MarkeTrak VII: Obstacles to adult non-user adoption of hearing aids

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INTRODUCTION

Over the last 20 years, hearing aid adoption has remained stubbornly at about one in five adults with an admitted hearing loss. While in the recent past hearing aid adoption has grown slowly to 23%, most of this growth can be attributed to free hearing aids obtained through the Department of Veterans Affairs (VA) or low-cost Internet sales.[1] Given the consequences of untreated hearing loss, why do more than 22 million adults with hearing loss in the United States delay or avoid a hearing solution?[1]

In studying this issue, we have attempted to identify the principal causes of non-adoption so that reasons could be quantified. Because non-users are significantly different from hearing aid users in terms of their hearing loss, we have segmented the non-owner population by degree of hearing loss so that reasons for non-use can be more accurately quantified. For instance, a response of *"My hearing loss is not severe enough to use hearing aids"* is a reasonable response for persons with hearing loss in the lower 10% of the hearing loss population, but a probable sign of denial or minimization for people with hearing loss at the 60% or higher hearing loss level.

It is our hope that quantification of obstacles to hearing aid adoption can lead to more precisely targeted public awareness strategies for overcoming these obstacles.

METHOD

In November 2004, a short screening survey was mailed to 80,000 members of the National Family Opinion (NFO) panel. The NFO panel consists of households that are balanced to the latest U.S. census information with respect to market size, age of household, size of household, and income within each of the nine census regions, as well as by family versus non-family households, state (with the exceptions of Hawaii and Alaska), and the nation's top 25 metropolitan statistical areas.

The screening survey covered three issues: (1) physician screening for hearing loss, (2) whether the household had a person *"with a hearing difficulty in one or both ears without the use of a hearing aid,"* and (3) whether the household included a person who owned a hearing instrument. This short survey helped identify close to 16,000 people with hearing loss and also provided detailed demographics on those individuals and their households. The response rate to the screening survey was 66%.

The data presented in this article are generalizable only to households as defined by the U.S. Bureau of Census, that is, people living in a single-family home, duplex, apartment, condominium, mobile home, etc. People living in institutions have not been surveyed; these would include residents of nursing homes, retirement homes, mental hospitals, prisons, college dormitories, and the military.

Demographic comparisons of hearing aid owners with non-adopters were presented earlier and will not be repeated here.[1] In January 2005, an extensive survey focusing primarily on customer satisfaction with hearing aids was sent to 3000 random hearing aid owners drawn from the screening phase. A separate survey was sent to 3000 random adults (age >22, and adult non-dependents ages 18-22) with hearing loss who had not yet adopted hearing aids. Non-adopters responded to a seven-page survey covering demography, hearing loss measures, visitation with hearing health professionals and physicians, and reasons for non-adoption of hearing aids, as well as future plans. The response rates to the detailed surveys were 75% and 77%, respectively.

Hearing loss measures

Since hearing aid adoption is related to degree of hearing loss, both aided and unaided subjects were asked to complete the four subjective measures of hearing loss listed below. They were then segmented into one of ten groups (called deciles) based on their responses to all four hearing loss measures:

- Number of ears impaired (one or two)
- Score on the Gallaudet Scale,[2] an eight-point scale in which respondents indicated whether they can understand speech under the following conditions: "whisper across a quiet room," "normal voices across a quiet room," "shouts across a quiet room," "loud speech spoken into their better ear," and "not able to understand loud speech in their better ear." In addition, respondents were asked if they could "tell noises from each other," "hear loud noises at all," and "hear any sound or any noise." A person's score could range from 1 to 8. Typically, respondents are classified in one of five groups (1-hear whisper, 2-hear normal voice, 3-hear shouts, 4-hear speech in loud ear, or 5-can't hear speech). What makes the Gallaudet Scale particularly valuable is that it has been validated against clinical information (dB loss better ear). The Gallaudet Scale has historically been used by the Centers for Disease Control in their quantification of the hearing-impaired population.
- Score on the Unaided Abbreviated Profile of Hearing Aid Benefit (APHAB),[3] an inventory of how

difficult it is to hear without hearing aids in 18 listening situations. The APHAB consists of four scales: ease of communication (EC), reverberation (RV), background noise (BN), and aversiveness of sounds (AV). We did not administer the AV subscale and we changed the scaling to 0% to 100% of the day in 10% increments. A factor analysis of BN, EC, and RV revealed that the APHAB was unidimensional; thus, the unaided APHAB score for each individual was the mean of the three subscales.

- Subjective hearing loss score: The respondents subjectively evaluated their hearing loss as "mild," "moderate," "severe," or "profound." This measure is given a score of 1 (mild) to 4 (profound).

Performing a factor analysis of the above subjective measures revealed a single subjective measure of hearing loss. Factor analysis is a method for extracting common variance among multiple variables. The composite hearing loss score was determined by computing factor scores for hearing aid owners and non-adopters. Based on their scores they were placed into one of ten hearing loss groups where decile 1 = the mildest hearing loss (the lower 10% of people with hearing loss) and decile 10 = the most serious hearing loss (the top 10% of people with hearing loss).

Finally the data were weighted to reflect hearing aid adoption rates (23%) in the general population. *(Note: It is beyond the scope of this paper to document detailed factor analysis and factor scoring methodology. Any researcher wishing to reproduce hearing loss deciles based on the methodology employed in this paper is invited to contact the author.)*

RESULTS

Hearing loss characteristics

Table 1 documents the degree of hearing loss for more than 2057 hearing aid owners and 2169 non-adopters. Hearing aid owners are more likely to have a bilateral loss (83% versus 61%), to have a perceived loss of severe to profound (39% versus 14%), to have more difficulty hearing normal speech above a whisper across a room without visual cues (95% versus 84%), and to have a hearing difficulty more than 50% of the time in a typical day (63% versus 29%). To a certain extent one could argue that the populations are more alike than different. For instance, the modal response to the unaided APHAB for non-adopters is 40%-49% of the day compared with 50%-59% of the day for hearing aid owners. Quite simply, the higher the degree of hearing loss, the greater the likelihood of hearing aid adoption.

