, where level I represents the highest level of evidence and level IV the lowest (NHMRC, 2009).

Table 2. Research articles identified			
Articles identified	Purpose	Level of evidence (NHMRC, 2009)	
Croot et al. (2009)	Reviews published impairment- and activity/participation-directed interventions in semantic dementia and progressive aphasia	Reviews a mix of Level IV studies and others	
Diehl et al. (2003)	Pilot support group for spouse-carers of people with frontotemporal dementia, reports survey of carers after group	Not applicable	
Henry et al. (2008a)	Reviews anomia treatment in semantic dementia	Reviews a mix of Level IV studies and others	
Henry et al. (2008b)	Semantic treatment for anomia in progressive vs. stroke-induced aphasia	IV	
Jokel et al. (2010)	Computer-based treatment for anomia in semantic dementia	IV	
Newhart et al. (2009)	Spoken naming therapy using a cueing hierarchy in 2 cases, one logopenic progressive aphasia and one semantic dementia	IV	
Robinson et al. (2009)	Therapy naming, defining and using objects in 2 individuals with semantic dementia	IV	
Rogalski & Edmonds (2008)	Attentive reading and constrained summarisation (ARCS) treatment to promote intentional language use and attentional focus to improve discourse in a man with PPA	IV	
Taylor et al. (2009)	Reports a survey of PPA referrals to NSW speech pathologists and services provided	Not applicable	
Note. PPA = primary progre	essive aphasia		

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Table 3. Overview of cases similar to your current client			
Authors	Case description	Intervention	
Cartwright & Elliot (2009)	F, 65 years, F, 59 years, and F, 66 years with increasingly nonfluent speech, with social disinhibition, pronounced anomia and agrammatic output respectively	Group program with aphasia-friendly TV viewing to promote discourse comprehension and production	
Cress & King (1999)	M, 60 years & F, 59 years with 6-7 year histories of nonfluent speech	AAC: communication boards, books and file cards	
Jokel et al. (2009)	F, 58 years, 3-4 year history of nonfluent aphasia, slow and anomic speech	Cued naming treatment to improve retrieval of nouns	
McNeil et al. (1995)	M, 61 years, lawyer with 9 month history or anomia, mild spastic dysarthria, and mild aphasia	Hierarchical cueing of synonyms and antonyms to improve retrieval of adjectives	
Pattee et al. (2006)	F, 57, primary progressive aphasia with apraxia of speech	Text-to-speech and American sign language	
Rogers et al. (2000)	M, 71 years, 2-year history of anomia, AOS and telegraphic speech	Principles of proactive intervention, AAC	
Schneider et al. (1996)	F, 62 years, nonfluent aphasia (anomia, slow, agrammatic speech, pronunciation errors)	Gestural combined with verbal forms to promote use of nouns, verbs and tense markers	

Note. F = female, M = male

You read over the summary of cases reviewed by Croot et al. (2009) and the abstracts of the additional articles, to identify individuals similar to your current client. The findings are provided in Table 3.

You notice some things in common across these studies, with the controlled impairment-directed interventions producing a treatment effect in all cases but almost no generalisation. Furthermore treatment gains are not well maintained once therapy ceases. The activity and participation-directed interventions are reported to be successful in helping the participant achieve desired social and communicative goals, but these reports are case descriptions not controlled studies. You select the article by Jokel and colleagues as appropriately similar to the potential new referral and critically appraise the study following the EBP guidelines http://www.ciap.health.nsw.gov.au/ specialties/ebp_sp_path/resources.html (Table 4).

As the paper reports a single case design you also evaluate the methodology of the paper using a scale for rating Single Case Experimental Designs (SCED; Tate et al., 2008). The method received 8/10 points for clear identification of target behaviours, overall design (multiple baselines across behaviours), establishing a stable pre-treatment baseline, sampling during treatment, providing raw data in a graph, use of statistics, replication across two individuals, and testing of generalisation. The 2/10 points that were not awarded were for independence of assessors and inter-rater reliability. However, given the nature of the outcome measures (naming accuracy) you feel this is not too great a problem.

Clinical bottom line

Having surveyed the literature you return to your clinical question and determine the clinical bottom line:

There is Level IV evidence for the efficacy of word retrieval interventions for treated items in progressive aphasia and semantic dementia. Some of these were studies that rated highly on the Tate et al. (2008) SCED scale, indicating methodological adequacy for single case designs. Hence, these provide some basis for clinical decision-making in your service, taking into account the similarity of presenting clients to participants described in the published studies. However, there are no randomised control trials and almost no replications of the same treatment with different individuals that would indicate the generality of the results for any intervention, thus at this point in time, every intervention would need to be considered experimental.

Table 4. C	ritically appraised article
Article title	Relearning lost vocabulary in nonfluent progressive aphasia with MossTalk Words®
Citation	Jokel, R., Cupit, J., Rochon, E., & Leonard, C. (2009). Relearning lost vocabulary in nonfluent progressive aphasia with MossTalk Words [®] . <i>Aphasiology</i> , <i>23</i> (2), 175-191.
Design	Case series pretest posttest
Level of evidence	NHMRC: IV Tate et al. (2008): 8/10
Participants	2 people with nonfluent progressive aphasia, one slow and anomic, the other hesitant and anomic
Experimental group	Cued naming of 3 lists of 14–15 words, 1 hour 2–3 times per week for 4 weeks (participant 1) and 12 weeks (participant 2) using MossTalk Words [®] , a computer-based therapy with a large array of words with pictures and cues including high frequency items.
Results	Improvement on all 3 treated lists by both participants, maintained at 1 month with no practice but not at 6 months. No generalisation to a 180-item picture naming test but improved syntactic production at 1 month but not 6 months post treatment.
Summary	Two individuals with anomia in the context of nonfluent progressive aphasia improved word retrieval for treated items that did not generalise to untreated items but improved syntax in a sentence production task.
Clinical bottom line	Word retrieval can be improved with treatment in nonfluent progressive aphasia, but improvement is likely to be restricted to treated items and may not be maintained when therapy activities cease.

There is limited evidence for other interventions. For example, there is no evidence for an impairment-directed intervention that targets apraxia of speech in this population, and predominantly anecdotal evidence for the success of activity/participation-directed interventions.

Collaborative decision-making and goal-setting with client and significant communication partner(s) is necessary. Collaborative decision making is required when deciding whether to proceed with an impairment-directed or an activity/participation-directed intervention and about

selection of words to target in treatment given the lack of evidence for generalisation. Consultation will also include full disclosure to the client and communication partners about the limits to the evidence that any therapy will work, the need to rehearse to maintain any relearned vocabulary, the eventual loss of learning with disease progression, and the fact that the aim of therapy is to maintain current abilities or slow decline, not return to previous levels of function.

Regular review

Some people with progressive aphasia have deteriorated rapidly, within 1–2 years, while others maintained very good communicative abilities over 8 or more years (Croot, 2009). Therefore regular reviews will be essential, and it will be important to discuss with the client the need to proactively manage anticipated decline (Rogers & Alarcon, 1998).

Conclusion

Can your service offer an evidence-based approach to intervention in progressive aphasia? In your view, the limited empirical evidence suggests that intervention may be appropriate. Hence you conclude that for each case you will base your clinical decision-making on the combination of the best currently available evidence, your own clinical expertise, and the client's values (Harasty, 2010).

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The role of speech pathologists in assessing children with language disorders

Does the need for funding make a difference?

Nerina Scarinci, Wendy Arnott, and Anne Hill

This edition of Ethical Conversations is one which many readers will find pertinent to their everyday speech pathology practice. In this column we will discuss the ethics of assessment and report writing for children with language disorders when funding for additional services for the child is being sought. Specifically, we will discuss (a) the speech pathology assessment process and the role of reports in disseminating results and recommendations to different recipients, and (b) potential changes in the perception of the role of the speech pathologist when the assessment process involves funding outcomes. This discussion will highlight ethical issues faced by speech pathologists working with paediatric language disorders. It is not our intention to offer answers to these issues but to facilitate discussion by posing reflective questions for consideration by readers.

