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Running head: ICT for speech pathology service delivery

A Comparison of Rural Speech Pathologists' and Rural Residents' Access to and Attitudes Towards the Use of Information and Communication Technologies for Speech Pathology Service Delivery

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Abstract

This paper reports results and implications of two related studies which investigated (a) access of residents and speech pathologists of rural New South Wales to information and communication technologies (ICT) and (b) their attitudes towards the use of ICT for delivery of speech pathology services. Both studies used mail out questionnaires, followed by interviews with a subset of those who completed the questionnaires. Data were obtained from 43 questionnaires from rural residents and 10 interviews with a subset of those residents, and from questionnaires returned by 49 speech pathologists and 4 interviews with a subset of those speech pathologists. Results show a mismatch between rural residents' and speech pathologists' access to and attitudes towards use of ICT for speech pathology service delivery. Rural residents had better access and more positive attitudes to the use of ICT for speech pathology service delivery than expected by speech pathologists. The results of this study have important implications for education and professional development of speech pathologists and for research into the use of ICT for telespeech pathology.

Key words: attitudes, service delivery, access, information and communication technologies, telehealth

A Comparison of Rural Speech Pathologists' and Rural Residents' Access to and
Attitudes Towards the Use of Information and Communication Technologies
for Speech Pathology Service Delivery

The World Health Organization's (WHO) goal of Health for All (1985, 1998) upholds the right of every person to healthcare and requires the adoption of policies and strategies to promote equity in healthcare access (WHO, 1998). Although understanding of equity varies, one of the most frequently adopted interpretations by health service providers is that of equal access to health services for equal need (Humphreys & Rolley, 1993; McClelland, 1991). When there is unequal access, inequities are said to exist.

One of the major inequities of healthcare access in Australia is between rural and metropolitan populations (Australian Institute of Health and Welfare, 1998). This is also reflected in the maldistribution of speech pathology services (Wilson, Lincoln, & Onslow, 2002), with rural residents appearing to have fewer speech pathologists per head of population than residents in urban areas. For example, Lambier and Atherton (2003) reported that 3.9% of members of Speech Pathology Australia provided speech pathology services in the rural areas of Australia classified as moderately accessible/ inner regional, remote and very remote, areas which were home to 13.4% of the Australian population (Australian Bureau of Statistics, 2003). Similar inequities of access exist also in other countries, such as the United States (e.g. see US Department of Health & Human Services, 2000) and Canada (e.g. see Hutten-Czapski, 2001).

Alternative healthcare service delivery methods have been adopted as strategies to promote equitable healthcare to rural populations. Telehealth is one such alternative that appears to be a promising option for mainstream service delivery to underserved rural populations, both within Australia and beyond (American Speech-Language-Hearing

Association, 2005; Hornsby & Hudson, 1997; Project for Rural Health Communications & Information Technologies (PRHCIT), 1996; Strong, Trickett, Titulaer, & Bhatia, 1998; Theodoros, 2008; Toyne & Granites, 1995; Wilson et al., 2002). Telehealth is defined as ‘the *delivery of healthcare*[italics added] and the exchange of healthcare information across distances using telecommunications and information technology’ (National Health Information Management Advisory Council, 2002, p. 1).

Clinical applications of telehealth include consultation, assessment and direct service delivery, client management and documentation, and transmission of diagnostic images (American Speech-Language-Hearing Association, 2005; Serghis, 1999; Stanberry, 2000). For direct clinical applications in speech pathology, technologies that approximate normal face-to-face communication as much as possible are likely to be the most useful (Hornsby & Hudson, 1997; Jerome & Zaylor, 2000). The following features would be beneficial: two way communication (Watson, 1997), the use of both auditory and visual signals allowing the use of nonverbal communication (Hornsby & Hudson, 1997), and real time, synchronous transmission (no delay between sending and receiving the signal) (Hornsby & Hudson, 1997).

