
COPING WITH AGE-RELATED VISION LOSS IN EVERYDAY READING ACTIVITIES

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The activity of reading is often threatened in later life by gradual vision loss due to age-related conditions such as macular degeneration. We conducted in-depth semi-structured interviews with 26 visually impaired seniors experiencing severe or moderate vision loss. Our aim was to clarify the role of reading for leisure in their lives and also to learn how they dealt with the reading required for instrumental activities of daily living (IADLs). Participants judged reading, both before and after vision loss, as extremely important to them especially for the purposes of learning and enjoyment. On average, the time spent reading remained the same, and the main decline in the types of materials read was for newspapers and magazines. Approximately 60% of the participants used talking books, while a quarter used computer technology for reading print. With regard to functional independence, the participants identified reading demands involving small print, dials, and currency for the separate IADL domains. Specific strategies reported for coping with these reading-related barriers were analyzed in terms of the selection-optimization-compensation framework of Baltes and Baltes (1990). Providing information in alternate modes and improving access to appropriate assistive devices could enhance older adults' ability to read for life.

Reading is an important communication skill for maintaining connections to the social world, carrying out essential everyday activities, and for overall quality of life. We interviewed older adults with a visual impairment about their reading for leisure and functional independence in order to identify barriers and strategies for reducing them.

Vision loss is one of the most prevalent disabilities affecting the general population, with the majority of occurrences afflicting those individuals over 65 years of age (Branch, Horowitz, & Carr, 1989; Myrberg, Baeckman, & Lennerstrand, 1996; Orr, 1997; Stone, Mann, Mann, & Hurren, 1997). More than one in nine Canadians over age 65 and more than one in four over age 80 experience severe vision loss (Canadian National Institute for the Blind [CNIB], 2001). Prevalence of self-reported vision impairment increases with age: 15% of Americans age 45–64 years; 17% age 65–74 years and 26% age 75 years and older (Lighthouse, 1995).

The most common age-related eye diseases are macular degeneration, glaucoma, cataracts, and diabetic retinopathy (Davis, Lovie-Kitchin, & Thompson, 1995; Orr, 1997; Stone et al., 1997). Individuals with moderate impairment have an acuity of 20/70 or worse in the better eye with best possible correction, while legal blindness (or severe impairment) refers to a visual acuity of no better than 20/200 (Lampert & Lapolice, 1995). While most older adults still have some useable vision, age-related visual impairments particularly affect the ability to see print (Branch, Horowitz, & Carr, 1989; Flax, Golembiewski, & McCaulley, 1993).

Vision loss can have a widespread, negative impact on the lives of older adults (Branch et al., 1989; Lawton & Brody, 1969; Lighthouse, 1995; Mann, Hurren, Tomita, & Charvat, 1997; Rudberg, Furner, Dunn, & Cassel, 1993; Salive, Guralnik, Glynn, Christen, & Wallace, 1994). Within the Berlin Longitudinal Study, visual acuity was strongly correlated with age-related decline in performance of required daily activities and leisure pursuits (Marsiske, Klumb, & Baltes, 1997). In addition, the loss of vision is often associated with psychological reactions such as depression, low morale, hopelessness, and poor self-esteem (Branch et al., 1989; Dodds et al., 1994; Horowitz & Reinhardt, 1998). Vision impairment also may compound other physical, psychological or cognitive losses (Branch et al., 1989; Warren, 1995). The severity of the disability varies with such factors as age of onset, other chronic health conditions, support networks, and coping strategies (Beaver & Mann, 1995).

The onset of vision loss in later life poses a serious threat to the activity of reading for leisure and for functional independence. Maintaining the ability to read and write letters, read books and magazines and use other items associated with leisure, such as playing cards, contributes to well-being in later life (Smith, 1993). Reading is one of the most frequent leisure activities of older adults (Bond & Miller, 1987; Harris & Associates, 1981; Patterson, 1996; Zuzanek & Box, 1988). Reading is considered beneficial for numerous reasons: learning, mental stimulation, keeping current, social connections, enjoyment, relaxation, and staying connected with younger generations (Gold, 1990; Rice, 1986; Scales & Glenn, 1984; Scales, Harvey, & Brown, 1993; Smith, 1993). Driver, Tinsley, and Manfredo (1991) identified that reading offered compensation, security, intellectual stimulation, and solitude in later life. Reading can be a useful tool for reflection on the aging process and gaining perspective on one's life (Gold, 1990). However, participation in leisure activities has been shown to be reduced among people with age-related disabilities, such as vision loss (Heinemann, Colorez, Frank, & Taylor, 1988; Gordon, Gaitz, & Scott, 1976).

