Dual Sensory Loss——An Ageing Issue!

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[Abstract] With the ageing of populations, dual sensory loss (DSL) (combined vision and hearing loss) is a pertinent issue, especially since many older adults experience vision and hearing difficulties as they age. This combined disability is associated with difficulty in social communication situations, often leading to diminished psychological well-being and quality of life. The aim of this paper is to review the literature regarding the prevalence of dual sensory loss and its impact on older people, with special relevance to the older adult Chinese population.

[Key words] Population ageing; Dual sensor loss

耳聋目盲——老年的视听双损问题

【摘】伴随着人口老龄化，老年人视听功能的双损（视听双损，DSL）的问题已经是社会面临的实际问题。眼和听觉同时的损伤很常见，是很多老年人正在经历的困难。而且随着年龄的增长，问题会更加严重。这种双损不仅仅关医学问题，而且也给社会带来挑战。“耳聋目盲”老年人的社会沟通能力受到影响，并因此影响他们的心理健康和社会功能。本文目的是通过文献回顾，提出双损伤的流行率以及对老年人的影响。这些科学证据对快速老龄化的中国具有借鉴意义。

【关键词】老龄；视听双损

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Introduction

With the current increase in longevity, many adults are living longer. It is expected that by 2050, there will be two billion people worldwide aged 60 years and over (World Health Organization, 2012). Concomitant to this population expansion are the number of older adults aged 80 years and over, constituting the old-old pop-

ulation. According to the World Health Organization (WHO, 2012), between 2000 and 2050, the number of people aged 80 years and over will almost quadruple to 395 million. According to the Chinese National Survey (CNRCA, 2010), in 2010 under 10% of Chinese adults were aged 65 years and over. In comparison, by 2060, this population is predicted to increase to 30% with 8.8% of the population aged 80 years and over (106.7 million) (CNRCA, 2002). In order to accommodate this rapid population growth in the aged population, services and policies for older adults will need to be reviewed and expanded.

A number of disabling conditions are associated with ageing, including for many people, deterioration of their vision and hear-
ing. Vision and hearing impairment in older adults are prevalent and disabling conditions that have generated extensive but separate literatures. In comparison, the literature in relation to dual sensory loss (DSL), the combined loss of vision and hearing, is limited, and only sparse information is available regarding the description, definition and consequences of this disability.

Although an exact definition and description of DSL still prevails, studies generally express sensory loss on a continuum such as varying from no sensory loss to vision or hearing loss only and finally DSL. The assessment of sensory acuity has also been evaluated using various measures. Brennan, Su and Horowitz (2006) measured DSL in response to self-reports (i.e., Do you have any difficulty with your hearing/vision?) whilst Lin, Gutierrez, Stone et al. (2004) classified participants as having DSL according to the outcomes of clinical measures. Specifically, participants were categorized as having DSL if they had any degree of both visual impairment (visual acuity < 20/40) and hearing impairment (audiometric threshold at any frequency, 40 dBHL cut-off point).

**Prevalence of DSL**

Since studies differ in their methodologies, the exact prevalence of DSL is also difficult to measure. According to Caban et al. (2000), the prevalence of DSL in their sample of 1,110 community residing people in the US was 7.3% in those participants aged 69 - 79 years and 16.6% for those aged 80 years and over. Similarly, Chou and Chi (2004) conducted a study on 2,003 elderly Hong Kong residents and concluded that 20.0% had poor vision, 17.5% had impaired hearing whilst 6.5% had vision and hearing loss. In contrast, Brennan, Su and Horowitz (2006) estimated the prevalence of DSL to be 22.5%. Irrespective of methodology, results of these studies support the notion that DSL presents as a significant difficulty for many older adults.