Factors influencing uptake of telehealth for telespeech pathology have also been identified. One factor thought to limit the uptake of telehealth applications in speech pathology is ICT illiteracy. In 1997, Parsons concluded that ICT illiteracy and apprehension regarding technology among families and professionals are two reasons why ICT was not widely used as a method of service delivery in speech pathology. Baur (2008) has cautioned also on the impact of the digital divide: that ‘the same population groups that have poorer health status also have less access to the internet and health information’ (p. 417). Rural residents’ perceptions of a health service also contribute to the uptake of services. Health services perceived as appropriate or useful are more likely to be used than those perceived as inappropriate (Swanson, 1999).

Although ICT illiteracy, apprehension, unequal access and acceptance of ICT service delivery are perceived concerns, it is unclear what attitudes and levels of confidence with ICT are held by speech pathologists and potential consumers, and whether those attitudes affect the uptake of ICT as a method of service delivery. If ICTs are to be used as a solution to addressing inequity in healthcare, these factors need to be investigated. The match between clinician and potential consumer attitudes, knowledge and skills for the use of ICT for service delivery also needs to be investigated. This paper presents results from two studies that begin to address these needs. These studies asked:

1. What are the access and attitudes of rural New South Wales (NSW) residents towards the use ICT for delivery of speech pathology services?
2. What are the access and attitudes of rural NSW speech pathologists towards the use ICT for delivery of speech pathology services?
3. Are there differences in the access and attitudes of rural speech pathologists and residents towards the use of ICT for delivery of speech pathology services?

The methods and data analysis used in the two studies are described separately below. The results are then jointly discussed.

Method

Two related studies were conducted to describe access to and attitudes towards the use of ICT for speech pathology service delivery. The first study sought to describe the perspectives of rural NSW residents who are potential consumers of telespeech pathology services (Pattie, 2004), while the second study focussed on the perspectives of speech pathologists in rural NSW who potentially might deliver telespeech pathology services (Dunkley, 2004).

Study 1: Perspectives of Potential Rural Consumers of Speech Pathology Services

Study 1 used a combination of quantitative and qualitative methodologies to elicit and analyse responses to a questionnaire and telephone interview. Questionnaires were sent to 1100 branch members by the NSW Branch of the Isolated Children's Parents' Association (ICPA) with a letter explaining to participants the purpose and benefits of the research, issues of confidentiality, instructions for completing the questionnaire, and contact information for the researchers and ethics committee. In addition, members were invited to consent to participate in a short qualitative telephone interview, further exploring their attitudes towards the use of ICT for telespeech pathology services. A follow up letter and invitation to complete the questionnaire electronically were sent to the ICPA members on the association's email list to encourage more people to respond after the initial closing date for returns.

The data from the questionnaires were analysed using simple frequency counts and non-parametric correlations, and the interview data were analysed using content analysis (Patton, 1990). Further details of the research methods can be found in Pattie, McAllister and Wilson (2005).

Respondents.

Forty-three of the 1100 members of the NSW branch of the ICPA to whom the questionnaires were sent responded to the questionnaire, giving a response rate of 3.9%. Respondents ranged in age from 25-34 years to 45-54 years with a mode of 35-44 years. Forty one were female, two were male. They represented a range of ages, levels of education and industries of work and included six health professionals.

Twenty one of the respondents consented to complete a follow up telephone interview. Of these respondents, 10 were selected using the principles of purposive sampling (Patton, 1990). The following criteria were used to purposively select interviewees: differing levels of access to the technologies, residence in areas of NSW of differing geographic

accessibility, differing levels of experience and confidence in the use of ICT, and inclusion of people both with and without previous experience of speech pathology services.

Questionnaire.

A written questionnaire consisting of 32 questions, designed by the researchers, was used to collect quantitative data about respondents' access to a range of ICT facilities (nine questions), their current use of these technologies (four questions), confidence using the technologies (one question), and who in the family knows most about each technology (one question). Demographic information was also collected. This included participants' need for and experiences of speech pathology services (five questions), where participants lived (three questions), and nine other questions requesting information such as age, income, and industry/ type of employment. Most questions (18) were multiple choice tick boxes, three were self-rating scales and 11 were short answer questions. Informants involved in piloting the questionnaire took between 10 and 25 minutes to complete the questionnaire, with a mode of 15 minutes.

