Speech and hearing professionals' perspectives on providing aural rehabilitation services to adults with hearing loss in Alberta

by

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Abstract

The occurrence of hearing loss increases markedly with age. Given that the population in Alberta is aging, hearing loss is expected to affect an increasing proportion of people in this province in the coming years. Research indicates that approximately half of adults in Canada with hearing loss are underserved. Aural rehabilitation (AR) services, which can include the assessment/screening of hearing, selection/fitting dispensing of hearing aids/listening devices, and post-fitting rehabilitation (such as adjustment counselling) are considered to be of benefit to adults with hearing loss. AR falls primarily within the scope of practice of three professional groups in Canada: audiologists, hearing-aid practitioners (HAPs) (also known as hearing-instrument practitioners), and speech-language pathologists (SLPs). Prior to conducting this project, very little was known about the delivery of AR services to adults in Alberta. As such, the present study is primarily an investigation of AR services provided by these groups to adults in the province.

This thesis contains two studies. The purpose of Study I was to describe the current state of AR services for adults in Alberta. In order to do so, a survey was made available to all SLPs, audiologists, and HAPs registered to practice in Alberta. Other known providers of AR services (e.g., speechreading instructors and psychologists) were also invited to participate. Descriptive and inferential statistics were utilized to analyze survey data. The purpose of Study II was to describe the perceptions of SLPs regarding SLP provision of AR services. Within this study, interviews were conducted with SLPs. Interview data were analyzed using a qualitative description approach.

Findings revealed that most audiologists and HAPs reported that they provide AR services to adult clients, while very few SLPs reported that they do so. A small group of other professionals, including psychologists, speechreading instructors, and AR specialists also reported that they provide AR services to this population. In terms of the services provided, the

main focus of audiologists is reported to be the assessment of hearing, while HAPs reported that their focus is primarily on the selection/fitting/dispensing of hearing aids/listening devices. Members of each of the three main professional groups reported providing post-fitting rehabilitation services to adults.

A comparison of professionals' perceived roles/responsibilities in AR with the services they deliver in practice revealed that SLPs are not using the full-range of their knowledge and skills in AR to deliver services to adults. SLPs explained that barriers, such as their lack of confidence to deliver AR services, make it difficult to provide these services. If SLPs are to increase their involvement in delivering AR services to adults with hearing loss in the future, the following changes are recommended: greater interprofessional collaboration between SLPs and other providers of AR; opportunities for SLPs to practice hands-on AR skills within coursework, clinical practica, and post-professional training; and SLP governing body advocacy with regard to the importance of AR services (in particular post-fitting rehabilitation services) for the well-being of adults with hearing loss. SLPs have the potential to increase their involvement in the delivery of AR services to adults in Alberta, and as a result, better serve the growing population of adults with hearing loss in the province.

Preface

This thesis is an original work by Alison Harding. The research project to which this thesis contributes received research ethics approval from the University of Alberta Research Ethics Board. The submitted project was named “Professionals perspectives on aural rehabilitation,” numbered Pro00062994, and dated 25 May, 2016. Several resources for the literature review and methodology were provided by the thesis supervisory committee. Dr. Melanie Campbell and Dr. Wonita Janzen were the supervisory authors, and assisted with the conceptualization of the project and drafting of this manuscript.

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Table of Contents

List of Tables

Introduction

Hearing Loss in Adults

According to the World Health Organization (WHO, 2011), the world's population is aging. The percentage of the population aged 65 years or older is projected to increase from 8% in 2010 to 16% by the year 2050 (WHO, 2011). This phenomenon is driven by declining fertility rates, increasing longevity, and changes in the leading causes of disease and death (WHO, 2011). Much of this increase in the older adult population is expected to occur in developing countries, however, an aging trend can also be seen in developed nations, such as Canada (Taylor, 2014; WHO, 2008). The proportion of the population comprised by Canadian seniors is expected to rise from 15.3% in 2013 to 25% by the year 2056 (Taylor, 2014). What is more, people aged 85 or older make up the fastest growing segment of the Canadian population (Taylor, 2014). This same pattern can be seen in Alberta, where the percentage of seniors aged 65 and over is expected to rise from 12% in 2010 to 20% in 2030 (Canadian Institute for Health Information, 2011). While the long-term impact of an aging population is unknown, the WHO (2011) suggests it will "challenge national infrastructures, particularly health systems" (p. 6). Increases in the prevalence of age-related health issues will result in greater demand for health programs and services (Taylor, 2014).

One age-related health issue is hearing loss. Hearing loss is the world's most common disabling condition, affecting 10% of the world's population (WHO, 2008). The prevalence of this condition increases markedly with age, affecting approximately 25% of adults aged 50-60, and 50% of those older than 85 (Boi et al., 2012). This trend can also be seen in Canada, where hearing loss affects 6.4% of adults aged 55-64, 11.9% of those between the ages of 65-74 and 29.5% of those 75 years or older (Statistics Canada, 2009).

The term presbycusis is used to describe hearing loss associated with the aging process (Tye-Murray, 2015). It is typically diagnosed when an adult presents with high-frequency

hearing loss, and often leads to decreased word recognition ability, and sometimes to decreased auditory processing abilities (Tye-Murray, 2015). Currently, there is no cure for sensorineural hearing loss (Gagné, Jennings, & Southall, 2009). Hearing aids can improve hearing perception, but they do not restore “normal” hearing (Shanks, Wilson, Larson & Williams, 2002). According to Gagné et al. (2009), “regardless of the treatment program undertaken, a person who consults a health professional because of difficulties with hearing loss always will have this loss” (p. 9).

The subjective experience of living with hearing loss differs for each person, and cannot be predicted by audiometric thresholds or word-recognition scores (Tye-Murray, 2015). Hearing loss may affect an individual’s experiences in a broad range of environments, such as the home, the workplace, and the community (Tye-Murray, 2015). Untreated hearing loss leads to diminished psychosocial well-being (Dye & Peak,1983), and elevated levels of distress, depression, and loneliness (Gopinath et al., 2009). It also negatively impacts quality of life, both for the person with hearing loss and for his/her frequent communication partners (Dalton et al., 2003). Hearing loss may trigger a “negative feedback loop,” in which an older adult with hearing loss withdraws from conversation (due to the increased effort required to hear), which leads to negative reactions from conversation partners (such as the assumption that the older adult is senile or demented), which results in emotional distress for the older adult and further withdrawal from social interaction (Tye-Murray, 2015, p. 444).

Another factor relevant to the experience of living with hearing loss is that of self-stigma. Corrigan, Larson and Rüsch (2009) wrote that “Self-stigma comprises three steps: awareness of the stereotype, agreement with it, and applying it to one’s self” (p.75). Self-stigma occurs when a person with hearing loss consciously or unconsciously adopts negative views about hearing loss held by members of the community (Gagné, Southall, and Jennings, 2011). It amplifies negative feelings associated with hearing loss, including stress, shame, and low self-esteem

(Gagné et al., 2011).

Hearing aids improve mood and quality of life in older adults, increasing their sense of general health, vitality, social functioning, emotional stability, and mental health (Boi et al., 2012). Hearing aids reduce the psychosocial, social and emotional effects of hearing loss, and improve perceptions of health-related quality of life (Chisolm et al., 2007). They also increase a patient's sense of confidence and independence, and positively impact his/her outlook on life and relationships with family (National Council on Aging, 1999).

Despite the positive outcomes associated with hearing-aid use, many seniors with hearing loss do not seek treatment. According to Donahue, Dubno, & Beck (2010), only 20% of seniors with hearing loss seek treatment, and often wait 10 or more years (from the time they first notice a hearing problem), or until the condition has become severe before seeking intervention. What is more, "of the people who seek out hearing aids, a significant proportion does not adhere to them (i.e., do not wear the aids or wear them intermittently)" (Laplante-Levesque, Hickson & Worrall, 2010b, p. 148). According to the WHO (2006), only one in five people who would benefit from hearing aids actually use them.

The literature points to two main reasons for this lack of hearing-aid use: issues accessing services and dissatisfaction with hearing aids. There are both internal and external factors that affect an individual's ability to access hearing services. Hogan, Reynolds and O'Brien (2011) suggest that self-stigma (an internal factor) leads people to deny their hearing loss, and inhibits them from accessing the services they need, "even if this denial poses disadvantages for their well-being" (p. 13). External factors, such as limited numbers of hearing healthcare providers and programs to train these professionals, lack of government funding, and limited public and professional awareness also affect individuals' ability to access services (Goulios & Patuzzi, 2008; Swanepoel et al., 2010).

Dissatisfaction is another main reason for the lack of hearing-aid use. According to

Kochkin (2005), less than 60% of hearing-aid owners are sufficiently satisfied with their hearing aids to use them on a regular basis. Many hearing-aid owners stop using their devices after a brief trial period (of a few days or a week), and then put them away in a drawer or return them (Tye-Murray, 2015). Some common reasons for returning hearing aids include: perceived lack of benefit, trouble listening in the presence of background noise, annoying signal feedback, and discomfort (McCormack & Fortnum, 2013). Historically, aural rehabilitation (AR) programs have been developed to address these problems and to reduce dissatisfaction with hearing aids.

Literature Review

Aural Rehabilitation

The field of AR originated during the Second World War, at which time there was a need to address hearing damage in veterans (Hull, 2001). Since then,

> The importance of AR services within the discipline of audiology and the types of services provided by rehabilitative audiologists, and the service delivery models used to organize and define the scope of practice in rehabilitative audiology have been in constant evolution (Gagné & Jennings, 2008, p. 371)

In the early twentieth century, AR services tended to focus on speechreading (formally known as lip-reading) training (Tye-Murray, 2015). Since the invention of hearing aids, cochlear implants, and assistive listening devices, AR has focused more on the use of residual hearing and less on speechreading (Tye-Murray, 2015).

According to Patterson (2001), “while the cornerstone of aural rehabilitation is the use of hearing aids, there are many other facets to a comprehensive program” (p. 9). According to Tye-Murray (2015), AR (as broadly outlined for children and adults) may involve any of the following services:

> Identification, quantification, and diagnosis of hearing loss and other hearing-related communication difficulties, assessment of visual-only and audiovisual speech recognition, selection and fitting of listening devices, speechreading and auditory training, patient and family counselling, psychosocial support, follow-up services, communication strategies training, tinnitus treatment, literacy promotion, speech and language therapy, classroom management, parent instruction, sign-language instruction, noise protection, workplace accommodations and school and nursing home in-services. (p. ix)

What unifies these services is “an emphasis on understanding and addressing the needs of patients who have hearing loss and their family members and an emphasis on ensuring the

patients and their communication partners achieve maximum communication success in their everyday environments" (Tye-Murray, 2015, p. ix).

According to Laplante-Levesque et al. (2010b), "the provision of a range of interventions, beyond the common fitting of hearing aids, is likely to result in more older adults being willing to take up rehabilitation" (p. 150). However, in reality, many programs continue to have a "predominantly technical focus, with hearing aids being the most common form of treatment" (Hickson & Worrall, 2003, p. 2S84). Providing hearing aids without follow-up intervention is inadequate, as it fails to address "strategies and techniques necessary to optimize effective communication" (Hickson & Worrall, 2003, p. 2S85) or "communication difficulties between the person with hearing impairment and his or her family members" (Scarinci, Meyer, Ekberg, & Hickson, 2013, p. 88). In cases where AR is provided after the fitting of hearing aids, these services vary from provider to provider (Tye-Murray, 2015). Several variables factor into the decision about which AR services to provide, including: "the needs and desires of the patient, the availability of services within an aural rehabilitation practice and the surrounding community, and the cost-effectiveness of providing a particular intervention treatment" (Tye-Murray, 2015, p. 26).

Post-hearing-aid-fitting counselling plays an important role in the AR process. According to Erdman (2006), there is "mounting evidence of the benefits to be gained by providing counselling and other client-centered rehabilitative services" (p. 4). It is recommended that AR programs "promote client participation, specifically, client-centeredness, joint goal setting, and shared decision making," as this improves adherence to hearing aids and outcomes for people with hearing loss (Laplante-Lévesque, Hickson & Worrall, 2010a, p. 11). Counselling-based AR programs have a number of benefits, including: increased knowledge of hearing-related issues (Borg, Danermark, & Borg, 2002), decreased perception of hearing-related difficulties (Taylor & Jurma, 1999) and participation restrictions (Ventry & Weinstein, 1983), enhanced ability to use

coping strategies (Backenroth & Ahlner, 2000), and improvements in quality of life, both for the person with hearing loss and for frequent communication partners (Kramer, Allessie, Dondorp, Zekveld, & Kapteyn, 2005). Participation in counselling also increases the likelihood a person will wear his/her hearing aids, and reduces the perception of hearing handicap (Hickson, Worrall, & Scarinci, 2007).

AR may be provided in individual or group sessions (Tye-Murray, 2015). In either case it is recommended that family members and/or frequent conversation partners be included in the rehabilitation process, so they can learn to optimize communication with the affected individual (Scarinci, Worrall, & Hickson, 2012). Auditory training and speechreading are often practiced individually at home, with the guidance of a clinician or a computer-based program (Tye-Murray, 2015). Home-based auditory-training programs are also available to adults with cochlear implants, such as the nine programs reviewed by Zhang, Miller, and Campbell (2014). It has been found that individual auditory training improves listening skills in adults with hearing loss (Sweetow & Palmer, 2005). Individual speechreading training can improve patients' ability to recognize speech stimuli, but these improvements are generally modest (Bernstein, Auer, & Tucker, 2001).

There is much support in the literature for the provision of group AR services. A meta-analysis by Hawkins (2005) revealed that group AR programs result in short-term psychosocial benefits, including reduced self-perception of hearing difficulty, and improved self-perception of quality of life. Other benefits of group AR programs include: increased interaction with peers, expansion of one's social network, decreased loneliness, and increased motivation to seek hearing-related health care (Tye-Murray, 2015). Group counselling provides opportunities for interpersonal interaction, and allows patients to "exchange stories and solutions, share frustrations, and talk about their hearing aids" (Tye-Murray, 2015, p. 469). For individuals with chronic conditions like hearing loss, group counselling has been shown to be as effective, if not

more effective than individual counselling (Burlingame, Fuhriman, & Mosier, 2003; Yalom & Leszcz, 2008). According to Erdman (2009), group counselling is “invaluable in facilitating adjustment to hearing impairment and hearing aid use” (p. 17). As such, it is not surprising that “group aural rehabilitation programs increase compliance with hearing aid use” (Tye-Murray, 2015, p. 336). In addition to these benefits, group AR programs are also time- and cost-effective for clinicians, as this approach allows them to treat a greater number of patients in a shorter amount of time (Erdman, 2009).

Given that there is no cure for sensorineural hearing loss, the overall goal of AR is not to correct a person’s hearing impairment or to restore perfect hearing (Gagné et al., 2009). As such, AR does not fit well within a traditional medical model of health, which focuses on the restoration of physical function. AR fits better within the WHO (2001) International Classification of Functioning (ICF) model, a biopsychosocial classification of health (Gagné et al., 2009). The WHO ICF is well suited for application to chronic conditions, such as hearing loss, that involve “impaired body structures or functions that cannot return to normalcy” (Gagné & Jennings, 2011, p. 10). This model allows for the consideration of factors beyond the impairment of body structures and functions, including activity limitations, participation restrictions, and environmental and personal factors. The WHO (2001) ICF model also accounts for the impact of health conditions on the family and/or frequent communication partners of the affected individual; this phenomenon is called “third-party disability” (Scarinci et al., 2012).

Considering the many goals, purposes, styles and formats of AR, it is of little surprise that one standard definition of it does not exist in the literature. Comparison of several of the existing definitions reveals that they differ in the following three ways: the extent to which they align with the goals of the WHO (2001) ICF model, the terminology used, and the component-services included as belonging within AR. With regard to the WHO (2001) ICF model, authors incorporate the goal of increasing participation in activities of daily living to varying degrees. For

example, Tye-Murray (2015) states that AR is “intervention aimed at minimizing and alleviating the communication difficulties associated with hearing loss” (p. 700). Hull (2001) defines AR as “an attempt to reduce barriers to communication that result from hearing impairment and facilitate adjustment to the possible psychosocial, educational, and occupational impact of an auditory deficit” (p. 12). Gagné et al. (2009) state that AR comprises “intervention procedures designed to restore or optimize participation in activities considered limitative by persons with hearing loss or by other individuals who partake in activities that include persons with hearing impairment” (p. 49-50). The Gagné et al. (2009) definition is most closely aligned with the WHO (2001) ICF model, because it refers specifically to activity and participation restrictions, as well as the impact of hearing loss on conversation partners. Combining the ideas from the definitions written above demonstrates that a standard definition of AR could incorporate the following goals: minimizing communication difficulties associated with hearing loss (both for the affected individual and/or for the conversation partner), facilitating the process of adjusting to living with hearing loss, and enhancing participation in activities of daily life.

A second factor that contributes to variations in the definition of AR is the inconsistent use of terminology, namely: 1) aural rehabilitation vs. aural habilitation, and 2) aural rehabilitation vs. audiologic rehabilitation. With regard to the first set of terms, it is generally understood that aural rehabilitation is used to describe services provided to people who incur hearing loss postlingually (i.e., after they have acquired spoken language) (Tye-Murray, 2015). As such, these services are generally provided to adults and aim to restore lost communicative function (American Speech-Language Hearing Association (ASHA), 2011; Tye-Murray, 2015). By contrast, aural habilitation is generally used in reference to services provided to people with prelingual hearing loss (i.e., hearing loss incurred prior to the acquisition of spoken language) (Tye-Murray, 2015). As such, these services are generally provided to children who are “currently acquiring listening, speech, and language skills” and aim “to develop (i.e., to habilitate

or furnish) skills that were not present beforehand" (Tye-Murray, 2015, p. 699). Despite this distinction in terminology stated by Tye-Murray (2015), this same author lists classroom management, parent instruction, and sign-language instruction as components of aural rehabilitation (p. ix). While it is possible that these services could be provided to an older child with hearing loss who has already acquired the fundamentals of language, it seems more likely that they would fit within an aural habilitation program for a younger child. Another example of inconsistent use of these terms comes from Hardick and Lesner (1979), who discuss "the need for habilitation programs to assist individuals [in coping] with the denial acceptance issue" (p. 23). This statement leads to confusion, as it is generally adults, not children, who struggle to overcome feelings of denial associated with hearing loss. Consistent use of the terms rehabilitation and habilitation would facilitate the development of a standard definition of AR.

With regard to the second set of terms, we see that aural rehabilitation and audiologic rehabilitation are used inconsistently in the literature. ASHA (2001) defines the terms identically: "audiologic/aural rehabilitation (AR) is an ecological, interaction process that facilitates one's ability to minimize or prevent the limitations and restrictions that auditory dysfunctions can impose on well-being and communication, including interpersonal, psychosocial, educational, and vocational functioning" (p. 394). And yet ASHA uses the term audiologic rehabilitation in the ASHA (2004) Scope of Practice in Audiology document, and aural rehabilitation in the ASHA (2007) Scope of Practice in Speech-language Pathology. Based on this information, it would appear that what differentiates these terms (in the United States) is not the type of services provided, but rather the professional providing those services. In Canada, Speech-Language & Audiology Canada (SAC, 2004) uses the term aural rehabilitation within the scope of practice documents for both audiology and speech-language pathology (SLP). However, instances of the term audiologic rehabilitation can also be found in Canadian research literature (e.g., Gagné & Jennings, 2011). From this information, it appears that the terms audiologic and aural

rehabilitation are interchangeable. Yet another term used in the literature, rehabilitative audiology, appears to be synonymous with audiologic/aural rehabilitation (International Collegium of Rehabilitative Audiology, 2015). As such, the creation of a standard definition of AR would necessitate the consideration of the following terms: aural rehabilitation, audiologic rehabilitation and rehabilitative audiology.

Beyond the terminology or the degree to which the WHO ICF model is incorporated within the definitions, the component services included within AR also affect the ways in which the term is defined. Tye-Murray (2015) states that AR may include the assessment (Ax) of hearing, the selection and fitting of listening devices, as well as post-hearing-aid-fitting intervention, such as counselling. However, Tye-Murray (2015) also defines AR as "intervention aimed at minimizing and alleviating the communication difficulties associated with hearing loss" (p. 700). Similarly, Gagné et al. (2009) refers to AR as "intervention" without mention of the assessment of hearing or the fitting of hearing aids/listening devices. Boothroyd (2007) leaves out the testing of hearing from his definition, but mentions the importance of "sensory management" (i.e., the use of a listening device) in AR, as well as "perceptual training and counselling" (p. 69). These differences make it difficult to know at which point in the process of assessment, hearing-aid fitting, and post-fitting intervention AR is considered to officially begin. The creation of a standard definition among professionals would clarify the component services that belong within AR. In summary, the establishment of a standard definition of AR would necessitate consideration of the following: the extent to which the goals of AR align with the WHO ICF model, the terminology used (i.e., aural (re)habilitation and aural/audiologic rehabilitation) and the component services that belong within AR.

Providers of AR to Adults: Overlapping Scopes of Practice

According to Tye-Murray (2015), AR services for adults may be provided by audiologists, speech-language pathologists and teachers of the deaf and hard-of-hearing. Though not

mentioned by Tye-Murray, in the province of Alberta hearing-aid practitioners (HAPs) may provide AR services to adults, too (College of Hearing Aid Practitioners of Alberta (CHAPA), n.d.). Of these four professions, however, it is more typical for teachers of the deaf and hard-of-hearing to work with children (M. Campbell, personal communication, March 23, 2016). The roles of SLPs, audiologists and HAPs relative to AR provision will be explored because these are the most likely professions to provide services to adults.

SLPs and audiologists. The practice of AR involves "many areas of knowledge and skills that are fundamental to both audiology and speech-language pathology" (ASHA, 2001, p. 393). According to ASHA (2001), AR represents "an area of clinical endeavour in which the audiologists' and speech-language pathologists' knowledge and skills have been most clearly related and intertwined" (p. 394). Given that hearing loss can affect the development and use of speech, language and communication, it makes sense that "audiologists' and speech-language pathologists' roles may be complementary, interrelated, and at times, overlapping" (ASHA, 2001, p. 393).

Audiology and SLP students in both Canada and the United States are required to take a minimum of one course of aural habilitation/rehabilitation, which "spans issues related to infants, children and adults, as well as devices (hearing aids, cochlear implants and assistive technology), counselling, educational placement issues, communication methods and communication training" (Grimes, 2002, p. iii). What is more, both SLPs and audiologists form the membership of professional groups identified with the topic of AR, such as *ASHA Special Interest Group 7: Aural Rehabilitation and its Instrumentation*, and the *Academy of Rehabilitative Audiology* (Montano, n.d.).

SAC and ASHA have each developed separate scope of practice descriptions for the professions of SLP and audiology. The descriptions list the knowledge and skills necessary for clinical certification in each country (ASHA, 2004; ASHA, 2007; SAC, 2004). The documents

provide a framework upon which respective university programs and national certification exams are based. These scope-of-practice documents also specify the knowledge and skills necessary to the provision of AR, within each profession. In terms of SLP skills in the area of AR, Canadian SLPs must demonstrate knowledge of the following (note that the age of the client is not specified):

> Approaches to habilitation and rehabilitation of speech and language (e.g., oral, manual, total, aural, visual communication) and their advantages and disadvantages; the use, care, and maintenance of hearing aids, assistive listening devices, and amplification systems; modifying management plans to accommodate varying degrees of hearing loss. (SAC, 2004, p. 36)

Within the SAC (2004) audiology scope-of-practice document, the knowledge/skills necessary to the provision of AR by audiologists is broken down by the age group of the client. With respect to providing rehabilitative services to the adult population, Canadian audiologists must demonstrate knowledge of the following:

> Appropriate rehabilitation teams; components in the comprehensive functional communication maintenance program; rehabilitation programs that promote self-care; educational and training programs for the elderly and their communication partners, including family and caregivers providing assistance in activities of daily living either in the home or in institutional settings; speechreading training requirements and procedures for maintenance of communication function; environmental modifications (e.g., modification of room acoustics to reduce noise and reverberation, lighting, seating arrangements, scheduling of activities); benefits and limitations of amplification; benefits and limitations of personal institutional assistive listening devices for the client and their communication partners (e.g., telephone devices, television devices, FM and infra-red systems, handheld amplification devices, signaling devices. (p. 20)

In comparing these two descriptions, we see that the knowledge and skills required of SLPs is stated more generally than that of audiologists, but that both have a role to play in providing AR services.