The speech pathology assessment

There are many reasons for assessing a child's language development. Assessment can be undertaken to screen for various conditions, to differentiate between language difference and disorder, to make a differential diagnosis, to determine goals for intervention, and to establish a baseline against which the efficacy of intervention can be measured (Hegde & Davis, 2010). Within the context of initial assessment and inclusive education, one of the critical roles of assessment is to assist teachers in the identification and implementation of realistic, relevant, and functional changes in the delivery of the classroom curriculum to promote the child's activity and participation within their learning environment (WHO, 2001). Also significant is the need for confirmation of a diagnosis or categorical label where required, and the formulation of a holistic communication profile of each child's strengths and weaknesses to determine eligibility for funding or access to additional resources (Speech Pathology Australia, 2004).

Given the role of diagnosis in the funding process to determine eligibility for speech pathology services, a

question of interest for this column is "Does the purpose of the assessment and the intended recipient of information influence the assessment process and the subsequent written report?" An examination of best practice principles supports the argument that assessment is part of the cyclical nature of the clinical management process and that the role of the speech pathologist should not vary according to the reason for assessment. However, in everyday practice, do speech pathologists change their perception of their role in the assessment process depending on its purpose? For example, if confirmation of diagnosis of a language disorder is required in order for the child to access additional services, guidelines may mandate that the speech pathologist uses both formal (norm-referenced) and informal (criterion-referenced) tests in order to highlight the presenting language impairments and predict the impact of these on academic performance (Eger, 2007). Further, depending on the context of the situation, different service providers may have specific reporting standards to which speech pathologists must adhere. For example, they may require that a specific assessment battery consisting of the Clinical Evaluation of Language Fundamentals, 4th Edition (CELF-4; Semel, Wiig, & Secord, 2003) and the Peabody Picture Vocabulary Test, 4th Edition (PPVT-4; Dunn & Dunn, 2007) is undertaken in order to directly benchmark against established eligibility criteria. These protocols may be in contrast to what the speech pathologist would typically do in situations where funding is not being sought. The question arises then: Does this create an ethical dilemma for the speech pathologist?

The need for a label or confirmed diagnosis in order to access additional support services is another ethical issue at the core of child language assessment. Understandably, families want the best for their child. Accordingly, parents and other medical and allied health providers may insist that the child receive a formal diagnosis or categorical label following the assessment process based on the perception that a label is needed in order to fulfil eligibility requirements for additional funding. This raises the further question: To what extent does this perceived notion influence the speech pathologist in their assessment and subsequent written summary and recommendations?

The role of the assessment report

Speech pathology reports are necessary for communicative, administrative, and legal purposes (Cranwell & Miller, 1989).







Nerina Scarinci (top), Wendy Arnott, and Anne Hill

Written assessment reports are traditionally viewed as a permanent record of a child's communicative functioning, documenting the status of a client at a given time (Hegde & Davis, 2010). However, in the context of providing a diagnosis for funding purposes, reports may be perceived by the speech pathologist to be the core piece of tangible evidence supporting the family's quest for additional funding and support. As the predominant form of communication between professionals, reports may also represent the sole means of communication between clinicians and service providers (Flynn & Parsons, 1994; Thompson, 1997), placing further pressure on the clinician to describe the child's communicative ability in a way that will convince relevant authorities of the child's eligibility for funding.

In the provision of written assessment reports, there may be one or more intended recipients of the assessment information and this may also influence the type of report provided by the speech pathologist. In a study examining parent and clinician perceptions of written assessment reports, clinicians identified parents as the intended recipient of reports (Donaldson et al., 2004). However, not all clinician participants identified parents as the primary target group; some clinicians identified other professionals such as school teachers, doctors, guidance officers, and other allied health professionals as the primary target group for the report. In the case of presenting a summary of assessment as written evidence to support eligibility for funding, the speech pathologist may present information differently when compared with writing for a parent recipient. In a previous Ethical Conversations column, Leitão, Scarinci, and Koenig (2009) highlighted ethical issues relating to access of information for parents when reports are written with unfamiliar jargon and terminology obviously targeted at another recipient.

In situations described above where assessment reports constitute a request for funding, speech pathologists must consider where their primary responsibility lies. Who is the client? The Code of Ethics includes a standard of practice relating to our duties to our clients and to the community. However, it does not provide guidance for speech pathologists in identifying who the client is across different settings and therefore the question may be answered differently depending on where the speech pathologist works. In a health setting, is the patient the client? In the school setting, is the classroom teacher the client because they are being provided with strategies to assist curriculum change in order to maximise participation of the child? In a paediatric private practice setting, is the child the client or is their parent/guardian the client? Given the complexities of this question, speech pathologists must give due consideration to their ethical responsibilities. McAllister, Pickstone, and Body (2009) highlight the complexities inherent in determining who the client is in their examination of ethical scenarios in paediatric speech and language disorders and conclude that in any one case, there may be more than one "client" and therefore many stakeholders in the assessment of any one client.

While we may be responsible to a number of "clients" in any one case, ultimately, the child is the focus of our professional service delivery and we must not lose sight of this. Given that "the child is the one with no say but with all the potential consequences" (Hand, reported in McAllister, Pickstone, & Body, 2009, p. 102), it is critical that we express and protect his/her interests (Speech Pathology Australia, 2010). This extends to the provision of an assessment process that adequately profiles the child's strengths and weaknesses and makes recommendations which support the child's access to appropriate services and removes barriers to their participation in the classroom curriculum and family and community life (WHO, 2001).

The role of the speech pathologist in assessment

According to the Speech Pathology Australia Code of Ethics (2010), one of the principles that speech pathologists must recognise and adhere to is the principle of fairness (justice). Specifically, this refers to the need to provide accurate information and provide clients with access to services consistent with their need. In regards to duties to our clients and to the community, we also have an obligation to ensure our services are accessible and ensure there is equity of access to services for our clients (3.1.6 Service Planning and Provision). At the core of these ethical considerations is the need to provide clients with access to services based on their needs. This is our driving motivation and in order to do this, we must advocate the right to services for our clients (3.1.6 Service Planning and Provision). Does this responsibility to advocate for appropriate services, however, challenge our ethical conduct when client access to appropriate services hinges on our assessment and subsequent report? For example, in the assessment and management of an Indigenous child with English as a second language, we know that the administration of a standardised assessment such as the CELF-4 would not be a valid assessment. However, if the purpose of our assessment and subsequent report was to seek additional funding and thus additional services for this child and that required the use of a standardised measure of language skills, what ethical principles should we adhere to? Does our ethical responsibility lie with the client and ensuring they can access additional services, or does our ethical responsibility lie with ensuring that we use valid assessments to identify their areas of language difficulty even if that means we do not use a standardised measure of language ability?

Given the high demand for school-based speech pathology services and the limited resources available for students with special needs in communication, the Position Paper on Speech Pathology Services in Schools (Speech Pathology Australia, 2004), currently under review highlights the potential conflict for speech pathologists in relation to client access to services and anti-discrimination legislation. The federal Disability Discrimination Act 1992 provides guidelines for access to services for people with disability (Attorney-General's Department, 1992). Despite the existence of guidelines for categorising disability for students with communication difficulties, service providers have a professional and legislative obligation to identify and respond to the therapeutic needs of all children despite their diagnosis or categorical label for educational placement purposes. After all, the Disability Discrimination Act definition of disability applies to all clients, regardless of their eligibility for funding or categorisation (Department of Education and Training, 2010).

This issue of equity is addressed by McAllister and colleagues (2009) in their "Three Es of ethical resource allocation" (p. 124). Specifically, speech pathologists should

consider the principles of effectiveness, efficiency, and equity in their decision making processes regarding assessment practices and subsequent recommendations and service delivery (McAllister et al., 2009). Kenny, Lincoln, Blyth, and Balandin (2009) highlighted the tension between "quality" and "quantity" in their study of ethical dilemmas related to quality of care for new graduate speech pathologists. Participants in this study perceived a number of ethical dilemmas when they did not have adequate resources or support to meet the needs of paediatric clients (i.e., time pressure, long waiting lists for assessment, children with complex medical and social histories). Limited time for report writing and discussing complex cases with more experienced colleagues impacts the speech pathologist's ability to offer competent, wholistic assessments. This research highlights the tension between "quality" and "quantity" in assessment loads and whether there are some "duties to our profession and ourselves" at stake in models of assessment delivery and how we value the "assessment" component of our work.

