

Do or Die for Hearing Aid Industry

By Fan-Gang Zeng, PhD

A recent search of patent activities and research papers in the past half century yielded a surprise: The data showed that, relatively speaking, the hearing aid industry has been consistently emphasizing development over research. Because of this imbalanced approach, it is now a do-or-die time for the hearing aid industry.

Modern hearing aids had a glamorous start, with Alexander Graham Bell and Thomas Edison as their celebrated inventors in the late 1800s. On the other hand, cochlear implants started nearly 100 years later and were initially ridiculed as a cruel hoax on deaf people. Generally, the cochlear implant patent activities paralleled those of hearing aids, with a slightly faster growth rate (fourfold per decade) but at an overall level that is still one order of magnitude less, roughly reflecting the difference in their respective market size and capitalization.

An even more surprising result was that together, the “Big Six” hearing aid manufacturers have published a total of 124 papers, whereas the three cochlear implant manufacturers have produced 1,582 papers. This disparity likely reflects the hearing aid industry’s tradition of favoring conference presentations and trade journal papers over peer-reviewed publications for quick turnaround and broad accessibility.

The relative lack of rigor in these non-peer-reviewed publications, however, has damaged the industry’s reputation, which has led to absurd behaviors such as some hearing aid manufacturers being unwilling to disclose their products in independent research, or some journals requiring them to have an outside

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author in their papers. More seriously, the continuous market pressure to introduce new features may produce questionable or premature technologies, such as a large number of compression bands or frequency transposition, which are driven by technology for technology’s sake. As a result, their cost cannot be adequately justified. The hearing aid industry must conduct a thorough cost–utility analysis, providing strong evidence for hearing aid benefits in children, in adults, and in special populations while justifying a cost that is consistent with the benefits.

The current imbalance in practice may not be sustainable even in the short term, as the hearing aid industry is facing stiff competition from consumer

electronics. As an example, a Google search for hearing-aid–related patents by Apple, Samsung, and Qualcomm showed zero patents 20 years ago but 816 in 2015—slightly more than half of the total patent activities by the Big Six in the same period.

A chill runs through my spine to read patent titles such as *Remotely updating a hearing aid profile*; *Social network for sharing a hearing aid setting* (Apple); *Method of controlling the digital hearing aid using the mobile communication terminal*; *Hearing aid for playing audible advertisement or audible data* (Samsung); and *Gain control for a hearing aid with a facial movement detector*; *Systems and methods for classification of audio environments* (Qualcomm). These cellphone and chip companies can circumvent regulation by either pitching their products with hearing aid functions as personal assistive listening devices, or making technologies available to third parties such as iHear, SoundHawk, or AuStar, which will compete directly against the existing hearing aid companies. 



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Figure 1. A. The number of patents related to “hearing aid” (blue dotted line) or “cochlear implant” (red solid line) from 1960 to 2014, with search being performed on October 7, 2015 (<https://patents.google.com>). The total number was 113,000 for hearing aids and 16,700 for cochlear implants. These values were much higher than the actual number of patents issued because Google search results contained duplications, cross references and other redundancies. B. The number of research papers related to hearing aids and cochlear implants, with search being performed on October 7, 2015 but at a different platform (<http://www.ncbi.nlm.nih.gov/pubmed>).

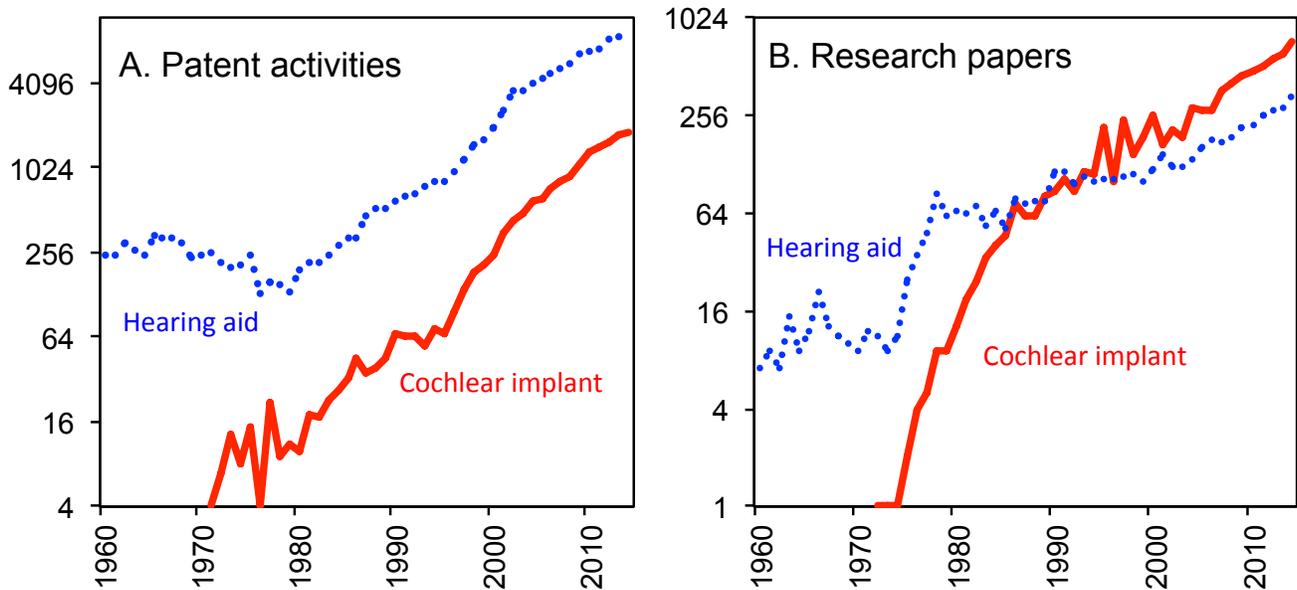


Figure 2. Relative distribution of hearing aid related patents found on Google Patents by the Big Six, Apple, Samsung and Qualcomm in 2015. An independent search on the US Patent and Trade Office (<http://patft.uspto.gov>, October 13, 2015) found a similar 2:1 ratio for patents issued in 2015 to the Big Six (105) and to Apply, Samsung and Qualcomm combined (52).