Similarly in the United States, ASHA (2001) published a document entitled *Knowledge and Skills Required for the Practice of Audiologic/Aural Rehabilitation* to differentiate the roles of SLPs and audiologists in providing AR. This document outlines the "basic areas of knowledge," which are common to both professions, as well as "special areas of knowledge and skills" that are unique to SLP or audiology. While these "special areas of knowledge and skills" differ between the two professions, instances of overlap can still be seen. For example, with respect to AR case management, ASHA (2001) states that audiologists "provide appropriate individual and group adjustment counselling related to hearing loss for individuals with hearing impairment and their families" (p. 398) and that SLPs "provide for communication and counselling intervention in the client's preferred mode of communication" (p. 400). While the role description for audiologists is more detailed than that for SLPs, it is clear that both professions have a role to play in the counselling process.

HAPs and audiologists. The Canadian Hearing Instrument Practitioners Society (CHIPS) is the national professional organization for "Hearing Instrument Practitioners (HIPs)." This term appears to be a variation on "Hearing-Aid Practitioner." The CHIPS website is silent on "aural rehabilitation" itself, but the website indicates that the society is focused on helping its members to be "recognized as vital members of the hearing healthcare team in the delivery of services" to people with hearing impairment (Canadian Hearing Instrument Practitioners Society, 2017). According to the College of Hearing Aid Practitioners of Alberta (CHAPA, n.d.), the scope of practice of HAPs includes the following activities: assessment of hearing, explanation of assessment results to the client, fitting and dispensing of hearing aids, follow-up services including adjustment and maintenance of hearing aids, recommendation of assistive

listening devices, and counselling of clients and families “to ensure that they may derive the best benefit possible from the amplification dispensed” (p. 1). CHAPA (n.d.) states that “counselling may include assistance in teaching clients alternative methods used to enhance communication and referral to sources such as Deaf and Hard of Hearing Services which may be of benefit to the client” (p. 1). In Alberta, HAPs are trained at MacEwan University. This program includes two courses in AR. *AR I* is described as an introductory course, in which “students learn about health promotion and the use of a team approach to providing health care services and support to adults with hearing loss” (MacEwan University, 2013). In *AR II*, “students learn to incorporate aural rehabilitation and communication strategies into practice with individuals and groups, with a specific focus on the older population” (MacEwan University, 2013).

There are a number of areas of overlap between the services provided by HAPs and audiologists, such as the testing of hearing, the fitting of hearing aids, and the provision of post-hearing-aid rehabilitation. As such, “there has been a long history of confusion and controversy regarding the titles and scopes of practice of audiologists and hearing-aid practitioners” (SAC, 2014, p. 2). In order to differentiate the scopes of practice of audiologists and HAPs, SAC (2014) published a document entitled *Differences Between Audiologists and Hearing Instrument Practitioners in Hearing Health Care.* It states that “the hearing instrument practitioner’s scope of practice is narrower than the audiologist’s” (p. 3). HAPs “test peripheral hearing for the purpose of selecting, fitting, and dispensing hearing aids and other assistive listening devices,” and are limited to working with the adult population (p. 3). By contrast, audiologists “are uniquely qualified to assess, identify, diagnose (restricted to some provinces) and manage individuals with peripheral or central hearing loss, hyperacusis, tinnitus and balance disorders; and to select, prescribe, fit and dispense hearing aids and other listening devices” (p. 3). Audiologists are also trained in counselling and aural (re)habilitation, and provide services to people of all

ages (SAC, 2014). There are “substantial differences in the education level and scope of practice between the two professions” (Alberta College of Speech-Language Pathologists and Audiologists (ACSLPA), 2015b). In terms of education, audiologists must have completed six to eight years of university-level coursework and practica, leading to a Master’s degree or Doctor of Audiology degree (ACSLPA, 2015b). By contrast, HAPs are required to complete a two-year diploma program (which includes coursework and practica) (ACSLPA, 2015b).

Overall, we see that the scope of practice of audiologists is broader and their training is more comprehensive than that of HAPs. Despite these differences in education, the MacEwan University (2013) curriculum suggests that HAPs also have an important role to play in providing AR services to adults in Alberta. On the other hand, it is interesting to note that Article III on the membership of the Academy of Rehabilitative Audiology Bylaws prescribes that:

> Members shall hold a graduate degree in audiology, speech-language pathology, education of persons who are hearing-impaired or a related discipline as determined by the membership committee and shall have two years of post-degree involvement in habilitation, rehabilitation or education of persons who are hearing-impaired. (Academy of Rehabilitative Audiology, September 2014).

It is not clear whether Hearing-Aid or Hearing-Instrument Practitioner is considered a “related discipline”.

SLPs, audiologists, and HAPs. No literature was found ***directly*** comparing the ***three*** professions in terms of AR. For the purposes of making my own comparison among the scopes of practice of SLPs, audiologists, and HAPs, I will consider AR in three parts, namely: the testing of hearing, the selection/fitting/dispensing of hearing aids/listening devices, and the provision of post-fitting rehabilitation services, such as counselling, communication-strategies training, speech reading, etc. Given that the literature shows a varied view about when in the process of assessment/screening of hearing, selection/fitting/dispensing of hearing

aids/listening devices, and post-fitting rehabilitation AR technically beings, I have decided to use a broad conception of the term (including all possible AR services) within this thesis. This was done so as to be inclusive of the various viewpoints that exist with regard to the component-services that constitute AR.

As seen in Table 1, audiologists and HAPs/HIPs can play a role in all three of the above-named steps. By contrast, SLPs are generally not involved in the testing of hearing (beyond performing routine screenings) or the selection/fitting/dispensing of hearing aids. Thus, the role of SLPs in providing AR focuses on the provision of hearing screenings and post-fitting rehabilitation services. Post-fitting rehabilitation represents an area of overlap among all three professions. As such, an examination of AR services in Alberta requires consideration of SLPs, audiologists, and HAPs.

Table 1: Scope of practice overlap among professionals in delivering AR services

	Assessment/screening of hearing	Selection/fitting/dispensing of hearing aids/listening devices	Post-fitting rehabilitation
Audiologists			
HAPs/HIPs			
SLPs	(screening only)		

AR Services for Adults in Alberta

According to Tucci, Merson & Wilson (2009), there is a global shortage of services for people with hearing loss, both in developing and developed nations. Tye-Murray (2015) states that “many people with hearing loss are unserved or underserved” (p. 17). The term *unserved* is used to mean that a group “is not served as a result of policy, practice, or environmental barriers,” and *underserved* to denote “a population that is inadequately served” (p. 17). In Canada, a study entitled *The 2006 Participation and Activity Limitation Survey* (Statistics Canada, 2006) revealed that approximately 49% of adults aged 15-64 and 43% of adults aged 65 or older with hearing loss are in need of more help and support than they currently get, in

order to overcome activity/participation restrictions and participate fully in society. This means that a sizeable portion of the adult Canadian population with hearing loss is unserved or underserved. The proportion of adults with hearing loss in Alberta who are unserved or underserved is not currently known. The Alberta Government subsidizes the cost of hearing aids, listening devices, and aural rehabilitation through the Alberta Aids to Daily Living program (Government of Alberta, © 1995-2017).

In order to gather preliminary information on the prevalence and scope of AR services in the province of Alberta, an environmental scan was conducted (see Appendix A for search strategy and findings). This environmental scan involved conducting Internet searches using two different search engines: Google.ca and Bing.com. In each of the internet searches performed, the following criteria were used to determine relevancy of search results: a) the website needed to use the term “aural rehabilitation” to describe services provided to adults in Alberta, and/or b) the website needed to use a term relating to AR component services (e.g., “counselling”) to describe services provided to adults with hearing loss in Alberta. These criteria were not search terms (the search terms are outlined below), but rather were used as a way to select websites that contained relevant information.

The search term “aural rehabilitation services Alberta” yielded 12 relevant results on Google.ca and only five on Bing.com. As a result, Google.ca was used for all follow-up searches, including: “orientation to hearing aid Alberta” (1 relevant result), “speechreading Alberta” (7 relevant results), “auditory training Alberta” (4 relevant results), “hearing loss counselling Alberta” (8 relevant results), “conversation communication strategies training hearing loss Alberta” (6 relevant results), “partner training hearing loss Alberta” (3 relevant results), and “assistive listening devices hearing loss Alberta” (14 relevant results). Among these search results there was considerable duplication (e.g., the *Canadian Hard of Hearing Association* website came up during six of the above searches). Overall, the results of this

environmental scan revealed that aural rehabilitation services (and component services therein) are advertised as being provided by 34 different organizations in Alberta. While some of these organizations list the professionals they employ (e.g., audiologists, HAPs, SLPs, psychologists, etc.), they generally do not indicate which services the different professionals provide. As such, questions remain regarding the specific roles of SLPs, audiologists, and HAPs in providing AR services to adults in Alberta.

A picture of AR in Alberta has not been found in the literature. The goal of this thesis is to provide both quantitative and qualitative description of the current state of AR in Alberta with attention to professions that provide AR, the component services comprising AR, the perceptions of professionals regarding *if* and *how* AR relates to their professional scopes of practice, and the degree to which such services may or may not be coordinated in an interdisciplinary manner.

Study Goals

Three goals were outlined to describe AR services for adults in Alberta. The first goal of this research was to describe the current state of AR in Alberta for adults with hearing loss. I asked two specific questions aimed at producing a comprehensive description:

1. Who reports providing AR services to adults with hearing loss in Alberta and what are their demographics (profession, work location, training in AR, etc.)?
2. What is the nature of the AR services provided? That is, what are the service components provided?

The second goal of this research was to examine professionals' perceived scopes of practice in the area of AR and their perceived confidence to deliver those services. As such, this research also seeks to answer the following research question:

3. Which AR component-services do speech and hearing professionals report falling within their scopes of practice, and how confident are they in providing those services?

The third goal of this research is to describe the perceptions of SLPs in Alberta regarding SLP provision of AR services:

4. How do SLPs in Alberta perceive SLP provision of AR services to adults with hearing loss (whether or not they currently provide such)?

Study I: Survey

Survey Methods

According to Fowler (2009), “surveys are designed to produce statistics about a target population.” (p. 11). These authors state, “the process by which this is done rests on inferring characteristics of the target population from the answers provided by a sample of respondents” (p. 11). In this study, a web survey was utilized, as it allowed me to efficiently gather data from speech and hearing professionals across Alberta. According to Wright (2005), advantages of web surveys include: “access to individuals in distant locations, the ability to reach difficult to contact participants, and the convenience of having automated data collection” (p. 00). Other advantages of web surveys include: “low cost of data collection and potential high speed of returns” (Fowler, 2009, p. 83). A major limitation of online survey research, however, is non-response bias (Hibberts, Burke Johnson, and Hudson, 2012). Further information about non-response bias and how it was mitigated is included within the Population and Sampling section that follows.

Population and sampling. The population for this study was speech and hearing professionals in the province of Alberta. This included SLPs, audiologists, HAPs, and other professionals who may provide components of AR services (speechreading instructors, psychologists, rehabilitation counsellors, and teachers of the deaf and hard of hearing). According to the most recent *Annual Report* created by ACSLPA (2015a), there are approximately 164 audiologists and 1352 SLPs currently registered to practice in the province. The CHAPA (2017) website lists 235 HAPs currently registered to practice in Alberta. The number of other professionals (e.g., speechreading instructors) in Alberta who may provide AR is unknown.

Due to privacy laws, ACSLPA and CHAPA were not allowed to provide me with the email addresses of their members. Instead, CHAPA sent an email containing a link to the online

survey to its list of members. ACSLPA was not able to send an email to its members on behalf of the researchers. Instead, ACSLPA included a link to the survey in *Communication Matters*, a newsletter that is emailed to members on a monthly basis. The survey was advertised in both the June 2016 and July 2016 editions of *Communication Matters*. In addition to this, a link to the survey was emailed to managers of SLP and audiology departments at Alberta Health Services (AHS) and Covenant Health (CH); managers were asked to forward the link to their employees. Prior to sending these email requests to managers, operational requests were submitted to Research Administration at AHS and CH. These requests were approved for the following programs/sites: Public Health Centres (AHS, Edmonton), Allied Health Services and Programs (AHS, Edmonton), and SLP/audiology programs at the University of Alberta hospital (AHS, Edmonton), the Misericordia Hospital (CH, Edmonton), the Grey Nuns Hospital (CH, Edmonton), and St. Mary's Hospital (CH, Camrose). Operational approval requests for the Glenrose Rehabilitation Hospital and for AHS sites outside of the Edmonton region were not approved until September 2016, at which time the survey had closed. As such, requests were not sent to managers at these sites. In addition to these recruitment efforts, a link to the survey was sent via email to organizations/programs advertising AR services (e.g., *Deaf and Hear Alberta* and various private audiology clinics). The link to the survey was also emailed to SLPs, audiologists, HAPs, and other professionals (who advertised the provision of AR services) whose email addresses are publicly available online (e.g., on private-practice websites). The survey was also advertised via social media (e.g., on the *University of Alberta Faculty of Rehabilitation Medicine* Facebook and Twitter pages). The recruitment poster containing a link to the survey (Appendix B) was used to advertise the survey via email and social media.

Given that ACSLPA and CHAPA were not able to grant me access to their member lists, probability sampling was not possible. Instead, voluntary sampling, a nonprobability sampling technique, was utilized (Couper, 2000). In voluntary sampling, participants self-select, which

introduces non-response bias into the study (Hibberts et al., 2012). Non-response bias occurs when some individuals are more likely to respond to a request to participate than others (Hibberts et al., 2012). For example, in this study, professionals who have an interest in the topic of AR may have been more likely to participate in the survey than those who do not. As suggested by Nulty (2008), the following efforts were made to mitigate non-response bias and encourage survey participation: participants were assured that their responses would be confidential, the survey was designed to be brief (15 questions), the survey was thoroughly pretested prior to opening (to ensure that the survey functioned as intended), email reminders were sent to professionals whose email addresses were publicly available and who had not yet participated in the survey (at the half-way and end points of the data collection period), and the data collection period was extended to allow non-responders another opportunity to participate. While these efforts to reduce non-response bias were made, the survey results may not represent the views of all speech and hearing professionals in Alberta. Despite this limitation of voluntary sampling, it has allowed me to recruit participants who have relevant information to share on the topic of AR services in Alberta.

Survey design and data collection. The survey was designed to collect information pertaining to the first three goals of the study (Appendix C). Survey data were collected and managed using Research Electronic Data Capture (REDCap) tools hosted by the Women and Children's Health Research Institute (WHCRI) at the University of Alberta (Harris et al., 2009; WHCRI, 2014). REDCap is a "mature, secure web application for building and managing online surveys and databases" (Vanderbilt University, 2016). Participants who clicked the link to the survey were brought directly to an informed consent page. Once participants had read the information letter (Appendix D), they could then proceed to answer the survey questions and submit their responses. REDCap software was able prevent duplicate submissions from participants who entered the survey via a personalized email link (as each one was unique).

However, the program was not able to do so for participants who accessed the survey via a public link (e.g., in the *Communication Matters* newsletter) (Vanderbilt University, 2016). Further information regarding ethical considerations can be found in Appendix E.

Prior to sending the survey link to speech and hearing professionals, it was pretested by seven graduate students at the University of Alberta. Students reported the length of time it took them to complete the survey and offered feedback about the clarity of the questions. Survey questions were then modified as necessary. The survey remained open to participants for eight weeks in total (from June 1 to July 26, 2016). A response rate of 30% was targeted for the survey, based on a finding by Nulty (2008), who reported an average response rate of 33% for web surveys.

Analysis of survey data. Descriptive statistics (e.g., frequency, percentage, mean) were used to summarize survey responses that yielded continuous data. Inferential statistics were used to compare data among the three main groups of professionals (SLPs, audiologists, and HAPs) when appropriate. The Kruskal-Wallis test and the Mann-Whitney test were used to compare groups for survey questions yielding continuous data. The Kruskal-Wallis and Mann-Whitney tests are the nonparametric equivalents of the one-way between-subjects analysis of variance and the *t*-test for independent means, respectively (Brace, Kemp, & Snelgar, 2013, p. 247). These nonparametric tests were used because the data for the AR component-services violated one or both of the following assumptions of parametric tests: normality of distribution and homogeneity of variance (Aron, Coups, & Aron, 2011). In order to reduce the risk of type I error when using the Mann-Whitney as a post-hoc test, a Bonferroni-corrected critical level of significance was used (0.05/3=0.0167).

A multi-dimensional chi-square test was used to compare the three groups of professionals for the survey questions yielding categorical data. According to Yates, Moore & McCabe (1999), in order for the results of a chi-square test to be valid, “no more than 20% of

the expected counts [can be] less than 5 and all individual expected counts [should be] 1 or greater" (p. 734). As such, the chi-square test was only used to compare categorical variables for which this requirement was met. While a multidimensional chi-square test reveals whether there is an association between variables, it does not indicate at which level of a variable this association occurs (Brace et al., 2013). For chi-square tests with probabilities below an alpha of 0.05, adjusted standardized residuals and associated p-values were utilized to determine cells that differed significantly from values that would be expected by chance (Sharpe, 2015). In order to minimize the risk of type I error, a Bonferroni-corrected critical level of significance was used during each chi-square post-hoc analysis (Sharpe, 2015).

Survey Results

In total, 249 participants clicked the link and entered the online survey in REDCap. Of those who entered the survey, 217 of these participants (87.1%) submitted their survey responses to be analyzed for research purposes. Thirty-two (12.9%) entered the survey and either did not answer the questions or did not submit their responses. Please note that only the responses of the 217 participants who completed the survey are included in the results that follow.

Upon entering the survey in REDCap, all participants viewed a short information letter containing the title of the study, the names of the investigators, and an introductory paragraph about the purpose of the study. Participants then had the option to expand this page to view the complete information letter (Appendix D). Of the 217 participants who completed the survey, 79 (36.4%) clicked to view the full information letter, while 138 (63.6%) chose to continue without viewing the full form.

Description of the survey sample. In this section, demographic information collected from survey participants has been compared with that reported by ACSLPA (2015a), which describes all SLPs and audiologists in Alberta. Demographic information for registered HAPs

was not available for comparison from CHAPA. As seen in Table 2, the majority of survey participants (n=192, 88.5%) identified as female. This was expected, as 97.1% of SLPs and 78.0% of audiologists registered to practice in Alberta are women (ACSLPA, 2015a). The age-ranges of survey participants were quite evenly distributed across the age-categories. This was also expected, as the age-ranges of SLPs and audiologists in Alberta are as follows: 20-39 (49.9% of SLPs, 39.6% of audiologists) and 40-60+ (50.1% of SLPs, and 60.4% of audiologists) (ACSLPA, 2015a). Survey participants' responses were also quite evenly distributed in terms of the numbers of years since their graduation from university/college. Data regarding the number of years since graduation from university are not available through ACSLPA. Most survey participants reported that they work in the Edmonton (n=105, 48.4%), Calgary (n=64, 29.5%), or Central (n=21, 9.7%) regions of Alberta. Data regarding the geographic employment locations of SLPs and audiologists are not available through ACSLPA. Most survey participants, despite profession, (n=189, 87.1%) reported that they work at least 20 hours per week. This was expected, as ACSLPA (2015a) reports that 83.1% of SLPs and 85.3% of audiologists work at least 20 hours per week.

Table 2: Demographic characteristics of survey participants (N=217)

	Freq.	%
Gender		
Female	192	88.5%
Male	21	9.7%
Other	0	0%
Not specified	4	1.8%
Age		
20-29	44	20.3%
30-39	61	28.1%
40-49	47	21.7%
50-59	46	21.2%
60+	15	6.9%
Not specified	4	1.8%
Number of years since graduation		
0-5	54	24.9%
5-10	44	20.3%
10-15	31	14.3%
15-20	30	13.8%
20+	56	25.8%
Not specified	2	0.9%
Geographic region		
North	8	3.7%
Edmonton	105	48.4%
Central	21	9.7%
Calgary	64	29.5%
South	8	3.7%
Two or more regions	10	4.6%
Not specified	1	0.5%
Number of hours worked per week		
0-10	10	4.6%
10-20	17	7.8%
20-30	34	15.7%
30-40	111	51.2%
40+	44	20.3%
Not specified	1	0.5%

Of the 215 participants who specified their profession, 151 identified themselves as SLPs, 23 as audiologists, 31 as HAPs, three as AR specialists, and seven as “Other”. Given

that there are 1352 SLPs, 164 audiologists, and 235 HAPs registered to practice in Alberta, the response rates for these professional groups are as follows: 11.6% of SLPs, 14.0% of audiologists, and 13.2% of HAPs (ACSLPA, 2015a; CHAPA, 2017). The total number of AR specialists and "Other" professionals in the province is unknown, and so percentages could not be calculated for these groups. The seven participants who selected "Other" were asked to specify their profession by typing it into a text box provided in the survey. In order to protect the identity of those participants, the details of their responses have not been reported. However, some general descriptions provided by participants included: "AR specialist," "psychologist", and "speechreading instructor". The total number of participants in the "AR specialist & Other" group was 10. This group was excluded from group comparisons in the results that follow for two reasons. Firstly, the small sample size rendered statistical power too low (Aron et al., 2011). Secondly, the group is heterogeneous (as it is comprised of various types of professionals). If this "AR specialist & Other" group was included in a between-groups comparison and a subsequent significant result was found, it would be difficult to interpret the results.

The response rate within each of the professional groups was lower than the targeted 30%. In examining these response rates, however, it is important to remember that while the survey was made available to all SLPs, audiologists, and HAPs registered in Alberta, not all of the SLPs and audiologists would have known about its existence. While all of the HAPs received a direct request to participate from CHAPA, many of the SLPs and audiologists would have needed to open the *Communication Matters* newsletter and click on the *Research Studies* tab prior to seeing the advertisement for the survey. This limitation in recruitment could explain the lower-than-expected response rate in the SLP and audiology groups. A possible explanation for the lower-than-expected response rate within the HAP group is that these professionals may not commonly conduct and participate in clinical research. If so, they would not be familiar with the process, and may be less likely to participate as a result.

As seen in Table 3, of the 214 participants who identified the percentage of adult clients on their caseloads, most reported that their caseloads consist of either 0-5% adult clients (i.e., primarily pediatric clients) or 75-100% adult clients. Comparing the data by profession, we see that most SLPs reported serving almost exclusively of pediatric (n=98, 65.8%) or adult clients (n=47, 31.5%). This was expected, as 73.0% of SLPs in Alberta work exclusively with children, while the remaining SLPs serve either exclusively adult clients or clients of all ages (ACSLPA, 2015a). The majority of audiologists (n=20, 87.0%) reported that their caseloads consist of at least 5% adult clients. These data fit with demographic information outlined by ACSLPA (2015a), which states that 80.4% of audiologists in Alberta work with adult clients in some capacity (i.e., their caseloads either consist of exclusively adult clients, or a mixture of both pediatric and adult clients). Almost all of the HAPs surveyed (n=30, 96.8%) reported that they serve almost exclusively adult clients. The patterns in the data for the SLP, audiologist and HAP groups fit with that outlined in the literature review, which states that SLPs and audiologists are trained to work with both adult and pediatric clients, while HAPs generally work exclusively with adults.

Table 3: Proportion of adult clients on caseloads by group (n=214)

	Adult clients on caseload (n=214)		SLP (n=149)		Audiology (n=23)		HAP (n=31)	
% Adult Clients	Freq.	%	Freq.	%	Freq.	%	Freq.	%
0-5%	105	48.4%	98	65.8%	3	13.0%	1	3.23%
5-25%	4	1.8%	2	1.3%	2	8.7%	0	0.00%
25-50%	2	0.9%	0	0.0%	2	8.7%	0	0.00%
50-75%	9	4.1%	2	1.3%	6	26.1%	0	0.00%
75-100%	94	43.3%	47	31.5%	10	43.5%	30	96.77%

A multi-dimensional chi-square test was used to compare the three main professional groups in terms of the percentage of adult clients on their caseloads. Due to cells with low counts, the rows from Table 3 were grouped into the following two categories: 50% or fewer adult clients and 50% or greater adult clients (Table 4). The multi-dimensional chi-square test

revealed that there was a relationship between profession and the percentage of adult clients on one's caseload: $\chi^2(2, N=203) = 46.094$, $p < 0.0005$. Table 4 shows that fewer SLPs reported serving at least 50% adult clients than would be expected by chance. More HAPs reported serving at least 50% adult clients than would be expected by chance. The percentage of adult clients served by audiologists did not differ significantly from chance.