From the discussion above, it is clear that there are many complexities involved in decision making. These include the identity of the "client", the assessments to be undertaken, and the format of reporting. Given these complexities, taken together, the "Three Es - effectiveness, efficiency, and equity", and the importance of viewing the child as our primary focus, may provide an enduring framework to guide the practice of speech pathologists working with children with language disorders.

Conclusion

The preceding discussion has raised several ethical issues facing speech pathologists working with children with language disorders. Many of these relate to the relationship between assessment and educational funding. Some guiding principles have been offered.

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ebwords freely admits to her passions and pet peeves. Passions? She could bore for Australia on child phonology and her perennial hobby horse of reasonably priced access to quality journals for clinicians. Peeves? Don't get her started on graffiti, waiting lists, oral motor exercises or apostrophe use. Above all, you should never, never ask her for a derivation unless you really, really want an answer! As a researcher she is perseverance personified: a ferret, a terrier, Hercule Poirot, and Robert the Bruce's spider united in the pursuit of accuracy.

Child language bonanza

Webwords 39

Caroline Bowen

Midnight oil

Caroline Bowen

Our friend Speechwoman tells of a half-full red-eye flight to Darwin when she idly wondered aloud about the origin of "hobby", prompting a 15-minute disquisition from Webwords, Kindle Dictionary in hand, disambiguating hobbies as "small or middle-sized horses; ambling or pacing horses; and ponies". A further 15 minutes passed as Webwords provided the good oil on hobby horses (children's toys, pet topics, and Mayday in Padstow, Cornwall). She had only just launched into a soliloquy on the difference between "Mayday" and "PAN-PAN" when she was cut short by a perambulating passenger who had the three seats in front of them to himself. Apologising for interrupting he asked Webwords whether the battery life of her Kindle was long enough for space shuttle missions. Or, by any chance, the Sydney to Darwin via Adelaide midnight flight!

Speechwoman gladly exchanged seats with The Liberator spreading out luxuriously in 23D, E, and F, and listening drowsily as the Kindle discussion developed between the occupants of 24D and 24F behind. The Liberator was clearly Webwords' kind of guy: fond of words, delighted by a clever turn of phrase, articulate, precise, sociable and computer literate. The conversation ebbed and flowed soporifically with Webwords taking turns to consider and to share ideas and information with a kindred spirit. The Liberator matched her eloquence and particularity until the fitful, light flickering, galley clattering experience that passes for a good night's sleep on a 767 overtook all three of them.

Morning light

Breakfast came early and a lively flight attendant murmured to Speechwoman and The Liberator that they should return to their allocated seats, securely fasten their seatbelts, lock their tray tables, ensure their seats were in the upright position, do something in the overhead locker that Speechwoman couldn't quite hear, and generally make ready for Darwin.

"Sorry I stole your travelling companion."

"No problem." Speechwoman smiled, heading for the shuttle into town with Webwords not far behind defining, with examples, "**portmanteau word**"¹ for a surprised and yawning new friend from Malta.

"On your first visit to the Territory?"

"Third. I'm here to work with some children with language disorders. Just for a few weeks. For the **Remote Area Health Corps**²; I'm a speech pathologist."

"Really? So am I ... I mean, so are we! What a coincidence! Are you coming back for the conference? Did you tell Webwords you were a speechie?"

It was The Liberator's turn to be surprised. "Webwords? We didn't exchange names. She's not ACQ Webwords, is she?" "The very same!"

"Then I must talk to her some more. Pick her brain about how to access articles on child language while I'm here. I want to explore some of the recent literature while I have the evenings to myself to read. The one compensation for being away from my family for so long. You don't think she'd mind, do you?"

"Mind what?" The sleepy traveller had met his hosts and was asking them what Maltesers were, and Webwords had caught up with them. "What wouldn't I mind?"

Bonanza

Webwords did not disappoint, providing TL with a prize collection of useful sources such as the **Boston University Conference on Language Development**³, the Child Language Data **Exchange System (CHILDES)**⁴, the **Child Language Research Center**⁵ at the University of Iowa, the **Child Language Video Archive**⁶ at Macquarie University, free **EBP Briefs**⁷ from Pearson, the University of Western Ontario's **Encyclopedia of Language and Literacy Development**⁸, resources and publications from the **LOCHI Study**⁹, the **SRCLD Archive**¹⁰, and faculty pages of prominent researchers in child language disorders. TL was surprised to find how many of these scholars, like **Mabel L. Rice**¹¹ at the University of Kansas, freely share their published works. Other rich sources were the ASHA Convention archives for 2009, 2008, 2007 and 2006.

The Liberator was looking a little pale in the face of all these suggestions, so for recreation Webwords proffered several language-related blogs: **Literal-Minded**¹² by Neal Whitman, Lynne Murphy's **Separated by a Common Language**¹³, treasures, including wicked cartoons from **Dorothy Bishop**¹⁴, witty and interesting reflections from **David Crystal**¹⁵ and for a complete change of pace, the high jinks of the **Banbury Hobby Horse Festival**¹⁶ (giving the page at least ten minutes to load before enjoying Rosy Burke's cheerful images).

Links

- 1. http://www.worldwidewords.org/articles/blend.htm
- 2. http://www.rahc.com.au/
- 3. http://www.bu.edu/bucld/
- 4. http://childes.psy.cmu.edu/
- 5. http://www.uiowa.edu/~clrc/home.html
- 6. http://www.maccs.mq.edu.au/laboratories/acquisition/ languagevideos.html
- 7. http://www.speechandlanguage.com/ebp/
- 8. http://www.literacyencyclopedia.ca/
- 9. http://www.outcomes.nal.gov.au/index.html
- 10. http://www.srcld.org/Archive/ArchiveIndex.aspx
- 11. http://www2.ku.edu/~cldp/MabelRice/
- 12. http://literalminded.wordpress.com/
- 13. http://separatedbyacommonlanguage.blogspot.com/
- 14. http://deevybee.blogspot.com/
- 15. http://david-crystal.blogspot.com/
- 16. http://www.hobbyhorsefestival.co.uk/

Webwords 39 is at http://speech-language-therapy.com/ webwords39.htm with live links to featured and additional resources.

Fremantle Language Development Centre's Top 10 resources

Lara Lambert, Mary Bishop, and Wendy Strang

Remantle Language Development Centre is a school for children with specific language impairment in Western Australia. It provides specialised speech, language, and academic intervention in small groups for students from kindergarten to year 3. We work within a collaborative model of service that includes teachers, education assistants, speech pathologists, and school psychologists.

1. Mr Good Guess Inferencing Pack



This resource promotes the use of visual clues and the drawing of inferences. Visual distractors are included and the children are encouraged to be detectives! It was devised by Catherine Redmayne, illustrated by Helen Rippon and published by Black Sheep Press, who recommend it for 6 to 11 year olds. The price is $\pounds35$ (http://www.blacksheeppress. co.uk).

2. Speech Bubbles set of busy illustrations of everyday activities



This is another favourite from Black Sheep Press. The children are stimulated to adopt another's perspective, to discuss characters' feelings and to predict what they could be thinking or saying. The age range suggested by the publishers is again 6 to 11 years. The price is £15 (http://www.blacksheeppress.co.uk).



3. Therapy Friends: Classroom Tools Kit The *Therapy Friends: Classroom Tools Kit* includes a manual and CD containing engaging and effective behaviour management resources for young children (early childhood and early primary). These include listening posters, reinforcement charts, social stories and activities. It is available through Spectronics. The price is A\$159 (http:// www.spectronicsinoz.com).