Interviews.

A flexible interview protocol (Minichiello, Aroni, Timewell, & Alexander, 1995) was used to explore several topics during the interviews, which each took between 15 and 35 minutes to complete. Respondents with previous experience of speech pathology services were asked to compare prospective ICT-delivered speech pathology with their experiences of face-to-face speech pathology. All respondents were asked to describe their attitudes towards using the technology for receiving health services, speech pathology in particular.

Other topics explored with interview respondents included the reasons why they might not want to use ICT for speech pathology services and the modes of service delivery respondents would prefer more or less than delivery using ICT. The types of training

respondents would prefer with unfamiliar technologies in order to become confident in their use were also discussed.

Study 2: Perspectives of Rural Speech Pathologists

Like Study 1, Study 2 utilised a mixed method approach. A questionnaire was sent to 210 rural speech pathologists on the Charles Sturt University NSW clinical placements database. The university fieldwork administration officer mailed to potential respondents a letter explaining to participants the purpose and benefits of the research, issues of confidentiality, instructions for completing the questionnaire, and contact information for the researchers and ethics committee. In addition, respondents were invited to consent to participate in a short qualitative telephone interview, exploring their attitudes towards the use of ICT for speech pathology services.

As with Study 1, data from the questionnaires were analysed using simple frequency counts and non-parametric correlations, and the interviews were transcribed and analysed using content analysis (Patton, 1990). A forthcoming paper (McAllister, Dunkley, & Wilson, 2008) describes the data analysis and other aspects of the results in more detail.

Respondents.

Forty nine questionnaires were returned in reply-paid envelopes, a response rate of 23.3%. Study 2 respondents ranged in age from 20-24 years to 50-54 years, with a mode of 25-29 years. Forty seven informants were female, two were male and 92% were from an Anglo Saxon/Anglo Celtic background, consistent with the demographics of speech pathologists in Australia (see Lambier, 2002). Professional experience of the informants ranged from 0.5 years to 20 years full time equivalent, with a mode of 0.5 years experience and an average of 5.5 years experience.

Questionnaire.

The questionnaire in Study 2 contained 22 questions relating to the accessibility of ICT and the informants' experiences using ICT. Questions were a combination of tick-a-box, short answer, and self rating scales. Descriptive statistics and content analysis were used to analyse the data obtained.

Interviews.

Using principles of purposive sampling (Patton, 1990), four suitable candidates were selected from among the speech pathologists who had indicated on their returned questionnaires that they would like to participate in telephone interviews. These participants were selected based on their access to ICT, professional experience, and positive and negative attitudes toward ICT, as expressed on the questionnaire. Two of the interview informants were 40-45 years old and had worked as speech pathologists for over 15 years. The other two informants were aged 20-24 years and had worked as speech pathologists for less than 3 years. All four were female and from an Anglo Saxon/Anglo Celtic background. Interview questions covered topics such as the perceived impact ICT has had on speech pathology to date, what future impacts ICT might have, and possible solutions to barriers of ICT access and use. The interview took an average of 30 minutes to complete.

Comparison of Quantitative Results of Questionnaires

Both questionnaires required respondents to answer some questions using rating scales. For example, rural residents were asked to describe their ease of access to a range of ICTs using scales from 1 (*no access*) to 7 (*very easy access*). A similar question completed by speech pathologists used scales from 1 (*not at all easy*) to 5 (*very easy*). The scales used were different because the two research projects were conceived and conducted as separate projects. Therefore, in order to enable comparison between the two data sets, the raw data have been converted into indices with potential values from 1 to 100, weighted to take

account of the range and frequency of responses to the questions. An identical procedure was used for the data pertaining to rural residents' and speech pathologists' confidence with using a range of ICTs.