Table 4: Comparison of the proportion of adult clients on caseloads by group (n=203)

% of Adult Clients		SLP (n=149)	Audiology (n=23)	HAP (n=31)
≤50%	Frequency	100	7	1
	Percentage	67.2	30.4	3.2
	Adjusted Standardized Residual	6.60	-2.32	-6.06
	P-value*	0.00000	0.02034	0.00000
≥50%	Frequency	49	16	30
	Percentage	32.8	69.6	96.8
	Adjusted Standardized Residual	-6.60	2.32	6.06
	P-value*	0.00000	0.02034	0.00000

*Bonferroni-corrected alpha level (0.05/6=0.0083)

Given the sampling methods used for the survey (as discussed in the Methods section), the survey results may not be generalizable to all SLPs, audiologists, and HAPs in Alberta. However, similarities between the demographic information gathered in the survey and that available through ACSLPA (2015a) suggest that the data may be representative of a broader population of SLPs and audiologists in Alberta. Given that no demographic information was available from CHAPA, one cannot know whether this data is representative of a broader population of HAPs in Alberta.

Research Question 1: Who provides AR services to adults?

Survey Question: In your current position, do you provide aural rehabilitation services to adult clients?

Note: Only the n=109 participants who reported that their caseloads consist of at least 5% adult clients were asked to report whether they provide AR services to adult clients.

More than half of the survey participants (n=65, 59.6%) answered "yes" to this question,

indicating that they do provide AR services to adult clients. Comparing the data by profession (Table 5), we see that greater than three-quarters of the HAPs (n=28, 93.3%) and audiologists (n=16, 80.0%) reported that they provide AR services to adult clients, while only about a third of SLPs (n=17, 33.3%) reported that they provide these services to adults. A multi-dimensional chi-square test revealed that there was a relationship between profession and whether AR services are provided: $\chi^2(2, N=101) = 32.436$, $p < 0.0005$. Table 5 shows that fewer SLPs provided AR to adult clients than would be expected by chance, while more HAPs provided AR to this population than would be expected by chance. The number of audiologists who provided AR services to adult clients did not differ significantly from chance.

Table 5: Comparison of AR provision by group (n=101)

AR to adult clients (yes/no)		SLP (n=51)	Audiology (n=20)	HAP (n=30)
Yes	Frequency	17	16	28
	Percentage	33.3	80.0	93.3
	Adjusted Standardized Residual	-5.62	2.00	4.40
	P-value*	0.00000	0.04550	0.00001
No	Frequency	34	4	2
	Percentage	66.7	20.0	6.7
	Adjusted Standardized Residual	5.62	-2.00	-4.40
	P-value*	0.00000	0.04550	0.00001

*Bonferroni-corrected alpha level (0.05/6=0.0083)

Survey Question: To what percentage of your adult clients do you provide aural rehabilitation services?

Note: Only the n=65 participants who reported that they do provide AR services to adult clients were asked to specify the percentage of adult clients to whom they provide these services.

As seen in Table 6, approximately half of the AR providers (n=33, 50.8%) reported that they provide AR services to 75-100% of the clients on their caseloads. Comparing the data by profession (Table 6), we see that most of the audiologists (n=12, 70.6%) and HAPs (n=19, 67.9%) reported providing AR services to 75% or more of the clients on their caseloads.

Conversely, most of the SLPs (n=15, 88.3%) reported providing these services to 25% or fewer of the clients on their caseloads.

Table 6: Percentage of adult clients served by group (n=65)

	Adults clients on caseload (n=65)		SLP (n=17)		Audiology (n=16)		HAP (n=28)	
% Adult Clients	Freq.	%	Freq.	%	Freq.	%	Freq.	%
0-5%	9	13.8%	8	47.1%	0	0.0%	0	0.0%
5-25%	9	13.8%	7	41.2%	0	0.0%	2	7.1%
25-50%	4	6.2%	1	5.9%	3	17.6%	0	0.0%
50-75%	6	9.2%	0	0.0%	1	5.9%	4	14.3%
75-100%	33	50.8%	0	0.0%	12	70.6%	19	67.9%
Not specified	4	6.2%	1	5.9%	0	0.0%	3	10.7%

A multi-dimensional chi-square test was used to compare the three main professional groups in terms of the percentage of adult clients on their caseloads. Due to cells with low counts, the rows from Table 6 were grouped into the following two categories: AR provided to 50% or fewer of clients, and AR provided to 50% or more of clients (Table 7). The multi-dimensional chi-square test revealed that there was a relationship between profession and the percentage of clients to whom AR services are provided: $\chi^2(2, N=57) = 38.617$, $p < 0.0005$. Table 7 shows that fewer SLPs reported providing AR to 50% or more of the adult clients on their caseloads than would be expected by chance, while more HAPs reported providing AR to 50% or more of the adults on their caseloads than would be expected by chance. The number of audiologists who reported providing AR services to 50% or more of the adult clients on their caseloads did not differ significantly from chance.

Table 7: Comparison of percentage of adult clients served by group (n=57)

AR to adult clients (%)		SLP (n=16)	Audiology (n=16)	HAP (n=25)
≤50%	Frequency	16	3	2
	Percentage	100.0	18.8	8.0
	Adjusted Standardized Residual	6.18	-1.77	-3.99
	P-value*	0.00000	0.07673	0.00007
≥50%	Frequency	0	13	23
	Percentage	0.0	81.3	92.0
	Adjusted Standardized Residual	-6.18	1.77	3.99
	P-value*	0.00000	0.07673	0.00007

*Bonferroni-corrected alpha level (0.05/6=0.0083)

Survey Question: If you do NOT see clients for aural rehabilitation, why not?

Notes: Survey participants who reported that they do not provide AR services (n=44) were asked to provide their reasons for such. In responding to this question, participants could select multiple answers (e.g., “No referrals received” and “No inquiries received from adults with hearing loss”, etc.). Please also note that while this survey question does not directly answer the first research question, it includes related information. As such, it has been situated within the analyses relevant to research question 1.

As seen in Table 8, survey participants selected various reasons for not providing AR services. The most common reasons cited by survey participants include: “People with hearing loss are seen by members of another profession for device selection/fitting” (n=26, 59.1%), and “No referrals received” (n=21, 47.7%). Comparing the data by profession (Table 8), we see that most responses to this question were provided by SLPs. Table 8 shows that the most common responses among SLPs were also “People with hearing loss are seen by members of another profession for device selection/fitting” (n=24, 70.6%) and “No referrals received” (n=19, 55.9%). Several SLPs (n=7, 20.6%) also cited “Other” reasons for not providing AR services. Only four audiologists answered this survey question, among whom “Other” was the most common response. Two HAPs answered this question, one of whom selected “No inquiries received from adults with hearing loss” and the other chose “Other” as his/her reason for not providing AR

services. The “Other” responses are outlined in the paragraph following Table 8. A chi-square test could not be used to compare the three main professional groups because the number of respondents in the audiologist and HAP groups was very low. As well, the rows in Table 8 could not be logically combined to form two categories (as was done in the analysis of previous survey questions).

Table 8: Reasons for not providing AR services (n=44)

	Those who do not provide AR (n=44)		SLP (n=34)		Audiology (n=4)		HAP (n=2)	
Reasons for not providing AR	Freq.	%	Freq.	%	Freq.	%	Freq.	%
No referrals received	21	47.7%	19	55.9%	1	25.0%	0	0.0%
No inquiries received from adults with hearing loss	18	40.9%	16	47.1%	1	25.0%	1	50.0%
People with hearing loss are seen by members of another profession for device selection/ fitting	26	59.1%	24	70.6%	1	25.0%	0	0.0%
People with hearing loss are seen by members of another profession for rehabilitation following device fitting	18	40.9%	16	47.1%	1	25.0%	0	0.0%
Other	13	29.5%	7	20.6%	2	50.0%	1	50.0%

Participants who selected “Other” were asked to specify their answers further by typing them into a text box provided in the survey. The lists that follow outline the “Other” reasons for not providing AR services, organized according to profession (identifying information has been removed).

SLPs:

- “Does not fit with my role in my current practice setting”
- “Not a part of our mandated activities”
- “These referrals are not accepted by the outpatient program where I work They are referred on to private or AHS audiology services”
- “Those services are not amongst those provided by the program in which I work. Other programs may provide those services”

- “Not a target in acute care. At the last hospital I was at, patients needed to leave the hospital to get a device fitted/adjusted, and this rarely, if ever, happened”
- “SLP caseload is full with dysphagia and brain injury related communication clients”
- “Little interest from older clients to receive such services, or work on clear speech/loud voice or even get a hearing screening, even when hearing loss is evident”

Audiologists:

- “Public Health services do not allow for rehabilitative services (re: time); primarily a diagnostic service. Not for lack of interest or need....”
- “We have not yet provided sufficient rationale to the literature, the government, and to ourselves to believe this is the most critical thing that audiologists do. We need to change this. I believe strongly that people, or governments will one day pay for aural rehab services as a critical component to the success of a hearing aid fitting. We need to do our work to prove that”

HAPs:

- “Most clients aren't willing to return to clinic for support”

As seen above, many of the “Other” responses written by SLPs relate to the idea that AR does not fit within their role in their current program/setting. The audiologist responses indicate that AR services provided by audiologists tend to be diagnostic, and that the profession should advocate for the importance of post-fitting rehabilitation services. The HAP response highlights a reluctance among clients to pursue AR services.

Demographic information for the professionals who provide AR services is shown in Table 9 and has been compared by profession. Geographic region was omitted in the comparison to protect participant identity.

Table 9: Demographic characteristics of AR providers (n=65)

	AR Providers (n=65)		SLP (n=17)		Audiology (n=16)		HAP (n=28)	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender								
Female	52	80.0%	15	88.2%	12	75.0%	21	75.0%
Male	13	20.0%	2	11.8%	4	25.0%	7	25.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Age								
20-29	8	12.3%	5	29.4%	1	6.3%	2	7.1%
30-39	19	29.2%	7	41.2%	5	31.3%	7	25.0%
40-49	12	18.5%	0	0.0%	6	37.5%	6	21.4%
50-59	21	32.3%	4	23.5%	3	18.8%	11	39.3%
60+	4	6.2%	1	5.9%	1	6.3%	2	7.1%
Not specified	1	1.5%	0	0.0%	0	0.0%	0	0.0%
Number of years since graduation								
0-5	13	20.0%	4	23.5%	1	6.3%	8	28.6%
5-10	12	18.5%	5	29.4%	3	18.8%	4	14.3%
10-15	10	15.4%	4	23.5%	2	12.5%	3	10.7%
15-20	17	26.1%	2	11.8%	5	31.3%	9	32.1%
20+	13	20.0%	2	11.8%	5	31.3%	4	14.3%
Geographic region								
North	3	4.6%						
Edmonton	31	47.7%						
Central	8	12.3%						
Calgary	12	18.5%						
South	7	10.8%						
Two or more regions	4	6.2%						
Number of hours worked per week								
0-10	0	0.0%	0	0.0%	0	0.0%	0	0.0%
10-20	3	4.6%	1	5.9%	0	0.0%	2	7.1%
20-30	7	10.8%	1	5.9%	2	12.5%	3	10.7%
30-40	33	50.8%	13	76.5%	4	25.0%	14	50.0%
40+	22	33.8%	2	11.8%	10	62.5%	9	32.1%
AR course								
Yes	60	92.3%	17	100%	16	100%	27	96.4%
No	5	7.7%	0	0.0%	0	0.0%	1	3.6%
Post-prof. training								
Yes	44	67.7%	2	11.8%	14	87.5%	24	85.7%
No	21	32.3%	15	88.2%	2	12.5%	4	14.3%

As seen in Table 9, the majority of AR providers (n=52, 80.0%) identified as female. Comparing the data by profession, we see that most of the SLPs (n=15, 88.2%), audiologists (n=12, 75.0%), and HAPs (n=21, 75.0%) also identified as female. A multidimensional chi-square test could not be used to compare the three main professional groups in terms their gender, as 33.3% of the expected counts were less than 5. The age of the AR providers was quite evenly distributed across the categories presented in Table 9. The most common age-range was 30-39 (n=7, 41.2%) among SLPs, 40-49 (n=6, 37.5%) among audiologists, and 50-59 (n=11, 39.3%) among HAPs. A multi-dimensional chi-square test was used to compare the three main professional groups in terms of their age-ranges. Due to cells with low counts, the age ranges were grouped into the following two categories: 20-39 years and 40-60+ years (Table 10). A multi-dimensional chi-square test revealed that there was a relationship between profession and age-range of AR providers ($\chi^2(2, N=61) = 6.739$, $p = 0.034$). Table 10 shows that while the majority of SLPs fall within the 20-39 age-range and the majority of audiologists and HAPs fall within the 40-60+ range, these patterns do not differ significantly from what would be expected according to chance. It is likely that the post-hoc tests were not statistically significant due to the small sample size (which decreases statistical power).

Table 10: Comparison of age of AR providers by group (n=61)

Age		SLP (n=17)	Audiology (n=16)	HAP (n=28)
20-39	Frequency	12	6	9
	Percentage	70.6	37.5	32.1
	Adjusted Standardized Residual	2.57	-0.63	-1.76
	P-value*	0.01017	0.52869	0.07508
40-60+	Frequency	5	10	19
	Percentage	29.4	62.5	67.9
	Adjusted Standardized Residual	-2.57	0.63	1.76
	P-value*	0.01017	0.52869	0.07508

*Bonferroni-corrected alpha level (0.05/6=0.0083)

As seen in Table 9, the AR providers were quite evenly distributed in terms of the number of years since their graduation from university/college, as were members of each of the

three main professional groups. After condensing the number of years since graduation into two categories (0-10 years, and 10-20+ years), a multi-dimensional chi-square test was conducted. This multi-dimensional chi-square test revealed that there was no relationship between profession and the number of years since graduation from university/college: $\chi^2(2, N=61) = 2.736$, $p = 0.255$. With regard to geographic region, most AR providers reported that they work in either the Edmonton (n= 31, 47.7%) or Calgary (n= 12, 18.5%) regions. As recommended by the Health Research Ethics Board at the University of Alberta, this data have not been compared according to profession, as the combination of profession and geographic region could allow participants to be identified. Most AR providers reported that they work either 30-40 hours per week (n=33, 50.8%) or more than 40 hours per week (n=22, 34.4%). The majority of SLPs (n=13, 76.5%) and HAPs (n=14, 50.0%) work 30-40 hours per week, while the majority of audiologists (n=10, 62.5%) work over 40 hours per week. In order to conduct a multi-dimensional chi-square test, the number of hours worked per week were grouped into the following two categories: 0-20 hours and 20-40+ hours. However, the results of this chi-square test were not valid and thus have not been reported (as 50.0% of the expected counts were less than 5, and the individual expected counts for the SLP and HAP groups were less than 1).

As seen in Table 9, most AR providers (n=60, 92.3%) reported having taken a course in AR during their university/college training. Comparing the data by profession, we see that all of the SLPs and audiologists reported having taken a course in AR, while all but one of the HAPs did. A multidimensional chi-square test could not be used to compare the three main professional groups in terms of their participation in (at least) one AR course, as 50% of the expected counts were less than 5, and the individual expected counts for the SLP and audiology groups were less than 1. This finding aligns with information outlined in the literature review, which states that SLPs and audiologists educated in Canada and HAPs educated in Alberta are required to take at least one course in AR. Most AR providers (n=44, 67.7%) reported that they

have taken post-professional training in AR (e.g., a workshop, certificate program, etc.). Comparing the data by profession revealed that most SLPs (n=15, 88.2%) have not taken post-professional training in AR, while the majority of audiologists (n=14, 87.5%) and HAPs (n=24, 85.7%) have. A multidimensional chi-square test revealed that there was a relationship between profession and whether post-professional training in AR has been taken: $\chi^2(2, N=61) = 30.243$, $p < 0.0005$. Table 11 shows that fewer SLPs reported having taken post-professional training in AR than would be expected by chance. More HAPs reported having taken post-professional training in AR than would be expected by chance, while the number of audiologists who reported taking this training did not differ significantly from chance.

Table 11: Comparison of participation in post-professional AR training by group (n=61)

Post-prof. training in AR		SLP (n=17)	Audiology (n=16)	HAP (n=28)
Yes	Frequency	2	14	24
	Percentage	11.8	87.5	85.7
	Adjusted Standardized Residual	-5.50	2.15	-1.76
	P-value*	0.00000	0.03156	0.00229
No	Frequency	15	2	4
	Percentage	88.2	12.5	14.3
	Adjusted Standardized Residual	5.50	-2.15	1.76
	P-value*	0.00000	0.03156	0.00229

*Bonferroni-corrected alpha level (0.05/6=0.0083)

Research Question 2: What is the nature of AR services provided?

Survey Question: If you DO see clients for AR, what services do you provide?

Note: Only the n=65 survey participants who reported that they do provide AR services to adult clients were invited to answer this question. In responding to this question, participants could select multiple answers (e.g., “hearing screening” and “orientation to hearing aid/listening device care/use,” etc.). In the section that follows, AR services have been presented according to the three main components of AR (as outlined in the literature review): 1) assessment/screening of hearing, 2) selection/fitting/dispensing of hearing aids/listening devices, and 3) post-fitting

rehabilitation services.

Component 1: Assessment/screening services. As seen in Table 12, the majority of survey respondents reported that they provide hearing screenings, while fewer than half reported testing for peripheral or central hearing loss. Comparing the data by profession (Table 12), we see that approximately one third of the SLPs who answered this question reported that they provide hearing screenings, while only one (5.9%) reported that he/she conducts tests for peripheral or central hearing loss. Given that hearing screenings fall within SLP scope of practice, it was expected that more SLPs would provide this service to adult clients. At least 75% of the audiologists reported providing hearing screenings and testing for peripheral hearing loss. Less than half of the audiologists reported testing for central hearing loss. All but one of the HAPs reported providing hearing screenings, while less than half reported testing for peripheral or central hearing loss. Given the scope of practice differences between audiologists and HAPs, it was expected that more audiologists would be involved in formally testing for peripheral or central hearing loss than HAPs.

Table 12: Provision of assessment/screening services by group (n=65)

	Provision of Ax/screening services (n=65)		SLP (n=17)		Audiology (n=16)		HAP (n=28)	
Ax/ screening services	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Hearing screening	45	69.2%	6	35.3%	12	75.0%	27	96.4%
Test for peripheral hearing loss	26	40.0%	0	0.0%	14	87.5%	12	42.9%
Test for central hearing loss	16	24.6%	1	5.9%	6	37.5%	9	32.1%

A multi-dimensional chi-square test was used to compare the three main professional

groups in terms of whether they provide assessment/screening services. Due to cells with low counts, the rows from Table 12 were added together (Table 13). The multi-dimensional chi-square test revealed that there was a relationship between profession and whether assessment/screening services were provided: $\chi^2(2, N=183) = 33.529$, $p < 0.0005$. Table 13 shows that fewer SLPs reported providing assessment/screening services than would be expected by chance, while more audiologists reported providing these services than would be expected by chance. The number of HAPs who reported providing these services did not differ significantly from chance.

Table 13: Comparison of provision of assessment/screening services by group (n=183)

Provision of Ax/ screening services		SLP (n=51)	Audiology (n=48)	HAP (n=84)
Yes	Frequency	7	32	48
	Percentage	13.7	66.7	57.1
	Adjusted Standardized Residual	-5.69	3.09	2.40
	P-value*	0.00000	0.00200	0.01640
No	Frequency	44	16	36
	Percentage	86.3	33.3	42.9
	Adjusted Standardized Residual	5.69	-3.09	-2.40
	P-value*	0.00000	0.00200	0.01640

*Bonferroni-corrected alpha level (0.05/6=0.0083)

Component 2: Selection/fitting/dispensing of hearing aids/listening devices. As seen in Table 14, more than half of survey participants reported providing services relating to the selection, fitting, and dispensing of hearing aids/listening devices. Comparing the data by profession (Table 14), we see that SLPs generally did not report providing selection, fitting, or dispensing services. All but one of the HAPs reported providing each of the services listed in Table 14, as did three quarters of the audiologists. Based on scope of practice information outlined in the literature review, it was expected that audiologists and HAPs would provide services related to the selection/fitting/dispensing of hearing aids, while SLPs would not.

Table 14: Provision of selection/fitting/dispensing services by group (n=65)

	Provision of selection/fitting/ dispensing services (n=65)		SLP (n=17)		Audiology (n=16)		HAP (n=28)	
Selection/ fitting/ dispensing services	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Selection of hearing aids/listening devices	39	60.0%	0	0.0%	12	75.0%	27	96.4%
Fitting of hearing aids/listening devices	39	60.0%	0	0.0%	12	75.0%	27	96.4%
Dispensing of hearing aids/listening devices	40	61.5%	1	5.9%	12	75.0%	27	96.4%

A multi-dimensional chi-square test was used to compare the three professional groups in terms of whether they reported providing selection/fitting/dispensing services. Due to cells with low counts, the rows from Table 14 were added together (Table 15). The multi-dimensional chi-square test revealed that there was a relationship between profession and whether selection/fitting/dispensing services were provided: $\chi^2(2, N=183) = 126.792$, $p < 0.0005$. Table 15 shows that fewer SLPs reported providing selection/fitting/dispensing services than would be expected by chance, while more HAPs reported providing these services than would be expected by chance. The number of audiologists who reported providing these services did not differ significantly from chance.

Table 15: Comparison of provision of selection/fitting/dispensing services by group (n=183)

Provision of selection/ fitting/ disp. services		SLP (n=51)	Audiology (n=48)	HAP (n=84)
Yes	Frequency	1	36	81
	Percentage	2.0	75.0	96.4
	Adjusted Standardized Residual	-10.98	1.77	8.32
	P-value*	0.00000	0.07673	0.00000
No	Frequency	50	12	3
	Percentage	98.0	25.0	3.6
	Adjusted Standardized Residual	10.98	-1.77	-8.32
	P-value*	0.00000	0.07673	0.00000

*Bonferroni-corrected alpha level (0.05/6=0.0083)

Component 3: Post-fitting rehabilitation services. As seen in Table 16, the majority of survey participants reported providing the following services: partner/family training, communication repair/conversation strategies training, orientation to care/use of hearing aids/listening devices, informational counselling, and adjustment counselling. Less than half of survey participants reported providing auditory training and speech/lip-reading training. Comparing the data by profession (Table 16), we see that most SLPs do not provide post-fitting rehabilitation services, with the exception of communication repair/conversation strategies training and family/partner training. Conversely, most audiologists and HAPs provide various post-fitting rehabilitation services, with the exception of speech/lip-reading training and auditory training. Speech/lip-reading training was the least commonly provided service by SLPs, audiologists, and HAPs. The most commonly provided services by audiologists were informational counselling and orientation to hearing aid/listening device care/use. Some professionals also reported that they provide AR services other than those listed in Table 16; these responses are summarized as follows:

SLPs:

- “Language”
- “Referral to audiology”
- “Referral to hearing screen, as AHS Edmonton Zone doesn’t screen adult’s hearing anymore, we refer on”

Audiologists:

- “Interdisciplinary team with nutritionist, counsellor, RMT, CST”
- “Tinnitus management”

HAPs:

- “Aural rehab provided by online services through our primary manufacturer”

Based on the information outlined in the literature review, it was expected that all three professional groups would play a role in providing post-fitting rehabilitation services, however the component-services they provide were unknown. These findings suggest that SLPs focus on delivering communication repair/conversation strategies training and partner/family training, while audiologists and HAPs provide more varied services.

Table 16: Provision of post-fitting rehabilitation services by group (n=65)

	Provision of post-fitting rehab. services (n=65)		SLP (n=17)		Audiology (n=16)		HAP (n=28)	
Post-fitting rehab. services	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Orientation to hearing aid/listening device care/use	50	76.9	6	35.3%	15	93.8%	27	96.4%
Informational counselling	50	76.9	5	29.4%	16	100.0%	26	92.9%
Adjustment counselling	40	61.5	3	17.6%	14	87.5%	20	71.4%
Speech/ lip-reading training	5	7.7	1	5.9%	2	12.5%	0	0.0%
Auditory training	20	30.8	2	11.8%	4	25.0%	12	42.9%
Communication repair/ conversation strategies training	53	81.5	15	88.2%	14	87.5%	21	75.0%
Partner/ family training	55	84.6	13	76.5%	13	81.3%	26	92.9%
Other	6	9.2%	3	17.6%	2	12.5%	1	3.6%

A multi-dimensional chi-square test was used to compare the three main professional groups in terms of whether they provide post-fitting rehabilitation services. Due to cells with low counts, the rows from Table 16 were grouped (Table 17). The multi-dimensional chi-square test revealed that there was a relationship between profession and whether post-fitting rehabilitation services were provided: $\chi^2(2, N=488) = 25.394$, $p < 0.0005$. Table 17 shows that fewer SLPs

reported providing post-fitting rehabilitation services than would be expected by chance. The number of audiologists and HAPs who reported providing these services did not differ significantly from chance.