4. Braidy the Storybraid teacher demonstration doll

From left to right: Mary Bishop (school principal), Wendy Strang (school deputy principal) and Lara Lambert (senior speech pathologist)



The "Braidy the Storybraid" teacher demonstration doll supports students with narrative difficulties to discover and remember to include the parts of the story, each of which is represented by visual icons. The Braidy manual supports a developmental approach to introducing narrative. Mind Wing Concepts Inc. (USA) suggest an age range of kindergarten to year 2. The price is US\$175.95 (http://www.mindwingconcepts.com).

5. Parallel texts



Ron and Sandi Gillam introduced the idea of "parallel texts" in their professional development workshops through Speech Pathology Australia in 2009. The children learn the structure of a narrative, while exploring the similarities and differences between stories. For example, two texts with a focus on a similar problem are *Lamb-a-Roo* by D. Kimpton and *Are you my mother?* by P. D. Eastman.

6. A Sound Way (2nd ed.)



The *Sound Way* text contains an interactive whiteboard CD with a range of fun, stimulating, developmentally sequenced phonological awareness activities for practising and consolidating early literacy skills. It was developed by Elizabeth Love and Sue Reilly and published by Pearson, Australia (2009). The price for the manual and the CD is A\$135 (http://www.pearson.com.au).

7. Smart Chute



The Smart Chute is a popular, card flipping, durable plastic tower that is fun, motivating and provides immediate feedback on sound and language responses given by the student. The child posts a card in the top of the chute from a deck of cards that targets, for example, final sounds or idioms. The child provides a response and gets feedback after the card has flipped. Its price is A\$29.95 (http://www.smartkids.com.au).

8. Facilitating Word Recall

Facilitating Word Recall (1995) was developed by Jean Gilliam DeGaetano. It assists young students with visual support and structured sequenced clues to develop their ability to recall specific labels. It is recommended



for ages 5 and beyond. You can purchase this resource through ACER for A\$63.95 (sales@acer.edu.au).

9. Developing Oral Language with Barrier Games resource book and CD



The Developing Oral Language with Barrier Games resource book and CD contain over 40 barrier games that can be printed in colour to develop the speaking and listening skills of young students. These resources were produced by Alison Jarred and Nadja Roelofs and published by Hands on Concepts (2003). They can be purchased through ACER for A\$57.95 (http://www.handsonconcepts.com).

10. Puppets



FLDC is committed to evidence based practice in education. In 2010 we undertook a research project, in collaboration with Karen Lock-Smith (Macquarie University) and Suze Leitão (Curtin University). Pre-primary students were involved in this project which examined the treatment efficacy of grammatical intervention in the classroom. Their favourite way to practise possessive ('s) was with puppets that they named and described (e.g., Zac's stripes / Zebra's tail).

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Top 10 favourite resources

The Royal Perth Hospital Team

Rindra is one of Australia's largest and busiest hospitals. It is divided into two campuses: Wellington Street (acute hospital care) and Shenton Park (the state's primary rehabilitation centre). Our top 10 resources represent a selection of traditional assessment and therapy tools, in addition to items that we feel have great potential for the future direction of speech pathology.

1. iPad

With the development of technology comes the opportunity to evaluate and incorporate innovative ideas into therapy. The potential of the iPad has yet to be fully explored; however, on an initial trial, the ease of using the touch screen, clear speech output, and great graphics have provided access to a variety of communication options that do not need to be packed into a bag and carried around the wards. The options include paint programs that allow for writing opportunities, picture symbols that can be used to support communication in sessions or to set therapy goals, and the ability to store a range of pictures and reading tasks (which can also be supported by spoken output if required). There are many applications available to explore, develop and adapt for therapeutic intervention. It is well worth having a look and considering the potential of the iPad.

2. LightWRITER® SL40

Manufactured by Toby Churchill Ltd, available from Zyteq (http://www.zygoaustralia.com.au).

This is an old favourite augmentive and alternative communication device (AAC) that is portable, easy to handle and durable. Its dual displays, one facing the "user" and the other facing a "communication partner", offer face-to-face conversation. Its storage facility offers the ability to write and save lengthy pieces of text and frequently used sentences as key-combinations, for example "Tea please, milk and one sugar" could be programmed under "TMS". Another great function is the word prediction option. As the user types, the LightWRITER offers possible word choices. Further useful functions include alarms for wake-up calls, and appointment reminders.

3. Comprehensive Aphasia Test (CAT)

Swinburn, K., Porter, G., & Howard, D. (2004) *Comprehensive aphasia test*. London: Psychology Press. Available from Psychology Press, Taylor and Francis Group (http://www.psypress.com).

The CAT is an assessment for people with acquired aphasia and is easy to administer and score. The main body of the test assesses expressive and receptive language skills across all modalities. The assessment provides a good structure for a therapist to develop a profile of a client's strengths and weaknesses. The normative data is based on people with and without aphasia, and information on validity and reliability is provided. Additional sections include a cognitive section, and an optional disability questionnaire.



4. Speech Sounds on Cue

Available from Multimedia Speech Pathology (http:// www.mmsp.com.au) in Miami, Qld.

Speech Sounds on Cue is a multimedia software program, primarily for motor speech difficulties, that provides a self-directed or a supported alternative for practising speech sounds at the individual and word levels. The program includes cues for over 500 words, based around coloured photos illustrating targeted word meanings. There are full motion video clips which a user can watch and listen to that have been combined with auditory and written trigger phrases. The professional version also provides exercises for the target phonemes that can be printed. The program can be operated easily with either a mouse or simple keyboard control.

5. Aphasia Tutor

Available from Multimedia Speech Pathology (http://www.mmsp.com.au).

These are a group of software packages, which have also been designed to assist supported or self-directed therapy. The programs have been created for clients who have had a brain injury (such as a stroke) resulting in aphasia. The



Back row: Left to Right: David Harrison. Adrienne Miles, Angela Thewliss, Yvette Yee, Alex Hunting, Natasha Matheson. Elspeth Tranthim-Fryer, Crystal Ladzinski, Michelle Byrne, Stephanie Borrello. Front Row: Left to Right: Mary Hunt, Courtney Fraser, Melita Brown (Head of Department), Asha Peet. Libby Sinclair



individual software packages have been hierarchically organised in increasing difficulty of reading comprehension, beginning with letters, words, sentences, functional reading, in addition to paragraph and story comprehension. Each program targets a different skill area and skill level, and each contains sub-lessons of varying complexity. Options for setting different levels of hints and support are available, in addition to recording a client's performance.

6. Talkabout – A Social Communication Skills Package

Kelly, A. (1996). *Talkabout – A social communication skills package*. Milton Keynes, UK: Speechmark Publishing. Available from Speechmark (http://www.speechmark.net).

Talkabout has become a very useful resource for running our social skills groups and consists of a comprehensive photocopiable manual with activities that can be used with children, adolescents and adults. It covers a wide array of



social skills including: awareness of self and others, problem-solving, reflecting on personal communication skills, body language, assertiveness and conversational and listening skills.

7. React 2

Available from Multimedia Speech Pathology (http://www.mmsp.com.au).

React 2 is another valuable software resource for working with people with aphasia. It contains a broad range of therapy tasks targeting receptive and expressive language skills such as auditory processing of everyday



sounds, semantic categories, grammatical error judgment, reading and listening comprehension. Each task contains well-developed hierarchies, and has clear instructions and pictures for self-directed and supported therapy.

8. Speechmark ColorCards®

Available from Speechmark (http://www.speechmark. net/).



Another old favourite, ColorCards have been created by language professionals and teachers to assist with the development or rehabilitation of language and social skills. The images of real objects, people, situations and activities have been professionally photographed and target a range of areas such as nouns, verbs, propositions, emotions, sequences of events and more. The cards can be incorporated into a variety of language learning opportunities such as listening, auditory memory, turn-taking, writing skills, vocabulary development, classification and problem-solving.

9. The Brain Injury Workbook

Powell, T. & Malia, K. (2003) *The brain injury workbook*. Milton Keynes, UK: Speechmark Publishing Ltd. Available from B&S Books (http://www.bsbooks.com.au).

This workbook contains over 140 cognitive rehabilitation exercises tailored for assisting memory, reasoning, executive function, awareness and insight, as well as emotional adjustment. The exercises and handout sheets can be photocopied and used during therapy or given to the client to independently complete or complete with the assistance of a carer or family member.