Numerous factors influence the exacerbation of sensory loss in older adults, such as increasing age, geographical location, institutionalisation and gender. According to Reznikoff, Passolini, Elia’ale et al. (2004), in 2002, there were 30,508 million people worldwide aged 50 years and over who were blind. Based on the China Nine Province Survey of 45,747 adults aged 50 years and older, living in rural China, Zhao, Ellwin, Gui et al. (2010), the prevalence of visual impairment was 5.30% and 1.93% for blindness. Furthermore, the increased prevalence of these disabilities was associated with older age, female gender, lack of education and geographical area (province). Hearing impairment is also a prevalent condition that increases with age. Results of a 1998 study conducted in Shanghai, China, suggested that 468 people aged 65 - 74 years (n = 2,044) rated their hearing as poor, whilst 415 people (n = 1,050) aged 75 years and over, also rated their hearing as poor (Yu, Kean, Slymen et al., 1998). Mitchell, Gopinath, Jin Wang et al. (2011) estimated that of 2,956 Australian adults aged 50 years and over, 33.0% had a hearing loss according to audiometric evaluation. Results of this study also suggested that hearing loss was more prevalent in men than in women and that the risk of incident hearing loss increased threefold for each decade of age after 60 years.

The association between visual impairment and gender may be attributed to the current longevity of women, with more females than males exhibiting visual impairment in the older age group. Alternatively, it may be the existence of specific etiologies in males and females. For example, age-related macular degeneration has a higher prevalence rate in females than males (VanNekirk et al., 2000) whilst proportionally more males than females experience hearing loss (Mitchell, Gopinath, Jin Wang et al., 2011). Factors such as occupational, recreational or military noise exposure have contributed to this disparity in hearing disability between males and females.

**Institutionalisation also affects sensory loss.** Whilst no Chinese based population data collection exists on this topic, using Australian samples of older adults residing in nursing homes, VanNekirk et al. (2000) confirmed a high prevalence of visual impairment in nursing home residents and concluded that underestimation of visual impairment may occur in residential population - based studies that exclude institutional or residential nursing homes and hostels. The prevalence of hearing impairment is also greater in nursing home residents than community - based samples. In the US, Cohen - Mansfield and Taylor (2004) found that in their sample of 175 nursing home residents, up to 62.7% were rated by any source (staff or resident) as having a hearing impairment. Thus, with the increase in longevity and consequential increase in the number of older people requiring assisted living, the prevalence of sensory loss is expected to increase.

**Eye and ear pathologies and ageing**

Numerous eye and ear pathologies are associated with ageing, particularly since a number of degenerative anatomical and physiological eye and ear changes commonly occur. Age-related macular degeneration is a common slowly progressing visual disorder occurring in the older adult population. This irreversible, acquired disorder usually affects central vision and often results in the inability to recognize faces, difficulty in reading print and inability to continue driving. Other disorders that commonly occur in the older adult population include cataract, diabetic retinopathy, retinal vascular disease, glaucoma and neuro-ophthalmological disorders (Ah - Chan & Downes, 2006). Results of the Beijing Eye Study conducted in rural and urban Beijing revealed that age related macular degeneration and diabetic retinopathy play only a minor role as a cause for visual field loss (VFL) in China (Wang, Xu & Jonas, 2006). More specifically, of the 4,439 people who were examined, in the 40 to 49 year age range, the most frequent cause for VFL was degenerative myopia followed by glaucoma, other optic nerve diseases and cataract. In contrast, the most frequent cause for VFL was cataract, followed by glaucoma and degenerative myopia in the 60 to 69 year olds with glaucoma as the major cause, followed by cataract and degenerative myopia in those aged 70 years and over.
The degree of impairment arising from these visual conditions varies, particularly if the disease (for example, cataract) is reversible through surgical or other types of management. Central or peripheral field losses result in a multitude of problems, ranging from intolerance, to variations in luminance, to dependence on high levels of luminance, reduced contrast sensitivity, inability to see fine detail of large low contrast objects, difficulty visualizing distant objects, discriminating detail, adapting to darkness and distinguishing between different colours (Orr & Rogers, 2006). Additionally, vision loss limits the engagement in out-of-home activities, such as engaging in leisure activities or completing Instrumental Activities of Daily Living (such as shopping) and also results in difficulty with accessing transportation (Berger, 2012). Liu, Song, Chi and Zheng (2008) analysed the 1987 and 2006 cross-sectional waves of the China National Sample Survey on Handicap/Disability and found that the average age of onset of a visual disability in 1987 was 61.6 years, which increased by 2.9 years to 64.5 years in 2006. Thus, visual impairment is a significant issue in the older adult Chinese population.