Table 17: Comparison of provision of post-fitting rehabilitation services by group (n=488)

Provision of post-fitting rehab. services		SLP (n=136)	Audiology (n=128)	HAP (n=224)
Yes	Frequency	48	80	143
	Percentage	35.3	62.5	63.8
	Adjusted Standardized Residual	-5.01	2.38	2.40
	P-value*	0.00000	0.01731	0.01640
No	Frequency	88	48	81
	Percentage	64.7	37.5	36.2
	Adjusted Standardized Residual	5.01	-2.38	-2.40
	P-value*	0.00000	0.01731	0.01640

*Bonferroni-corrected alpha level (0.05/6=0.0083)

Research Question 3: Which AR component-services do speech and hearing professionals report falling within their scopes of practice, and how confident are they in delivering those services?

Survey Question: Whether or not you provide these services, which of the following do you THINK fall within your profession's roles/responsibilities? (check all that apply). Please note that aural/auditory/audiological rehabilitation are considered synonymous in this survey.

Survey Question: Whether or not you currently provide this service to adult clients, how confident do you feel in your ability to provide this service?

Note: All N=217 survey participants were invited to complete the survey questions above. When answering the question about roles/responsibilities, participants could select multiple answers (e.g., "hearing screening" and "orientation to hearing aid/listening device care/use," etc.). Participants were only asked to rate their confidence for the AR services that they selected as falling within their roles/responsibilities. As in the previous section, the data have been presented according to the three main components of AR services.

Component 1: Assessment/screening of hearing. As seen in Table 18, the vast majority of survey respondents (N=197, 90.7%) reported that hearing screenings fall within their

professional roles/responsibilities. Less than half of the survey participants reported that testing for peripheral (n=44, 20.3%)) or central (n=35, 16.1%) hearing loss falls within their roles/responsibilities. Comparing the data by profession (Table 18), we see that almost all of the SLPs (n=147, 97.4%) felt that hearing screenings fall within their professional roles/responsibilities, while very few of them (less than 7%) felt that testing for peripheral or central hearing loss falls within their scope of practice. Given information outlined in the literature review, it was expected that SLPs would select hearing screenings as falling within their roles/responsibilities. Greater than 70% of the audiologists felt that hearing screenings and testing for both peripheral and central hearing loss fall within their professional domain. All of the hearing-aid practitioners considered hearing screening to be within their roles/responsibilities, while less than half of them felt that testing for peripheral or central hearing loss falls within their scope. Given the scope of practice differences between audiologists and HAPs, it was expected that more audiologists would select formal testing for peripheral and central hearing loss as falling within their scope than HAPs.

Table 18: Roles/responsibilities in assessment/screening by group (N=217)

	Entire Sample (N=217)		SLP (n=151)		Audiology (n=23)		HAP (n=31)	
Roles/resp. in Ax/ screening	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Hearing screening	197	90.7%	147	97.4%	17	73.9%	31	100.0%
Test for peripheral hearing loss	44	20.3%	10	6.6%	20	87.0%	14	45.2%
Test for central hearing loss	35	16.1%	8	5.3%	17	73.9%	10	32.3%

A multi-dimensional chi-square test was conducted in order to compare the three main professional groups in terms of whether they perceive that they have a role to play in the delivery of assessment/screening services. Due to cells with low counts, the rows from Table 18

were grouped (Table 19). A multi-dimensional chi-square test revealed that there was a relationship between profession and whether participants perceive assessment/screening services as falling within their professional roles/responsibilities: $\chi^2(2, N=615) = 51.865$, $p < 0.0005$. Table 19 shows that fewer SLPs reported that assessment/screening services fall within their professional roles/responsibilities than would be expected by chance. Conversely, more audiologists and HAPs reported that assessment/screening services fall within their professional domain than would be expected by chance.

Table 19: Comparison of roles/responsibilities in assessment/screening by group (N=615)

Role in Ax/ screening		SLP (n=453)	Audiology (n=69)	HAP (n=93)
Yes	Frequency	165	54	55
	Percentage	36.4	78.3	59.1
	Adjusted Standardized Residual	-6.78	5.98	3.07
	P-value*	0.00000	0.00000	0.00214
No	Frequency	288	15	38
	Percentage	63.6	21.7	40.9
	Adjusted Standardized Residual	6.78	-5.98	-3.07
	P-value*	0.00000	0.00000	0.00214

*Bonferroni-corrected alpha level (0.05/6=0.0083)

The average confidence ratings of survey participants to provide assessment/screening services can be seen in Table 20. Comparing the data by profession, we see that the average confidence level of SLPs was lower than that of audiologists and HAPs for hearing screening, testing for peripheral hearing loss, and testing for central hearing loss.

Table 20: Confidence to provide assessment/screening services by group (N=217)

	Entire Sample		SLP		Audiology		HAP		
Ax/ screening services	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	*p*
Hearing screening	82.7 (25.4)	199	77.1 (27.4)	147	99.7 (1.2)	17	99.1 (2.3)	31	0.000
Test for peripheral hearing loss	79.5 (29.7)	46	38.5 (22.2)	10	99.1 (3.0)	20	81.7 (26.5)	14	0.000
Test for central hearing loss	62.3 (35.2)	37	30.6 (30.3)	8	66.8 (34.2)	17	82.9 (14.7)	10	0.008

The Kruskal-Wallis and Mann-Whitney tests were used to compare perceived confidence ratings among SLPs, audiologists, and HAPs. A Kruskal-Wallis test revealed that participants' confidence to provide hearing screening services differed significantly across the professions: $H(2, N = 195) = 61.425$, $p < 0.0005$). A Mann-Whitney test revealed that there was a statistically significant difference between SLPs and audiologists: ($U = 286.500$, N1 = 147, N2 = 17, $p < 0.0005$, two tailed), and between SLPs and HAPs: ($U = 651.000$, N1 = 147, N2 = 31, $p < 0.0005$, two tailed). The audiologists and HAPs indicated greater confidence than the SLPs. There was no statistically significant difference between audiologists and HAPs: ($U = 229.000$, N1 = 17, N2 = 31, $p = 0.226$, two-tailed).

Participant's confidence to test for peripheral hearing loss also differed significantly across the professions: $H(2, N = 44) = 30.116$, $p < 0.0005$. There was a statistically significant difference between SLPs and audiologists: ($U = 0.000$, N1 = 10, N2 = 20, $p < 0.0005$, two tailed), between the SLPs and HAPs: ($U = 11.000$, N1 = 10, N2 = 14, $p < 0.0005$, two tailed), and between the audiologists and HAPs ($U = 49.000$, N1 = 20, N2 = 14, $p < 0.0005$, two tailed). The audiologists and HAPs indicated greater confidence than the SLPs. The audiologists indicated greater confidence than the HAPs.

Participants' confidence to test for central hearing loss differed significantly across the professions: $H(2, N = 35) = 9.725$, $p = 0.008$. There was a statistically significant difference

between the SLP and HAP groups: (U = 4.500, N1 = 8, N2 = 10, p = 0.002, two tailed). The HAPs indicated greater confidence than the SLPs. There was no statistically significant difference in confidence ratings between the audiologists and SLPs: (U = 28.000, N1 = 8, N2 = 17, p = 0.019, two tailed). The difference between the audiologist and HAP groups was not statistically significant: (U = 68.500, N1 = 17, N2 = 10, p = 0.405, two tailed).

Component 2: Selection/fitting/dispensing of hearing aids/listening devices. As seen in Table 21, approximately 25% of survey participants reported that services relating to the selection/fitting/dispensing of hearing aids/listening devices fall within their respective professional roles/responsibilities. Comparing the data by profession, we see that very few SLPs (less than 2%) reported that the selection/fitting/dispensing of hearing aids/listening devices belong within their professional roles/responsibilities. Conversely, all of the HAPs and almost all of the audiologists reported that these services fall within their respective professional domains. These findings align with information outlined in the literature review, which suggests that the selection/fitting/dispensing of hearing/listening devices falls within the scopes of practice of both audiologists and HAPs, but not SLPs.

Table 21: Roles/responsibilities in selection/fitting/dispensing by group (N=217)

	Entire Sample (N=217)		SLP (n=151)		Audiology (n=23)		HAP (n=31)	
Role/resp. in selection/ fitting/ dispensing	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Selection of hearing aids/listening devices	56	25.8%	2	1.32%	22	95.7%	31	100.0%
Fitting of hearing aids/listening devices	56	25.8%	3	1.99%	22	95.7%	31	100.0%
Dispensing of hearing aids/listening devices	55	25.3%	1	0.66%	23	100.0%	31	100.0%

Due to cells with low counts, the rows from Table 21 were grouped for the multi-

dimensional chi square test (Table 22). Results indicated that there was a relationship between profession and whether participants perceive selection/fitting/dispensing services as falling within their professional roles/responsibilities: $\chi^2(2, N=615) = 575.101$, $p < 0.0005$. Table 22 shows that fewer SLPs reported that selection/fitting/dispensing services fall within their professional roles/responsibilities than would be expected by chance. More audiologists and HAPs reported these services fall within their respective professional domains than would be expected by chance.

Table 22: Comparison of roles/responsibilities in selection/fitting/dispensing by group (n=615)

Role in selection/ fitting/ disp.		SLP (n=453)	Audiology (n=69)	HAP (n=93)
Yes	Frequency	6	67	93
	Percentage	1.3	97.1	100.0
	Adjusted Standardized Residual	-23.98	13.92	17.22
	P-value*	0.00000	0.00000	0.00000
No	Frequency	447	2	0
	Percentage	98.7	2.9	0.0
	Adjusted Standardized Residual	23.98	-13.92	-17.22
	P-value*	0.00000	0.00000	0.00000

*Bonferroni-corrected alpha level (0.05/6=0.0083)

The average confidence ratings of survey participants to provide selection/fitting/dispensing services can be seen in Table 23. Comparing the data by profession, we see that the average confidence level of SLPs was lower than that of audiologists and HAPs for the selection, fitting, and dispensing of hearing aids/listening devices. However, given that fewer than 5 SLPs rated their confidence for each of these component services, the SLP group has been omitted from the statistical comparisons that follow.

Table 23: Confidence to provide selection/fitting/dispensing services by group (N=217)

	Entire Sample		SLP		Audiology		HAP	
Selection/ fitting/ dispensing services	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean(SD)	n
Selection of hearing aids/listening devices	92.0 (17.6)	58	37.5 (53.0)	2	92.5 (16.4)	22	94.4 (9.8)	31
Fitting of hearing aids/listening devices	88.3 (26.7)	58	3.0 (2.6)	3	89.64 (23.1)	22	97.3 (4.6)	31
Dispensing of hearing aids/listening devices	91.5 (20.4)	56	0 (n/a)	1	89.2 (23.6)	22	96.84 (4.9)	31

A Mann-Whitney test revealed that participants' confidence to select hearing aids/listening devices did not differ significantly between the audiologist and HAP groups: (U = 314.000, N1 = 22, N2 = 31, p = 0.590, two tailed). Participants' confidence to fit hearing aids/listening devices did not differ significantly between the audiologist and HAP groups: (U = 335.000, N1 = 22, N2 = 31, p = 0.904, two tailed). Similarly, participants' confidence to dispense hearing aids/listening devices did not differ significantly between the audiologist and HAP groups: (U = 312.000, N1 = 22, N2 = 31, p = 0.563, two tailed).

Component 3: Post-fitting rehabilitation services. At least 44% of survey respondents reported that each of the post-fitting AR component-services listed in Table 24 fall within their professional roles/responsibilities. The most common responses among survey participants included: "Communication repair or conversation strategies training" (n=196, 90.3%) and "Partner/family training" (n=176, 81.1%). Comparing the data by profession, we see that these same component-services were also the most commonly selected ones among SLPs (93.4% and 81.5%, respectively). The fewest SLPs (n=38, 25.2%) selected "Orientation to hearing aid/listening device care/use" as falling within their professional domain. The most common response among audiologists was "adjustment counselling" (n=23, 100.0%), while HAPs most commonly reported that "Orientation to hearing aid/listening device care/use" (n=31,

100.0%) and “informational counselling” (n=31, 100.0%) belong within their professional roles/responsibilities. The least common response among both audiologists and HAPs was “speech/lip-reading training” (47.8% and 16.1%, respectively). Based on information outlined in the literature review, it was expected that all three professional groups would report some of the post-fitting rehabilitation services fall within their scope. The exact component services they would select, however, were unknown.

Table 24: Roles/responsibilities in post-fitting rehabilitation by group (N=217)

	Entire Sample (N=217)		SLP (n=151)		Audiology (n=23)		HAP (n=31)	
Roles/resp. in post-fitting rehab.	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Orientation to hearing aid/listening device care/use	97	44.7%	38	25.2%	22	95.7%	31	100.0%
Informational counselling	134	61.8%	73	48.3%	22	95.7%	31	100.0%
Adjustment counselling	125	57.6%	63	41.7%	23	100.0%	30	96.8%
Speech/ lip-reading training	125	57.6%	102	67.5%	11	47.8%	5	16.1%
Auditory training	139	64.1%	99	65.6%	18	78.3%	15	48.4%
Communication repair/ conversation strategies training	196	90.3%	141	93.4%	22	95.7%	24	77.4%
Partner/ family training	176	81.1%	123	81.5%	21	91.3%	25	80.6%

A multi-dimensional chi-square test was used to compare the three main professional groups in terms of whether they perceive post-fitting rehabilitation services as falling within their professional roles/responsibilities. As was done for the component 1 (assessment/screening) and component 2 (selecting/fitting/dispensing) services, the rows of post-fitting rehabilitation services from Table 24 were added together (Table 25). The multi-dimensional chi-square test revealed that there was a relationship between profession and whether participants perceived post-fitting rehabilitation services as falling within their professional roles/responsibilities: $\chi^2(2, N=1435) = 50.049$, $p < 0.0005$. Table 25 shows that fewer SLPs reported that post-fitting rehabilitation services fall within their professional roles/responsibilities than would be expected

by chance. More audiologists and HAPs reported that post-fitting rehabilitation services fall within their professional domain than would be expected by chance.

Table 25: Comparison of roles/responsibilities in post-fitting rehabilitation by group (n=1435)

Role in post-fitting rehab.		SLP (n=1057)	Audiology (n=161)	HAP (n=217)
Yes	Frequency	639	139	161
	Percentage	60.5	86.3	74.2
	Adjusted Standardized Residual	-6.64	5.92	2.94
	P-value*	0.00000	0.00000	0.00328
No	Frequency	418	22	56
	Percentage	39.4	13.7	25.8
	Adjusted Standardized Residual	6.64	-5.92	-2.94
	P-value*	0.00000	0.00000	0.00328

*Bonferroni-corrected alpha level (0.05/6=0.0083)

The average confidence ratings of survey participants to provide post-fitting rehabilitation services can be seen in Table 26. Comparing the data by profession, we see that the average confidence level of SLPs was lower than that of audiologists and HAPs for all post-fitting rehabilitation component-services, with the exception of speechreading training, for which HAPs were less confident than SLPs.

Table 26: Confidence to provide post-fitting rehabilitation services by group (N=217)

	Entire Sample		SLP		Audiology		HAP		
Post-fitting rehab. services	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	p
Orientation to hearing aid/listening device care/use	71.3 (34.2)	98	40.1 (28.0)	37	94.5 (11.6)	22	97.1 (4.1)	30	0.000
Informational counselling	68.0 (31.1)	133	46.8 (25.8)	70	95.7 (7.2)	21	93.5 (8.7)	31	0.000
Adjustment counselling	63.6 (34.7)	125	37.1 (28.3)	61	89.7 (12.8)	22	91.5 (9.7)	30	0.000
Speech/lip-reading training	40.9 (29.2)	126	34.7 (24.5)	101	72.7 (24.4)	11	28.0 (33.3)	5	0.000
Auditory training	48.2 (30.0)	138	40.9 (29.1)	98	62.7 (29.1)	18	66.6 (19.7)	13	0.001
Comm. repair/ conversation strategies training	75.5 (20.8)	198	72.1 (21.5)	140	81.6 (22.0)	22	82.3 (12.5)	24	0.019
Partner/ family training	67.7 (25.6)	177	60.5 (24.8)	121	82.2 (22.1)	21	84.3 (16.7)	25	0.000

A Kruskal-Wallis test revealed that participants' confidence to orient clients to their hearing aids/listening devices differed significantly across the professions: $H(2, N = 89) = 61.613$, $p < 0.0005$). A Mann Whitney test revealed that there was a statistically significant difference between SLPs and audiologists: ($U = 27.500$, N1 = 37, N2 = 22, $p < 0.0005$, two tailed), and between SLPs and HAPs: ($U = 12.00$, N1 = 37, N2 = 30, $p < 0.0005$, two tailed). The audiologists and HAPs indicated greater confidence than the SLPs. There was no statistically significant difference between audiologists and HAPs: ($U = 309.500$, N1 = 22, N2 = 30, $p = 0.669$, two tailed).

Participants' confidence to provide informational counselling differed significantly across the professions: $H(2, N = 122) = 79.252$, $p < 0.0005$). There was a statistically significant difference between SLPs and audiologists: ($U = 35.000$, N1 = 70, N2 = 21, $p < 0.0005$, two tailed), and between SLPs and HAPs: ($U = 77.000$, N1 = 70, N2 = 31, $p < 0.0005$, two tailed).

The audiologists and HAPs indicated greater confidence than the SLPs. There was no statistically significant difference between audiologists and HAPs: (U = 272.500, N1 = 21, N2 = 31, p = 0.294, two tailed).

Participants' confidence to provide adjustment counselling differed significantly across the professions: H(2, N = 113) = 70.833, p < 0.0005). There was a statistically significant difference between SLPs and audiologists: (U = 66.500, N1 = 61, N2 = 22, p < 0.0005, two tailed), and between SLPs and HAPs: (U = 62.500, N1 = 61, N2 = 30, p < 0.0005, two tailed). The audiologists and HAPs indicated greater confidence than the SLPs. There was no statistically significant difference between audiologists and HAPs: (U = 322.000, N1 = 22, N2 = 30, p = 0.879, two tailed).

Participants' confidence to provide speech/lip-reading training differed significantly across the professions: H(2, N = 117) = 15.492, p < 0.0005). There was a statistically significant difference between SLPs and audiologists: (U = 157.500, N1 = 101, N2 = 11, p < 0.0005, two tailed). The audiologists indicated greater confidence. While the HAPs indicated lowest confidence among the three professional groups, neither the differences between SLP and HAP groups (U = 202.500, N1 = 101, N2 = 5, p = 0.456, two tailed), nor the audiologist and HAP groups (U = 10.000, N1 = 11, N2 = 5, p = 0.052, two tailed) were significant.

Participants' confidence to provide auditory training differed significantly across the professions: H(2, N = 129) = 14.607, p = 0.001). There was a statistically significant difference between SLPs and audiologists: (U = 522.500, N1 = 98, N2 = 18, p < 0.006, two tailed) and between SLPs and HAPs: (U = 307.000, N1 = 98, N2 = 13, p = 0.002, two tailed). The audiologists and HAPs indicated greater confidence than the SLPs. There was no statistically significant difference between audiologists and HAPs: (U = 114.000, N1 = 18, N2 = 13, p = 0.921, two tailed).

Participants' confidence to provide communication repair/conversation strategies training

differed significantly across the professions: $H(2, N = 186) = 7.953$, $p = 0.019$). While the HAPs indicated greater confidence than the audiologists, and the audiologists indicated greater confidence than the SLPs, these differences were not statistically significant: audiologists and HAPs ($U = 238.000$, N1 = 22, N2 = 24, $p = 0.565$, two tailed), HAPs and SLPs ($U = 1264.000$, N1 = 140, N2 = 24, $p = 0.053$, two tailed), and SLPs and audiologists ($U = 1072.500$, N1 = 140, N2 = 22, $p = 0.022$, two tailed).

Participants' confidence to provide partner training differed significantly across the professions: $H(2, N = 167) = 35.643$, $p < 0.0005$). There was a statistically significant difference between SLPs and audiologists: ($U = 544.000$, N1 = 121, N2 = 21, $p < 0.0005$, two tailed) and between SLPs and HAPs: ($U = 576.000$, N1 = 121, N2 = 25, $p < 0.0005$, two tailed). The audiologists and HAPs indicated greater confidence than the SLPs. There was no statistically significant difference between audiologists and HAPs: ($U = 253.500$, N1 = 21, N2 = 25, $p = 0.842$, two tailed).

Study II: Interviews

Interview Methods

In addition to the survey, a qualitative study was conducted in order to understand "the stories behind the numbers" (Mayan, 2009, p. 10). As seen in the previous section, survey data revealed that many SLPs are not involved in delivering AR services. This qualitative section seeks to elaborate upon these findings, and to understand why this pattern exists.

Qualitative description. The qualitative portion of the study is framed within a qualitative description approach. According to Sandelowski (2000), this method aims to produce "a comprehensive summary of events in the everyday terms of those events" and is "the method of choice when straight descriptions of phenomena are desired" (p. 334). Qualitative descriptive studies "are typically directed toward discovering the who, what, and where of events or experiences, or their basic nature and shape" (Sandelowski, 2000, p. 338). Research questions that fit well within this approach include, for example, "What reasons do people have for using or not using a service or procedure? Who uses a service and when do they use it? What factors facilitate or hinder recovery from an event?" (Sandelowski, 2000, p. 337). Qualitative description is used in healthcare research to answer questions (such as those above) that are relevant to practitioners and policy makers (Sandelowski, 2000).

Data collection in qualitative descriptive studies generally involves "minimally to moderately structured open-ended individual and/or focus group interviews" (Sandelowski, 2000, p. 338). The analysis of qualitative descriptive studies is generally "not highly interpretive" as compared to traditional qualitative methods (i.e., grounded theory, phenomenology, and ethnography) (Sandelowski, 2000, p. 336). Rather, researchers tend to "stay close to their data and to the surface of words and events" (Sandelowski, 2000, p. 334). Qualitative description fits well with this portion of the study, as it seeks to describe (in everyday terms), SLPs' perspectives on AR services, including factors that facilitate and hinder SLP involvement in

providing those services. The findings may be of interest to both practitioners (SLPs) and policy makers.

Population and sampling. Interviews were conducted with SLPs (both practicing and retired) in Alberta. For the majority of the data collection period, only SLPs whose caseloads consist of at least five percent adult clients were eligible to participate in an interview. However, an exception was made for one SLP, who works only with children, but is very knowledgeable about hearing loss and aural (re)habilitation. Rather than focusing on service-delivery for children, this SLP spoke to general issues affecting the provision of AR services to adult clients.

Interview participants were recruited using purposive sampling. This sampling method involved recruiting individuals who have specific knowledge about the research topic, namely SLP provision of AR services to adults. According to Mayan (2009), purposive sampling is well suited to qualitative research, as it aims to "understand a phenomenon of interest in-depth" (p. 61). Morse and Richards (2002) state that "good informants/participants are those who know the information required, are willing to reflect on the phenomena of interest, have the time, and are willing to participate" (p. 221). Morse and Richards also state that "qualitative researchers may seek bias, deliberately choosing the worst case or best instance of an event rather than the average experience, for the characteristics of a phenomenon are more easily explored in the outstandingly good or bad examples" (p. 221). In this study, purposive sampling was conducted by asking SLPs to participate in a follow-up interview at the end of a completed survey from Study I. To supplement this technique, I used snowball and solicitation sampling. Snowball sampling occurs when "participants already in the study recommend other person to be invited to participate" (Morse & Richards, 2002, p. 221). In this case, SLPs who participated in an interview were asked to recommend other SLPs with relevant knowledge or experience, who might be willing to participate in an interview. Solicitation sampling involves inviting people with relevant positions in the community to participate (Patton, 2015). In this study, this involved

seeking the participation of SLPs who work for specific programs/organizations, such as *Alberta Health Services*. Participants who were not recruited via the survey were sent a link to the survey and asked to complete it prior to their interview.

Thirteen interviews were conducted with SLPs. The interviews took place in the order that participants signed-up (i.e., the first interview was conducted with the first SLP to sign-up, and so on until saturation was reached). Saturation is said to occur "when no new data emerge, when all leads have been followed, when negative cases have been checked, and when the story or theory is complete" (Mayan, 2009, p. 63). Prior to the start of data collection, the exact sample size needed to achieve saturation was unknown. It was expected, however, that saturation would be reached after approximately 10 interviews. This notion was based on the idea that smaller studies with modest claims tend to achieve saturation more quickly than those of broader scope (Charmaz, 2006). In this study, saturation was reached after 13 interviews had been conducted.