Reading is more than just the ability to read for pleasure; it is a functional prerequisite for autonomy in many instrumental activities of daily living (e.g., shopping and handling one's finances) (Beaver & Mann, 1995; Warren, 1995). Adequate performance of such everyday activities involves the use of written materials such as instructions, signs, labels, appliance dials, or directories.

Older adults compensate for visual loss by making both subtle and significant changes in how and what they read. A combination of high and low technologies may enhance useable vision, depending on the

nature of the reading material and the reading environment (Beaver & Mann, 1995; D'Allura, McInerney, & Horowitz, 1995; Orr, 1997). Three major categories of vision technologies are available for reading: enlarged print materials, optical aids (e.g., magnifiers) and audible formats (e.g., talking books) (Orr, 1997). Talking books are one of the more frequently utilized devices by older adults with visual impairments (Murray, Huynh, & Williamson, 1995). Notably, visually impaired older individuals report dissatisfaction with one out of every five devices used (Mann, Hurren, Karuza, & Bentley, 1993; Stone et al., 1997). Myrberg and colleagues (1996) found a smaller proportion of old-old clients mastering an alternative reading technique in vision rehabilitation than young-old clients. Although a number of clients gave up use of optical devices over the three-year period of the study, reading performance improved among those continuing to use the devices.

THE PRESENT STUDY

The World Health Organization (2001), conceptualizes the term disablement along three broad dimensions: impairment, activities, and participation. We propose that age-related vision impairment threatens the activity of reading which in turn can affect an older adult's participation in leisure and instrumental activities of daily living. We intend to characterize how older adults with low vision maintain their participation in the leisure activity of reading and cope with the reading requirements of everyday life.

With regard to the general impact of vision impairment, two research teams have qualitatively examined older adults' self-reported strategies for managing everyday life. Horowitz and colleagues (Horowitz, Brennan, Reinhardt, Leonard, Benn, & Cimarolli, 1998; see also Brennan & Cardinali, 2000) used a grounded theory approach to organize strategies into behavioral, psychological, and social coping categories. Wahl, Oswald, and Zimprich (1999) classified compensation strategies as person-related (i.e., more effort/time, latent skills, simplification, new behavior) and environment-related (i.e., use of devices, lighting, and structure). We focus here specifically on a single activity (reading) and specify strategies relevant to each domain of participation, rather than collapsing across domains.

The Baltes and Baltes' (1990) model of Successful Aging emphasizes a life-course perspective and a constructive approach to balancing gains and losses in later life (Baltes & Carstensen, 1996). Adaptations to age-related losses are categorized in terms of selection (modifying goals), optimization (allocating internal and external resources to best achieve the goals), and compensation (finding alternate ways to meet

the goals). Greater use of these three strategies is associated with positive outcomes such as subjective well-being, positive emotions, and absence of loneliness (Freund & Baltes, 1998). Gignac, Cott, and Bradley (2000) effectively applied this model to coping with everyday problems arising from osteoarthritis and osteoporosis. Hence, we chose this fruitful three-strategy framework for analyzing the ways of coping with reading-related barriers.

Participants were 26 community-dwelling older adults with severe or moderate visual impairment. The overall purpose was to assess the impact of vision loss on reading for leisure and for instrumental activities of daily living (IADL). The specific aims were to: (1) determine the importance and extent of reading activity before and after visual loss; (2) identify the reading-related barriers encountered within leisure and IADL; (3) explore strategies utilized to manage reading limitations.

METHOD

Participants

This convenience sample of late onset visually impaired older adults was recruited through two ophthalmologist offices and referrals from professionals working with seniors in the community. The participants were 18 women (69%) and 8 men ranging in age from 65 to 93 ($M = 78.5$). Four participants had moderate impairment (vision acuity worse than 20/70) while most (22) had severe impairment (vision acuity of 20/200 or worse). The majority had been diagnosed with macular degeneration (23). Other diagnoses were diabetic retinopathy (2) and glaucoma (1).