Many adults also experience a range of ear conditions as they age. Age-related hearing loss (presbycusis) is common, usually resulting in bilateral progressive loss of hearing sensitivity and central auditory processing difficulties (Weinstein, 2002). Thus, older people frequently have difficulty discriminating high frequency sounds such as p, t, k, f, th, sh, and s, which affects accurate reception and understanding of conversational speech (Ehrl, 2003). Other ear conditions that commonly occur in older adults include cerumen (earwax) impaction, middle ear changes (due to stiffness, arthritis, atrophy and ossification including otosclerosis) and the hearing loss attributed to excessive exposure to high intensity noise (Weinstein, 2002). Central auditory system or higher auditory pathway changes responsible for auditory processing, speech understanding and discrimination are also common in older adults (Golding, 2007).

Impact of sensory loss

The link between physiological damage caused by eye and ear pathology and decreased performance on visual and auditory tasks is well established. Age-related, acquired visual and hearing impairments are usually slowly, progressive conditions that impact on people’s everyday lives and activities, and have implications regarding performance and well being.

Difficulties with communication are a significant issue for those with DSL (Heine & Browning, 2002; Heine, Erber, Osborne & Browning, 2002). Communication is an essential skill required for maintenance of social interaction that in turn, enhances well being. The communication difficulty associated with visual loss includes decreased visual perception necessary for effective verbal communication to occur (Heine & Browning, 2002). Visual perceptual difficulties include difficulty with perceiving cues, such as lipreading and other non-verbal cues (such as visual detail, distance, illumination, and facial acuity of the communication partner). Many people with severe visual loss (low vision or legal blindness) cannot see their communication partner’s face, and therefore cannot lipread or perceive cues such as gesture, facial expression and body posture and thus need to rely heavily on the auditory modality for adequate speech reception. However, in those with DSL, auditory acuity is reduced and cannot compensate for diminished visual acuity. Furthermore, many older adults with hearing loss or DSL do not successfully use amplification or other assistive listening devices successfully to improve their hearing (Ehrl, 2003), further increasing the incidence of communication difficulty in people with DSL.

In addition to communication restrictions, many older adults with DSL are at risk for developing depression (Capella – McDonnell, 2005), have difficulty with everyday competence (Brennan, Horowitz & Su, 2005), have poorer health (Harada et al., 2008), display stronger morbidity indicators (Lee, Lan et al., 2005) and have an increased risk of mortality (Lee, Gomez – Martin et al., 2007).

Managing DSL

DSL is a complex area requiring a multidisciplinary perspective to assessment and management. The multidisciplinary team not only includes vision and hearing specialists such as the Optometrist, Otolaryngologist and Audiologist, but usually also includes the Speech Pathologist and other Allied Health professionals. The use of visual and hearing aids and assistive devices are of utmost importance and have thus been described exhaustively in the vision and hearing literatures. Aids and devices are however only one component of an aural rehabilitation plan. Since DSL has implications for both communication and psychosocial behaviour (Heine & Browning, 2003), additional areas should be included in the management plan such as auditory training, communication strategies training, frequent communication partner training, information counselling and psychosocial support (Tye – Murray, 2009). Audiologists and/or Speech Pathologists with specialization in the area of DSL are ideally placed to provide this type of management. This diversification in management can lead to enhanced well being and quality of life of older adults with DSL.

Conclusion

The impact of DSL is immense and since the number of older people is set to increase, the prevalence of DSL will also likely increase. This condition therefore requires further investigation and allocation of resources, so that older adults with DSL can be appropriately identified and managed.