Yet, even among people with greater hearing losses we find substantial segments of people who do *not* use hearing aids. These include:

- 7 out of 10 adults with bilateral loss
- half of adults with a self-perceived "severe" hearing loss and 65% of those with a self-perceived "profound" hearing loss

Table 1. *Hearing loss characteristics—adult hearing aid owners compared to non-owners.*

Hearing Loss Measure	% of Non-owners *(n=2,169)*	% of Owners *(n=2,057)*	Hearing Aid Adoption (%)
Ears impaired			
Unilateral loss	39	17	12
Bilateral loss	61	83	30
Perceived loss*			
Mild	39	7	6
Moderate	48	53	26
Severe	11	35	51
Profound	3	4	35
Gallaudet Scale*			
Hear whisper	16	5	9
Hearing normal speech	52	33	17
Hear shouts	27	48	35
Hear shout better ear	3	9	46
Tell speech from loud noise	2	6	45
Unaided APHAB*			
0-9%	8	1	2
10-19%	13	1	3
20-29%	12	4	8
30-39%	17	11	16
40-49%	21	21	24
50-59%	18	27	32
60-69%	7	17	44
70-79%	2	9	58
80-89%	1	6	67
90%+	1	4	74
Hearing Loss Composite (Deciles)*			
1	13	1	2
2	13	2	4
3	12	3	7
4	12	5	11
5	11	7	16
6	10	10	24
7	9	12	30
8	8	16	38
9	7	20	48
10	5	25	60

* Percentages may not add up to 100% within hearing aid owner or non-owner segments due to rounding.

- 83% of adults who "cannot hear normal speech across a room" and 65% who cannot "comprehend speech when shouted across a room"
- a substantial number of adults (42%) who have a hearing loss of 70% in a typical day.

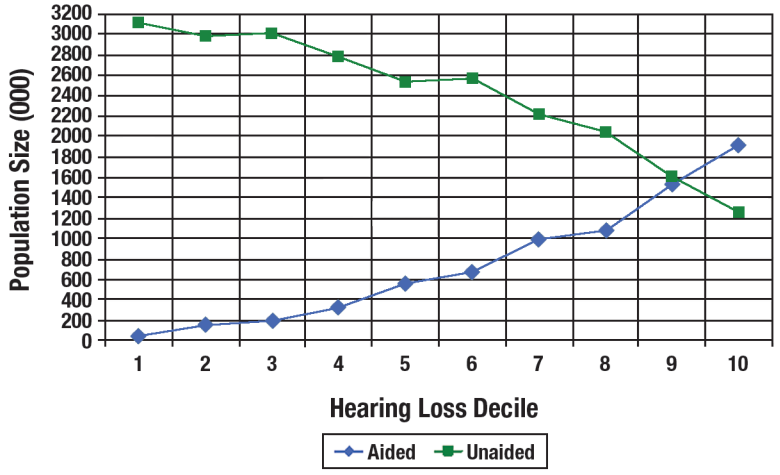

Figure 1a. *Aided versus unaided populations by hearing loss decile.*

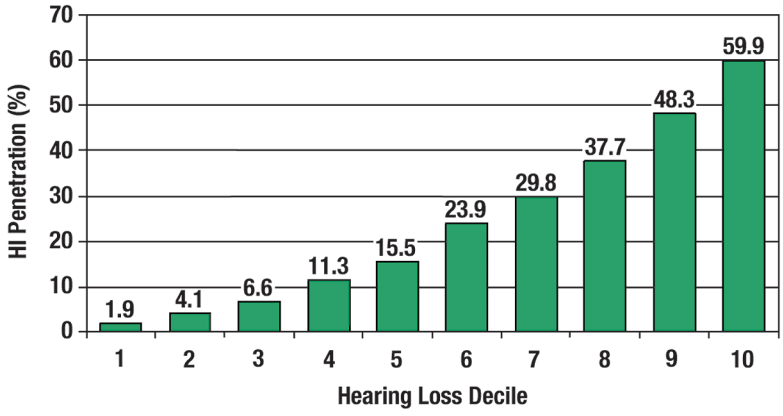

Figure 1b. *Hearing aid adoption rates by hearing loss decile.*

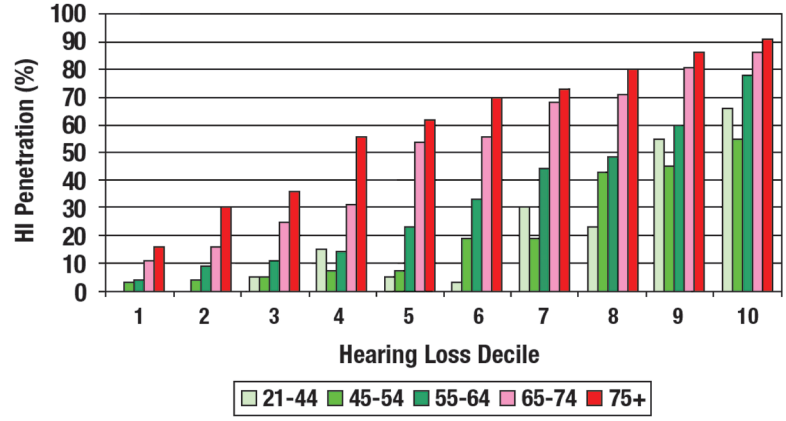

Figure 1c. *Hearing aid adoption rates by HL decile controlling for age; evidence for the effects of age stigma.*

In order to begin comparing the non-adopting population with hearing aid owners it is helpful to control for hearing loss. A useful way is to derive a composite measure of hearing loss based on the methodology stated above (i.e., deciles) and then report differences within hearing loss deciles. In Figure 1a, we have plotted the population size for both non-adopters and hearing aid owners and in Figure 1b hearing aid adoption rates by decile. There is no decile level about which one can unequivocally state, *"This is the level where hearing aid adoption is necessary."* Rather, many non-adopters have hearing loss equal to or worse than the typical hearing aid owner.

