

THE HEARING BRAIN – THERE IS A ‘VICIOUS-CIRCLE’ BETWEEN HEARING LOSS AND COGNITIVE DECLINE: HEARING LOSS INCREASES BY OVER 3 TIMES THE RISK OF DEMENTIA, WHICH IN 3 OUT OF 4 IS ACCOMPANIED BY HEARING LOSS

PRESENTED TODAY IN MILAN THE CONSENSUS PAPER ‘THE HEARING BRAIN – THE CLOSE CORRELATION BETWEEN HEARING AND COGNITION’, WHICH PUTS IN EVIDENCE THE ‘DUAL-TRACK’ ASSOCIATION BETWEEN HEARING LOSS AND COGNITIVE DECLINE: TWO TOPICAL EMERGENCIES THAT REGARD, RESPECTIVELY, 360 MILLION AND 47 MILLION PEOPLE WORLDWIDE. EXPERTS UNDERLINE THE IMPORTANCE OF TAKING EARLY ACTION: SLOWING DOWN THE CLINICAL PROGRESS OF HEARING LOSS BY ONLY ONE YEAR MIGHT LEAD TO A 10% REDUCTION IN THE PREVALENCE RATE OF DEMENTIA IN GENERAL POPULATION.

Milan, May 10th, 2017 – There is a very close correlation between hearing and cognition, which feeds a dual-track vicious circle: hearing loss is associated with an over 3-fold increase in the probability of manifesting dementia, while 3 out of 4 people with cognitive decline also have some hearing loss¹. This is the outcome of the Consensus Paper “The hearing brain - The close correlation between hearing and cognition”, promoted by Amplifon, that analyses the association between two very topical social emergencies: 360 million people worldwide live with hearing loss² and 47 million with some sort of dementia³. These already impressive numbers are destined to double (720 million with hearing loss) and triple (131 million with dementia) in the next 30 years, by 2050, due to the ever increasing life expectancy^{2,3}.

The origins of the ‘bug’ that kick-starts this vicious circle are not clear, but its bidirectional nature is certain: on the one hand hearing loss entails a reduction in cerebral cortex volume and in the number of neuron branches, besides “tiring” the brain; on the other hand, cognitive decline facilitates the onset of hearing loss and entails loss of perception and verbal comprehension. Experts underline the importance of taking early action as recent studies show that correct hearing solutions can delay the onset of cognitive decline and improve performance in general.

The hearing brain. We do not hear using only our ears, but (and above all) using our brains. In practical terms, the sound of a word does not only ‘switch on’ the auditory cortex where the word is ‘heard’, but stimulates and links up to many functional locations in diverse cerebral areas where it is ‘understood’ or semantically or cognitively connected. It has been demonstrated how cognitive elements - such as short-term memory, central processing and life experiences - are crucial to understand speech in a noisy environment, being more important than hearing ability in itself,

¹ Meusy A. et al. Presbycusis and Dementia: Results from 8 years of follow-up in the three-city Montpellier study. *Alzheimers & Dementia. Journal of the Alzheimer’s Association* (2016) 12:175.

² Duthey B., WHO Background Paper 6.21 - Hearing Loss (2013), http://www.who.int/medicines/areas/priority_medicines/BP6_21Hearing.pdf.

³ Alzheimer’s Disease International World Alzheimer Report 2016, <https://www.alz.co.uk/>.

which accounts for only 10%⁴. *‘There seems to be a ‘dual track’ between hearing and cognition - says - **Andrea Peracino from the Lorenzini Foundation** - on the one hand, cognition influences how people hear, on the other, sounds activate the entire cerebral cortex. It implies a profound correlation that is present also when it comes to a deficit: hearing loss can, in fact, reduce cerebral cortex volume, determining structural and functional changes to the brain; while cognitive decline can deteriorate hearing and understanding ability, thus facilitating the onset of hearing loss. Other factors, such as stress and general tiredness, may also have an influence further worsening the effects of hearing loss and cognitive decline. All that shapes our cognitive resources throughout our whole life.’*