10. Functional Communication Therapy Planner (FCTP)

By Linda Worrall, available from http://www. speechtherapyshop.com.

The planner complements traditional impairment based assessments by promoting a client-centred approach for the identification of areas of communication the clients themselves perceive as challenging, for example, social interaction, finance planning, shopping, using a telephone, or participating in medical appointments.



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ACQuiring knowledge in speech, language and hearing

Clinical Insights

Creating your own therapy tool

Polly Woodfine

s speech pathologists, we are a creative bunch! How many of you have innovative ideas for therapy tools that are not yet realised? Maybe you should think about taking these ideas a little further. Here are some suggestions from Polly Woodfine, a speech pathologist who has spent the last six years creating a tool to promote vocabulary development in children.

Starting

Focus on your interest

We all have specific areas of interest within the field of speech pathology. We often seek further knowledge in these areas by reading relevant literature and attending training courses. It is essential that if you are going to develop a resource, you do it within a field that you are interested in and passionate about. If you have the interest, you will have the ideas and the energy to produce a finished resource.

Consider current resources

A tool will be more valuable to children, parents, and professionals if it (a) has a firm evidence base and will improve clinical or teaching practice within its field, (b) is unique, and (c) is motivating and fun for children. Once you have identified your idea for a therapy tool, you may want to check that it is novel by engaging in a comprehensive internet search. Consider contacting Intellectual Property Australia (http:// www.ipaustralia.gov.au) to review registered patents.

Reviewing the literature

Consider empirical evidence for therapy techniques in your field of interest. In my case, this meant going on training courses, studying the reading lists provided on the courses, following up on the references, and then keeping abreast of current publications on an ongoing basis.

Development

You are now ready to realise your idea. Start with a basic version. This may be a paper-based resource that you trial in classrooms and clinics. Gather feedback about the pros and cons of your tool from colleagues, other professionals, parents, and children so that you can modify it further. In the developmental period, you may revise your idea many times until it is easy to use and motivating for children!

Consider the different levels of development. For example, you could keep your design as a basic, paper-based tool, which will be simple and cheap to produce. Alternatively, you may decide to produce a more professionally designed and manufactured tool. This may sound costly, but there are excellent market-based websites, such as http://www.guru. com and http://www.elance.com where you can access professionals, such as graphic designers and computer programmers, at competitive rates. These websites work through a tendering process, where you describe your project on the site and the appropriate freelance professionals bid for your work. Sourcing printers from your local area and comparing and contrasting quotes is another way to reduce manufacturing costs. Take care to keep records of your expenditure and revenue because you will need to declare these on your personal tax statement (http:// www.business.gov.au).

Proof of effectiveness

You will need to have trialled your resource extensively and be confident it works before you decide to produce it. In addition, despite basing your tool on current evidence, it is also beneficial to collect data to prove the effectiveness of your resource. You may want to engage in a formal research study to establish the effectiveness of the tool itself and decide to submit your research for publication in a peerreviewed professional journal. If it gets accepted, not only will you have produced a valuable resource to improve the practice of others, you will also be contributing to the research of your profession.



Pollv Woodfine

Protecting your idea

It is important to think about protecting your idea and all of your hard work. Keep a diary that clearly records your inventive process, along with copies of early prototypes. Store these in a lawyer's archive, or keep them in a sealed envelope that you have posted to yourself resulting in an official postal stamp. Copyright is an exclusive right that is automatically granted to the author or creator of an original work. This covers texts, photographs, pictures, sound, video, and computer programs. Having a website, a business name, and a professionally produced resource confirms that you are established, which may deter others from copying your idea. Finally, investigate whether your idea would be suitable for patenting, or trademark the name of your resource. These can be costly processes, reaching into the \$100s for trademarks and \$1000s for patents. Throughout the process of developing your resource, be careful with whom you share your idea. Consider asking individuals to sign a non-disclosure agreement to protect your work (http://www.businesslink. gov.uk/bdotg/action/layer?topicId=1074415494).

Marketing

Word of mouth, presentations, training courses, publications, independent reviews and distribution of free copies to select professionals are mechanisms to consider when marketing your product. I have found that "flyers" yield limited results, but free presentations are popular because they educate other professionals by sharing the research upon which you have based your resource. They are also an effective way to demonstrate and discuss your tool. Developing a website is another method of providing further information about your resource.

Summary

Although creating a therapy tool requires investing a lot of time and energy, I have found it to be a thoroughly rewarding experience. It has helped me to develop many skills on the way, including those in business, marketing, and manufacturing. Above all, it is a good feeling to contribute something to the speech and language therapy profession. I would certainly do it again.

Polly Woodfine is a practising specialist speech pathologist.

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Individuals with Down syndrome (DS) have a phenotypic spoken and written language profile which includes elements of both delay and disorder, with considerable variation reported (e.g., Miller & Leddy, 1998). Significant advances have been made in understanding the spoken and written language in this population and the directions interventions might take. However, little is known about the language profiles of these children in the New Zealand (NZ) cultural and educational environment. Over the last 5

Down syndrome

Spoken and written language

development in children with

Anne van Bysterveldt years, joint research between the Champion Centre and the University of Canterbury has focused on addressing this gap by investigating spoken and written language development in NZ children with DS. The first sizeable national investigation to be carried out in NZ involved 88 school-aged children, comprising an estimated 15% of children with DS receiving instruction in years 1-8 in NZ schools. Children's parents and teachers completed comprehensive questionnaires investigating the home and school literacy environment. The majority of homes were rich in literacy resources and children and parents read together on a regular basis. However, parents reported that many children took a very passive role during these interactions, that fewer than one third of the children had complete letter name and sound knowledge, and that only 25% of the children were regular independent readers (van Bysterveldt, Gillon, & Foster-Cohen, 2010b). Teachers reported that nearly all children took part in regular classroom reading instruction, most frequently in small groups or in a one-on-one context. Teachers' reports of children's literacy skills were largely in line with those of parents. Far fewer children were reported to take part in regular writing compared to reading activities, both in the classroom and for allocated homework.

To investigate the development of phonological awareness, letter knowledge and decoding skills, 77 of these children completed further assessments. Results revealed a wide range of phonological awareness and decoding skills with some children demonstrating mastery of phoneme identity and letter knowledge tasks while others were unable to achieve correct scores on any assessment measure. Twenty-four percent of children were unable to read any words correctly and 6.6% were able to decode at a level expected for 7–8 year old children. Analysis of data by age group (5–8 and 9–14) revealed the development of skills with maturation. As a group, older children achieved significantly higher scores than younger children on all measures (van Bysterveldt, Gillon, & Foster-Cohen, 2008b).

The 31 children who could decode 10 or more words on a standardised reading test were invited to complete additional assessments of speech, reading accuracy and comprehension, and personal narrative (PN) production. Twenty-six children completed these assessments and produced analysable PN transcripts that were at least 60% intelligible (van Bysterveldt, Westerveld, Gillon, & Foster-Cohen, submitted). Results revealed considerable variability. Nearly 90% of children were able to produce 50 utterances; however mean length of utterance in morphemes (MLU-M) was generally low with over one-third of children producing PN samples with MLU-M of < 2. High point analysis revealed that most children produced early developing PN narrative structures, with only 4 children producing a PN with a high point.

Overall, the results of these investigations identified widespread and persistent spoken and written language disorder in school-aged children with DS. In addition, while home and school literacy environments were generally positive, and children were receiving regular reading instruction, many children were not equipped with the necessary prerequisite skills to enable them to become independent readers. These findings also highlighted the need for early, focused and integrated intervention to facilitate language development and to better prepare children with DS for the language learning environment at school.