In choosing a cut-off for increased likelihood of hearing aid adoption (e.g., perhaps hearing aid need), a logical place might be decile 6 (60th percentile of adults with hearing loss), which is the point where the adoption rate accelerates (see Figure 1b). Eighty-three percent of hearing aid owners can be found above this cut-off point compared with only 39% of non-adopters. Extrapolating from the total non-adopter population,[1] we can estimate that 8.8 million non-adopters have hearing loss equal to or greater than the current hearing aid user population. Above the decile 5 cut, hearing aid adoption rates vary from 23.9% (decile 6) to 59.9% (decile 10).

Detailed hearing loss characteristics as well as a basic demography by hearing loss decile are documented in Table 2. Referring to the bottom of the table, one can see that the average age varies between 56 and 62 years, certainly younger than the typical new user (age 70);[1] 6 out of 10 of them are male. In general, with the exception of the more serious hearing losses (deciles 9-10), only about half have received a hearing test and, with the exception of those in decile 10, few have tried hearing aids (3% in decile 1 compared with 40% in decile 10).

Table 2 shows that non-adopter mean average ages are between 8 and 15 years lower than those of typical non-users. What can account for the difference in ages between the typical hearing aid user and the non-adopter? It is our theory that age stigma accounts for a significant amount of the factors explaining hearing aid adoption.

Table 2. *Hearing loss characteristics and demography—unamplified adult population by level of hearing loss in deciles.*

	Hearing loss decile									
Hearing loss measure	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ears impaired										
Unilateral loss	71	50	43	37	37	28	26	18	26	18
Binaural loss	29	50	57	63	63	72	74	82	74	82
Perceived loss										
Mild	93	80	56	46	24	10	5	4	1	1
Moderate	7	19	42	50	68	77	80	77	53	18
Severe	0	1	2	3	7	11	13	15	40	57
Profound	0	0	0	1	1	1	2	4	6	25
Gallaudet Scale										
Hear whisper	62	21	19	13	8	2	2	2	0	0
Hear normal speech	38	76	74	73	63	65	42	16	10	1
Hear shouts	0	3	7	13	28	32	53	78	70	41
Hear shout better ear	0	0	0	0	1	1	3	2	17	27
Tell speech from loud noise	0	0	0	0	0	0	1	2	3	32
Unaided APHAB										
0-9%	41	12	6	2	0	0	0	0	0	0
10-19%	39	35	13	10	3	1	1	1	0	0
20-29%	14	23	33	16	11	6	1	1	0	1
30-39%	6	25	30	21	40	9	16	2	2	4
40-49%	0	4	13	41	19	60	30	23	19	4
50-59%	0	1	3	8	26	20	41	61	30	23
60-69%	0	0	1	3	2	3	11	10	36	30
70-79%	0	0	0	0	0	0	1	3	11	17
80-89%	0	0	0	0	0	0	0	0	3	13
90%+	0	0	0	0	0	0	0	1	0	8
Mean unaided APHAB	13	22	29	37	41	44	49	53	59	67
Demography										
Age (mean)	55.7	58.4	59.3	60.3	57.7	61.5	61.6	62.2	61.6	61.1
Male (%)	55	61	59	62	60	60	61	66	58	59
Female (%)	45	39	41	38	40	40	39	34	42	41
Have had hearing tested	47	46	50	50	51	56	53	54	56	66
Previously tried hearing aids (%)	**3**	**4**	**4**	**7**	**12**	**12**	**11**	**17**	**15**	**40**

The effect of age stigma is graphically portrayed in Figure 1c, where we plot hearing adoption rates by age group while controlling for degree of hearing loss. In all decile groups hearing aid adoption is significantly related to the age of the subject. For instance, in decile 8 people 75 years of age or greater have approximately a four times greater chance of owning hearing aids than individuals ages 21-44 and twice that of 55-64-year-olds. This finding is not due to higher incomes among the elderly. As an example, the median household incomes for non-adopters by age group in decile 8 are as follows: 21-44 ($58,750), 45-54 ($40,000), 55-64 ($52,500), 65-74 ($26,250), 75+ ($28,750).

Visitations with professionals

As shown in Table 3 and Figure 2a, half of the non-adopters discussed their hearing with a family doctor, ENT, audiologist, or hearing instrument specialist. The largest number (45%) discussed their hearing with their family doctors. Close to three out of four (73%) indicated that they received one or more hearing tests from their family doctor: 87% electronically, 22% with a tuning fork, 9% a whisper in the ear, and 6% a finger rub. Nearly half (48%) were referred for further testing and 25% told to wait and retest. With respect to hearing aids, 11% received a recommendation to get a hearing aid and 17% were told they did not need hearing aids or that hearing aids would not help them.

Slightly more than a third of non-adopters visited an ENT or an audiologist, while 17% visited a hearing instrument specialist. ENTs were more likely to refer for further testing (29%), while audiologists were more likely to recommend that the individual wait and be retested in the future (34%). Slightly more

Table 3. *Non-amplified adult visitation with medical doctors and hearing healthcare professionals.*

Professional	Discussed hearing	Recommendations (%) received				
		Referral further testing	Get hearing aids	Do not get hearing aids	Wait and retest	Get surgery
Family doctor*	45	48	11	17	25	n/a
ENT	36	29	25	25	28	11
Audiologist	34	13	33	25	34	n/a
Hearing Instrument Specialist	17	6	56	20	19	n/a
Received hearing test all professionals	50					

* Note: 73% received hearing tests from their family doctor; and 83% of those tested received an electronic screening.