References
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耳聋目盲——老年人的视听双损问题

1 背景
长寿是现代社会的明显特征，人们寿命越来越长。预计到2050年，世界上将有20亿人的年龄达到60岁及以上[1]。在日益增多的老年人口中，80岁及以上的老年人（即“老年人”）尤其值得我们关注，根据世界卫生组织报告，2000—2050年，老年人的数量将翻两番，达到3.95亿人[2]。中国的城乡老年人口状况调查显示，2010年时中国有10%的人口达到65岁及以上，预计到2060年65岁及以上人口比例将达到30%，其中老年人将达到8.8%，即1.07亿人[3]。为了迎接老龄化带来的新挑战，需要重新审视和研究应对老年人的服务和政策。

老龄化与失能之间的关系是明确的，失能包括了视、听能的退化。老年人视、听受损和听觉障碍的问题是普遍存在的，并影响老年人的心理及社会功能，从文献评价的结果看，有很多文献单独地研究其中一个功能障碍，而同时研究视、听能力的文献是很少的[4-5]。因此对“视听双
“视” 的描述、定义、后果的研究也很少。


2 视听双损的流行率


视觉损伤与听觉损伤的关系可能与女性更长有关。老年女性的视觉损伤流行率高于中年女性。当然，也可能存在性别差异与职业上的原因。比如，年龄较大的男性老年人的视觉损伤率高于女性[10]，而听觉损伤流行率则男性高于女性[11]。男性更多地暴露于职业性的、娱乐性的、军事方面的噪声，是男性听力损伤流行率高于女性的影响因素。


3 视听生理学与老龄化

很多眼和耳的病理学变化与老龄有关，随着年龄的增长，眼和耳会发生很多退行性变化和生理学变化。老年人群常见的年龄相关的衰老退变，会造成老年人慢性发展的视觉障碍。这些障碍是不可逆的，后天性的，影响视力、听力对于老年人的独立生活自理、阅读文字困难、穿行马路困难。老年人常见的其他障碍包括白内障、糖尿病视网膜病变、视网膜血管病、青光眼、神经眼科疾病[14]。在视觉的研究中，遗传病的研究结果表明，年龄相关的黄斑变性和糖尿病视网膜病变只是一种造成老年人视觉损伤的微弱因素[15]。这项研究对 4359 名参与者进行了调查，发现 40~49 岁参加者视觉损伤的最主要原因在是后天性的，其次为青光眼、其他眼神经疾病和白内障；60~69 岁视觉损伤的主要原因是白内障，其次是青光眼和后天性近视，70 岁及以上视觉损伤的主要原因是白内障和后天性近视。

各种视觉问题所带来的损伤程度是不同的，有些眼科疾病可能是“可恢复的”，如经过手术或其他治疗措施可以消除白内障问题。但是周边和中央视觉损伤会造成很多问题，如对各种亮度的不敏感，对光的依赖性，对视觉敏感性降低，不能看见小物体如欧式物体的细节，难以识别光线的亮度，难以分辨细微特征，难以适应黑暗环境，难以区分不同颜色[16]。此外，视觉损伤还会限制老年人的户外活动，如参加娱乐活动，或者日常的生活活动（如购物），并造成使用交通工具的困难[17]。中国的一项研究分析了 1987 年和 2006 年中国视力残疾和失明调查的数据，发现 1987 年发生视觉损伤的平均年龄是 61.6 岁，2006 年为 64.5 岁，即视觉损伤发生年龄推迟了 2.9 年[18]。

很多成人会存在耳的疾病。与年龄相关的听觉损伤（老年型耳聋）是常见的，通常会同时造成进行性听力灵敏性损失和中枢听觉处理的困难[19]。所以老年人经常会难以分清高低度的声音，如 p、t、k、f、th、s（彼得、特等）子、市、四）从而影响他们准确地接受和理解交谈的内容[20]。还有一些其他耳病如耳鸣（耳聋、耳痛）、中耳炎、耳硬化症（硬化、关节炎、萎缩、骨化、硬化症）等也会使听觉变差。因此，听力损伤还与过度暴露于高强度噪声有关[21]。老年人中听觉处理状态的变化，或高龄的听觉通路的变化，也会影响他们的听觉处理过程，语言理解能力和分辨能力[22]。

4 视听损伤带来的影响

有很多研究涉及眼和耳的病理学改变所带来的生理学损伤及与从事视觉和听觉有关的疾病降低的疾病问题。与年龄有关的，后天性的视觉和听觉损伤，通常是一个缓慢的和进行性的问题，会影响到人们日常的生活和活动，并影响人们的工作效率和人们的生活质量。