Results

Access to Information and Communication Technologies

Rural residents reported on their access to technologies in one or more of the following places: home, work, school, local library, council offices, hospital, or health centre. Speech pathologists reported only their access to these technologies at work. Figure 1 contains data reflecting the reported ease of access of respondents to a range of technologies.

[Insert figure 1 about here]

As seen in figure 1, rural residents had easy access to the following technologies: computers, CD-ROMs, internet, email, and VCRs or DVDs; while speech pathologists had the same level of access to only computers and email. The technologies of most interest for telespeech pathology service delivery (videoconferencing and webcam) were much less accessible for rural residents with nearly half the respondents (49%) reporting that both technologies were not at all easy to access. Thirty one percent of speech pathologists reported videoconferencing as neither easy nor difficult to access and 92% reported webcam as not at all easy to access.

Table 1 shows frequency of access to ICT by rural residents and speech pathologists. It demonstrates how frequently technologies were actually accessed as opposed to whether or not they could be accessed. It can be seen that a higher percentage of speech pathologists access computers and email more frequently compared with rural residents. Table 1 also demonstrates that speech pathologists and rural residents rarely used videoconferencing and webcam.

[Insert table 1 about here]

Both studies used open-ended questions to explore how respondents utilised technologies. As table 2 demonstrates, both clinicians and rural residents used technology for a range of purposes. Table 2 shows that rural residents used technologies for both personal and professional uses, including some relatively sophisticated applications such as guitar lessons. Study 2 did not ask speech pathologists to describe personal use of technologies. However, for work purposes, they appear to use fewer synchronous technologies than do rural residents.

[Insert table 2 about here]

Respondents to each study used a scale to identify their level of confidence in using ICT. Figure 2 contains data comparing clinicians' and rural residents' levels of confidence for using a range of technologies.

[Insert figure 2 about here]

Figure 2 demonstrates that speech pathologists were *very confident* with using email, the internet, VCRs and video cameras, and that rural residents were slightly less confident with these same technologies. Both rural residents and speech pathologists reported not being at all confident using those technologies having potential for synchronous telespeech pathology services, such as satellite telephones, videoconferencing and webcams.

Attitudes Toward the Use of Information and Communication Technologies

Analysis of responses to open ended questions from the questionnaires and of the interview data revealed that there were both personal and systemic barriers to the uptake of ICT for both speech pathologists and rural residents. The selection of typical comments made by the respondents presented in boxes 1 and 2 demonstrates these personal and systemic barriers.

[Insert box 1 about here]

[Insert box 2 about here]

Discussion

Two related investigations were conducted simultaneously to provide preliminary data on the access and attitudes of potential rural NSW speech pathology consumers and of speech pathologists toward ICT. Data from the two studies were compared in order to highlight similarities and discrepancies in attitudes and to identify any areas of mismatch between consumers' and speech pathologists' perspectives.

Access to ICT for rural residents had been reported as a major barrier to service delivery by ICT in a number of studies (PRHCIT, 1996). Therefore, it was expected that rural residents' access to these technologies would be significantly poorer than speech pathologists' access. However, the results of these two studies were surprising, in that rural families had considerably more access to a range of ICT than might be expected, whereas speech pathologists had considerably less access to ICT than expected.

Not surprisingly, speech pathologists' low confidence with ICT was linked to poor access to technology in their workplace. Of concern was the finding that speech pathologists erroneously believed that many rural consumers of health services would have poor access to ICT and negative attitudes towards receiving telespeech pathology. As further discussed below, our results do not support these beliefs.

In addition to rural residents' easier access, more frequent use, and higher levels of confidence for using ICT, rural residents reported a significantly wider than expected range of uses for the technologies they access. Families were using their ICT access for a range of purposes and were mostly positive towards the concept of telespeech pathology service delivery, believing it could save time and money, and increase the availability of services. By contrast, speech pathologists' uses for ICT were more limited, probably partly because of their poorer workplace access to even basic ICT such as the internet. Although many speech pathologists potentially had access to videoconferencing, few used this service to deliver

speech pathology services. Few had used webcam and the majority were unaware of the potential of satellite telephones.