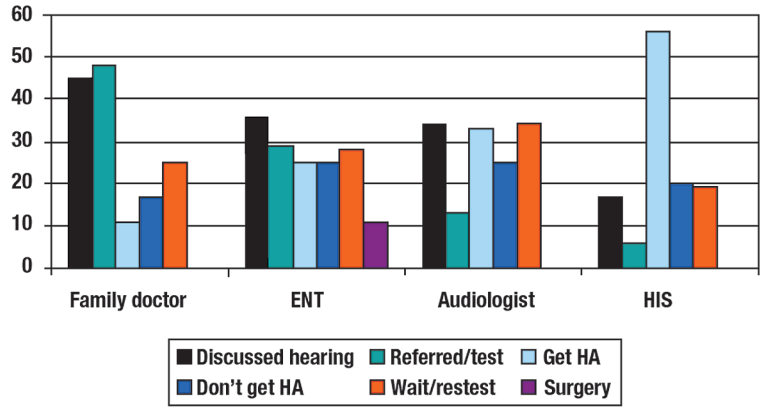

Figure 2a. *Percent of hearing-impaired evaluated for hearing loss and recommendations received.*

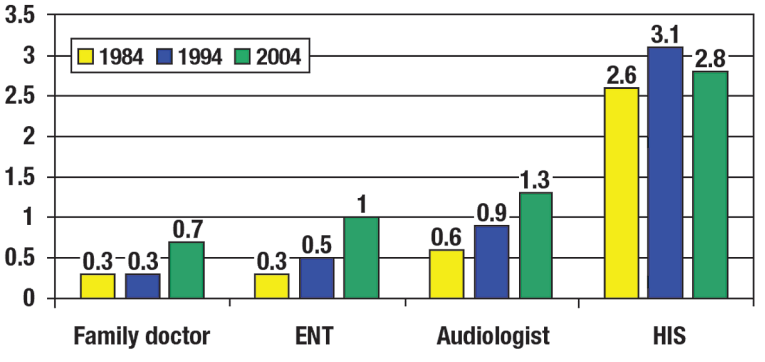

Figure 2b. *Ratio of positive recommendations for hearing aids to negative recommendations by profession (1984-2004).*

than one out of ten people (11%) were told they needed surgery to correct their hearing loss. Family doctors were more likely to recommend against getting hearing aids than for doing so.

The 20-year trend in the ratio of positive to negative recommendation by each of the four categories of professionals visited is plotted in Figure 2b. From 1984 to 2004, this ratio significantly improved for family doctors, ENTs, and audiologists.[4-5] For family physicians, the improvement is most likely due to the significant educational efforts targeted to this group by the hearing health industry and by improvements in technology. It is now accepted medical practice for ENTs to prescribe hearing aids and for audiologists to fit them.

Hearing solution adoption model

Before analyzing the barriers to hearing aid adoption we should consider how this information fits into an overall model of adoption of a hearing solution. As Figure 3 demonstrates, the decision to seek a hearing solution such as hearing aids is complex.[6]

Many variables may influence a person's decision whether or not to get hearing aids. These variables include, among others: attitudes toward wearing hearing aids, perceptions of the efficacy and value of hearing aids, perceptions of the appearance of people with hearing aids, internal and external stigma, hearing loss coping mechanisms, communication with others, stress associated with hearing loss, activity level, severity of hearing loss, social comparisons *(e.g., How do I hear compared with other people?)*, denial in its various stages *(from complete denial to minimization of hearing loss)*, anger prevalence, depressive symptoms affiliated with hearing loss, acceptance of hearing loss, satisfaction with life, availability of other assistive devices *(e.g., TV ears)*, social pressure, professional opinions, support network opinions, health status including physical dexterity and visual acuity, financial situation *(e.g., income, liquid assets, competing needs, third-party pay)*, financial optimism or view of future economy, communication performance in specific situations, need for cognition and perception of cognitive ability, internal and external