To investigate the impact of an early intervention strategy, 10 pre-school children with DS participated in an integrated intervention linking spoken and written language and designed to simultaneously facilitate speech production, letter name and sound knowledge and phonological awareness. The intervention contained three components: a parent-led home-based reading program using print referencing techniques to draw the child's attention to intervention targets, a computer-based program and an activities-based speech therapy component, all focusing on the same speech, letter name and letter sound targets. All 10 children made statistically significant gains on speech production targets and the majority of children also showed an increase in letter knowledge and phonological awareness skills (van Bysterveldt, Gillon, & Foster-Cohen, 2010a). Follow-up assessments after 2 terms of formal schooling revealed 7 of the 10 children made continued improvements in speech and phonological awareness skills and 5 children demonstrated some generalisation of these skills to real word reading and spelling (van Bysterveldt, Gillon, & Foster-Cohen, 2008a). These results suggest an integrated phonological awareness intervention which simultaneously targets speech, phonological awareness and letter knowledge can be effective in facilitating development in these skills for young children with DS.

Findings of these studies have identified the need for longitudinal research into spoken and written language development in children with DS to allow for the evaluation of specific early interventions within a preventative framework. The persistent nature of language difficulties in individuals with DS also suggests the need for sustained interventions. The evaluation of home- and classroom-based activities to promote spoken and written language development in this population is also warranted.

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The Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study

A brief overview of interim findings

Teresa Y. C. Ching, Julia Day, Kathryn Crowe, Nicole Mahler, Vivienne Martin, Laura Street, Jo Ashwood and Helen-Louise Usher

ne to two children in every thousand under the age of 3 have a permanent bilateral hearing loss of greater than 40 dB HL and are fitted with hearing aids (Ching, Oong, & Van Wanrooy, 2006). Permanent childhood hearing loss impacts negatively on the communicative, educational, and social developmental outcomes of children. Several retrospective studies have established an association between intervention before 6 or 9 months of age and better language skills measured at 3 and 5 years of age (Moeller, 2000; Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998). Despite the frequent citing of these studies as evidence in support of the effectiveness of early identification in improving outcomes for children with permanent bilateral hearing loss, the United States Preventative Task Force (USPSTF; Thompson et al., 2001) conducted a systematic review of evidence in 2001 and found that the "evidence to determine whether earlier treatment resulting from screening leads to clinically important improvement in speech and language ... is inconclusive because of the design limitations of existing studies" (reported in Helfand et al., 2001). More recent reviews (Nelson, Bougatsos, & Nygren, 2008; Wolff et al., 2009) revealed that the evidence on the efficacy of early intervention in improving language outcomes for children with permanent bilateral hearing loss is weak.

In Australia newborn hearing screening is now at above 80% coverage in all states except for Victoria, with five states now screening more than 95% of newborns.



Australian Hearing is the sole national service provider for all children diagnosed with permanent hearing loss. Several years ago, different Australian states were at different stages of implementing universal newborn hearing screening, and there was a narrow timeframe during which there were sufficiently large numbers of children who received early or later intervention from the same service provider (Australian Hearing) using consistent protocols. The National Acoustic Laboratories, the research arm of Australian Hearing, captured this unique research opportunity in 2005 to conduct a direct prospective comparison of outcomes for children who received early or later intervention. The LOCHI team in 2010 The aims of this study are (a) to establish an evidence base for the development of speech, language, functional and psychosocial skills, and educational attainment of children with hearing aids and/or cochlear implants, and (b) to identify the extent to which outcomes in each dimension are affected by a range of child-, family- and device-related factors, including age of intervention.

Method

Children who were first fitted with hearing aids and/or cochlear implants before the age of 3 years at Australian Hearing in New South Wales, Queensland, and Victoria were invited to participate.

Currently there are 477 children enrolled in the study with the youngest child due to complete evaluations at 5 years of age in 2012. The children are assessed at multiple assessment intervals, including (a) 6 and 12 months after hearing aid fitting or cochlear implant switch-on, (b) at 3 years of age, and (c) at 5 years of age. An extended phase of the study will include additional assessments at 9 and 11 years of age. The impact of a range of child and family characteristics, audiological and device-related factors, and intervention related factors on child outcomes are examined, and changes are tracked over time.

Interim findings

Results on the language ability of 133 children who completed their assessment at 3 years of age have been reported in detail in Ching et al. (2010). In summary, participants were administered the Preschool Language Scale (PLS-4; Zimmerman, Steiner, & Pond, 2002), Peabody Picture Vocabulary Test (PPVT-4; Dunn & Dunn, 2007), and Diagnostic Evaluation of Articulation and Phonology (DEAP; Dodd, Zhu, Crosbie, Holm, & Ozanne, 2002). Parents were asked to complete the Child Development Inventory (CDI; Ireton, 2005) and the Parents' Evaluation of Aural/Oral performance of Children (PEACH; Ching & Hill, 2007). This publication reported a significant effect of severity of hearing loss on results of the PLS-4 (language development) and on everyday functioning as measured by the PEACH. After allowing for the effect of hearing loss, children in families with maternal education greater than 12 years developed better language skills. Other factors, including age of first hearing aid fitting and socioeconomic status, were not significantly associated with speech and language outcomes of children at 3 years of age.

Results from 87 children with cochlear implants have been reported in Ching et al. (2009). On average, children who received a cochlear implant before 12 months of age developed language skills as measured on the PLS-4 within the range of their normal-hearing peers at 6 and 12 months after implantation. Children who received cochlear implants at a later age performed at 2 standard deviations below the normative mean on measures of language.

When further data becomes available, it will be possible to account for multiple factors on the long-term speech, language, and educational attainment as well as the rate of development in children with hearing loss. In 2011, the next phase of the study will commence with evaluations of children at 9 and 11 years of age. Progress on this study is available on the study website: www.outcomes.nal.gov.au.

Acknowledgements

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Around the journals

Effects of service delivery models on outcomes for school-age children

Cirrin, F., Schooling, T., Nelson, N., Diehl, S., Flynn, P., Staskowski, M., Torrey, T., & Adamczyk, D. (2010). Evidencebased systematic review: Effects of different service delivery models on communication outcomes for elementary school-age children. *Language, Speech and Hearing Services in Schools*, *41*, 233–264.

Rosemary Roberts

Given the consistently high demand, along with the low supply of speech pathology services within education settings, speech language pathologists (SPs) working in schools aim to provide high quality, evidence based interventions. In seeking to identify best practice in terms of service delivery models, these authors note that the 2008 American Speech Hearing Association (ASHA) Schools Survey data indicated that the traditional "pullout" model (1:1 intervention outside the classroom) is still the most common practice used by SPs in US elementary schools. Since both classroom-based interventions and indirect-consultative service delivery models are also used, the effectiveness of all methods warrants investigation.

The rigour required of an evidence-based systematic review (EBSR) resulted in a comprehensive search being conducted of 27 relevant electronic databases along with electronic searches of all ASHA journals; references from all relevant articles found were investigated. Once the inclusion criteria were applied, only 5 studies from the original 255 abstracts considered could be included in the systematic review.

The main question addressed in the review was the influence of the type and dosage of speech-language pathology service delivery models on nine outcomes, which included those related to the child (e.g., vocabulary, functional communication, literacy), the environment (e.g., language facilitation techniques of significant adults) and system-related outcomes (e.g., curriculum standards and rates of referral to special education).

While the authors conclude that comparisons between the effectiveness of direct services delivered in the classroom and pullout intervention were favourable, and that "highly trained" SP assistants following clear guidelines from SPs can be effective in some cases, the authors remind SPs to interpret their findings with caution, given the limitations of the EBSR. For example, this review did not capture the range and scope of available research for services provided to preschool or secondary students, suggesting the probability that "some evidence that could be quite useful to school clinicians did not meet the inclusion criteria for this review" (p. 249). Fortunately, the paper includes an extensive appendix containing abstracts which were not included in the current review, but which have the potential to inform clinical practice with regard to models of service delivery.

This paper makes us acutely aware of the difficulty of attempting high-quality experimental research in school

settings, and urges further and better designed studies to be undertaken in the future. The authors conclude that "clinicians have little research evidence on which to base decisions about service delivery options" (p. 248). We in the field must therefore continue to seek convergent findings to assist us to make clinical judgements, and to seriously consider all opportunities to contribute to the current body of evidence in terms of effective service delivery in schools. The comprehensive appendix and bibliography of this review will be useful to the school-based SPs for both purposes.