When hearing is reduced, the brain changes. Recent scientific studies show how hearing loss is associated with an over 3-fold increase in the probability of manifesting dementia, and how, on the other side, people with cognitive decline in 3 out of 4 cases, also have some hearing loss⁵. *‘The Consensus Paper ‘The hearing brain’- affirms **Gaetano Paludetti, director of the Otorhinolaryngology. Institute of Università Cattolica del Sacro Cuore, Rome** - brings new evidence of the correlation between hearing and cognition: the greater the degree of hearing loss, the higher the risk of developing severe cognitive decline. These data highlight the need for early intervention: the latest studies, in fact, show how the correct use of hearing amplification is associated with a slower development of cognitive decline over 25 years, allowing people to keep good brain functionality. Indeed, it is estimated that slowing down the clinical progress of hearing loss by only one year could reduce the prevalence rate of dementia by 10% in general population’.*

What happens to the brain when hearing is reduced? Experts point out the structural and functional changes that may happen. *‘Hearing loss is associated with a reduction in the auditory cortex volume - explains **Camillo Marra, Neurology Professor, Università Cattolica del Sacro Cuore, Rome** - and a reduction in the number of neuron branches, which find it more difficult to communicate among them and to perform normal functions. In fact, recent magnetic resonance imaging studies have revealed that the integrity of white matter, this is the matter that is responsible for the connection and interaction between neurons, is altered in people with hearing loss. Moreover, hearing loss also affects, by means of some compensatory mechanisms, the cognitive load necessary for hearing thus tiring the brain. It is estimated that hearing loss can increase by around 24% the risk of impaired cognitive skills such as concentration, memory and planning capacity’.*

The ‘bug’. Academics are looking for the factors that activate the vicious circle between hearing loss and cognitive decline. It is certain, for instance, that hearing loss leads to structural and functional changes to the brain: this, according to some theories, could determine a ‘sub-stimulation’ of brain areas usually activated by sounds, facilitating cognitive decline; another hypothesis suggests that the use of accessory neuronal networks to compensate for hearing loss would result in an increased exploitation of cognitive resources, thus reducing the attention and cognitive resources available for other tasks. Other studies blame social isolation: in fact, communication issues related to hearing loss may encourage solitude, which is considered a risk factor for cognitive disorders. Finally, some studies have theorised that both hearing loss and dementia could be caused by a common pathology, such as a microvascular condition.

In conclusion, experts agree on the importance of turning the tide and stopping this vicious circle: the most recent scientific studies show, in fact, how taking early action with a hearing solution

⁴ Anderson A. et al. A dynamic auditory-cognitive system supports speech-in-noise perception in older adults. *Hearing Research* (2013) 300:18-32

might slow down cognitive decline and improve general performances. Additionally, in the light of the Consensus Paper ‘The hearing brain’, it is clearly an imperative to consider people’s standing in terms of cognition when choosing the most appropriate hearing solution. *‘Hearing loss and dementia- says Susan Holland, Chairperson of Amplifon and the CRS (Amplifon Centre for Research and Studies) - are two very topical themes. Not only for their prevalence which is destined to increase even further in the coming years mainly due to the ever-increasing life-expectancy, but also for the impact they both have on people’s quality of life. Solving these issues is essential to improve the lives of millions of people worldwide. This is perfectly in line with Amplifon’s mission, which has always been committed to hearing health and to spreading information on all aspects of hearing, also the most unknown such as the correlation between hearing and cognition’.*

About Amplifon

Amplifon, listed on the STAR segment of the Italian Stock Exchange, is the global leader in hearing solutions and services for retail expertise, customization and consumer care. Through a network of over 9,600 points of sale, of which approximately 4,000 direct shops, 3,700 service centers and 1,900 affiliates, Amplifon is active in 22 countries across EMEA (Italy, France, the Netherlands, Germany, the UK, Ireland, Spain, Portugal, Switzerland, Belgium, Luxembourg, Hungary, Egypt, Turkey, Poland and Israel), Americas (U.S.A., Canada and Brazil) and APAC (Australia, New Zealand and India). With more than 7,000 hearing care professionals, the Group is committed to delivering the highest quality of service and care, in order to achieve the best hearing experience for customers worldwide. More information about the Group is available at: www.amplifon.com/corporate.

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