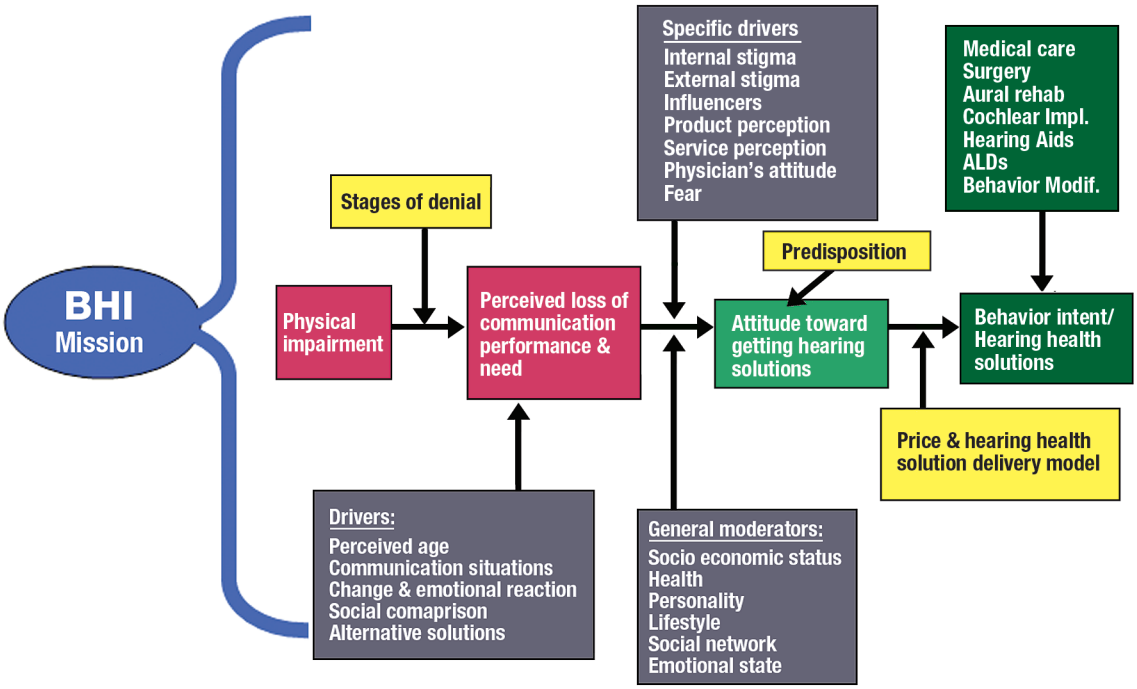

Figure 3. *Hearing solution adoption model.*

locus of control, self-consciousness, attitudes and proficiency with technology, and fear *(especially for a surgery or cochlear implant candidate)*, plus a host of personality variables such as extroversion, fatalism, etc.

Persons with a physical hearing loss must first accept and perceive that they have a hearing loss. If someone is in complete denial, we cannot expect the person to seek out information that would solve or mitigate the effects of the hearing loss. Persons in complete denial are not included in our statistics, since only those who identify themselves as hearing impaired are included in the MarkeTrak survey.

Without powerful solutions to absolute denial it is unlikely that educational efforts to change attitudes will be effective with this unmeasured population. From our previous research, we determined that close to 23 million adults are past this stage, though, as we will see, many are in some stage of denial regarding their hearing loss. The "admitting" population still has many barriers to acceptance of a permanent solution to their hearing loss, whether that solution is surgery, medical care, cochlear implants, or hearing aids.

It is to this "admitting" population that we shall address our educational efforts. It is our belief that admission at any level

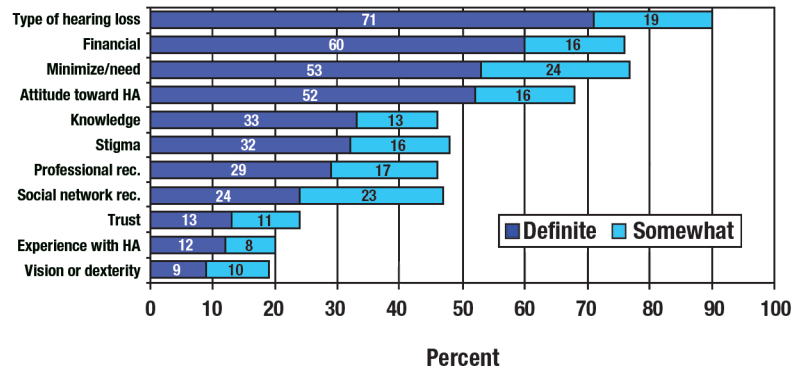

Figure 4a. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss.*

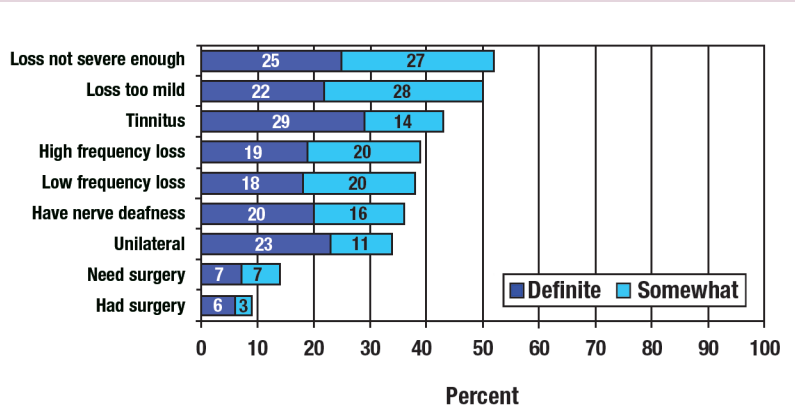

Figure 4b. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = hearing loss.*

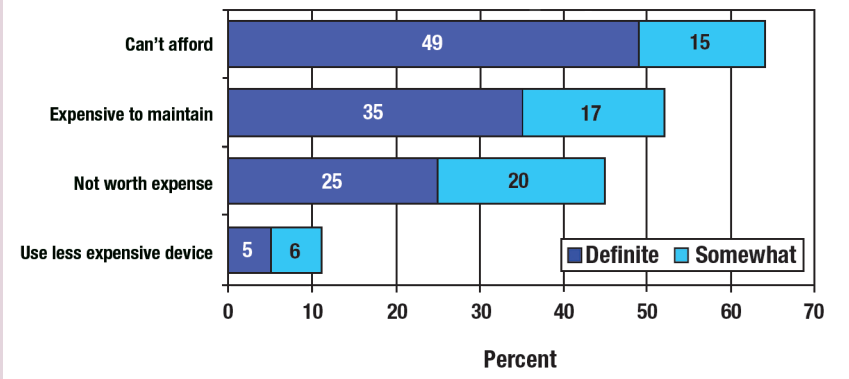

Figure 4c. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = financial.*

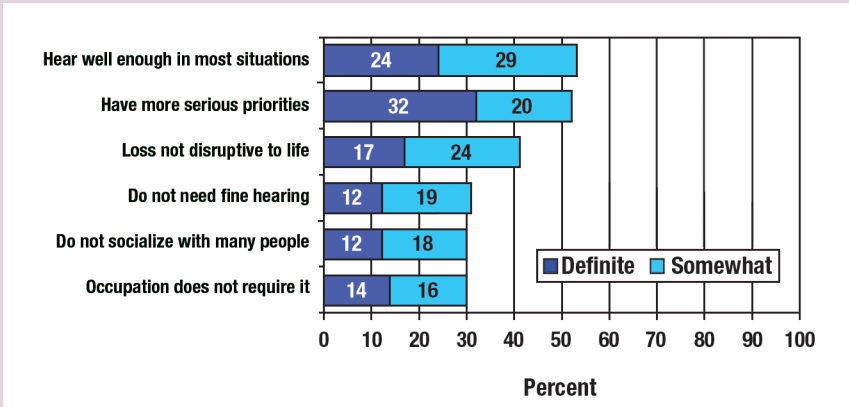

Figure 4d. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = minimization or lack of need.*