Many of the participants lived in their own home or apartment (69.2% [18]) or a seniors' apartment building (30.8% [8]). Most resided either with a spouse (42.3% [11]) or alone (46.2% [12]); three lived with adult children. They were relatively well educated; all had some high school; 30.8% [8] had a high school diploma and 50% [13] had a university degree or higher.

Materials and Procedure

Prior to the study, 11 older adults with visual impairments, aged 53 to 88 years, took part in a pilot study to identify the main issues for development of a semi-structured interview guide. An interviewer, also with a visual impairment, and experience in dealing with reading challenges, conducted individual discussions about the barriers and strategies associated with reading for leisure and performing

instrumental activities of daily living. The Baltes and Baltes (1990) Successful Aging model was a useful framework to characterize the richness of the coping strategies described by these participants.

The interview guide, emerging from qualitative analysis of these interviews, addressed two main areas: reading for leisure and reading for functional independence. "Reading" was defined for participants as dealing with "written materials including large print, talking books, computer, another person, etc." Questions focusing on reading for leisure, before and after vision loss, addressed the importance of reading (using a 10-point scale with 1 as "not important" and 10 as "extremely important"), reasons to read, materials read, and time spent (a 5-point scale indicated the number of hours per week spent reading, with 1 for 0–2 hours, 2 for 2–3.5 hours, 3 for 4–7 hours, 4 for 8–14 hours, and 5 for more than 14 hours) and how their vision loss had affected their ability to read for leisure. Questions focusing on instrumental activities of daily living were adapted from those used by Lawton and Brody (1969). The activities were the ability to prepare meals, use the telephone, handle personal finances, travel within and outside of the community, shop for groceries and specialty items, take medications, and do laundry (Fillenbaum, 1985; Judge, Schechtman, Cress, & the FICSIT group, 1996; Lawton & Brody, 1969). For each task, we inquired about the reading-related problems and strategies for dealing with them. The semi-structured interviews, all conducted in the participants' homes and audio-taped, lasted between 45 minutes and 2 hours. The transcripts, which were partially audited, were analyzed using NUD*IST 4.0, a software program for analyzing qualitative data. Brief quotations taken from interviewees' transcripts are identified by the letters of the alphabet.

A key focus was the identification of successful aging strategies: selection, optimization and compensation. To develop operational definitions, we started with those of Baltes and Baltes (1990) and Gignac et al. (2000). Selection strategies included restricting or limiting activity, performing it less often, and giving up or avoiding activity. We broadened the category of optimization to include altered behaviors, defining it as practicing, learning new skills, planning activity, modifying behavior, and enhancing motivation. Compensation was limited to include only strategies involving assistive devices and other people.

RESULTS

Reading for Leisure

Reading (defined as "dealing with written materials, including the aid of talking books, computers or another person") was just as important

after vision loss ($M=9.62$) as before ($M=9.00$), $t=1.59$, $p>.10$. Remarkably, reading was almost uniformly rated as “extremely important.” On average, participants spent an equivalent amount of time reading after vision loss as before (approximately 7 hours per week). Examination of these scores revealed that 9 participants gave ratings almost two scale points lower for after vision loss “It’s very important to me but . . . I can’t read print . . . the lack of communication at times leads to extreme frustrations” (#E); “I think I spend less now because I just don’t want to make the effort” (#Z Moderate). Eleven gave ratings almost two scale points higher “I love the talking books . . . I just can’t put them down . . . I just have to listen to the end” (#G); “I still read the newspaper . . . I struggle . . . I easily spend more time” (#W Moderate). Clearly, “reading” was and continues to be a crucial activity to these older adults despite their significant visual impairment “I mean all my life I’ve read . . . growing up I would be reading a book and stirring a pot on the stove” (#T); “It’s very important that I still read . . . it has just become harder” (#B).

Reasons for reading showed no significant change ($p>.05$). Reading was mainly for enjoyment, learning, and current events. Half of the sample also read to pass the time and to relate to people: “Reading the New York Times . . . was one of my favorite past-times . . . it expanded your ability to dialogue . . . and be more socially interactive” (#O).