One systemic barrier identified by the respondents of the two studies was the cost of infrastructure. Our studies revealed that speech pathologists' understanding of what rural residents were able to access was inaccurate. Speech pathologists in Study 2 commented they thought rural residents in remote settings are 'often not in good financial situations and will not have [access to] ICT' and that this may pose insurmountable barriers to developing telehealth service delivery. Although several rural residents acknowledged that ICT infrastructure was expensive, the study indicated that rural residents have easier access to a broad range of technologies than was thought by speech pathologists. Federal government initiatives such as the Higher Bandwidth Incentive Scheme (HiBIS) and Broadband Connect have made ICT available to many remote Australians (Department of Communications, Information Technology and the Arts, 2005).

Another barrier identified by both rural residents and speech pathologists was the need for ICT training and support, a finding consistent with other research (e.g. McCulloch & Sterling, 2006; Taylor & Lee, 2005). However, rural residents appeared more motivated to learn how to use ICT and to develop services using technologies than speech pathologists, because of their isolation and the absence of alternative services. Several rural residents reflected on the time that could be saved by using a webcam link up from home rather than travelling up to half a day for face-to-face appointments. They were asked whether the need to learn to use the technology would be a barrier to them embracing telehealth. One talked about their satellite internet connection: 'The stuff was just dumped, but we figured it out. If there's no alternatives and you're on your own, that's what you do. Now we use it all the time'. Speech pathologists may not recognise this motivation of rural residents to use ICT, as

speech pathologists erroneously believed rural residents have little access to ICT in the first place.

A final identified potential barrier to using ICT for service delivery was the concern that a telehealth service could not and should not replace a face-to-face service. Speech pathologists believed that current technology was not advanced enough for many clinical activities, but also 'because of the nature of people [they] work with we need to be a lot more hands on. Especially with feeding. You can't exactly just do that over the phone or by a videoconference'. Rural residents similarly believed that personal contact was important for effective service: 'I don't think the electronic system will ever, ever replace a heart to heart, face-to-face, eyeball each other across the table type approach to it [healthcare]'. Their views accord with those expressed by Cornford and Klecun-Dabrowska (2001) who caution against 'substitution of care with treatment' (p. 161). However, rural residents saw telespeech pathology services as an opportunity to supplement very infrequent services or to enhance communication currently occurring via telephone.

Speech pathologists and rural residents proposed similar solutions to their perceived barriers for implementing ICT as a means of providing speech pathology services. Both groups reflected on the need for government support for increased ICT infrastructure, adequate support, and education in the use of ICT. However, rural residents were willing to invest their own time to learn to use ICT whereas speech pathologists interviewed in our study expected employers to provide time for training and pay for the training itself. An additional concern reported by speech pathologists was the need for continued research into the efficacy of ICT for service delivery. Fortunately, research in telespeech pathology (e.g. Constantinescu, Theodoros, Russell et al., 2007; Fairweather, Parkin, & Rozsa, 2004; Hill et al., 2006; McAllister, Wilson, & Atkinson, 2008; Mashima et al., 2003; Perlman & Witthawaskul, 2002; Waite et al., 2006; Wilson, McAllister, & Atkinson, 2006; Wilson,

Onslow, & Lincoln, 2004; Wilson, Atkinson, & McAllister, 2008) is beginning to address this concern.

Conclusions and Implications

The two concurrent studies reported here have identified access and attitudes to ICT appropriate for telespeech pathology of small samples of rural residents and speech pathologists. These two studies have limitations. There was a low response rate by rural residents that may have lead to non-representative results. Also, the uses of ICT reported by rural residents and speech pathologists in these two studies could not easily be compared, because speech pathologists' use of technology only at work was investigated, whereas rural residents reported on their use in both work and domestic and leisure aspects of life.