is an important precursor to movement toward a hearing solution. The likelihood of seeking a hearing solution is, of course, contingent on the many moderating factors stated above. Some of these factors we can impact with educational efforts and some we cannot.

We will next look at barriers to adoption of hearing aids among the nearly 23 million adults who admit to hearing loss. As we look at these barriers it is important that we formulate which factors can be positively influenced by the hearing healthcare industry.

Barriers to hearing aid adoption

Non-adopters with an admitted hearing loss were presented with 64 possible reasons for their decision not to use hearing aids. They were asked to rate on a five-point scale whether each of the 64 items was "definitely," "somewhat," or "definitely NOT" a reason for non-adoption of hearing aids. The responses (in percentage) to all 64 items are shown in Table 4 and divided into 11 key areas: experience with hearing aids, financial, attitudes toward hearing aids, degree of hearing loss, lack of knowledge, minimization or lack of need, vision/dexterity problems, professional recommendations, social network recommendations, stigma, and trust. In this analysis, "somewhat a reason" is the midpoint on the scale used, while "definitely" and "definitely NOT" are the top two and bottom two points on the scale.

Results for the total population and for the populations with the most serious hearing loss (i.e., the top 50% of adults with hearing loss, who are in deciles 6 to 10) are documented in Table 4. Table 5 details "definite" reasons for non-adoption for each of the 10 hearing loss deciles.

With the most serious hearing loss segment in mind, we will now review the reasons for non-adoption summarized in Figure 4a. In this summary chart we have calculated the maximum score for each of the items within this category (as shown in Table 4). For example, there are nine items in the category "Hearing loss." The maximum score for the total score was derived by counting first any "definite" reason as a barrier to adopting hearing aids, then any "somewhat" responses, and finally the "definitely not" ratings.

Uniqueness of hearing loss

Using the methodology above, nine out of ten individuals reported that the uniqueness of their hearing loss was the main reason they did not purchase and use hearing aids. Details behind this "hearing loss" barrier are presented in Figure 4b. Only 14% indicated they needed surgery, while an even smaller portion (9%) reported that they had undergone surgery to correct their hearing loss. (A third of these people reported still having permanent hearing loss, despite the surgery.) Between 40% and 50% reported

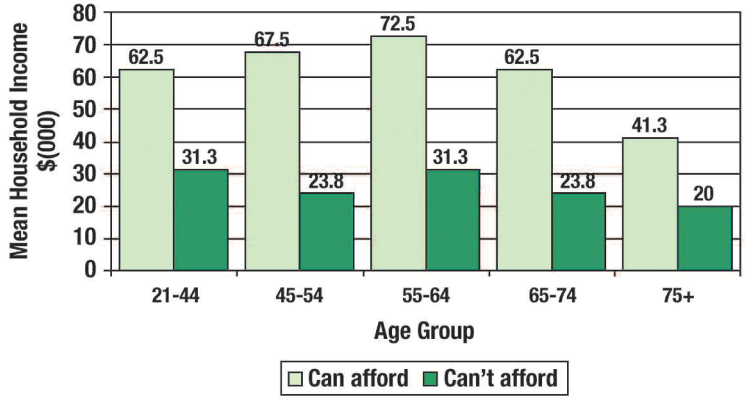

Figure 5. *Median income comparing people who state they can and cannot afford hearing aids controlling for age.*

Table 4. *Reasons why adults with hearing loss do not use hearing aids comparing total population and those in hearing loss deciles 6-10.*

		Total Population			HL Deciles 6-10		
Category	Reason for non-adoption	% Definite No	% Somewhat	% Definite Yes	% Definite No	% Somewhat	% Definite Yes
Experience	Tried and do not work	91	4	5	84	7	9
	Tried and do not like	90	4	6	84	7	9
Experience	**Total Experience**	**88**	**5**	**7**	**80**	**8**	**12**
Financial	Not worth expense	61	19	20	55	20	25
	Expensive to maintain	58	16	26	48	17	35
	Can't afford	49	16	35	36	15	49
	Use less expensive device	92	5	3	89	6	5
Financial	**Total Financial**	**35**	**19**	**46**	**24**	**16**	**60**
HA attitude	Uncomfortable	79	13	8	72	15	13
	They don't work well	71	16	13	65	19	16
	Pick up background noise	66	18	16	55	20	25
	Hassle	65	17	18	59	19	22
	They break down	78	13	9	74	16	10
	Unnatural sound	76	14	10	70	16	14
	Limited situational use	76	15	9	70	19	11
	Difficult to handle	77	14	9	69	18	13
	Don't work in crowds	66	16	18	58	18	24
	Require too many adjustments	71	15	14	63	18	19
	Cannot be used on phone	75	14	11	68	17	15
	Do not fit well	75	14	11	68	16	16
	Do not perform as promised	70	15	15	62	18	20
	Require frequent battery change	70	15	15	64	15	21
	Whistling and feedback	63	17	20	56	18	26
	Do not restore hearing to normal	62	16	22	53	20	27
	Do not work in noise	60	15	25	52	16	32
	Do not work in humid climates	76	14	10	70	15	15
HA attitude	**Total attitude toward hearing aids**	**41**	**17**	**42**	**32**	**16**	**52**
Hearing loss	Have nerve deafness	75	12	13	64	16	20
	Unilateral	61	17	22	66	11	23
	Had surgery—hearing aids not needed	94	2	4	91	3	6
	Tinnitus	62	14	24	57	14	29
	Loss too mild	31	26	43	50	28	22
	Need surgery	88	5	7	86	7	7
	Loss not severe enough	31	22	47	48	27	25
	High freqency loss	61	20	19	61	20	19
	Low frequency loss	64	21	15	62	20	18
Hearing loss	**Total hearing loss**	**6**	**15**	**79**	**10**	**19**	**71**
Knowledge	Hearing not tested yet	61	10	29	60	11	29
	Do not know where to get tested	86	8	6	81	10	9
	Do not know where to get hearing aids	87	7	6	83	9	8
Knowledge	**Total knowledge**	**56**	**13**	**31**	**54**	**13**	**33**