Interview design. The purpose of conducting these interviews was to explore the perceptions of SLPs with regard to SLP provision of AR services, including: roles/responsibilities of SLPs (and other professionals); scope of practice/role-overlap between SLPs, audiologists, and HAPs; as well as factors that facilitate and/or hinder SLP provision of AR services. The interviews were semi-structured and involved approximately seven open-ended questions (Appendix F). Follow-up questions/prompts were used to draw out further information from interviewees on relevant topics. For example, the following prompt was often used: "You mentioned xxx. Please tell me more about that". While the structure of the interviews was pre-planned, latitude was allowed for participants to express details that were specific and important to them.

The approach to interviewing as outlined above combines the standardized open-ended interview (in which questions are carefully worded beforehand) and the informal conversational

interview (in which questions are spontaneously generated based on the natural flow of the conversation) (Patton, 2015). Patton (2015) states that these interview techniques are not mutually exclusive and may be combined. Morse & Richards (2002) support the use of an interview guide in qualitative research, while also letting the conversation flow naturally to allow the participant to tell an uninterrupted story. The pre-planned interview questions were subject to change throughout the data-collection process, based on the findings from preliminary survey and interview data. Morse, Barret, Mayan, Olson and Spiers (2002) support this iterative approach, stating that "a good qualitative researcher moves back and forth between design and implementation to ensure congruence among question formulation, ...data collection strategies, and analysis" (p. 17).

Data collection. As recommended by Olson (2011), I practiced conducting interviews with two people prior to engaging in interviews with study participants. At the beginning of each interview, an effort was made to build rapport with the participant. Then, interviewees were provided with an information letter and consent form to sign (Appendix G). Interviewees were also asked to verbally consent to having their interview audio recorded; this statement of verbal consent was itself audio-recorded. After these steps were complete, interviewees were provided with a handout listing AR component-services (Appendix H) and then I began to ask interview questions. The interviews were conducted either in-person or over the phone. In-person interviews were conducted in locations that were convenient for the interviewees (e.g., a coffee shop or hospital cafeteria). Interviews were generally conducted outside of participants' work hours, so as not to conflict with their work responsibilities. The length of the interviews depended on the time a given interviewee had available and the level of detail he/she wished to discuss. The interviews ranged from 22 to 71 minutes in length; the average interview duration was 43 minutes. During and after each interview, I took written notes, as suggested by Olson (2011).

Analysis of qualitative data. After the completion of an interview, the data were transcribed verbatim. Content analysis was then used to analyze the data. Content analysis is defined as "the subjective interpretation of the content of text data through the systematic classification of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p. 1278). In this study, conventional content analysis was used, in which "categories [were] derived from data during data analysis" (Hsieh & Shannon, 2005, p. 1286). As suggested by Mayan (2009), the analysis of data was inductive, meaning that preconceived notions about the outcomes of the research were avoided. Microsoft Word was utilized to facilitate the grouping of data according to theme. This analysis involved the following steps, as outlined by Mayan (2009): coding (i.e., assigning a word/label to sections of data), memoing (i.e., "writing preliminary notes about the data" (p. 89), and theorizing (i.e., "moving from the particular instances that make up the data to speculation and possible explanation" (p. 89). Negative cases (i.e., "elements of data that contradict, or seem to contradict, the emerging explanation of the phenomena under study") were identified and explored (Mays & Pope, 2000).

It is important to note that "descriptions always depend on the perceptions, inclinations, sensitivities, and sensibilities of the describer" (Sandelowski, 2000, p. 335). Sandelowski (2000) states that "researchers seeking to describe an experience or an event select what they will describe, and in the process of featuring certain aspects of it, begin to transform that experience of that event (p. 335). To some extent, then, the data in this study have been co-constructed (by the participants and the researcher). In order to increase reliability and validity of the qualitative analysis, the following steps (as outlined by Noble and Smith, 2015) were followed: participant characteristics were described to create a picture of participant positionings; an audit trail of decision making was recorded to ensure transparency and to allow for replicability; similarities and differences among cases were explored in order to ensure that a variety of perspectives are represented; verbatim descriptions of participants' accounts were used to support findings. The

truth of the data was checked against the experience of thesis supervisors with experience in the aural rehabilitation field.

Interview Results

Description of the Interviewees. General information about the 13 interview participants is as follows:

- 11 participants were currently working, 2 were retired
- 13 participants worked in urban areas (in northern and southern regions of the province)
- 10 participants worked in the public health care or school system(s), 1 worked privately
- 11 of the participants worked exclusively with adult clients, 1 with exclusively children, and 1 with children and adults
- The participants worked in variety of settings, including:
    - Acute care (1 participant)
    - Inpatient rehabilitation (3 participants)
    - Outpatient rehabilitation (3 participants)
    - Community rehabilitation (1 participant)
    - Continuing Care (3 participants)
    - Private practice (1 participant)
    - Public school district (1 participant)

Neither the names of participants nor the names of the specific programs for which they work(ed) have been disclosed in the analysis that follows, so as to protect participant identity. Instead, participants have been named according to the setting in which they work (e.g., Inpatient Rehabilitation 1, Continuing Care 3, etc.)

Research Question 4: How do SLPs in Alberta perceive SLP provision of AR services to adults with hearing loss (whether or not they currently provide such)?

Description of SLP services delivered to adults with hearing loss. All of the SLPs reported that they provided services to clients with hearing loss. The SLPs were asked to describe the services they provided to this population. In asking this question, I chose not to mention the term “aural rehabilitation” because of the ambiguity that exists in its definition. Instead, I wanted to simply generate discussion around any/all of the services SLPs provide to clients with hearing loss, without them needing to consider whether they constitute AR. As it turned out, all of the services described by SLPs could be included within an AR program.

All of the SLPs reported that they play a role in identifying hearing loss. Inpatient Rehabilitation 1 described the process of identifying a hearing loss as “problem/no problem” (i.e., figuring out whether the client has a hearing loss). When identifying a hearing loss, Outpatient Rehabilitation 3 stated that she looks for contextual information, such as: “can [the client] understand [the speaker] in background noise? Does the communication partner have to raise [his/her] voice? Does the person seem to have more difficulty with higher [pitched] voices?”. Once a hearing loss has been identified, all of the SLPs reported that they refer the client to audiology. For example, Continuing Care 2 stated: “if we have a pretty good sense there’s a hearing loss, we try and get them out to an audiologist who will see them”. Inpatient Rehabilitation 3 commented that, when time permits, she accompanies certain clients to their audiology appointments. She stated that she makes an effort to attend the appointment “if the client doesn’t have social supports, or if they need help communicating during their assessment”.

SLPs working in acute, inpatient, outpatient, and community rehabilitation programs reported that they do not perform routine hearing screenings on adult clients. Acute Care 1 reported that most SLPs who work with adult clients in her city are not performing hearing screenings. This SLP stated: “in [my area], the only hearing screens that are being done [are] within pediatrics”. Outpatient Rehabilitation 2 stated: “I would say mostly we aren’t [conducting hearing screenings] in [other city] either”. The interview data suggest, however, that hearing screenings are more commonly conducted in continuing care settings. For example, Continuing Care 1 stated: “on our team, [hearing screenings are performed on] a case by base basis”.

Several barriers to conducting hearing screenings were outlined by the interviewees. One of these barriers is difficulty accessing an audiometer. For example, Community Rehabilitation 1 stated: “truthfully, if I had access to an audiometer I would probably do more hearing screenings, but I don’t and I don’t think it’s going to be a priority for our program to get

one". This same SLP later stated:

> It used to be a standard of practice in rehab to do hearing screenings...but I think it was too expensive to get the audiometer calibrated... And so, it stopped getting calibrated and it sort of fell out of [practice], even though it's something that we really should be doing with all of our clients.

Continuing Care 1 described the situation as follows:

> We've been asking for an audiometer for seven years...since I've been in this program, and we've never received one...so we borrow it from the university. It's access to equipment that's an issue. So it isn't a part of our standard that we screen everyone's hearing.

Beyond difficulties accessing an audiometer, SLPs outlined other factors affecting their ability to conduct hearing screenings. Several SLPs mentioned that even when they are able to access an audiometer, environmental factors make it difficult to conduct hearing screenings. For example, Continuing Care 1 stated:

> There's a lot of limitations on us being able to do an appropriate screening… at our sites it's just really loud. And we don't have control over being able to shut off fans or whatever it is that's making noise.

Outpatient Rehabilitation 2 stated that conducting routine hearing screenings for adult clients is not a sustainable practice. She reported that "everyone's going to have a hearing loss, because of the age of the population". Similarly, Continuing Care 3 stated: "in geriatrics, I'm not sure that hearing screening for everybody is the way to go". This same SLP reported that instead of formally screening all of the adult clients on her caseloads, it would be better to only refer to audiology those hearing loss is severe enough to impact communication.

SLPs working in acute, inpatient, and continuing care settings reported that they provide adults who they suspect have a hearing loss with a Pocketalker®. A Pocketalker® is a personal

amplification device that amplifies sound closest to the listener and reduces background noise (Williams Sound, n.d.). These SLPs reported that the Pocketalker® can be used as an informal screening device. They described that if a client appears to benefit from the amplification provided by the Pocketalker®, this confirms that he/she has a hearing loss and would likely benefit from a hearing aid. In such cases, a referral is then made to audiology. For example, Acute Care 1 stated: “if we do that kind of informal screen, sometimes we’ll say “you know what, you’re so happy with this [Pocketalker®] that I think we should send you off to an audiologist”. Inpatient Rehabilitation 2 stated:

> We’ll try the Pocketalker® and there’s no standardized procedure... we’ll try it in a quiet environment, we’ll try it in the dining room, we’ll adjust their volume based on what they report is comfortable for them, and literally ask the client, “is this helpful?”.

Other SLPs reported using the Pocketalker® as an interim amplification device while a client awaits his/her appointment with audiology. For example, Inpatient Rehabilitation 3 stated:

> We always stress to [clients] that the Pocketalker® is not a replacement for a hearing aid, and so we strongly encourage them to get assessed by an audiologist. But, in the meantime, a lot of our clients aren’t medically stable to go out for an appointment….so it’s kind of just a quick fix until they’re able to get that real assessment.

Similarly, Acute Care 1 stated:

> If we suspect that communication is being affected, we try to keep [clients] wearing the Pocketalker® throughout their assessment and treatment sessions. So, as best we can, we want to try and eliminate whatever barrier the hearing loss is to treatment.

While several SLPs reported that a Pocketalker® is not generally intended for long-term use, two continuing care SLPs reported that it can be a better fit than a hearing aid for clients with dementia and other cognitive changes. For example, Continuing Care 2 provided the following rationale for recommending the Pocketalker® for an older-adult client:

> Especially if people progress in their dementia, they're less willing to have the hearing aid in, or they're more likely to pull them out, so we do a lot of recommendation for Pocketalkers® and other sorts of assistive listening devices.

Continuing Care 1 stated that when a client with dementia experiences success using a Pocketalker®, she makes a note on the audiology referral stating that "[she has] tried a Pocketalker® and thinks that [it] is a good device for [the client]". After making this recommendation, she reported that it's then up to the audiologist to assess the client and recommend a device.

SLPs working in inpatient and continuing care settings reported that they play a role in cleaning hearing aids and changing hearing aid batteries for adult clients. For example, Inpatient Rehabilitation 1 stated:

> When a client comes here, the nurses will record whether or not they have hearing aids. If they do have a hearing aid, usually I'll meet with them, just to make sure that the batteries are working and that it's clean, and to test it out myself.

Similarly, Continuing Care 2 reported that she often shows clients "how to clean [hearing aids] and how to change the batteries".

SLPs from inpatient and outpatient rehabilitation settings reported that they make environmental modifications to support clients with hearing loss during their assessment and treatment sessions. For example, Inpatient Rehabilitation 3 stated that when providing services to a client with hearing loss "we make sure we're in a very quiet room". Similarly, Inpatient Rehabilitation 2 stated: "for clients with hearing loss, making sure that they are in a quiet environment would be a priority". When outlining treatment programs for clients with hearing loss, Outpatient Rehabilitation 3 stated that she tells therapy assistants: "this client needs to be in a quiet room… don't do it in the physio gym (which has horrible acoustics)". Outpatient rehabilitation 2 stated she modifies treatment groups for clients with hearing loss. For example,

if the client has a mild hearing loss, she recommends he/she “sit right next to the therapy assistant to make sure [he/she] can hear the instructions”. If the client’s hearing loss is profound or he/she does not have proper amplification, she reported that she generally sees them individually rather than in a group session.

All of the SLPs reported providing supported communication/conversation strategies training to clients with hearing loss. They reported using strategies such as: facing the speaker (so as to get visual feedback), speaking more slowly, and placing emphasis on key information. In general, however, the SLPs reported that these strategies are not specific to clients with hearing loss, but rather are general supportive conversation/communication strategies that are used with clients of various disorder types (e.g., aphasia, dysarthria, etc.). For example, Acute Care 1 stated: “I can’t really think of any specific examples of strategies that we might employ with that hearing impaired group that don’t sort of fit into the supported conversation”. Similarly, Inpatient Rehabilitation 2 described a situation where she treated a client with both aphasia and hearing loss. In doing so, she was not able to separate the supported communication strategies that were particularly helpful for aphasia or hearing loss. “It’s supporting both”, she stated.

Several SLPs reported that they include caregivers/family members in the therapy process when possible and that they provide them with suggestions for how to better communicate with the client who has hearing loss. For example, Continuing Care 2 stated: “we do a lot of basic education about talking face to face, using clear speech, over-articulating, sharing with families about higher-frequency sounds and higher voices, and just giving some of the basic strategies”. Similarly, Continuing Care 3 reported that she emphasizes the following communication strategies in partner/family training: “looking at someone, being face-to-face, not talking super fast or with your back turned to them”. Inpatient Rehabilitation 3 reported that she provides a handout to families that includes “tips for communicating with somebody with a hearing loss,” such as “making sure you’re in a quiet environment [and] reducing background

noise".

The SLPs working in continuing care settings reported that they provide education and training to staff members in long-term care and assistive living facilities. For example, Continuing Care 1 stated: "we have done some education on a case-by-case basis, depending on the interest of the site about maintaining hearing aids and general tips about how to communicate with people with hearing loss". Continuing Care 2 stated that she brings posters to these sites and delivers "15 minute informal sessions" to health care aids and nurses about how hearing aids work and how to "troubleshoot some of the more common problems that happen to [them]". This same SLP explained the importance of teaching staff members about hearing aids and hearing loss, stating that "often it's the staff members that are going to need to put [them] in for residents, especially as their vision and dexterity and cognition changes". Similarly, Continuing Care 3 stated that her work often involves training staff members at assistive-living and long-term care centres: "I pop in and then I give strategies to staff and then I check in to see how it's going".

Roles of SLPs and other professionals in delivering AR services. When asked to consider the role of SLPs more abstractly in providing AR services, SLPs generally reported that they have a role to play in identifying hearing loss and screening clients' hearing (when possible) and providing post-fitting rehabilitation services (such as communication repair/conversation strategies training). Beyond providing clients with Pocketalkers®, the SLPs generally did not feel they had a role to play in the selection, fitting, or dispensing of hearing aids/listening devices. Inpatient Rehabilitation 1 summed up her perception of the SLP role in the following way: "I'm fine with doing hearing screenings, that's totally easy, no pressure, you pass you fail. Then, once the person has been fitted properly, I would feel more comfortable to do some of the treatment-based things [referring to post-fitting rehabilitation services]".

In terms of post-fitting rehabilitation, interviewees reported that cleaning and

troubleshooting hearing aids and providing clients/caregivers with communication repair/conversation strategies training fit within the SLP role. Regarding communication strategies training, Acute Care 1 stated:

> The piece that's clear for me is that if it's about communication, and how the hearing loss is affecting the individual's ability to comprehend, or if the hearing loss has resulted in issues with their verbal expression, we should be involved.

This same SLP stated: "our role as SLPs should definitely be about communication… whether that has to do with [clients'] ability to hear others, or to verbally express [themselves]". Continuing Care 1 reported that out of all the services listed on the handout, she felt "most qualified" in providing those relating to communication strategies training. This SLP stated "we do [communication strategies training] regularly, and it's integrated in a lot of different training that we do". Many of the SLPs also stated that they include caregivers/family members in the communication-strategies training process.

Several interviewees reported that they could envision SLPs providing post-fitting rehabilitation services beyond those described in the paragraph above (such as informational and adjustment counselling), but that these services are not an SLP-specific role. For example, Community Rehabilitation 1 stated, "I see adjustment counselling as a role that an SLP could have with any kind of communication disorder, so I think that would be a reasonable role". However, she later stated:

> If there was a client who was needing lots of counselling specific to their hearing loss, I don't know if I would necessarily say that would be the main SLP role… that would be maybe more of an audiologist's role, or another profession.

Regarding adjustment counselling, Continuing Care 1 stated: "I think it doesn't just need to be an SLP… I think it could be somebody else, but I think it could be within the SLP realm". Similarly for informational counselling, SLPs generally felt that this could be a shared role

between SLP and audiology. For example, Inpatient Rehabilitation 2 stated: “I feel like in some cases that’s probably within our scope, but in some cases probably not”. She later explained that informational counselling regarding hearing aids/listening devices could come from an audiologist, whereas counselling relating to communication strategies would more likely come from an SLP.

SLPs also reported that that they could envision SLPs providing speech/lip-reading training and auditory training, but that they personally don’t have experience delivering these services. In order to feel comfortable in providing these services, the interviewees reported that they would either need to pursue further training in these areas or deliver them in collaboration with an audiologist. For example, Continuing Care 1 stated:

> I’ve really done very little speech or lip-reading training, but I could see that potentially being something we could help with. But I don’t know what additional education or coursework that you’d want to take to be appropriate at that… I don’t feel competent in that area right now.

In terms of auditory training, Continuing Care 2 stated: “I think auditory training is something a speech pathologist can be involved in. I would say a lot of it really should be a team effort [with an audiologist]”.

With regard to the role of audiologists in AR, interviewees often reported that audiologists are experts when it comes to delivering services to adults with hearing loss, and that SLPs play a supporting/complementary role. Continuing Care 1 described a situation in which she had worked closely with an audiologist:

> [The audiologist] was so much more knowledgeable than I was about all the ins and outs [of hearing-related health care], because this is what she does. She specializes in this...whereas with a lot of us [SLPs] are generalists, or this is a small part of what we do. We have a taste of the knowledge, but they have much more depth and breadth.

Referring to audiologists, Outpatient Rehabilitation 3 said “they’re the experts...that’s how I see it”. Inpatient Rehabilitation 2 stated that audiologists are responsible for “the main assessment, recommendations, and treatment” for clients with hearing loss. SLPs also reported that audiologists are particularly skilled in the area of hearing devices/technology. Private Practice 1 stated “when it comes to materials and equipment management, we need audiology”. In terms of specific AR services, SLPs reported that the role of audiologists includes: formally testing the client’s hearing, selecting/fitting/dispensing hearing aids/listening devices, providing the client with an initial orientation to the device, providing some counselling (both informational and adjustment), and discussing communication-repair strategies with the client and his/her caregiver or family. With regard to these services, Inpatient Rehabilitation 3 stated: “I would expect my clients to have gone through all that training before they come to us”.

With regard to the role of HAPs in AR, SLPs generally reported that the main role of these professionals involves selecting, fitting, and dispensing hearing aids/listening devices. The SLPs stated that HAPs generally take information from assessments (which are generally performed by an audiologist) in order to determine the best device for a client. Many of the SLPs articulated that while some HAPs perform hearing tests, that they prefer to refer clients to an audiologist. For example, Inpatient Rehabilitation 1 stated:

> I know there’s mixed opinions out there about the roles of hearing-aid practitioners. And all I know really is what I was told in school, which is that you should go to an audiologist before you go to a hearing aid practitioner.

Outpatient Rehabilitation 1 stated: “[when referring clients to have their hearing tested], I never gave them a list with HAPs on it, because I knew that if I dealt with audiologists it was going to make my life easier”. Outpatient Rehabilitation 3 explained her reason for referring to audiologists rather than HAPs in the following way:

> I always told family, when I gave them that list [of professionals], that I would suggest

they go to an audiologist and not a hearing aid practitioner. Because of my understanding that the audiologist is going to do the full exam, and some hearing-aid practitioners are not necessarily going to do that...it's more about the product.

Regarding HAPs, Continuing Care 2 stated: "I hope that they're not always trying to sell the most expensive [hearing aid/listening device]… although sometimes it feels that way".

Several SLPs commented on the role of psychologists in providing AR. Inpatient Rehabilitation 2 stated that psychologists provide clients with "emotional support" and help clients "transitioning to the hearing loss". Similarly, Continuing Care 1 stated that psychologists "definitely have the expertise in the counselling aspects, and the person adjusting to [hearing loss]". This same SLP later stated, however, that "access to psychologists in the continuing care world is very very limited… extremely limited. It's very difficult to get any sort of counselling… that's a huge gap". Other SLPs reported that prior to discussing the role of psychologists during the interview for this study, they had not considered that psychologists could be involved in AR. When discussing the role of psychologists in counselling people with hearing loss Inpatient Rehabilitation 3 stated: "I hadn't even considered that psychologists would be involved in that, but that makes so much sense…".

SLPs also commented on the role of speechreading instructors in providing AR. Several commented that the role of speechreading instructors is to teach speechreading (hence the name), but the SLPs reported that they did not have experience interacting/working with these professionals. Only one of the interviewees, School District 1, was familiar with speechreading instructors. She reported that these professionals tend to be people who are either deaf or have impaired hearing themselves, who have learned to speechread and now teach that skill to others. She reported that speechreading instructors are not generally trained as audiologists, SLPs or HAPs. When I discussed this idea with Inpatient Rehabilitation 3, she stated: "that's really neat! I did not know that existed, but I feel that's a very important role… I think a lot of it

for the SLPs is not knowing what's out there".

Factors influencing SLP provision of AR services. The following themes emerged from the data and are arranged in order of most-to-least prevalent.

Interprofessional collaboration with audiologists. Many of the SLPs stated that there is a lack of interprofessional collaboration between SLPs and audiologists who deliver services to adults with hearing loss. Numerous examples illustrating this point were found within the interview data. For example, Inpatient Rehabilitation 1 stated: "I've never even spoken to an audiologist since I started here….I just provide [the client's] family with information to independently contact an audiologist on their own. There is no working relationship, at least in our environment". Outpatient Rehabilitation 2, who previously worked in acute care, stated:

> I don't think we work collaboratively at all. In acute care, it just so happened that the audiologist was next door to me, so if I had questions I could ask her. But we were never sharing any of the same clients. At [my new site], my office is right in the same area as all the audiologists, but I actually don't know any… so it's just very separate.

This same SLP later stated:

> There doesn't seem to be any programming that has us in the same program together that would foster collaboration. I don't believe there's an audiologist assigned to any stroke unit...I don't think that there are programs for adults where there's an audiologist on the team (Outpatient Rehabilitation 2).

Continuing Care 1 stated: "access to other disciplines [including audiology] is so limited... I think that there's a real lack of recognition that audiologists should be in these centres as well". Private Practice 1 commented that the lack of collaboration between SLPs and audiologists is even visible within our provincial college, ACSLPA. She reported that at the most recent ACSLPA conference, she was the only SLP (that she knew of) to attend an audiology-focused presentation.

The lack of interprofessional collaboration between SLPs and audiologists appears to contribute to confusion among SLPs with regard to SLP scope of practice in the area of AR. For example, School District 1 stated “my view over the years of having tried to work collaboratively, is that there’s a lot of dancing around shared practice”. This same SLP stated that the professions are “territorial” and that there isn’t “a great commitment to sitting down and looking at it together”. Inpatient Rehabilitation 3 commented that she thinks SLPs are afraid to “step on the toes” of audiologists, and that increasing collaboration between the professions would give SLPs a better idea of “what’s within [SLP] scope and what’s within [audiology] scope”.

This lack of collaboration also appears to diminish the quality of services delivered to clients. For example, while referring to SLPs and audiologists, School District 1 stated:

> We’re so hyper-specialized and so hyper-compartmentalized that the person who needs the services ends up going from one person to another to another and gets a piece of [this] here, a little piece of [that] there, and then they get frustrated.