The frequency of reading the most popular materials declined significantly from before to after vision loss. These included newspapers, magazines, fiction, biographical/autobiographical, historical and religious books ($\chi^2 \geq 4.45$). The main change identified in reading content was the shift away from newspapers and magazines. Most participants gave them up because even the use of optical aids (e.g., magnifier, closed circuit television) was not sufficient. One participant indicated that she had replaced reading for current events with radio and television because “it’s less effort and yet its quality is good” (#J). However, some still clung to newspapers and magazines, allocating most of their limited visual reading energies to them.

Talking books were utilized by 58% of the participants to continue reading for leisure. Most of the participants obtained their books through the local library or the CNIB. These were much appreciated by users, especially for fiction, biographies, and historical books. “Mainly fiction I enjoy. I get . . . [talking books] through the CNIB right in the mail. They even send them down to Florida” (#V). Talking book users did not differ from non-users in the importance or amount of reading in the past. Some had tried the talking books but had lost interest. Others reported initial difficulties in learning to use them effectively, including falling asleep and poor concentration. Strategies

mentioned for dealing with these problems included listening to the books for brief periods at first, listening when performing household tasks to stay alert, listening in a well lit room, and learning to turn off the tape when interrupted to avoid having to rewind. Another difficulty was age-related hearing loss, especially for some women's voices.

Reading in Instrumental Activities of Daily Living

Barriers

The specific reading-related barriers in IADL are summarized in Table 1. Three types of barriers were identified: reading print "Reading recipes drives me nuts. I used to measure things out but I stopped doing that because I was constantly having to clean my magnifier . . . I find it very tiring to find my place and find the measurement" (#D), locating dial settings "It's hard to read on the oven the numbers and . . . I have a knob on there . . . I can't focus my magnifier on. I know where about 400 is so I just stick it at that . . .

TABLE 1 Reading-Related Barriers in Instrumental Activities of Daily Living

Activities	Barriers
Meal preparation	Recipes; expiration dates; labels; appliance dials
Telephone use	Numbers on phones; locating name/number in directory/address book; finding proper change or assistance for payphone.
Finances	Checks, deposit slips, receipts or bills; ATMs; dealing with coins/bills.
Travelling	Signs, bus schedules, maps; numbers on doors and buses; distinguishing small landmarks; electronic schedule board (bus times and location); locating unfamiliar bus depots.
Shopping	Product labels, prices and expiration dates; making proper change; writing checks; identifying location/store name; locating items within the store; money (coins and bills).
Medications	Labels on bottles; medication instructions.
Laundry	Appliance instruction manuals or warranties; labels on cleaning products; dials/buttons on washer/dryer.

With the microwave, I can just count in my head how many seconds it is” (#Q), and dealing with currency “I’ve got a little change purse that I dump in my hands and I say you pick it out” (#M); “I cannot differentiate without struggling between a quarter and a nickel . . . I know that you can feel the ridges, but I haven’t got into doing that properly” (#W Moderate).

Strategies

Table 2 contains illustrations of selection, optimization, and compensation strategies for dealing with the reading requirements of three IADL. With respect to selection, individuals can relinquish the activity altogether (i.e., rely on others’ assistance) or continue a valued activity (e.g., shopping) either by simplifying the activity (e.g., only going to small stores), restricting the activity (e.g., going less often), or developing alternative techniques (e.g., having goods delivered) “I shop at the same place . . . around the corner” (#Y Moderate); “Only if I have to have something will I go” (#H).

Participants were able to optimize their existing functional performance of a task by practicing priority skills, learning new skills, and downplaying the importance of relinquished tasks: “Sometimes I will just take the bus and go for a ride just to see where things are . . . like a tour” (#D); “It’s very, very frustrating, but I’m getting so I don’t mind asking people anymore” (#O); “Well I suppose [prices and expiration dates] could be [a problem] but it isn’t really because . . . I’m so used to shopping I know exactly what I want, my orange juice . . . my certain milk . . . I don’t care if it goes up a cent or two” (#K); “I used to think that things had to be perfect but it doesn’t have to be perfect at all” (#H).