that their hearing loss was either "too mild" or "not severe enough" to warrant using hearing aids.

The reader should keep in mind that this segment of the hearing loss population is in the top 50% of America's hearing-impaired population (deciles 6-10) in terms of the severity of their loss. One would expect them to have hearing loss greater than or equal to that of 80% of the current hearing aid owner population. Given the probable difficulty this population experiences in communicating *(and reported in their subjective measures of hearing loss)*, this response perhaps originates from misinformation received from professionals, their own perceptions regarding their hearing loss and its impact on their life *(people with hearing loss tend to underrate their degree of hearing loss compared to their social network)*, or perhaps it is simply denial.

Judging by their responses to the subjective hearing loss measures, this hearing

Table 4. *(continued from the opposite page)*

		Total Population			HL Deciles 6-10		
Category	Reason for non-adoption	% Definite No	% Somewhat	% Definite Yes	% Definite No	% Somewhat	% Definite Yes
Minimize/need	Have more serious priorities	51	18	31	48	20	32
	Loss not disruptive to life	47	22	31	59	24	17
	Do not need fine hearing	61	22	17	69	19	12
	Hear well enough in most situations	32	25	43	47	29	24
	Occupation does not require it	69	15	16	70	16	14
	Do not socialize with many people	77	13	10	70	18	12
Minimize/need	**Total minimizations or lack of need**	**18**	**20**	**62**	**23**	**24**	**53**
Physical	**Vision or dexterity problems**	**87**	**7**	**6**	**81**	**10**	**9**
Recommendation	Family doctor	74	12	14	71	15	14
	ENT	71	10	19	65	13	22
	Audiologist	73	10	17	68	12	20
	Hearing instrument specialist	87	6	7	80	10	10
Recommendation	**Total professional recommendations**	**58**	**14**	**28**	**54**	**17**	**29**
Social/family	Child opinion	87	8	5	82	11	7
	Spouse opinion	77	13	10	72	14	14
	Friend opinion	82	10	8	77	13	10
	Other hearing aid owner opinion	81	11	8	74	15	11
Social/family	**Total social network**	**61**	**20**	**19**	**53**	**23**	**24**
Stigma	Make you look weak and feeble	78	12	10	74	13	13
	Noticeable	71	15	14	65	18	17
	Make you look old	72	13	15	69	13	18
	Make you look disabled	74	13	13	69	14	17
	Make you look mentally slow	84	7	9	80	9	11
	Too embarrassed to wear	70	15	15	66	15	19
	Do not admit hearing loss in public	69	12	19	65	13	22
	Too proud to wear	77	11	12	71	12	17
	People make fun of you	83	8	9	78	10	12
	People treat you differently	77	11	12	72	12	16
Stigma	**Total stigma**	**57**	**16**	**27**	**52**	**16**	**32**
Trust	Do not trust audiologists	87	8	5	82	9	9
	Do not trust dispensers of HA	82	9	9	78	11	11
	Do not trust doctors	88	7	5	84	9	7
Trust	**Total trust**	**81**	**9**	**10**	**76**	**11**	**13**

loss population does not have a "mild" level of hearing loss. More than a third indicated they have tinnitus (44%), high-frequency hearing loss (39%), low-frequency hearing loss (38%), or "nerve deafness" (36%). About a third of respondents indicated they do not use hearing aids because they have a hearing loss in one ear. In this category of barriers, except for tinnitus, it would seem that the barriers to hearing aid adoption are attitudinal, perceptual, or based on misinformation.

Financial constraints

Three out of four (76%) respondents mentioned financial constraints as a barrier to hearing aid adoption. In Figure 4c, 64% indicated they cannot afford hearing aids, while nearly half (49%) indicated it is a definite reason why they don't use hearing aids. More than half (52%) complained that they are expensive to maintain while four out of ten (45%) indicated they are not worth the expense. Only one out of ten (11%) indicated that they use a less expensive device to compensate for their hearing loss.

Is an individual who says "I can't afford hearing aids" being truthful? In numerous conversations with hearing health professionals we have heard that this is simply a convenient form of denial. Practitioners point out that household income cannot be relied on as an indicator of a person's ability to afford hearing aids—especially among the elderly, because their wealth is not simply income but also liquid assets

Table 5. *Reasons for non-adoption of hearing aids by hearing loss decile (% definite reason for non-purchase).*