School District 1 also stated that SLPs and audiologists work “in isolation as opposed to collaboration” and that this is a “weakness in terms of the professionals and the practice”. Continuing Care 3 described the situation as follows:

> If [professionals] are looking into their own thing and saying “oh that’s not my scope or I can’t go there”, then the client [doesn’t feel] like they’re being treated… [they feel] like there’s gaps in service... [when professionals] are operating within their own silo.

Private Practice 1 summarized the problem by stating that “when [professionals] work in isolation… the client loses”.

While SLPs reported that the amount of collaboration between SLPs and audiologists who serve adult clients is lacking, several also stated that when they have had the opportunity to collaborate with audiologists, that their interactions were positive and helpful. For example, Continuing Care 1 described a situation in which an audiologist had visited a long-term care site

(at which she also worked) to check on a client who had recently been fitted with hearing aids. This SLP reported that this experience "was very valuable" and that she appreciated being able to ask questions of the audiologist. Outpatient Rehabilitation 3 described the following experience working with audiology: "one of my colleagues arranged an inservice from an audiologist, because we wanted to be able to do a little bit more around troubleshooting [hearing aids]. And that was so helpful". In general, it appears that SLPs and audiologists collaborate well when given the opportunity, but that opportunities such as these do not often arise for professionals who serve adult clients.

Many interviewees reported that increasing the amount of interprofessional collaboration between SLPs and audiologists would facilitate SLP involvement in providing AR services to adults with hearing loss, and that this improvement in service delivery would ultimately benefit the clients. For example, School District 1 stated that working collaboratively "serves everyone well, most of all the person who is coming to us for need". Similarly, Community Rehabilitation 1 stated:

> I think that generally care is better when it's provided by a team... where the audiologist can focus on what they are best at… and the SLP can come in and focus on where their specific skill is. If you have a really well functioning team then you can actually treat the [client] more holistically.

SLPs also provided examples of what collaboration between SLPs and audiologists would ideally involve. School District 1 commented that SLPs and audiologists should work together throughout the process of aural rehabilitation, from the assessment through to treatment and discharge. She stated: "I think the audiologist and the speech-language pathologist should be working hand-in-hand right from the beginning... because there's complement where they work better together… rather than a 180 degrees each, you can get a 360 if you work together". Outpatient Rehabilitation 3 stated that SLPs could play an important role in helping clients with

complex communication needs during their audiological assessments. She claimed that “clients who [have been] deemed not testable” often struggle during their assessments due to a communication breakdown, and that SLPs could play an instrumental role in supporting communication between the client and the audiologist throughout the assessment process. Outpatient Rehabilitation 2 reported that SLPs and audiologists should work together to provide post-fitting rehabilitation services to adult clients. In her view, the SLP and the audiologist would share some of the same clients and “delineate roles”. This would involve deciding (as a team) who would provide post-fitting rehabilitation services such as counselling, speechreading, auditory training, and communication repair/conversation strategies training.

In summary, we see that the theme of interprofessional collaboration arose during many of the interviews. The paragraphs above demonstrate that SLPs viewed interprofessional collaboration as both a barrier to and a potential facilitator of SLP provision of AR services. Private Practice 1 summarized her thoughts on interprofessional collaboration in the following way: “[SLP and audiology] cross, and I see that as a very positive thing. But you have to roll up your sleeves and make it happen”.

Education and experience in AR. Many SLPs stated that they feel inadequately prepared (either by coursework or practical experience or both) to provide AR services to adult clients, and that because of this their confidence to provide AR services is low. Inpatient Rehabilitation 1 summed up this factor in the following way: “coming out of my program I did not feel well-equipped to provide aural rehab services… so my confidence in that area is limited”. This same SLP stated “I truly feel like I’m not as qualified as I need to be to provide an adequate service”. School District 1 reported that most provide AR services on a “superficial level”, but do not possess a depth of knowledge in the area of AR. In terms of coursework in AR Inpatient Rehabilitation 2 stated:

We had a great audiology prof, but there wasn’t a lot of focus on aural rehab...in grad

> school you get the basics for hearing screening and reading audiograms... but not how things will actually look in the real world.

Another SLP (who studied at a different university) stated: “[SLP students] just don’t get enough audiology”. Beyond the coursework, some SLPs reported they did not get enough exposure to AR during their clinical placements. For example, Inpatient Rehabilitation 1 stated that out of her entire graduating class, only one student had done a placement in aural (re)habilitation, and it was with children. Private Practice 1 commented that she would be surprised to meet a new SLP graduate who is familiar with AR services, as she finds that most haven’t had the opportunity to practice these skills during clinical placements.

SLPs reported that providing students with more practical experience in the area of AR would facilitate SLP involvement in delivering these services adult clients. For example, Inpatient Rehabilitation 1 commented that “SLPs learn best through practical demonstration and experience” and “the more hands-on the better”. Outpatient Rehabilitation 1 stated that practical AR experience for students “doesn’t have to be a whole long practicum”, but could instead involve students visiting a nursing home or seniors’ lodge to practice delivering AR services to seniors. She described this as “coursework you get [clinical] hours for”. This same SLP reported that students ought to take ownership for their education in the area of AR and ask their clinical educators (CEs) for opportunities to practice these skills. Even if a given student’s CE does not usually provide AR services in his/her practice, this SLP suggested the student ask: “what if we get [a client] with hearing loss? Can we try?”

Beyond seeking opportunities to practice delivering AR services in clinical placements, interviewees reported that SLPs should seek further education, knowledge and experience in AR after graduating from university. For example, School District 1 stated:

> I feel it’s time for a speech-language pathologist to really go beyond... yes you have a course in audiology… one academic study. But that is a foundational course, in the

> sense that it gives you [something] to draw on or to be aware of things that are unique to consider in practice. There's a lot more learning that needs to occur beyond the university instruction.

One continuing care SLP reported that she has gained confidence in AR since graduating, as she has had the opportunity to practice these skills at work. Continuing Care 2 stated "I got very little training in [AR], and I've just now in this role gained experience and confidence in it". She also stated:

> I've been in this position for five [years]… before that I wouldn't have felt comfortable doing any [AR], just because I didn't have any hands-on experience. But as we come across it more and realize that something needs to be done, you learn hands on.

While SLPs reported that part of the responsibility for gaining knowledge and experience in AR rests with students/SLPs themselves, interviewees also outlined some suggestions for changes that could be made to the educational process for SLPs learning about AR. Inpatient Rehabilitation 2 suggested that AR coursework should outline information about scopes of practices for SLPs and audiologists, including areas of difference and overlap between the professions. This same SLP commented that such information would help to clarify the roles of SLPs and audiologists in providing AR services. Inpatient Rehabilitation 3 suggested that coursework should involve "more functional education", such as case study assignments. This SLP described an example of a case study scenario that would be helpful for students to consider: "[imagine] you're in an inpatient setting and you have a client coming in with a hearing loss… what is best practice?". In addition to improving coursework in AR, SLPs also suggested that more professional development opportunities in AR should be available to SLPs. Inpatient Rehabilitation 3 stated that "a lot of SLPs would be interested in more free education after graduation", such as webinars. Outpatient Rehabilitation 1 commented that ACSLPA (our provincial college) could play a role in offering professional development programs that appeal

to both SLPs and audiologists. This SLP suggested that ACSLPA should offer such programs "for five years in a row… as one-offs are never enough".

In summary, SLPs reported that their limited education and experience in AR decreases their confidence and inhibits their involvement in AR services. Interview data suggest that further education and practical experience in AR would facilitate their delivery of AR by SLPs. The SLPs suggested that universities, the provincial college (ACSLPA), and SLPs themselves can all play a role in helping to improve education for SLPs in the area of AR.

Prioritization of services. When asked to comment on barriers to SLPs providing AR services, many SLPs highlighted the fact that their caseloads are heavy and that they need to prioritize the services they deliver. These SLPs stated that they prioritize some conditions, such as dysphagia and aphasia, over hearing loss and aural rehabilitation. Inpatient Rehabilitation 1 summarized the situation as follows: "our caseloads are quite demanding… and so, especially for people who have a stroke, we're going to be dealing with those who are more impaired as our priorities". This same SLP commented that when treating clients, goals relating to verbal expression "[take] precedence over receptive [deficits], including [the] hearing piece". Acute Care 1 stated that safe swallowing takes precedence in this setting, and that during their time in hospital clients "are lucky to even have an initial assessment for communication". This SLP stated that when clients are discharged home or to community rehabilitation programs, the hope is that another professional with follow up with regard to the hearing loss. SLPs working in other settings, such as outpatient and community rehabilitation programs, also commented on the demanding nature of their caseloads and the need to prioritize service delivery. For example, an SLP working in outpatient rehabilitation stated: "there's priorities in your caseload and there's competing priorities...in an adult setting, this tends to be swallowing and communication". Community Rehabilitation 1 stated that "you can't focus on everything" and that as such, aural rehabilitation gets neglected.

Several interviewees reported that they prioritize their caseloads according to guidelines dictated by the program/agency within which they work. For example, Private Practice 1 explained that AR is not a "funded priority" within the public health system, and so SLPs do not prioritize the delivery of this service. Similarly, Continuing Care 1 stated that management decides "where we draw the line" in terms of SLP service-delivery. Continuing Care 1 also commented that there is a misconception that clients with hearing loss "are managing" without services, and that administrations are sometimes unaware of the isolation and diminished quality of life associated with hearing loss. Continuing Care 1 felt that this misconception contributes to the low prioritization of AR services. Private Practice 1 made a connection between AR being a low-priority item for SLPs, and SLPs' decreased confidence to provide these services. She stated that "many feel they can [provide AR], but if they're only supposed to put 5% of their time into it, then they will struggle, because they're not getting to do it enough to feel comfortable".

Two SLPs commented that the busyness of their caseloads and the need to prioritize relates to the fact that there are not enough SLPs working. Inpatient Rehabilitation 1 stated that "there aren't enough hours in the day… there aren't enough staff members". She also stated that "if we had more FTE here, then maybe we would have time to provide everyone all the services they need, but sometimes you just need to prioritize". This same SLP expressed regret at not being able to provide more AR services to adult clients. She stated: "a number of clients [have] come through this facility, who I feel I have done all I can with, but that's not necessarily everything that could be done for them". Similarly, Continuing Care 3 stated:

> There's always more things I [could] do, especially for my communication clients… I feel so bad, I mean we only have a couple of [SLPs] covering the whole city and area, so [I] really can't go as in depth as [I] would like.

In order to make AR more of a priority, one SLP suggested that an AR-focused program

be created, in which SLPs could specialize in AR. Outpatient Rehabilitation 2 stated: “in order for us to really provide [AR] services to adults, there would have to be programing for that specifically”. She explained that this is because, “when you get more funding [to an existing program], they bring in more patients... so you get more of what you had, and you don’t usually get more time to do what you were already doing”. Other SLPs in support of AR-specific programming described one such program that used to exist in their service area. Outpatient Rehabilitation 1 stated that this program allowed participants the unique opportunity to practice AR skills in groups. Inpatient Rehabilitation 1 reported that the SLP position at this site was discontinued several years ago, after which AR services were no longer offered. She stated: “it’s sad that the position got cut, because there’s a huge portion of your aural rehab that’s gone”.

While some SLPs supported the creation of AR-specific programming, others felt that AR services are best delivered within currently existing programs. For example, Inpatient Rehabilitation 2 stated:

> What I personally do in this job to support clients with hearing [loss] is not a ton of extra work. It is all secondary to what our primary role [as SLPs] is, but I still feel it’s our role as a speech pathologist [to offer these services].

As such, Inpatient Rehabilitation 2 commented that she would rather continue to provide AR within the services she provides than promote the creation of an AR-specific program. Another interviewee, School District 1, commented that a drawback of having SLPs specialize in AR is that “if [an SLP specialized in AR] leaves or wants to change focus, the magic has left with them”. Instead, she supported the delivery of AR by all SLPs.

Given the busy caseloads of SLPs, interviewees suggested that the provision of ready-made resources would also facilitate the prioritization and delivery of AR services. For example, Inpatient Rehabilitation 3 stated: “if you’re doing partner/family training or working on communication repair/conversation strategies, any handouts that are premade are obviously

very helpful". This interviewee also stated that the SLPs at her site would like to provide information/brochures to clients suggesting follow-up aural rehabilitation services, but "at this point we would have no idea what to put in that brochure holder". Private Practice 1 commented that she wishes that a standard video existed that she could use to teach clients about the care/use of their hearing aids/listening devices. She stated:

> If there was a little blurb, a little video…this is the care and cleaning of your hearing aid or FM [system] (if you have one) and here's your maintenance schedule...as an SLP I could walk in, [use] the same video, and [say] "I'm good to go".

In summary, SLPs discussed the need to prioritize the services they deliver to clients, and the fact that AR ranks low on the list of services. Several SLPs felt AR-specific programming would support SLP involvement in AR services, while others felt the services should be delivered by all SLPs. In addition, some SLPs discussed the need for ready-made AR resources that could be provided to clients.

Access to SLP services for adults with hearing loss. Several SLPs reported that adult clients whose primary communication concern is hearing loss have difficulty accessing the services of an SLP within the public healthcare system. For example, Community Rehabilitation 1 stated that "hearing-loss [is] not an access point to an SLP" and that this is a barrier her providing AR services. This same SLP explained: "if [a client] only had a hearing loss, I probably wouldn't end up seeing them...unless it was associated with their brain injury". Similarly, Outpatient Rehabilitation 2 stated that "if it's only hearing loss, they're probably not in our system". Inpatient Rehabilitation 2 stated: "unless you were paying for private [SLP] services, there [are] no programs that I'm aware of [in this city] that would accept someone [for hearing loss alone]".

SLPs also explained that clients generally need to meet specific criteria in order to access rehabilitation services provided by an SLP. For example, Outpatient Rehabilitation 3

stated that the program in which she works “[does] not accept single-discipline referrals”. In other words, a client would need to have multiple rehabilitation goals (e.g., involving SLP, occupational therapy, physical therapy, and/or recreation therapy) in order to qualify for that particular program. Similarly, Outpatient Rehabilitation 1 commented that in order to qualify for the program in which she works, clients must have “a medical [concern] plus a rehabilitation issue of some kind”. Interviewees reported that once clients have met the criteria of the program, they can access SLP services. Community Rehabilitation 1 reported, however, that these services most often target safe-swallowing or communication-related goals (e.g., verbal expression). This same SLP reported that services relating to hearing loss can be treated “incidentally,” but are generally not the main focus of therapy.

While some interviewees reported that accessing a SLP is difficult for adult clients whose main concern relates to hearing loss, others (primarily those working in continuing care settings, and one in inpatient rehabilitation) reported that they see clients for services specifically targeted to hearing loss and aural rehabilitation. For example, Inpatient Rehabilitation 3 stated, “I have two clients that I’m following right now, only for hearing loss”. Similarly, Continuing Care 3 stated that hearing loss is “enough” to be referred to her. She explained: “our [referral] criteria is pretty broad... anything that interferes with a person’s ability to interact or communicate” can be a reason for an SLP referral. Continuing Care 3 stated that while she has never received a referral for hearing loss alone, “there’s nothing saying they couldn’t do that.” In the case that she received a hearing-loss-specific referral, the SLP stated that she “would do some education and support surrounding it”.

As can be seen above, access to SLPs for adults with hearing loss appears to depend on the program/setting. SLPs working in continuing care settings (and one in inpatient rehabilitation) consistently reported that they could accommodate referrals specific to hearing loss, while SLPs in other settings reported that they tend to treat hearing loss in addition to

client's primary communication concerns.

Advocacy regarding the importance of AR services. Several interviewees commented that AR services are lacking for adults with hearing loss in Alberta, and that SLPs should play a role in advocating for this population. Some SLPs felt that greater awareness of this gap in services, both among SLPs and the general public would encourage more SLPs to participate in delivering AR services. With regard to the lack of services available to adults with hearing loss, School District 1 stated: "[it's] humbling to see how much need[s] to be done, and how few people [are] actually doing it". This same SLP stated that SLPs have a "responsibility to acknowledge this as an area of need". Similarly, Outpatient Rehabilitation 3 commented that adults with hearing loss are "underserved" and that "[SLPs] need to advocate to make that known". In order to effectively advocate for adults with hearing loss, Outpatient Rehabilitation 2 commented that SLPs need to show "that there are enough clients to warrant providing [AR services], and that they're not getting [them] elsewhere". School District 1 suggested that SLPs should make it known that providing effective AR services for adults "goes beyond the identification [of hearing loss] and the provision of tools" and that professionals need to "follow-up [with clients] to ensure that [they] are thriving". This same SLP stated that "[the provision of post-fitting rehabilitation services] has to be something that we as a profession realize exists and is important". Some SLPs suggested that advocacy initiatives such as these could be done via SAC. For example, Inpatient Rehabilitation 1 suggested that SAC could play a role in helping to remind SLPs that AR is within our scope of practice and that "we can help" to deliver these services. Outpatient Rehabilitation 1 suggested that SAC could run a public-awareness campaign about adult-onset hearing loss, which could be used to alert the general public that this population is underserved, and encourage them to seek services from SLPs and audiologists.

As seen in the above paragraphs, some SLPs reported that they are aware of the gap in

services that exists for adults with hearing loss. These SLPs highlighted advocacy as a means to increase awareness of hearing loss among adults and the importance of providing AR services to this population. SLPs also felt that advocacy initiatives could encourage the involvement of SLPs in delivering AR services.

***Reluctance among adults to participate in AR services*.** Another barrier to SLP provision of AR relates to the fact that not all adults with hearing loss are willing to participate in these services. For example, Continuing Care 1 stated:

> Sometimes there's an older adult, and they just don't want it… they don't want what you're offering. And that is something I've experienced several times with clients. So if they're really not open to it, and they don't want to try it… there's only so far you can push it.

SLPs cited various reasons for adults' resistance to hearing-loss treatment. Several SLPs reported that stigma is a factor. For example, Continuing Care 1 stated that wearing a hearing aid or listening devices "[is] not like people wearing glass...it's not as socially accepted for some reason". Continuing Care 2 provided an example illustrating this point, stating that her grandfather "doesn't want to wear hearing aids, because he perceives [that] people will think less of him as a person". She stated that hearing aids are a "sign of disability". Beyond the stigma associated with hearing loss, one SLP cited finances as a reason for adults not pursuing AR. Outpatient Rehabilitation 3 stated that adults tend to only seek treatment for hearing loss "if they can get funding", and if they don't "it's generally been about the finances". Another SLP reported that some adults (and especially older adults) have difficulty adapting to new technological devices, such as hearing aids. For example, Continuing Care 1 stated that many adults "don't want to fuss with having something else to manage". She stated that for this reason, there can be better compliance with Pocketalkers® than hearing aids among older adults (particularly those with dementia or cognitive decline). Another reason relates to the idea

that some older adults are not aware of the extent to which hearing-aid technology has advanced, and that they would benefit from a modern device. Outpatient Rehabilitation 3 stated, “they don’t know, and they don’t realize that things have changed, and there’s better technology”. This SLP then told a story about an older adult client who received hearing aids that he could control with a little remote that he ended up being “quite happy with”.

As seen in the paragraphs above, another factor impeding SLP provision of AR services is that not all adults are willing to participate in the services. SLPs reported that adults’ hesitancy to pursue treatment relates to stigma, finances, and lack of understanding of modern hearing technologies. The notion that stigma affects SLPs’ willingness to pursue AR services connects with information outlined in the introduction.

Definition of AR. In discussing barriers to SLP provision of AR services, two SLPs mentioned that whether SLPs report providing these services depends on how the term AR is defined. These SLPs commented that SLPs probably deliver more AR services than they realize. For example, Continuing Care 2 stated:

> If someone had asked me, do you provide aural rehabilitation services? I would probably say no. But then…[with] all of this criteria, I’m like, well ya I do! So now, I would at least say: what do you consider aural rehabilitation? We might do this or that [service], but we wouldn’t do this other [service].

This same SLP stated, “I would say [AR] is probably happening a lot more than we say it is”. Continuing Care 3 explained that “[SLPs] are giving [clients/families] strategies for communication, [but] don’t necessarily think of it separately as aural rehab... they’re addressing communication functionally”. In other words, this interviewee felt that AR services are often included within broader communication goals. This same SLP reported that her response to a question asking whether she provides AR would depend on the “definition of what’s in the category [of AR]”.

In summary, SLPs recognize that different definitions of AR exist and that AR may consist of various component-services. According to the broad definition of AR included on the handout provided to interviewees (Appendix H), some SLPs realized that they provide more AR services than they previously realized. The fact that SLPs addressed the idea that ambiguity exists within the definition of AR fits with information outlined in the literature review.

Discussion

AR Services for Adults in Alberta

The study data provide a snapshot of AR services for adults in Alberta. This information tells us **what is** in terms of AR for adults in Alberta, including who provides AR and what these services consist of (i.e., the AR component-services provided). Most AR providers are female, and work half time or more in urban centres. Most of the AR providers identified themselves as audiologists or HAPs, and reported that they provide AR services to nearly all of their adult clients. In contrast, very few of the SLPs reported that they provide AR services to adult clients, and that when they do, it is generally to less than a quarter of the adult clients on their caseload. This information suggests that SLPs are less involved in the delivery of AR services to adult clients than audiologists or HAPs. Although audiologists, HAPs, and SLPs are most likely to provide AR services to adults, a small group of other professionals also provide services. For example, the results of the environmental scan indicated that a psychologist and an AR specialist at *Bridges Support Services* provide auditory training and adjustment counselling services to adults with hearing loss. The environmental scan also indicated that speechreading instructors (certified through the *National Speechreading Program* of the *Canadian Hard of Hearing Association*) provide speechreading training to adults in Alberta. While many audiologists and HAPs, and a few SLPs and other professionals, deliver AR services to adults with hearing loss, we do not know whether these services are sufficient to meet the needs of the many adults with hearing loss in Alberta. It is unlikely that needs are being sufficiently met, as Statistics Canada (2006) showed that approximately half of Canadian adults with hearing loss aged 15-64 and 43% of adults with hearing loss aged 65 or older indicated the need for more help and support than they currently receive, in order to overcome activity/participation restrictions and participate fully in Canadian society. While this information is not specific to Alberta, there is no reason to think that adults with hearing loss in Alberta differ in their needs

from those across Canada as a whole. What is more, given the aging trend in Alberta, it is expected that the number of adults with hearing loss will rise in the coming years (Canadian Institute for Health Information, 2011). As such, it is likely that more AR services will be needed to meet the needs of this population in Alberta.

With regard to the nature of the AR services (i.e., the component-services) delivered, survey data revealed that most of the audiologists who identified as AR providers deliver the following services: hearing screening and testing for peripheral hearing loss, selection/fitting/dispensing of hearing aids/listening devices, and several of the post-fitting rehabilitation services (including orientation to care/use of hearing aids/listening devices, informational and adjustment counselling, communication repair/conversation strategies training and partner training). All of the above-named AR component-services fit reasonably within the scope of practice of Canadian audiologists, as outlined by SAC (2004). For example, with regard to informational counselling, SAC (2014) states that audiologists must demonstrate the ability to "communicate diagnostic information, its implications and resulting rehabilitative recommendations to referral resources, the client, family, and caregivers providing assistance in activities of daily living either in the home or in institutional settings." With regard to adjustment counselling, SAC (2014) states that audiologists need to "understand the effects of hearing loss in daily life and of emotional reactions to hearing handicap" (p. 15).

Most HAPs who identified as AR providers reported providing the same AR component-services as audiologists, with the exception of testing for peripheral hearing loss. All of these component-services fit reasonably within the scope of practice description of HAPs, as outlined by CHAPA (n.d.). It is surprising, however, that most HAPs did not include testing for peripheral hearing loss within the list of services they provide. In discussing the differences that exist between the scope of practice of audiologists and HAPs, SAC (2014) stated that although audiologists possess more training/expertise in the area of hearing assessment than HAPs,

HAPs may also provide testing for peripheral hearing loss. Several possible reasons exist to explain this finding. Firstly, it is possible that HAPs were unfamiliar with the phrase “testing for peripheral hearing loss”. The scope of practice document for HAPs includes “testing and assessment of human hearing”, but does not specifically refer to testing for peripheral hearing loss (CHAPA, n.d., p. 1). Another possible explanation is that HAPs intentionally under-reported their role in the assessment process while completing the survey, so as to avoid “stepping on the toes” of audiologists. The creation of the SAC (2014) document outlining distinctions between the knowledge and skills of audiologists and HAPs suggests there is tension between audiologists and HAPs, with regard to which services each profession can and cannot provide. Knowing that audiologists were also completing the survey, and that audiologists have extensive training in the assessment (and diagnosis) of hearing impairments, HAPs may have avoided selecting “testing for peripheral hearing loss,” for fear of encroaching on the audiologists’ territory. If this is indeed the case, it is unfortunate, as scope of practice overlap cannot be avoided in the area of AR. As opposed to thinking about AR services in a territorial way, professionals could explore the similarities that exist between their profession and that of others, as this leads to interprofessional collaboration.