Speech production in primary progressive aphasia

Wilson, S.M., Henry, M.L., Besbris, M., Ogar, J.M., Dronkers, N.F., Jarrold, W., Miller, B.L., & Gorno-Tempini, M.L. (2010). Connected speech production in three variants of primary progressive aphasia. *Brain*, *133*, 2069–2088.

Rhonda Holmes

The neurodegenerative syndrome of primary progressive aphasia (PPA) can be classified into three distinct clinical syndromes depending on the linguistic and cognitive features present. These are progressive non-fluent aphasia (PNFA), semantic dementia (SD) and logopenic progressive aphasia (LPA). Previously fluent and non-fluent dichotomies have been applied to these dementia types; however, the authors point out that the notion of fluency depends on the particular dimension of verbal expression being considered and furthermore, that the concept is applied inconsistently. This study firstly aimed to characterise the connected speech of each PPA variant by considering motor speech and linguistic features, and secondly, to determine the neuroanatomical correlates associated with the verbal expression deficits.

The researchers recruited 70 participants: 50 patients with mild to moderate aphasia from the populations of interest and 20 controls. The sample of interest included 14 participants with PNFA, 25 with SD, 11 with LPA, and the control sample included 10 participants with behavioural variant frontotemporal dementia (the neurodegenerative control group), and 10 normal controls. An extensive battery of linguistic, motor speech, and cognitive assessments were undertaken and connected speech samples for all participants were recorded, transcribed and analysed. Patients underwent MRI and had areas of atrophy mapped and correlated with each speech/language measure.

Results indicated participants with PNFA had the slowest speech rate with distortions, syntactic errors and markedly reduced complexity, but did not have the agrammatism of a "classic" Broca's dysphasia. Participants with SD showed normal speech rate with few speech or syntactic errors, but demonstrated lexical retrieval difficulties evidenced by their high usage of closed class words, pronouns, verbs, and high frequency nouns. Those with LPA had a speech rate between the other two groups, which, in the authors' opinion, explained the variable results from other studies in describing this variant as both non-fluent and fluent. Distortions and syntactic errors were less frequent than in the PNFA group and lexical retrieval was better than in the SD group.

Neuroanatomical correlates revealed that motor speech and syntactic structures and complexity were localised to frontal regions, with lexical retrieval associated with anterior and inferior temporal regions, and phonological errors as well as other measures of impaired fluency associated with posterior temporal regions. Speech rate was non-localisable with atrophy present in both anterior and posterior language regions.

This study demonstrates that it is an oversimplification to refer to the language symptoms of the investigated dementia types as non-fluent or fluent. The authors have provided a detailed account of the linguistic and motor speech differences between these three variants of primary progressive aphasia, which will assist in the diagnostic process.

Risk factors in severely neglected children with language delay

Sylvestre, A., & Merette, C. (2010) Language delay in severely neglected children: A cumulative specific effect of risk factors? *Child Abuse & Neglect*, *34*, 414–428.

Nikki Worthington

Children who have experienced neglect and in particular, severe neglect, are at an increased risk of developing communication problems. This study investigated whether language delay in severely neglected children under 3 years of age was influenced by specific risk factors or whether it was the cumulative effect of risk factors that resulted in the language delay. A total of 48 risk factors were evaluated including those of a biological (e.g., inherited), psychological (e.g., cognitive development) and environmental (e.g., maternal characteristics) nature.

The participants were 68 French-speaking children living in Canada. The children were registered for Youth Protection Services and had experienced severe neglect by their families. Data regarding risk factors and the child's communication abilities were collected in the form of two 90-minute interviews from 68 mothers whose children ranged in age from 2 to 36 months (average 16.7 months). Two scales of the Rossetti Infant-Toddler Language Scale (ITLS) were used to evaluate the communication skills of each child (i.e., language comprehension and language expression).

Results from the ITLS demonstrated that over 35% of the children in the study presented with a language delay, which is significantly greater than the incidence in the general population, and that this delay was evident from a very early age (< 9 months).

When the authors analysed the biological and psychological risk factors associated with children identified with language delay results pointed to one specific risk factor – cognitive development. Despite the obvious link between language and cognition, this result was surprising as previous research had established a cumulative risk model.

Although environmental risk factors did not have a cumulative effect on language development, a number of those factors were more closely associated to language delay than others. These included maternal mental health, the mother's own history of childhood neglect and abuse, and the mother's low acceptability level towards her child. These factors may lead to a reduction in the quantity and quality of interactions between carer and child. Findings from the study may help determine the type of intervention programs most suitable for neglected children with language delay. Current interventions that focus on improving mother–child attachments however fail to address the mother's own abuse history. The authors conclude that intervention should be targeted at providing a supporting, nurturing environment not only for the child but also for the mother if there is any hope of breaking the intergenerational neglect cycle. This would suggest that speech pathologists working with vulnerable children and their families need to collaborate closely with other professionals to ensure that both caregiver and child can benefit from intervention.

Recovery of global aphasia

Smania, N., Gandolfi, M., Aglioti, S.M., Girardi, P., Fiaschi, A., & Girardi, F. (2010). How long is the recovery of global aphasia? Twenty-five years of follow-up in a patient with left hemisphere stroke. *Neurorehabilitation and Neural Repair*, *24*(9), 871–875. doi: 10.1177/1545968310368962

Emma McLaughlin

Speech pathologists working with adults with aphasia are faced with many challenges, questions and doubts. As a clinician who has worked with such clients for 18 years, I have sometimes questioned the degree to which I helped my clients, and often wondered what their lives were like years after I was no longer a part of it. The paper by Smania et al. (2010) offers some insight into both of these questions, and provides us with valuable information from long term longitudinal research.

In this single case study set in Italy, a 37-year-old man with global aphasia after a large ischemic stroke was assessed 9 times between 3 weeks and 25 years post-stroke using several language, cognitive and speech tests. He had received "language rehabilitation" (but the qualifications of the health professional who provided the rehabilitation were not stated in the paper) for 2 years, 5 times per week in the first 6 months and then 3 times per week until the end of the second year. The participant was subsequently re-tested over 25 years, using several assessments including the Milan Language Examination, the Token Test, the Raven Test, and tests for oral, ideational, and ideomotor apraxia at 3 weeks, 2 and 6 months, and 1, 2, 3, 10, 21, and 25 years post stroke. An additional examination performed 3 years after his stroke suggested that spatial memory and selective attention were unimpaired. Verbal memory could not be assessed.

Statistical analyses were conducted to determine trends of improvement over time, and the relationship between differing measures of linguistic function. Results suggested improvement in all language functions over time, but with differing patterns of recovery that continued for many years after the stroke. Three broad periods of recovery were identified. The first year after the stroke saw most recovery in verbal comprehension and word repetition. In 1–3 years after the stroke, naming and reading began to emerge. The third and final period of recovery (3–25 years) was characterised by progressive improvement of previously improved modalities, as well as the development of limited but appropriate spontaneous speech (first evident at 10 years post-stroke).

The authors speculate that several factors may have contributed to the participant's long-term continuing recovery, including an initial period of rehabilitation, young age, and high levels of motivation and social participation.

This study has several limitations that need to be taken into account when considering its findings. Limited information is provided about the participant. For example, his occupation is not reported. Also, readers in Australia may be unfamiliar with some of the assessments used (although a table of subtest scores over each assessment period is provided which helps the reader to interpret the results, i.e., the participant's improvement over time). The paper also focused on an impairment level of function; it would have been useful and more comprehensive to provide some report of generalisation through assessment of participation in life roles and quality of life or well-being/distress. The details of treatment and assessment were also unclear; for example, the location of the assessment, whether "language rehabilitation" was undertaken by a speech pathologist, and who completed the assessments were not reported. Thus, some sources of bias cannot be excluded. As the paper did not report on a controlled intervention study, the contributing factors to this participant's recovery could not be isolated. As with all single case studies, this participant's pattern of recovery may not be representative of other individuals with similar histories and impairments.