Nonetheless, some important findings and implications emerged from the studies. A key finding of these studies is the mismatch between access and attitudes between rural residents and speech pathologists. Overall, speech pathologists' misperceptions of rural residents' access to technology and attitudes towards telespeech pathology services constitute a barrier to the establishment of such services. Speech pathologists participating in the study thought that access to ICT in rural and remote NSW was very poor and that telespeech pathology services would be unacceptable to rural residents. Speech pathologists' statements relating to both ICT and telehealth service delivery are predominantly negative (Dunkley, 2004). Rural residents' responses relating to high levels of access to technologies and willingness to participate in telespeech pathology services appear to be incongruent with perceptions of NSW speech pathologists. This incongruence has significant implications for the adoption of telehealth as a service delivery alternative for rural and remote speech pathology. The results indicate a need for funded training for speech pathologists in uses of ICT for service delivery. The results also highlight the need for more research and better

communication between professionals and rural residents in planning future service delivery, a need that extends beyond NSW and Australia to the international context.

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Table 1.

Frequency of Access by Rural Residents and Speech Pathologists of a Range of Information and Communication Technologies.

	Computer				CD ROM				Internet			
	Rural residents		Speech pathologists		Rural residents		Speech pathologists		Rural residents		Speech pathologists	
	n	%	n	%	n	%	n	%	n	%	n	%
Never	0	0.0	0	0.0	2	4.7	9	18.4	1	2.3	5	10.2
Yearly	0	0.0	0	0.0	0	0.0	3	6.1	0	0.0	0	0.0
Two to several times per year	0	0.0	0	0.0	3	7.0	3	6.1	2	4.7	1	2.0
Monthly and up to several times by month	0	0.0	0	0.0	3	7.0	10	20.4	1	2.3	6	12.2
Weekly	2	4.7	0	0.0	9	20.9	12	24.5	8	18.6	18	36.7
Two to several times per week	12	27.9	1	2.0	12	27.9	0	0.0	13	30.2	1	2.0
Daily	28	65.1	48	98.0	11	25.6	4	8.2	17	39.5	16	32.7
Missing data	1	2.3	0	0.0	3	7.0	8	16.3	1	2.3	2	4.1
Total	43	100.0	49	100.0	43	100.1	49	100.0	43	99.9	49	99.9

Table 1 cont.

	Teleconfer- encing		Videoconferencing				Web camera			
	Speech pathologists ^a		Rural residents		Speech pathologists		Rural residents		Speech pathologists	
	n	%	n	%	n	%	n	%	n	%
Never	4	8.2	31	72.1	13	26.5	34	79.1	42	85.7
Yearly	6	12.2	4	9.3	6	12.2	2	4.7	0	0.0
Two to several times per year	15	30.6	2	4.7	14	28.6	1	2.3	0	0.0
Monthly and up to several times by month	18	36.7	1	2.3	7	14.3	1	2.3	0	0.0
Weekly	0	0.0	1	2.3	0	0.0	1	2.3	1	2.0
Two to several times per week	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Daily	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Missing data	6	12.2	4	9.3	9	18.4	4	9.3	6	12.2
Total	49	99.9	43	100.0	49	100.0	43	100.0	49	99.9

Table 1 cont.

	Satellite phone				VCR/DVD				Video camera			
	Rural residents		Speech pathologists		Rural residents		Speech pathologists		Rural residents		Speech pathologists	
	n	%	n	%	n	%	n	%	n	%	n	%
Never	37	86.0	43	87.8	4	9.3	11	22.4	21	48.8	22	44.9
Yearly	2	4.7	0	0.0	0	0.0	2	4.1	5	11.6	9	18.4
Two to several times per year	0	0.0	0	0.0	5	11.6	9	18.4	7	16.3	4	8.2
Monthly and up to several times by month	0	0.0	0	0.0	8	18.6	13	26.5	6	14.0	7	14.3
Weekly	0	0.0	0	0.0	10	23.3	6	12.2	2	4.7	1	2.0
Two to several times per week	0	0.0	0	0.0	8	18.6	0	0.0	0	0.0	0	0.0
Daily	0	0.0	0	0.0	6	14.0	0	0.0	0	0.0	0	0.0
Missing data	4	9.3	6	12.2	2	4.7	8	16.3	2	4.7	6	12.2
Total	43	100.0	49	100.0	43	100.1	49	99.9	43	100.1	49	100.0

Table 1 cont.