Both survey and interview data revealed information about AR component-services delivered by SLPs. With regard to assessment/screening services, survey data revealed that only one third of SLPs provide hearing screenings to their adult clients. Interview data supported that the majority of SLPs do not provide this service, with the exception of those who work in continuing care settings. It is surprising that so few SLPs reported formally screening clients for hearing loss, given that this service falls within their scope of practice (SAC, 2004). Rather than conducting formal hearing screenings, interview data suggested that SLPs identify hearing loss via other means (e.g., trialing the use of a Pocketalker® with a client and/or examining contextual information that suggests a client may have a hearing loss). Interview data revealed

that when a hearing loss is suspected, SLPs refer the client to an audiologist. Both survey and interview data suggested that SLPs are not involved in the selection/fitting/dispensing of hearing aids/listening devices to clients, with the exception of providing clients with a Pocketalker®. The fact that SLPs reported using Pocketalkers® with clients fits within the scope of practice description for the profession. SAC (2004) states that "the use, care and maintenance of hearing aids, assistive listening devices and amplification systems" fall within SLP scope of practice (p. 36). With regard to post-fitting rehabilitation, survey data revealed that most of the SLPs who identify as AR Providers deliver communication/conversation strategies training and partner/family training services to adult clients. Interview data revealed that SLPs also provide other post-fitting rehabilitation services in addition to this, including: cleaning and troubleshooting hearing aids, modifying the environment for clients with hearing loss (e.g., reducing background noise during assessment/treatment sessions), and providing training to staff at continuing care sites regarding care/troubleshooting of hearing aids, and strategies for communicating with adults with hearing loss. Again, these services fit reasonably within SLP scope of practice. For example, SAC (2004) includes "modification in speech language assessment procedures to accommodate varying degrees of hearing loss" within SLP scope of practice (p. 36). It is interesting to note, however, that services relating to communication repair/conversation strategies training do not fall within the "hearing disorders" section of the SAC (2004) document. Rather, services relating to the assessment/treatment of communication/conversational difficulties and the inclusion of partners/families in the therapy process are present in various sections of the document. This suggests that these are foundational aspects of clinical practice for SLPs and are relevant to the assessment/treatment of various disorder types. This information fits closely with reports from interviewees who stated that the communication repair/conversational strategies they use with clients are not disorder-specific, but instead may be used to support clients with different communication disorders (e.g.,

aphasia and hearing loss).

Looking once again to the survey data, it is interesting to note that auditory training and speech/lip-reading training were the least commonly provided services by all three professional groups. While these services are not specifically mentioned within the scope of practice descriptions of SLPs or HAPs, they are included within the scope of practice of audiologists (SAC, 2004). As such, it is surprising that most audiologists do not provide these services. Makhoba & Joseph (2016), who examined the provision of AR services in South Africa by audiologists and professionals trained as SLPs/audiologists, found that speechreading and auditory training are being provided by fewer of these professionals over time. These authors suggested that improvements in hearing aid technology have rendered these services less relevant. Similarly, Tye-Murray (2015) stated that speechreading training was more a focus of AR services in the early twentieth century, prior to the advent of hearing aids and assistive listening devices. While speechreading and auditory training are not currently being provided by the three main professional groups (SLPs, audiologists, and HAPs), there is evidence that these services are provided via other means. For example, the results of the environmental scan showed that speechreading and auditory training services are offered through organizations such as *Bridges Support Services* and the *National Speechreading Program*. In recent years, several computerized home-based auditory training modules have been developed for adults (Zhang, Miller, and Campbell, 2014). Computerized speechreading programs, such as ReadMyQuips™ have also been created for home practice (Sense Synergy Inc.©, n.d.). What is more, cochlear implant companies (such as Cochlear©), provide links to speechreading and auditory training resources on their websites (Cochlear©, 2017). This information suggests that auditory training and speechreading services continue to be needed and utilized by adults with hearing loss. It is advisable that speech and hearing professionals examine why they no longer provide these services, and whether clients would benefit from the reintroduction of these

services.

Overall, the survey results indicated that more audiologists reported delivering assessment/screening services and more HAPs reported delivering selection/fitting/dispensing services than was expected by chance. Again, these findings align with what we know about the scopes of practice of audiologists and HAPs. Audiologists are “uniquely qualified to identify, diagnose (restricted to some provinces) and manage individuals with peripheral or central hearing loss, hyperacusis, tinnitus and balance disorders; and to select, prescribe, fit and dispense hearing aids and other listening devices” (SAC, 2014, p. 3). By comparison, HAPs “test peripheral hearing for the purpose of selecting, fitting, and dispensing hearing aids and listening devices” (SAC, 2014, p. 3). In other words, SAC (2014) suggests that the main focus of AR services for audiologists relates to assessment, while that of HAPs centers more around the provision of hearing devices to clients. Another finding of the survey was that more audiologists and HAPs reported delivering post-fitting rehabilitation services than was expected by chance. Fewer SLPs reported delivering each of the three main categories of AR services than was expected by chance. This provides additional evidence that SLPs are less involved in the delivery of AR services than audiologists and HAPs.

A Comparison of Professionals’ Perceived Roles/Responsibilities in AR with the Services They Deliver in Practice: Could SLPs do More?

While audiologists’ and HAPs’ perceptions of their respective roles/responsibilities in AR generally aligned with the AR component-services they deliver in practice, SLPs reported that they do not provide several of the AR component-services that fall with their perceived roles/responsibilities. This suggests that there may be potential for SLPs to provide more AR services than they currently do. In order to see if SLPs could reasonably provide additional AR services, barriers to and potential facilitators of SLP involvement in AR are examined. These provide insight into why SLP involvement in AR is currently limited and strategies for how it could be augmented in the future. Overall, this section provides us with an idea of **what could**

be, in terms of AR services delivered by SLPs to adults with hearing loss in the future (please note that scope of practice and roles/responsibilities are considered synonymous in this section).

Most audiologists reported that all of the component-services within the assessment/screening, selection/fitting/dispensing, and post-fitting rehabilitation categories of AR fall within their scope of practice, with the exception of speechreading training. As shown in the previous section, most audiologists reported delivering these same services to clients, with the exception of speechreading training and testing for central hearing loss. The fact that most audiologists reported that they do not provide speechreading training to clients and that they do not perceive this component-service as falling within their scope of practice suggests that the perception of scope of practice for some audiologists is influenced by the services they themselves provide to clients. The fact that most audiologists reported that testing for central hearing loss falls within their scope, even though most audiologists reported that they do not provide this service to clients, suggests that this is a specialized service delivered only by a select few audiologists. Most of the HAPs reported that hearing screening, selection/fitting/dispensing of hearing aids/listening devices, and all post-fitting rehabilitation services, with the exception of speechreading training and auditory training, fall within their scope. As outlined in the previous section, most HAPs reported delivering these same AR component-services to clients. Given that the services provided by audiologists and HAPs aligned closely with their perceptions of their respective scopes of practice, there is little room for audiologists and HAPs to provide additional AR component-services.

Alternatively, findings from the survey and interview data demonstrate that there are notable differences between SLPs' perceived roles/responsibilities in AR and the services they reported providing to adult clients in practice. Most SLP survey participants reported that hearing screenings and several of the post-fitting rehabilitation services (communication repair

and conservation strategies training, partner/family training, speech/lip-reading training, and auditory training) fall within their scope of practice. In practice, however, the only AR component-services that most SLP survey respondents reported delivering to adult clients were communication repair/conversation strategies training and partner/family training. Interview findings supported the notion that although SLPs generally consider hearing screenings, speech/lip-reading training and auditory training to fall within their roles/responsibilities, they generally do not provide these services to clients. Interviewees outlined several reasons as why SLPs do not deliver these particular services. SLPs stated that difficulty accessing an audiometer and background noise in institutional settings prohibit them from conducting routine hearing screenings with adult clients. SLPs stated that speechreading and auditory training represent areas of shared practice with audiology, and that there is confusion surrounding the specific role of SLPs and audiologists in delivering these services.

While SLPs provided explanations as to why they do not provide several of the AR component-services that fall within their perceived roles/responsibilities, the fact remains that SLPs do not appear to be utilizing the full-range of their knowledge or skills to deliver AR services to adults with hearing loss in Alberta. In order to explore whether SLPs could reasonably be expected to provide additional AR services, barriers to SLP provision of AR services are explored next. Several of these barriers are interconnected.

One of the barriers to SLP provision of AR services is the lack of interprofessional collaboration that exists, in particular between audiologists and SLPs. While SLPs reported that they enjoy working with audiologists, they stated that opportunities to collaborate with them are limited. Interviewees also reported that this lack of collaboration reduces the quality of the AR services delivered to clients. A connection can be drawn between this lack of interprofessional collaboration and another barrier highlighted by SLPs: reluctance among adult clients to pursue AR services. Tye-Murray (2015) indicates that clients are often dissatisfied with their hearing

aids and discontinue using them after a short trial period. While interview data suggested that various factors affect the likelihood that clients will use hearing aids and pursue AR services (e.g., self-stigma and financial limitations), it is also possible that clients are dissatisfied with services delivered by speech and hearing professionals. According to interview data, adults with hearing loss receive fragmented AR services from various professionals who may not collaborate directly with one another. For example, a client's hearing loss may first be identified by an SLP, who may refer him/her to an audiologist for a hearing assessment, who may then refer him/her to an HAP for a device fitting. The client could become frustrated by the lack of continuity of care, and choose not to pursue post-fitting rehabilitation services. Such an instance would be unfortunate, as post-fitting rehabilitation services, such as counselling, are known to increase adherence to hearing aids (Laplante-Lévesque, Hickson & Worrall, 2010a). Lingard (2013) provides evidence that interprofessional collaboration is lacking among healthcare professionals from various disciplines (e.g., nursing, pharmacy, rehabilitation medicine, etc.). She states that healthcare professionals tend to focus on their own individual competence rather than developing collective competence of the healthcare team. As a result, she states that "patients fall between the cracks of individually competent healthcare providers." Interview findings suggest this same phenomenon occurs in the area of AR, whereby adults with hearing loss fall between the cracks of speech and hearing professionals.

Another barrier highlighted within the interview data is that adults with hearing loss have limited access to SLP services. According to interviewees, SLPs who work with adults generally serve clients with swallowing and/or communication deficits resulting from a neurological event (e.g., a stroke or brain injury) or disorder (e.g., dementia). According to interview data, if a client has a hearing loss in addition to a disorder such as dysphagia or aphasia, he/she may receive some AR services from the SLP incidentally. However, if the client's primary communication concern is hearing loss, SLPs reported he/she will not be able to access SLP services outside

of a continuing care facility. This barrier connects closely with the fact that SLPs reportedly prioritize services relating to safe-swallowing and verbal expression above those targeting receptive deficits, such as hearing loss. Evidence of such prioritization exists in the literature. Upon examining the caseload priorities of SLPs who work with adult clients, ASHA (2015) found that the majority of service-delivery time was spent in the areas of swallowing (41%), aphasia (16%), and dementia (13%). Services relating to hearing loss or aural rehabilitation are not mentioned within the ASHA (2015) document, but likely fall within the group of "other" services provided by SLPs to adult clients less frequently (1%). Given the low prioritization of AR services among SLPs, it makes sense that adults with hearing loss have difficulty accessing these services.

The low prioritization of AR services also means that SLPs have little opportunity to practice and develop their skills in AR. Interviewees reported that their lack of experience delivering AR results in decreased confidence in their skills to provide AR services. Survey data also provided evidence that SLPs confidence to deliver AR services is low (compared with audiologists and HAPs). Interviewees also connected their lack of confidence in AR to inadequate educational training. While most SLPs have taken a course in AR in university, most have not pursued post-professional training in AR (e.g., a workshop or certificate program). In university, SLPs highlighted the fact that there was little opportunity to practice AR-specific skills (both in coursework and during clinical placements). The literature supports the notion that students' confidence to deliver therapy services is impacted by their clinical placement experiences. In a study examining confidence among OT students, Derdall, Olson, Janzen & Warren (2002) found that students' perceived confidence to deliver services increased during each of their clinical placements. While literature addressing the impacts of AR-focused placement experience on students' confidence could not be found, it makes logical sense that providing students with the opportunities to practice their skills in AR would increase their

confidence to deliver these services to clients.

Examination of the barriers above provides explanation as to why the role of SLPs in delivering AR services is currently limited (as compared with audiologists and HAPs). Factors such as SLPs' perceived lack of confidence in AR would make it difficult for them to increase their involvement in delivering AR services at this time. If SLPs are to increase their involvement in delivering AR services in the future, it is recommended that changes be made in several key areas, namely: interprofessional collaboration, education, and advocacy. With regard to interprofessional collaboration, findings suggest that it would be beneficial for SLPs and audiologists to work together throughout the process of AR (i.e., from assessment through post-fitting rehabilitation). This would allow professionals to clarify and delineate roles, and thus utilize their unique skills to serve the client. Beyond collaboration with audiologists, increased collaboration between HAPs and SLPs would be of benefit. Interview data demonstrated that SLPs have little understanding of and appreciation for the contributions of HAPs in the area of AR. If SLPs communicated and collaborated more with HAPs, they would likely realize that the role of HAPs extends beyond the sale of hearing aids. They would also have the opportunity to explore the similarities between SLP and HAP scope of practice, in particular with regard to post-fitting rehabilitation services. Increasing interprofessional collaboration between SLPs and other professionals would not only facilitate SLP delivery of AR services, but would allow for the development of collective competence (as described by Lingard, 2013). This in turn, would likely result in better quality services for adults with hearing loss.

A number of stakeholders have a role to play in the improvement of AR education for SLPs. Within coursework, it is recommended that university professors highlight AR as an area of overlap between SLPs, audiologists, HAPs, and other professionals (psychologists, etc.), and discuss scope of practice similarities and differences. It is also recommended that university coursework include opportunities for SLPs engage in practical "hands-on" learning (e.g., case-

study assignments, or visiting seniors' homes to trial the delivery of AR services). During clinical placements, it is recommended that SLP students proactively seek opportunities to practice and develop their skills in this area (even if their clinical educators do not generally provide these services). Given that SLP coursework provides only foundational knowledge in AR, it would be beneficial for SLPs to seek post-professional training in this area (e.g., workshops offered by ACSLPA or SAC). Given the interconnected nature of factors impacting SLP delivery of AR services, improving AR education for SLPs has the potential to increase SLPs' confidence to deliver these services. In turn, this may mean that SLPs engage more readily in the delivery of AR services for adults.

With regard to advocacy, it is recommended that SLPs make it known that AR services (in particular post-fitting rehabilitation) are beneficial for adults with hearing loss. In doing so, SLPs could highlight that the provision of post-fitting rehabilitation services increases adherence to hearing aids (Laplante-Lévesque, Hickson & Worrall, 2010a), and that hearing aids improve mood and quality of life among older adults (Boi et al., 2012). SLPs could also emphasize the fact that unaided age-related hearing loss has been linked with cognitive decline (Wayne & Johnsrude, 2015). Beyond highlighting the importance of AR services, SLPs could make it known that their profession has the potential to increase its involvement in the delivery of AR services to adults. In order for SLPs to do so, barriers (such as the low prioritization of AR services) should be examined further. Study findings suggest that information regarding the importance of post-fitting AR services and the potential for increased SLP involvement could be communicated via a public-awareness campaign supported by Speech-Language Audiology Canada.

Implications of Findings for the Definition of AR

As outlined previously, a standard definition of AR does not exist in the literature. Some definitions suggest that the three main categories of AR (i.e., assessment through to post-fitting

rehabilitation services) belong within its definition, while others exclude assessment and/or selection/fitting/dispensing services. While the roles/responsibilities of professionals who provide AR overlap in many ways, audiologists reported that they perceive their role to centre around the assessment of hearing, while HAPs reported that they focus primarily on the selection/fitting/dispensing of hearing aids/listening devices. SLPs reported that they deliver some post-fitting rehabilitation services, particularly those that relate to communication repair/conversation strategies training for clients with hearing loss and their partners. However, there was confusion among SLPs as to whether these services even constitute AR. Findings of this study also suggested that other professionals, such as speechreading instructors and psychologists play a small role in delivering a select few post-fitting rehabilitation services, such as speechreading and counselling services. Overall, these findings suggest that no one profession provides comprehensive AR services, and AR in its most complete sense is interdisciplinary. If a standard definition of AR is created in the future, the findings of this study suggest that all three categories of AR component-services should be included within it. It is recommended that the definition incorporate language that acknowledges potential contributions of various professional groups and the importance of interdisciplinary and collaborative service delivery.

Limitations

While the survey and interview results produced meaningful data that answer the research questions, there are limitations associated with this project. Firstly, the number of professionals who participated in the survey was lower than expected. I had originally hoped to achieve a response rate of 30% in each of the three main professional groups. Instead, I achieved responses rates less than half of the expected 30%. Given that a larger sample size would have increased statistical power (the probability that a given test will yield a statistically significant result), the following efforts were made to boost survey participation: I kept the survey

open for two weeks longer than originally planned and sent additional email reminders to participants who had not yet completed the survey (Aron, Coups, & Aron, 2011). Upon completion of the data collection period, I realized that the targeted response was overly ambitious, as a 30% response rate can only be expected when each participant receives a direct request to participate (Nulty, 2008). In this study, many professionals accessed the survey indirectly (via the *Communication Matters* newsletter). While all SLPs and audiologists registered to practice in Alberta receive this newsletter, it likely that not all of them read it. What is more, those who do would have needed to click the *Research Studies* tab prior to seeing the survey advertisement. As such, this provides a logical explanation for the lower-than-expected survey response rate within in the SLP and audiology groups.

The sampling method utilized to recruit survey participants was another limitation of this study. In designing the project, I had hoped to be granted access to the email addresses of all of the SLP, audiologists, and HAPs registered to practice in Alberta. This would have allowed me to employ probability sampling. Given that ACSLPA and CHAPA policies did not allow sharing email information with me, I instead employed voluntary sampling. While this sampling method allowed me to recruit participants with an interest in AR, it meant that I could not generalize the results to all SLPs, audiologists, and HAPs in Alberta. That being said, the demographic characteristics of the survey sample were similar to those reported by ACSLPA (2015a), indicating that the survey data may be representative of a broader population of SLPs and audiologists in Alberta.

A flaw in the design of several survey questions represents another limitation in this study. Some survey questions that required a numerical response (e.g., “What percentage of your clients are 18 or older?”) provided multiple choice answer options with overlapping values (e.g., 0-5%, 5-25%, 25-50%, etc.). This posed a problem for use of the multi-dimensional chi-square test, as one assumption is that the categories are mutually exclusive. In such cases,

response categories were combined into two categories (e.g., 0-50% and 50-100%). This meant that only two categories were overlapping, and thus minimized the effects of this problem.

Future Research

Prior to conducting this project, very little was known about the delivery of AR by speech and hearing professionals to adults with hearing loss in Alberta. This study is the first in Canada to examine the provision of AR services to adults. In future, data on hearing (AR) from Alberta Health Services could be used to conduct a secondary analysis, to confirm the results of this study. Another direction for future research would be to survey adults with hearing loss, in order to find out if their needs are being met, and what changes to the services provided would encourage them to seek post-fitting AR services.

Conclusions

A description of the current state of AR services in Alberta revealed that most audiologists and HAPs provide AR services to adult clients, while very few SLPs do. A small group of other professionals, including psychologists, speechreading instructors, and AR specialists also provide AR services. In terms of the AR component-services provided, the main focus of audiologists was the assessment of hearing, while HAPs focused primarily on the selection/fitting/dispensing of hearing aids/listening devices. Members of the three main professional groups (SLPs, audiologists and HAPs) reported providing post-fitting rehabilitation component services, with speechreading and auditory training being the least-commonly-provided services. Although speechreading and auditory training are included within audiology scope of practice, the continued need for/relevance of these services has been questioned in the literature. Despite this, speechreading and auditory training services continue to be made available to adults with hearing loss via other means (e.g., home-based computer programs). This suggests that adults with hearing loss continue to seek out and benefit from these services.

A comparison of professionals' perceived roles/responsibilities in AR with the services they deliver in practice revealed that SLPs are not using the full-range of their knowledge and skills in AR (in particular with relation to hearing screenings and post-fitting rehabilitation services) to deliver services to adults. SLPs explained that barriers, such as their lack of confidence to deliver AR services, make it difficult to deliver these services. In order to increase SLP involvement in the delivery of AR services to adults in future, the following changes are recommended: greater interprofessional collaboration between SLPs and other providers of AR; more opportunities for SLP students to practice hands-on skills in the area of AR (both within coursework and clinical practica); participation in advocacy by SLPs and their professional organizations (with regard to the importance of post-fitting rehabilitation for the well-being of adults with hearing loss). SLPs have the potential to increase their involvement in the delivery of

AR services to adults in Alberta, and as a result, better serve the growing population of adults with hearing loss in the province.

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Appendix A: Environmental Scan Search Strategy and Results

Source Searched	Date searched	Search terms	Results
Google.ca	Jan 17, 2016	Aural rehabilitation services Alberta	Reviewed the first 50 results (12 relevant): 1. Alberta Health Services - Rehabilitation (SLP & Audiology) 2. Bridges Support Services 3. Canadian Hard of Hearing Association - Hearing Awareness Project (Edmonton, Calgary, Lethbridge) 4. Prairie Hearing Centre (Grande Prairie) 5. The Hearing Loss Clinic (Calgary, Okotoks) 6. Lloydminster Hearing Centre (Lloydminster) 7. Living Sounds Hearing Centre (Edmonton) 8. Acute Hearing Inc. (Edmonton) 9. Audiology Clinic of Northern Alberta (Edmonton) 10. National Speechreading Program (Canadian Hard of Hearing Association) 11. Wildrose Audiology Clinic (Edmonton) 12. Calgary Hearing Aid and Audiology
Bing.com	Jan 17, 2016	Aural rehabilitation services Alberta	Reviewed the first 50 results (5 relevant; most search results listed services provided outside of Alberta): 1. Calgary Hearing Aid and Audiology 2. The Hearing Loss Clinic (Calgary, Okotoks) 3. Alberta Health Services - Rehabilitation (SLP & Audiology) 4. Living Sounds Hearing Centre (Edmonton) 5. National Speechreading Program (Canadian Hard of Hearing Association)
Google.ca	Jan 17, 2016	Orientation to hearing aid Alberta	Reviewed the first 25 results (1 relevant): 1. The Hearing Loss Clinic (Calgary, Okotoks)
Google.ca	Jan 17, 2016	Speechreading Alberta	Reviewed the first 50 results (7 relevant): 1. Deaf and Hear Alberta (Calgary) 2. Canadian Hard of Hearing Association 3. Calgary Hard of Hearing Association 4. National Speechreading Program (CHHA)

			5. Hearing Education and Rehabilitation for Adults (Calgary) 6. Hear in Red Deer 7. Leslee Scott (aural rehabilitation specialist based in BC, but offers LACE program, workshops & e-coaching online)
Google.ca	Jan 17, 2016	Auditory training Alberta	Reviewed the first 25 results (4 relevant): 1. Audiology Clinic of Northern Alberta (Edmonton) 2. Alberta Health Services - Rehabilitation (Audiology) 3. Hearing Education and Rehabilitation for Adults (Calgary) 4. Connect Society (Edmonton)
Google.ca	Jan 18, 2016	Hearing loss counselling Alberta	Reviewed the first 25 results (8 relevant): 1. Alberta Hearing Service (Edmonton) 2. The Hearing Loss Clinic (Calgary, Okotoks) 3. Hearing Care Clinic (Edmonton) 4. Miracle-Ear Hearing Aid Center (Calgary) → HA dispenser only 5. Audiology Clinic of Northern Alberta (Edmonton) 6. First Choice Hearing Centre Ltd. (Fort Saskatchewan) 7. L.A. Audiology Clinic Ltd. (Leduc) 8. Edmonton Ear Clinic 9. Discover Hearing (St. Albert)
Google.ca	Jan 18, 2016	Communication conversation strategies training hearing loss Alberta	Reviewed the first 50 results (6 relevant): 1. Deaf & Hear Alberta (Calgary & online) 2. Canadian Hard of Hearing Association - Hearing Awareness Project (Edmonton, Calgary, Lethbridge) 3. Hearing Education and Rehabilitation for Adults (Calgary) 4. Strategic Hearing Solutions (Red Deer, Lacombe) 5. The Hearing Loss Clinic (Calgary) 6. Prairie Hearing Centre (Grande Prairie)
Google.ca	Jan 18, 2016	Partner training hearing loss Alberta	Reviewed the first 25 results (3 relevant): 1. Hear Alberta (Calgary) 2. Bridges Support Services (Edmonton) 3. Beltone Hearing Centre (Edmonton)

Google.ca	Jan 18, 2016	Assistive listening devices hearing loss Alberta	Reviewed the first 25 results (14 relevant): 1. Deaf & Hear Alberta (Calgary) 2. Audiology Clinic of Northern Alberta (Edmonton) 3. Hudson's Bay Hearing Aid Centre (Edmonton) 4. The Hearing Loss Clinic (Calgary, Okotoks) 5. Living Sounds Hearing Centre Ltd. (Edmonton) 6. Hearing Care Clinic (Edmonton, St. Albert, Fort Saskatchewan, etc.) 7. Hearing Sense (Red Deer, Wetaskiwin) 8. Canadian Hard of Hearing Association 9. Alberta Hearing Service (Edmonton) 10. Leduc Camrose Hearing Clinic 11. Connect Hearing (Calgary, Cochrane, Edmonton, Grande Prairie, Okotoks, Red Deer) 12. Academy Hearing Centres (Calgary) 13. Peace Country Hearing Care Ltd. (Peace River) 14. Southern Alberta Hearing Aid Ltd. (Lethbridge)

Appendix B: Recruitment Poster (Survey)

Professionals' Perspectives on Aural Rehabilitation

Attention **ALL:**

- **SPEECH-LANGUAGE PATHOLOGISTS**
- **AUDIOLOGISTS**
- **HEARING-AID PRACTITIONERS**
- **AURAL REHABILITATION SPECIALISTS**

The University of Alberta invites you to participate in this short web survey (5 minutes).