Compensation involves the incorporation of assistive devices (A) into the older adult’s routine, or reliance on assistance from other people (B). Participants used a wide range of low and high technology devices to assist with reading for leisure and IADL, including magnifiers (73%), felt pens (73%), high intensity lamps (62%), talking books (58%), closed circuit television ([CCTV] 42%), and computers (23%). In most cases, low-tech devices (e.g., high intensity lights, magnifiers, and audio-tapes) were chosen to assist with immediate reading-related problems. The higher-tech CCTV was used for reading printed information at home. Computer technology offered many compensatory advantages to visually impaired readers. The computer was used for large print, scanning written materials, voice synthesis, keeping track of appointments, e-mail, and/or the Internet. “I had created on the computer a shopping list with everything you need to buy ever and then I transfer that to a current one each week . . . cross out what I don’t want . . . fax it in and they deliver it” (#I). Despite its advantages

TABLE 2 Successful Aging Strategies for Reading in Instrumental Activities of Daily Living

Activity	Strategy		
	Selection	Optimization	Compensation
Meal preparation	Continue as before; make simpler meals to decrease amount of reading needed; continue using recipes; forgo the activity in favor of other activities.	Memorize a small number of easy recipes with few ingredients; repeat to increase recipe familiarity; memorize dials on appliances; accept imperfection;	A) Large print measuring cups; tactile marks on appliances; microwave versus stove; audio tapes; computer programs to enlarge print; enlarged print diagrams of appliance dials. B) Assistance in reading recipes aloud; rely completely on support of others.
Telephone use	Independently dial phones in the home	Memorize keypad and important phone numbers; organize numbers/addresses in personal folders.	A) Large size keypads, memory keys, large print address books/ yellow page directories; magnifier. B) Assistance from telephone operator or others to dial/look up phone numbers.
Finance	Continue to read visual materials such as bills, checks or invoices; continue to use automatic teller machines; continue to handle coinage and bills; write personal checks only when absolutely necessary.	Memorize buttons and instruction screens of bank machines; take out only small amounts of money to prevent theft or errors; develop techniques for distinguishing different coins/bills; trust others; learn to increase size of signature; practice; accept imperfection.	A) Felt pen, magnifier, closed circuit television, computer, specialized large print check, coin purse. B) assistance from spouse/bank teller/financial advisor to read material aloud; assistance with locating keys on touchpad, reading the screen aloud, pointing out lines to fill in on check.

the computer fell short in terms of accessibility and convenience. Some users were on a long waiting list for computer training, did not know how to change settings to enable them to use their remaining vision, or gave up because it did not seem worth the effort. "I have a computer in there with a scanner... but it's slow and the voice is not pleasant. They have a long way to go. I'm kind of frustrated with the industry" (#Q).

Relying on other people was another important compensatory option for coping with reading barriers. "Price tags on clothing is more of an issue; I usually go out with [name] for that" (#K). Some people mentioned the usefulness of a white cane as a signal for facilitating help with reading while traveling or shopping.

In line with Baltes and Baltes (1990), the three strategies for successful coping with visual loss were often intertwined. For example, one interviewee compensated for his inability to prepare meals by choosing to be responsible for another activity that he was still able to manage independently and competently: "My wife does all the cooking and I do the dishes" (#B).

DISCUSSION

Reading for Leisure

The importance of reading for leisure was near the maximum both before and after vision loss. The general reasons for reading (stable after vision loss) were similar to those identified by Scales and Glenn (1984). Participants consistently endorsed reading for learning and enjoyment. They continued to spend an average of seven hours per week reading with an impairment, with some spending considerably more time after vision loss, and others spending less. The types of reading material remained the same although the amount of print read was reduced. Literature about reading among older adults (Scales et al., 1993; Smith, 1993) suggests that reading is a major daily activity for older adults who are visually impaired. For some, reading can be even more important after vision loss because other activities may be limited due to difficulty traveling outside the home (Branch et al., 1989; Mann et al., 1997). Reading for leisure is understandably a major component of a high quality life for those who have always been avid readers, as a significant tool for regularly enriching everyday life (Driver et al., 1991; Gold, 1990; Smith, 1993).