	Email			
	Rural residents		Speech pathologists	
	n	%	n	%
Never	4	9.3	0	0.0
Yearly	0	0.0	0	0.0
Two to several times per year	0	0.0	0	0.0
Monthly and up to several times by month	1	2.3	0	0.0
Weekly	8	18.6	0	0.0
Two to several times per week	10	23.3	3	6.1
Daily	19	44.2	46	93.9
Missing data	1	2.3	0	0.0
Total	43	100.0	49	100.0

a Data not gathered from rural residents

Table 2.

Speech Pathologists' and Rural Residents' Reported Uses of Information and Communication Technologies.

Rural residents	Speech pathologists
Education/school	Report writing
Business	Professional development
Accounting/finance	Caseload management
Hobbies/entertainment	Statistics
Information/research	Resource access/
Games	development.
Music	Professional correspondence
Shopping	Research/ information access
Weather information	Meetings/ case conferences
Meetings	Networking
Staying in touch	Service delivery
Telehealth	(asynchronous only)
Guitar lessons	
Gambling	

Figure Captions

Figure 1. Ease of access of rural residents and speech pathologists to a range of information and communication technologies.

Figure 2. Confidence of rural residents and speech pathologists for using a range of information and communication technologies.

Box 1.

Personal Barriers to and Facilitators of the Use of ICT for Telespeech Pathology.

Speech pathologist: 'Clients in remote settings are often not in good financial situations and won't have ICT'.

Rural resident: 'Our access is about average, like everyone else we've got a fax and a computer and the internet [satellite connection] and all that'.

Speech pathologist: 'If you're not willing or wanting to use ICT, then that's a barrier as well. It's a total intrusion on my time as a clinician'.

Speech pathologist: 'Younger speech pathologists just accept ICT as part of normal routine'.

Speech pathologist: 'To treat a client properly, you need to be face-to-face'.

Rural resident: 'I don't think my son could cope with high tech link ups but it might be ok for other kids'.

Speech pathologist: 'Nobody wants to give up their face-to-face visits'.

Rural resident: 'I don't think the electronic system will ever, ever replace a heart to heart, face-to-face, eyeball each other across the table type approach to it [healthcare]'.

Box 2.

Systemic Barriers to and Facilitators of the Use of ICT for Telespeech Pathology.

Speech pathologist: 'Anything that costs money the department won't come at'.

Rural resident: 'It would be too expensive for me to buy the high tech stuff'.

Rural resident: 'This is a low-income area. As long as the government subsidises it [telehealth], like Telstra or the health department subsidise it, I think it would be great'.

Speech pathologist: 'Management are forgetting that if you want speech pathologists to continue what they're already doing and use technology, you need to give them more time and more resources to do that'.

Speech pathologist: 'Speech pathologists don't have the technical know how for using IT service delivery and there is a need for better supports in place to use this technology'.

Speech pathologist: 'Having a helpdesk available, knowing that it's there is more comforting'.

Rural resident: 'As long as there's a hotline or something, I'd give it [new technology] a go'.

Speech pathologist: 'Because of the nature of people I work with, we need to be a lot more hands on. Especially with feeding. You can't exactly just do that over the phone or by a videoconference'.

Rural resident: 'I don't think my son would cope with high tech link ups but it might be ok for other kids'.

Rural resident: 'He [son with intellectual disability receiving speech therapy] only talks when I leave. He couldn't use it [technology] on his own so there's no point'.