沟通困难，这是视听双损的老年人面临的最大问题[23]。沟通是维持社交互动的一个最基本的技能，并进一步影响到人们的健康和幸福。与视听损伤有关的沟通困难包括基础的视觉感知功能下降，这些视觉功能下降会影响对交谈中语言的理解[24]。我们知道，社交中的沟通是通过“听者和者说”来实现的。对视觉损伤的人来说，他们会难以识别对方表达意
思的各种线索，如看不清对方的思维；也难以抓住那些语言线索，如对话语的细节、语速等。对于那些严重视觉损害的人来说，视觉是最重要的有声方法，他们看不清对方的语言，也看不到对方的表情。对这些患者，特别是对视幻觉的患者，我们往往要依赖语言方

来理解对方的谈话内容。但是，如果是一个视幻觉的患者，他的视幻觉功能和视觉功能同时受损，不具有用听觉来代替视觉的功能，进一步讲，很多听觉损伤或视幻觉的患者的语言，没有或不能使用听觉装置改善他们的语言功能。因此，视幻

觉的患者的沟通非常困难。

除了视幻觉的老年人的沟通造成很大困难外，他们的心

理健康也受到严重影响，往往会出现抑郁和焦虑行为[25]；他

们的健康状况往往较差[26]，患病率较高[27]，而且死亡率也较

高[28]。

5 视觉丧失的管理和挑战

因视觉丧失是一个比较复杂的领域，需要采用多学科的思路来评估和管理。针对视觉丧失的多学科团队不仅包括视力和听力方面的专家（如眼科专家、验光师、耳鼻喉科专家、听力

专家），还经常包括语言病理专家和帮助性健康服务工作者。使用视力和听力辅助器械和装置是非常重要的方法，而且这些方法使用和听觉研究中的研究有其重要的意义。不过，辅助器械和装置目前还仅用于语言康复训练（即听觉的使用）。由于视力丧失和听觉的丧失，患者会失去对语言的识别，出现语言

障碍，然后会对心理社会行为产生影响[29]，因此应该在视

觉丧失的管理中增加其他内容，比如听力训练、沟通策略培训、对听力丧失的进行心理支持等[30]。致力于视听丧失研究的听力专家和语言病理专家，是提供管理服务的理想人选。对视觉丧失老年人的多样化和跨学科合作，将明显地促进老年人的幸福，提高其生活质量。

6 结论

视幻觉给老年人带来很大的影响。随着老年人口的增

加，视幻觉的老年人数和终身率也会增加。临床需要对视

幻觉展开进一步的深入研究，并对深入研究的复杂性以完善对

视幻觉的老年人的识别和管理。

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· 热点关注 ·

震后第一人——震后互救

震后互救，指地震后灾区幸免于难的人们对被埋压人员实施救授援助的措施。由于各种条件的限制，外界救援人员不可能立即到达现场。因此，灾区人民互救互动措施迅速形成，以熟悉情况，可以在短时间短内对灾区副灾人员，具有难以替代的作用。

1. 快速救人：据1983年山东菏泽地震统计，震后20 min 没有活命的伤员，震后1 min 没有活命的伤员，震后2 min 没有活命的伤员，灾区总死亡人数的伤员死亡总伤员50%以上。

2. 救人原则：(1) 先近后远：先救近处的人。不论是否家中、邻家、还是本村本村的人，只要近处有人有面包就应救。如果条件允许，可以被救出人行军。(2) 先救年长、易救的人、中年人、老年人，以尽量扩大互救可能性。 (3) 实战性：要求把安全放在首位，防止对被埋压者造成的伤害。

3. 一般方法：震后救人，要根据灾情的环境与条件，因地制宜地采取相应的措施。(1) 确定位置：根据建筑物倒塌特点，判断被埋压者的位置。 (2) 拆解建筑物倒塌后形成的一些“安全岛”，在这些空间内可以找到遇险者；可用人工喊话、敲击、地震器、及呼喊等声音寻找被埋压者。也可请被埋压者家属、同事或邻居提供被埋压线索；也可利用先进的科学检测技术，如红外线探测技术、核生化定位技术、光学目视探测技术、无线电定位技术等。