Talking books were the main available resource for allowing people with visual impairment to continue reading for leisure. The CNIB provides a talking book service specifically for people with a severe

visual impairment (see also Murray et al., [1995] for Australia). These unabridged materials also are available across Canada to those with print impairments through public libraries, where the service is a natural addition to other reader services. Almost 60% of the participants used talking books as a means of continuing to “read” for leisure. For life-long avid readers and for individuals reading more now via talking books, the satisfaction derived from this form of technology-assisted reading can be an important ingredient for adjustment to visual loss.

One of the most surprising findings was that 42% of the visually impaired older adults did not use talking books. This high proportion of non-users may be the result of lack of information about their availability, resistance to changing modality, and difficulty in learning to use them. The talking book service of the public library is not well known, and many older adults think of the CNIB as a resource only for people with total blindness. Increasingly, commercial publishers are creating abridged (and even unabridged) audio tapes for new publications, and these are readily available to all library borrowers (e.g., for joggers and commuters). Growth in the general popularity of listening to books on tape may decrease the potential stigma associated with an assistive device and lead to an increase in older adults’ familiarity with this technology. Comments from the users of talking books underscored the difficulties encountered in learning to attend while listening.

Access to newspapers and magazines is limited, in contrast to books, which are readily available on tape. A study conducted by Smith (1993) found that older adults tended to read primarily newspapers and magazines, rather than fiction books, due to their informative content. In the present study however, we found the opposite pattern after vision loss, despite the continuing priority of reading to learn. This contrast in findings may be due to the emphasis on fiction in talking book collections. Moreover, listening to news on tape requires special attentiveness. The linear presentation contrasts with the way people typically skim newspapers and magazines. The Internet and new CD-ROM technology facilitate access to current information based on individual interests (Cantor, 1996).

Coping Strategies for Instrumental Activities of Daily Living

It is necessary to deal with print, dials, and currency to manage the many everyday tasks required for an independent lifestyle. Participants were flexible, persistent, and creative in dealing with these reading barriers. A variety of concrete examples of coping strategies were offered for each domain of IADL.

Within the Baltes and Baltes (1990) framework, these visually impaired participants reported a variety of successful adaptation strategies. Mapping adaptive behaviors according to strategy type and separate IADL domains reveals commonalities while still preserving details useful for theorizing and for client education. With regard to selection, participants were faced with continuing decisions about when to maintain goals (goal tenacity) and when to modify them (goal flexibility). Appropriate goal selection was characteristic of most participants in that they aimed for challenging but potentially achievable goals. For others there was always the possibility of premature relinquishment of goals. The tension between goal tenacity and goal flexibility has been examined by Brandtstaedter (1999), who demonstrated that these dimensions are orthogonal and underlie successful adaptation to loss.

For optimization, the main tactics were to rely more on new learning and on memory. Despite negative stereotypes of aging, these participants demonstrate that memory can be improved with strategies, effort, and attention and that new learning is not only possible, but necessary. This response to challenge may help maintain cognitive skills, and the ongoing learning may facilitate further adaptations to age-associated changes (Rowe & Kahn, 1997). Yet, the added burden on memory puts visually impaired older adults at risk if they develop memory or cognitive problems.

For compensation, these adults effectively used devices and reliance on others to be as independent as possible. Participants reported overcoming print-related barriers with domain-specific compensations such as special measuring cups, large print or audio taped recipes, large button telephones, large print or audio-taped address books, and raised marks on dials. Within each domain, participants often relied on help to carry out specific activities (e.g., using a white cane to facilitate requesting bus information or item prices).

As in Wahl et al. (1999) and Horowitz et al. (1998), this study was based on listening to the voices of older adults about strategies for coping with visual loss. Within the Wahl framework, selection and optimization strategies would be termed person-oriented strategies and compensation would be termed environment-oriented strategies. Within the Horowitz conceptualization, all strategies would be considered behavioral, as opposed to psychological and social coping. Our focus on reading within specific domains of everyday functioning complements these two studies and highlights the value of exploratory, qualitative research in enriching the possibilities for future hypothesis-directed quantitative investigations.

Adaptive Technology for Reading

Visually impaired seniors rely on a variety of low tech and high tech devices, and often more than one optical device is needed to successfully complete reading and writing tasks. New devices or compensatory techniques were often utilized by participants in order to prevent the relinquishment of a given activity. The main reason for using an assistive device was to continue to perform activities that participants identified as personally meaningful and satisfying (see Gitlin, 1995). Mastering new devices can give a sense of competence and autonomy. Moreover, new and different avenues of expertise can be explored, especially with computer technology (e.g., developing alternate styles of cooking and financial planning).