Research shows that adults with hearing loss benefit from aural rehabilitation, but that many do not receive services beyond the fitting of hearing aids. **We are looking to gather information on aural rehabilitation services in Alberta.**

We value your opinion, whether or not you currently provide aural rehabilitation services. For more information about this ethics approved research study and to access the survey, please visit the following link: https://redcap.ualberta.ca/surveys/?s=XX399WANDE

Investigator: Alison Harding (MSc student)
Supervisors: Dr. Melanie Campbell, Dr. Wonita Janzen

If you have any questions or would like to discuss the project further, please contact Alison Harding at amhardin@ualberta.ca or (587) 990-7339.

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Appendix C: Survey Questions

Survey Instructions: Currently, very little is known about aural rehabilitation services in Alberta. We are looking to gather information on this topic and welcome your input. Please take 5 minutes to complete the following survey. Thanks in advance for your participation!

Demographic Information:

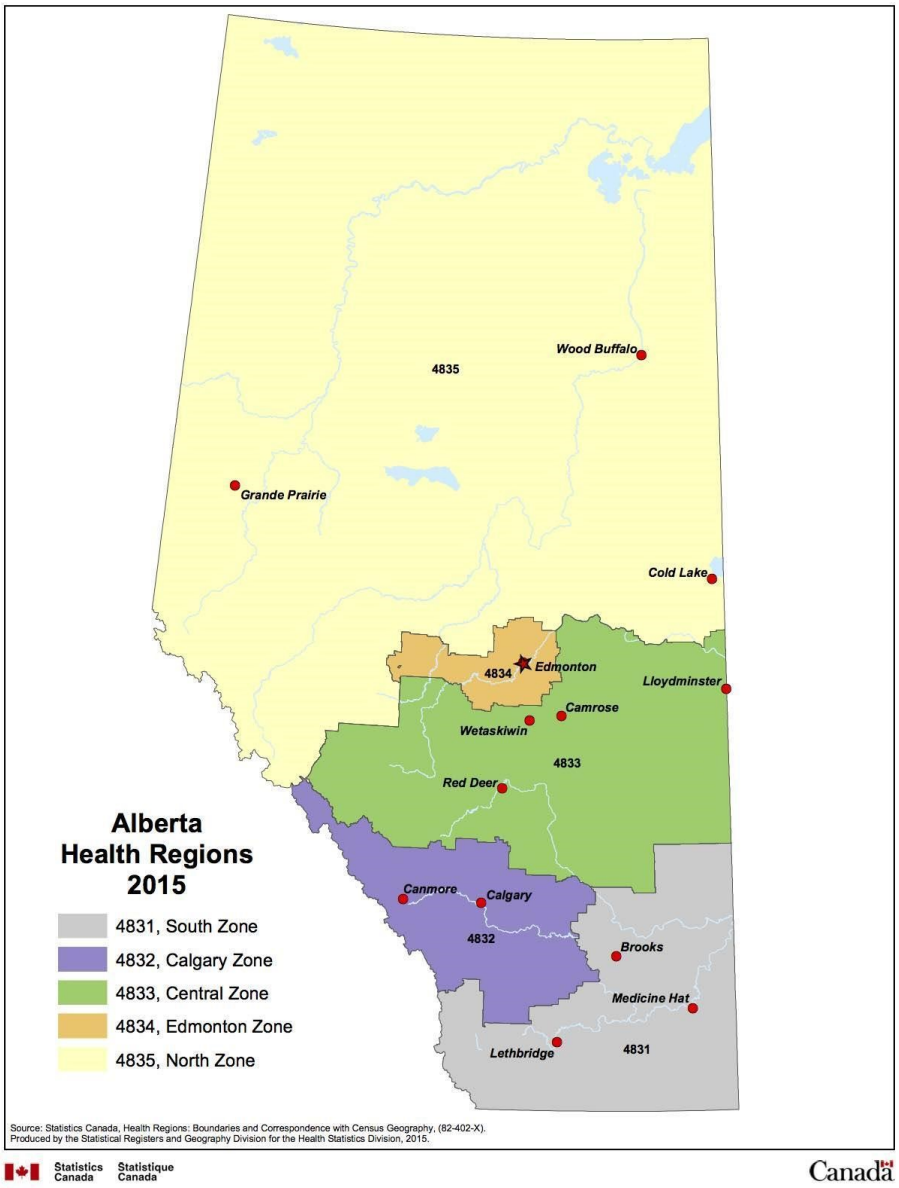
1. What is your profession? (select one answer)
    a. ▢ Speech-language pathologist (SLP)
    b. ▢ Audiologist
    c. ▢ Hearing aid practitioner (HAP)
    d. ▢ Aural rehabilitation specialist
    e. ▢ Other
        i. → Specify other (type answer into blank provided)

2. With which gender do you identify? (select one answer)
    a. ▢ Female
    b. ▢ Male
    c. ▢ Other

3. What is your current age? (select one answer)
    a. ▢ 20-29
    b. ▢ 30-39
    c. ▢ 40-49
    d. ▢ 50-59
    e. ▢ 60+

Work:

4. Please refer to the following Alberta Health Regions map to answer the following question (Statistics Canada, 2015).



In which region(s) of Alberta do you currently work? (select all that apply)

a. ▢ North zone
b. ▢ Edmonton zone
c. ▢ Central zone
d. ▢ Calgary zone
e. ▢ South zone

5. How many hours per week do you currently work (# hours/week)? (select one answer)
   a. 0-10
   b. 10-20
   c. 20-30
   d. 30-40
   e. 40+

6. What percentage of your clients are adults (18 or older) (select one answer)
    a. 0-5%
    b. 5-25%
    c. 25-50%
    d. 50-75%
    e. 75-100%

Aural Rehabilitation:

7. Research shows the following component services may be included within an aural rehabilitation program. Whether or not you provide these services, which of the following do you THINK fall within your profession's roles/responsibilities? (check all that apply). Please note that aural/auditory/audiological rehabilitation are considered synonymous in this survey.
    a. ▢ Hearing screening
    b. ▢ Test for peripheral hearing loss (i.e., problems with the ear structures)
    c. ▢ Test for central hearing loss (i.e., problems with the brain's ability to process sound)
    d. ▢ Selection of hearing aids/listening devices
    e. ▢ Fitting of hearing aids/listening devices
    f. ▢ Dispensing of hearing aids/listening devices
    g. ▢ Orientation to hearing aid/listening device care/use
    h. ▢ Informational counselling (provision of information to help clients and/or their families in making informed decisions)
    i. ▢ Adjustment to hearing loss counselling (provision of emotional support to help clients as they adjust to living with hearing loss; e.g., support groups for adults with hearing loss)
    j. ▢ Speech/lip-reading training
    k. ▢ Auditory training (i.e., formal listening activities aimed to optimize speech perception)
    l. ▢ Communication repair/conversation strategies training for the client with hearing loss
    m. ▢ Partner/family training (e.g., Clear Speech, hearing-device care, counselling, etc.)

8. For each of the responses selected in question 7, a follow-up question in the following format was asked:
    a. Whether or not you currently provide ____(e.g., hearing screenings)____ to clients, how confident do you feel in your ability to provide this service? (select response on visual analog scale ranging from 0-100).
    b. Whether or not you currently provide ____(e.g., tests for peripheral hearing loss)___ to clients, how confident do you feel in your ability to provide this service? (select response on a visual analog scale ranging from 0-100).
    c. Etc.

9. In your current position, do you provide aural rehabilitation services to adult clients? (select answer)
    a. ▢ Yes
    b. ▢ No

10. To what percentage of your adult clients do you provide aural rehabilitation services? (select one answer)
    a. 0-5%
    b. 5-25%
    c. 25-50%
    d. 50-75%
    e. 75-100%

11. If you do **NOT** see adult clients for aural rehabilitation, why not? (select all that apply)
    a. ▢ No referrals received
    b. ▢ No inquiries received from adults with hearing loss
    c. ▢ People with hearing loss are seen by members of another profession for device selection/fitting
    d. ▢ People with hearing loss are seen by members of another profession for rehabilitation following device fitting
    e. ▢ Other
        i. → Specify other (type answer into blank provided)

12. If you **DO** see adult clients for aural rehabilitation, what services DO YOU PROVIDE?
    a. ▢ Hearing screening
    b. ▢ Test for peripheral hearing loss (i.e., problems with the ear structures)
    c. ▢ Test for central hearing loss (i.e., problems with the brain's ability to process sound)
    d. ▢ Selection of hearing aids/listening devices
    e. ▢ Fitting of hearing aids/listening devices
    f. ▢ Dispensing of hearing aids/listening devices
    g. ▢ Orientation to hearing aid/listening device care/use
    h. ▢ Informational counselling (provision of information to help clients and/or their families in making informed decisions)
    i. ▢ Adjustment to hearing loss counselling (provision of emotional support to support clients as they adjust to living with hearing loss, e.g., support groups for adults with hearing loss)
    j. ▢ Speech/lip-reading training
    k. ▢ Auditory training (formal listening activities that aim to optimize speech perception)
    l. ▢ Communication repair/conversation strategies training for the client with hearing loss
    m. ▢ Partner/family training (e.g., Clear Speech, hearing-device care, counselling, etc.)
    n. ▢ Other
        i. → Specify other (type answer into blank provided)

Education:

13. How long ago did you graduate from college/university? (select one answer)
    a. ▢ 0-5 years ago
    b. ▢ 5-10 years ago
    c. ▢ 10-15 years ago
    d. ▢ 15-20 years ago
    e. ▢ 20+ years ago

14. During your college/university training, did you take at least one course in aural (or auditory or audiological) rehabilitation? (select one answer)
    a. ▢ Yes
    b. ▢ No

15. Have you taken post-professional training in aural (or auditory or audiological) rehabilitation (e.g., a workshop, certificate program, etc.)? (select one answer)
    a. ▢ Yes
    b. ▢ No

Follow-up:

16. Thanks so much for completing the survey! As an SLP student, I'm interested in gathering additional information on the role of SLPs in providing AR services. Over the next four weeks, I'll be conducting interviews with SLPs. Both SLPs who provide AR services and those who do not are eligible to participate. The interview may be conducted in-person, on the phone, or via Skype (whichever is most convenient for you). Would you be willing to participate in an interview?
    a. ▢ Yes
    b. ▢ No

--> If yes, please provide your name and contact information (type into blanks provided)

Appendix D: Information Letter and Consent Form (Survey)

Title of Study:
Professionals' perspectives on aural rehabilitation

Principal Investigator:
Alison Harding
MSc. Speech-language Pathology student
Department of Communication Sciences and Disorders
University of Alberta
amhardin@ualberta.ca
(587) 990-7339

Supervisors:
Melanie Campbell, PhD
Associate Professor
Department of Communication Sciences and Disorders
University of Alberta

Wonita Janzen, PhD
Adjunct Professor
Faculty of Rehabilitation Medicine
University of Alberta

Introduction:
Your opinion is important to us! Research shows that adults with hearing loss benefit from aural rehabilitation (AR), but that many do not receive services beyond the fitting of hearing aids. We are looking to gather information on AR services in Alberta. Please complete the following short survey (5 minutes).

Purpose:
The purpose of this research is to describe the current state of AR in Alberta for adults with hearing loss.

Description of the Research:
This survey will ask questions about your experiences and opinions regarding aural rehabilitation services in Alberta. It will take about 5 minutes to complete. Some questions inquire about your education background and work setting, in order to see if your experiences/opinions vary according to those details. For example, the survey asks for the geographical zone in which you work. If you are an SLP, you will be invited to participate in a separate interview stage of the research. If you agree, you will be asked to provide your name and contact information on the last page of the survey.

Possible Risks:
We do not expect that you will experience any harm if you participate in this study. If you are upset by the questions asked, or are feeling tired, you can take a break or choose not to complete the survey. If you need more support, please contact the researcher.

Possible Benefits:

We do not expect that you will experience direct benefit from participating in this research study. This study may inform aural rehabilitation services for adults with hearing loss in Alberta.

Voluntary Participation:
Participation in this study is voluntary. It is your choice to take part. You can stop at any time and choose not to complete the survey. You do not have to answer any questions that you do not want to answer.

Confidentiality:
This survey has been distributed across Alberta via the Alberta College of Speech language and Audiology (ACSLPA) *Communication Matters* newsletter, the College of Hearing Aid Practitioners of Alberta (CHAPA) member-list, managers of health services organizations and private agencies/practices, social media, email, and flyers. All responses to the survey will be confidential. Please be aware that a smaller number of speech and hearing professionals work outside of the Edmonton and Calgary zones; there is a small chance that you could be identified by the zone in which you work. In order to protect participant identity, all surveys will be identified with a code and data will be presented in aggregate form. The survey data will be kept in an encrypted file on a computer that requires a password. When the research is done, the data will be kept on the Faculty of Rehabilitation Medicine (FRM) "R: Research Drive" for at least five years (as per university policy) and may be used for future research.

The results of the study may be printed in a conference proceeding, journal, or newsletter; you will not be identified.

Freedom to Withdraw:
If at any point you do not wish to continue with the survey, you may stop and/or choose not to submit your responses. After the survey has been submitted, you may not withdraw your data from the study; your responses will be analyzed for research purposes.

Contact information:
The plan for this study has been reviewed for ethical guidelines by a Research Ethics Board at the University of Alberta. For questions about participant rights and ethical conduct in research, contact the Research Ethics Office at (780) 492-2615. If you have any questions about the research now or later, please contact Alison Harding (amhardin@ualberta.ca; 587-990-7339).

By clicking "next page" and completing the questions in the following survey, you indicate that you have been informed about the important aspects of this study, that you are willing to participate, and that you consent to your responses being used for research purposes.

Appendix E: Ethical Considerations

This study was approved by the Health Research Ethics Board at the University of Alberta on May 25, 2016. Modifications to the interview information letter (Appendix G) were approved on July 14, 2016. The rights of participants, as outlined in the University of Alberta (2015) *University Standards for the Protection of Human Research Participants,* were respected in this study. Prior to beginning the survey, participants consented to participate without coercion. They were informed about the purpose of the research and were given the opportunity to assess potential risk to themselves, as well as potential benefit to themselves and to the society. No participants requested to withdraw from the study. However, if they had wanted to, participants could have withdrawn from the study without penalty or risk of any kind. After a participant submitted his/her survey data, this data could not be withdrawn from the study. Interview participants had the option of withdrawing their data for up to one week after their interview. In the event that a participant wanted to withdraw, he/she could have contacted me (the principal investigator), whose email address was provided on the survey and interview information letters. Survey participants were informed that personal information would not be collected unless provided voluntarily at the end of the survey. When provided, this information (name, email address, and telephone number) was used to contact the participant to set up an interview. In order to ensure confidentiality, a study code was assigned to each participant. Corresponding documents containing identifying information were encrypted and saved on a computer to which only I have access. Identifying information of interview participants was not included with the results/analysis. Upon completion of the research, data was stored on the Faculty of Rehabilitation Medicine (FRM) “R: Research Drive” for at least five years (as per university policy) and may be used for future research.

Appendix F: Guiding Questions for Interviews

Introduction:

I would like to ask you a few questions about your thoughts on aural rehabilitation services for adults in Alberta. But first, let me give you an idea of what I mean when I use the phrase "aural rehabilitation (AR)." When I was looking for a definition of AR, it was difficult to find one that different authors agreed on. So I've compiled a list of various services that can be considered part of AR, such as (*refer interviewee to handout provided*):

- Hearing screening and assessment services
- Selection/fitting/dispensing of hearing aids/listening devices
- Orientation to the use/care of hearing aids/listening devices
- Informational and adjustment counselling
- Speechreading training
- Auditory training
- Communication/conversation strategies training
- Partner/family training

Now we'll move into some questions about AR. We'll begin with some that are specific your current (or past) position. Then we'll move into some general questions about the role of SLPs (and other professionals) in providing AR services, as well as factors that facilitate/hinder SLP involvement in AR service-delivery.

Guiding Questions:

Specific questions (relating to the interviewee's caseload):

1. Describe your current (or past) position (including the age-range and disorder types of clients, services provided, etc.)
2. Do you work with clients who have hearing loss? If so, please tell me more about this.
    a. When providing speech-language services to a client with hearing loss, does the client's hearing impairment affect/change the way you conduct your session? If so, how?

General questions:

3. In your opinion, what is the role of SLPs in providing AR services (*refer to handout provided*) to adults with hearing loss in Alberta?
4. In addition to SLPs, audiologists, HAPs and other professionals (e.g., speechreading instructors, rehabilitation counsellors, etc.) may provide components of AR to adults with hearing loss. In your opinion, what are the roles (*refer to handout provided*) of these other professional groups in providing AR services to this population?
5. According to my survey, many SLPs who work with adult clients reported that some of the services listed on this handout (e.g., hearing screening, orientation to hearing aids/listening devices and below) fall within their professional roles/responsibilities. However, many also stated that they don't currently provide AR services to adult clients. Why do you think that is?
6. What barriers diminish the involvement of SLPs in providing AR services?
7. What factors facilitate or might facilitate greater SLP involvement in providing these services?

Wrap-up:

8. That covers everything I'd like to ask, is there anything else you'd like to add?
9. When it comes to interpreting the data, I may have questions regarding what you meant. May I contact you a second time (up to six months after today) to clarify your meaning? This may also involve presenting you with a transcript of this interview, and/or an aggregate of interpreted data.
10. Do you know of other SLPs who might be willing to participate in an interview on this topic?
11. Thank you for your participation!

Prompts:

- You mentioned xxx. Please tell me more about that.
- You mentioned xxx. Why do you think that is?
- Are you say that….?
- Am I hearing you correctly that…?

Appendix G: Information Letter and Consent Form (Interviews)

Title of Study:
Professionals' perspectives on aural rehabilitation

Principal Investigator:
Alison Harding
MSc. Speech-language Pathology student
Department of Communication Sciences and Disorders
University of Alberta
amhardin@ualberta.ca
(587) 990-7339

Supervisors:

Melanie Campbell, PhD
Associate Professor
Department of Communication Sciences and Disorders
University of Alberta

Wonita Janzen, PhD
Adjunct Professor
Faculty of Rehabilitation Medicine
University of Alberta

Introduction:
Your opinion is important to us! Research shows that adults with hearing loss benefit from aural rehabilitation (AR), but that many do not receive services beyond the fitting of hearing aids. We are looking to interview speech-language pathologists (SLPs) in Alberta (including retired SLPs), in order to describe the perspectives of SLPs regarding the provision of AR services to adults with hearing loss.

Purpose:
The purpose of this research is to describe the perspectives of SLPs in Alberta regarding SLP provision of AR services to adults with hearing loss.

Description of the Research:
The interview will include questions on the nature of current and potential AR services for adults with hearing loss in Alberta. The interview may be conducted in-person, via telephone or Skype. It will take approximately 30-45 minutes to complete, however this will depend on the time you have available and the level of detail you wish to discuss.

Possible Risks:
We do not expect that you will experience any harm if you participate in this study. If you are upset by the questions asked, or are feeling tired, you can take a break or choose not to complete the interview.

Possible Benefits:
We do not expect that you will experience direct benefit from participating in this research study.

This study may inform aural rehabilitation services for adults with hearing loss in Alberta.

Voluntary Participation:
Participation in this study is voluntary. It is your choice to take part. You can stop at any time and choose not to complete the interview. You do not have to answer any questions that you do not want to answer.

Confidentiality:
No data relating to this study that includes your name will be released outside the researcher's office or published by the researchers. Interview data will be presented using pseudonyms (i.e., fictitious names), so as to protect the identity of participants. Interview data will be kept in an encrypted file on a computer that requires a password. After the research is complete, the data will then be stored on the Faculty of Rehabilitation Medicine (FRM) "R: Research Drive" for at least five years (as per university policy) and may be used for future research.

The results of the study may be printed in a conference proceeding, journal or newsletter; you will not be identified.

Freedom to Withdraw:
If at any point during the interview you do not wish to continue, you may stop and withdraw your responses from the study. After completing the interview, you have up to 7 days to withdraw your data from the study. In order to do so, please contact the principal investigator. Once 7 days have passed (from the date of your interview), you may no longer withdraw your data from the study and your responses will be analyzed for research purposes.

Contact information:
The plan for this study has been reviewed for ethical guidelines by a Research Ethics Board at the University of Alberta. For questions about participant rights and ethical conduct in research, contact the Research Ethics Office at (780) 492-2615.

If you have any questions about the research now or later, please contact Alison Harding (amhardin@ualberta.ca; 587-990-7339).

CONSENT FORM

Title of Study: Professionals' perspectives on aural rehabilitation

Principal Investigator: Alison Harding **Phone Number: 587-990-7339**

Do you understand that you have been asked to be in a research study?	▢ Yes	▢ No
Have you received and read a copy of the attached Information Sheet?	▢ Yes	▢ No
Do you understand the benefits and risks involved in taking part in this research study?	▢ Yes	▢ No
Have you had an opportunity to ask questions and discuss this study?	▢ Yes	▢ No
Do you understand that you are free to leave the study at any time without having to give a reason and without penalty?	▢ Yes	▢ No
Has the issue of confidentiality been explained to you?	▢ Yes	▢ No
Do you understand who will have access to your study records?	▢ Yes	▢ No

Who explained this study to you? _____

I agree to take part in this study:
Signature of Research Participant _____

(Printed name) _____

Date: _____

Signature of Investigator or Designee _____
Date: _____

For those participating in interviews via telephone or Skype, please send a signed copy of this form to Alison Harding prior to the start of your interview, either via email (to amhardin@ualberta.ca) or fax (to 780-492-9333).

THE INFORMATION SHEET MUST ACCOMPANY THIS CONSENT FORM AND A COPY OF THE INFORMATION SHEET MUST BE GIVEN TO THE RESEARCH PARTICIPANT.

Appendix H: Handout Provided to Interview Participants

Aural Rehabilitation Component Services for Adults:

- Hearing screening (i.e., a preliminary hearing check to see if further evaluation is required)
- Testing for peripheral hearing loss (i.e., problems with the ear structures)
- Testing for central hearing loss (i.e., problems with the brain's ability to process sound)
- Selection of hearing aids/listening devices
- Fitting of hearing aids/listening devices
- Dispensing of hearing aids/listening devices
- Orientation to the hearing aid/listening device care/use
- Informational counselling (i.e., provision of information to help clients in making informed decisions)
- Adjustment counselling (i.e., provision of emotional support to help clients as they adjust to living with hearing loss)
- Speech/lip-reading training
- Auditory training (i.e., formal listening activities aimed to optimize speech perception)
- Communication repair/conversation strategies training for the client with hearing loss (e.g., the person with hearing loss could ask the speaker for a topic or keyword)
- Partner/family training (e.g., Clear Speech, hearing-device care, counselling, etc.)