Despite these limitations, this paper has a lot to offer the speech pathology clinician. It provides us with some guidelines which we can use to discuss potential recovery patterns with clients and their families. It also suggests that some people with global aphasia may improve in different communication domains at different times, which could help us in more realistically evaluating progress and further potential to improve. The results of this study support what many of us already know through anecdotal evidence recovery from aphasia can continue for many years. Data from this paper can be used to advocate for treatment funding for people with chronic aphasia. I think the most important information this paper provided me was that longterm longitudinal research with the dysphasic population is possible and valuable. Further single case studies as well as larger group studies will help us to understand how our intervention aids our clients with dysphasia not just during intensive treatment, but over the long term.

Factors influencing auditory development in early amplified children with hearing loss

Sininger, Y., Grimes, A. & Christensen, E. (2010) Auditory development in early amplified children: Factors influencing auditory-based outcomes in children with hearing loss. *Ear Hear*, *31*(2): 166–85.

Julia Day

Hearing loss early in life has shown to have a significant impact on the development of speech, language, and educational progress. Previous studies have demonstrated that early intervention can mitigate the deleterious effects of early hearing loss on later outcomes (e.g., Moeller, 2000; Yoshinaga-Itano et al., 1998). Other studies have found a relationship between the level of hearing loss and later language outcomes, but no relationship between the age of identification of hearing loss and the development of language (e.g., Fitzpatrick et al., 2007; Wake et al., 2005). Similarly as with language, speech production was also found by these studies to have no relationship with age of intervention. The purpose of this longitudinal study was to determine the effect that the age of fitting (of amplification) had on auditory-based outcomes, including speech perception, speech production, and spoken language.

Participants were 44 children identified with bilateral, congenital, sensorineural hearing loss sufficient to require amplification. Exclusionary criteria included additional disability, neonatal factors, reduced cognitive function, auditory neuropathy and late onset loss. The key predictor variables considered were the age the amplification was fitted and the degree of hearing loss. Additional variables included parent–child interaction, home language, and type and intensity of intervention. Outcome measures included speech perception tests (Paediatric Speech Intelligibility test and the Online Imitative Test of Speech Patterns Contrast Perception), a speech production test (Arizona Articulation Proficiency Scale–3) and a spoken language measure (Reynell Developmental Language Scales).

Results indicated that the age of fitting amplification had a significant influence on all outcomes measured. Degree of hearing loss predicted speech production and receptive and expressive language but did not predict speech perception outcomes. Use of a cochlear implant was the only other major contributor to speech perception, speech production and language outcomes.

Although this study presents some significant findings suggesting that early fitting of amplification predicts auditorybased outcomes for children with hearing impairment, the age of the children at the final testing period and their educational levels were unclear, making it difficult to interpret the longitudinal evidence presented. The authors stated some of the other limitations of the study, such as the issue of selection bias in many longitudinal studies, with families from higher SES more represented than those from lower SES. They also noted that children with hearing impairment often have additional disabilities and this study chose only to look at otherwise typically functioning children with hearing loss. They discussed the importance of studying early factors on later outcomes with all children with hearing loss.

Despite these limitations, this study makes a valuable contribution to the growing body of research looking at the complex issue of the age of identification of hearing loss to later outcomes.

ASD Education and Resources Online

A range of Autism Spectrum Disorders (ASD) resources and education modules have been developed by Speech Pathology Australia with the aim of providing professional development and capacity building for speech pathologists working in the area of ASD, to assist in their provision of services under the Helping Children with Autism package.

These initiatives have been supported by funding from the Government Department of Health and Ageing. The speech pathology specific resources available are as follows:



ASD Position Paper

- Online Peer Support Discussion Board
 DVD production of the Autism National
 - Tour presentation
- Independent Study Resource

Visit: www.speechpathologyaustralia.org.au



Belafsky, P., Coffey, M., Costello, D., Gilman, M., Lewis-McColloch, N., Sumida, Y., Atkinson, M., McHanwell, S., & Tunstall, R. (2010). *3D anatomy for speech language pathology*. London, UK: Primal Pictures. ISBN 978-1-907061-12-7 DVD-ROM; UK £145.00; www.primalpictures.com

Nicole Watts Pappas

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3D anatomy for speech-language pathology is an electronic resource aimed at speech-language pathologists for use in both clinical practice and student training. The interactive DVD-ROM contains a number of features. For example, the software allows the clinician to display detailed 3D images of various structures of the body. The images are clear and accurate and can be

manipulated in a number of ways, including 360 degree rotation and adding or removing layers of anatomy. Holding the mouse over any section of the picture labels the relevant structure and displays information regarding its function. Images included incorporate all areas of the body that would be of interest to speech-language pathologists including head and neck anatomy (incorporating skull, face, ear, oral cavity and infratemporal fossa, oronasal cavities, neck, pharynx and larynx, brain and cranial nerves, and thorax) and systems of the body (incorporating the skeletal, muscular, cardiovascular, lymphatic, nervous, endocrine and respiratory systems).

A number of animations show movements of the face, the larynx and pharynx, the temporomandibular joint, and respiration. One of the best features of this software is the inclusion of "movies" of speech sound production, voice production, and swallowing. The production of all English consonant and vowel sounds is provided as separate video files, displaying tongue, teeth and palate movement, and audio. Small movies are also included of the mucosal wave, actions of the larynx, and the swallowing mechanism. These movies would be an excellent teaching tool for clients, provided an important visual aid for learning.

As a final feature, the program includes a number of "patient information sheets" which can be viewed in either PDF or word format and printed out for clients. Topics include evaluation procedures of the larynx and swallowing, vocal disorders, structural abnormalities, and swallowing problems. The information provided on the sheets is easy to follow and includes visual representations to aid understanding. However, it would be nice to see this section expanded somewhat, with further information sheets provided on topics such as motor speech disorders.

The program is relatively easy to navigate and a tutorial provides a good introduction to the use of the software. Overall, this DVD-ROM provides a number of excellent and innovative features that would be invaluable to the working clinician in the areas of voice, motor speech, and dysphagia. It also has the potential to be an extremely useful teaching tool. Woodfine, P. (2009) *Word whizzer! Level 1*. Perth, WA: Woodfine; A\$80 plus GST plus postage and packaging; www.wordwhizzer.com

Roslyn Neilson

Word Whizzer! is a simple game that claims (with a liberal sprinkling of exclamation marks) to "improve children's ability to understand, use, and remember words so they can succeed with speaking, reading



and writing". The resource consists of a short, carefully written explanatory manual and a sturdy cardboard spinner; the adult using the game provides the vocabulary words. Given the nature of the semantic questions, all the vocabulary items have to be concrete nouns. The spinner contains six questions, three with a semantic focus and three tapping phonological awareness. The semantic questions at Level 1 (4- and 5-year-olds) are: "What does it look like?", "Where do you find it?" and "What do you do with it?". The phonological questions are: "Can you clap it?, What is the first sound?" and "What does it rhyme with?" (The reviewer has not been provided with the Level 2 version, which presumably has more difficult questions.) There is no game board along which participants can move, to give the game a competitive edge or to set limits to its duration; the "fun" of the game resides entirely in the spinning of the wheel and the surrounding discussion. Some extension games are suggested as well.

The logic of including both semantic and phonological awareness questions on the spinner is explained quite simply in the manual. It is argued that research shows that consolidating semantic and phonological information in the lexicon facilitates word retrieval in spoken and written language.

Adults are required to make sure that the child is able to answer the questions before playing the game. That is, adults are expected, when necessary, to be able to teach children basic phonological awareness skills (often difficult with 4-year-olds), question comprehension, and also the use of relevant descriptive language. Adults are also expected to be competent at choosing, introducing, explaining, and enriching the meaning of new words. Some guidance is given regarding question comprehension, but it may be problematic that *Word Whizzer!* is presented as suitable for parents and teachers as well as speech pathologists.

I see *Word Whizzer!* (Level 1) as a useful item to be kept on preschool shelves, most safely used with familiar words rather than new vocabulary. As the game values the study of words, it can hopefully increase the metalinguistic awareness of parents and preschool teachers as well as children.

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