Nevertheless, many participants mentioned that they experienced frustration when using assistive devices. For example, magnifiers are easily misplaced and unsuited to some tasks (e.g., reading curved dials). In addition, their fixed magnification levels may render them useless if vision continues to deteriorate. Participants had difficulty hearing some voices while listening to talking books (see Murray et al., 1995). Age-related hearing loss should make the use of optimal audio equipment a priority for older adults. Some talking book users make do with inadequate tape-players. Increased vertigo problems in later life can also interfere with the use of closed-circuit television systems by older people. Moreover, some older adults gave up reading for leisure (despite its universal top importance rating), much in the same way that Gignac and colleagues' (2000) participants were more likely to limit valued activities that are discretionary (such as reading books and periodicals) than activities necessary for daily life (such as meal preparation when living alone). Guidance in selecting assistive devices and training in their use can help older adults to maximize benefits for both personally important and required activities of daily life (Mann et al., 1997; Warren, 1995).

High tech devices were rarely employed. However, their use is likely to increase dramatically in the near future as part of the technology revolution. With computer technology more reading is possible, especially for current information (e.g., newspapers) and for personal lists (e.g., address book, recipes). Print can be magnified very flexibly for reading on the screen or in printouts. In addition, written materials can be scanned and read aloud with text-to-speech software; and voice-to-print software eliminates the need to see or memorize the keyboard. However, there is a need to make speech-based software more user-friendly as most people are understandably reluctant to become reliant on complex and unpredictable technology. Older adults can learn

to use computers with appropriate initial and ongoing training, but simpler systems are more conducive to regular use (Charness, 2001). The universal popularity of computer technology provides access to an assistive device without the stigma commonly associated with disability (Ryan, Bajorek, Anas, & Beamer, 2001).

FUTURE RESEARCH AND PRACTICAL IMPLICATIONS

This study was limited by its qualitative, exploratory nature and the relatively small sample size. While the current purpose was to identify the scope of strategies for coping with reading barriers, future research with a larger sample could examine the frequencies of specific effective strategies (see Freund & Baltes, 1998; Gignac et al., 2000). It would be useful to examine the relationship between coping strategies and severity of visual loss, duration, age of loss, current age, living arrangements (alone versus with spouse), and adaptation to earlier significant losses. A longitudinal study would be useful with repeated assessments to track the gradual loss of vision and the accompanying coping strategies. Such a longitudinal study could also include assessments of actual abilities to deal with written materials with participants' usual assistive devices (see Baldasare, Watson, Whittaker, & Miller-Shaffer, 1986). Future research could also address access to appropriate eye care, assistive devices, and community support for reading which could be influenced by factors such as socioeconomic status, cultural background, living arrangements, and geographic location.

Public education and early intervention might be especially useful to seniors because of the prevalence of age-related vision disorders and their gradual onset. The ongoing changes can result in the gradual relinquishing of valued activities such as reading. However, this unnecessary loss can be avoided by early intervention in terms of instruction in the use of low tech devices such as high intensity lighting and magnifiers. Policy changes occurring in Canada at the CNIB and the public libraries are facilitating access to talking books and computer technology earlier in the progress of visual loss so that individuals can learn to use these technologies while their vision can help them. Learning to use the device before it is actually needed enables seniors to become comfortable with the technology for a future time when they may have to rely upon it. The use of high technology, such as computers, must be supported by timely access, appropriate initial training, and ongoing support. With regard to reading barriers inherent in the performance of everyday tasks, designers and gerontologists should be seeking to remove these barriers with the

principles of universal design as much as possible. For example, dials on telephones and household appliances could include tactile marks. Information for shoppers, medication users, travelers, and bank customers should be made increasingly available in large print and/or auditory modes where feasible.

In summary, from the perspective of the World Health Organization classification scheme, this study highlights the continued priority of the activity of reading for older adults experiencing age-related visual impairment and the various strategies they employ in maintaining this activity both for participation in leisure and in key functional domains of everyday life.

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