		Hearing loss deciles									
Category	**Reason for non-adoption**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Experience	Tried and do not work	2	2	1	4	3	4	6	7	8	26
	Tried and do not like	3	2	3	4	4	6	6	12	6	18
Experience	**Total Experience**	**3**	**3**	**3**	**6**	**5**	**9**	**9**	**12**	**10**	**31**
Financial	Can't afford	14	26	27	28	38	38	51	54	52	49
	Expensive to maintain	16	21	19	23	25	26	41	39	34	36
	Not worth expense	17	16	19	17	17	24	27	26	19	28
	Use less expensive device	3	1	2	4	5	5	3	5	5	8
Financial	**Total Financial**	**26**	**36**	**39**	**41**	**48**	**46**	**65**	**68**	**64**	**60**
HA attitude	Do not restore hearing to normal	16	13	20	22	24	23	26	32	24	37
	Do not work in noise	17	18	21	23	23	27	36	33	29	37
	Pick up background noise	12	14	14	17	20	22	26	28	23	31
	Do not perform as promised	10	10	12	14	16	16	26	21	18	25
	Do not work in humid climates	5	6	8	4	13	12	16	13	15	25
	Require frequent battery change	10	10	12	14	16	16	25	21	18	25
	Hassle	10	17	15	17	16	23	21	24	20	24
	Require too many adjustments	7	8	10	11	16	17	23	16	19	24
	Uncomfortable	5	5	5	7	8	8	13	11	13	24
	They don't work well	8	9	12	11	9	13	12	19	14	23
	Whistling and feedback	10	10	11	12	15	15	25	23	19	23
	Do not fit well	7	6	9	8	12	10	18	19	14	22
	Don't work in crowds	11	11	15	17	18	23	28	25	19	22
	Cannot be used on phone	6	7	9	7	11	13	16	14	15	17
	Difficult to handle	4	5	10	7	9	10	15	14	13	16
	Unnatural sound	8	7	9	8	11	13	13	16	14	14
	Limited situational use	6	5	8	7	8	12	15	10	12	13
	They break down	9	6	7	6	9	12	11	10	8	13
HA attitude	**Total attitude toward hearing aids**	**26**	**36**	**39**	**43**	**42**	**47**	**57**	**54**	**48**	**55**
Hearing loss	Have nerve deafness	4	5	10	10	12	14	10	20	26	38
	Tinnitus	18	19	17	27	21	24	32	30	26	33
	Unilateral	28	21	22	18	24	21	24	16	29	24
	High freqency loss	18	17	21	17	19	19	18	20	20	22
	Low frequency loss	10	15	15	15	16	14	20	17	18	21
	Need surgery	4	4	7	8	7	7	4	5	7	16
	Had surgery—hearing aids not needed	3	2	3	6	4	4	5	4	7	11
	Loss too mild	75	66	56	44	33	31	29	17	12	11
	Loss not severe enough	73	68	62	52	53	32	31	24	18	7
Hearing loss	**Total hearing loss**	**89**	**86**	**85**	**79**	**76**	**74**	**74**	**69**	**66**	**75**
Knowledge	Hearing not tested yet	24	33	26	31	28	29	35	29	30	17
	Do not know where to get tested	5	4	6	5	6	8	9	9	9	8
	Do not know where to get hearing aids	3	2	8	3	6	8	9	8	8	7
Knowledge	**Total knowledge**	**24**	**33**	**30**	**30**	**30**	**32**	**39**	**33**	**33**	**21**

(e.g., 401k accounts, stocks, bonds).

We think we can judge the integrity of this response by comparing the incomes of people (controlling for age) who said they can afford hearing aids with those who reported they cannot (see Figure 5). In this graph, median household incomes are plotted for individuals reporting they can and can't afford hearing aids. Three of the five age groups show close to a $40,000 differential in income, while in the youngest segment (age 21-44) we find a $30,000 differential and in the elderly segment (75+) an income differential of $21,000. Clearly, the "can't afford" group is being truthful, especially when one considers that they earn as much as $26,000 below the U.S. median household income.[7]

Minimization or lack of need

About three-quarters of respondents (77%) demonstrated a tendency either to minimize their hearing loss or to report a lack of need due to their life circumstances

Table 5. *(continued from opposite page)*

		Hearing loss deciles									
Category	**Reason for non-adoption**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Minimize/need	Have more serious priorities	23	33	33	31	36	33	35	35	33	23
	Loss not disruptive to life	56	48	42	26	25	19	18	14	12	20
	Do not socialize with many people	5	7	9	9	12	9	13	11	13	15
	Do not need fine hearing	22	22	22	14	14	18	12	8	7	12
	Occupation does not require it	17	18	18	12	15	18	14	15	12	12
	Hear well enough in most situations	65	63	58	41	34	38	32	18	12	11
Minimize/need	**Total minimizations or lack of need**	**75**	**75**	**70**	**60**	**57**	**60**	**53**	**54**	**47**	**48**
Physical	**Vision or dexterity problems**	**4**	**2**	**6**	**2**	**7**	**6**	**10**	**6**	**13**	**6**
Recommendation	ENT	20	13	17	17	16	19	15	23	24	33
	Audiologist	16	13	16	16	15	19	14	21	21	31
	Family doctor	17	12	12	9	14	10	13	15	14	26
	Hearing instrument specialist	6	4	5	5	9	8	6	10	10	19
Recommendation	**Total professional recommendations**	**32**	**23**	**26**	**24**	**25**	**26**	**25**	**28**	**30**	**41**
Social/family	Spouse opinion	3	5	10	7	11	11	13	14	17	17
	Friend opinion	4	5	7	4	7	8	10	11	12	12
	Child opinion	2	2	4	5	7	5	4	8	12	11
	Other hearing aid owner opinion	5	3	7	8	9	10	13	11	11	8
Social/family	**Total social network**	**8**	**11**	**18**	**15**	**21**	**21**	**24**	**25**	**27**	**27**
Stigma	Do not admit hearing loss in public	14	14	17	17	19	21	26	24	19	18
	Too embarrassed to wear	10	12	16	12	19	18	24	21	18	15
	People treat you differently	7	7	9	10	15	13	22	17	14	13
	Make you look disabled	11	10	10	12	17	14	20	19	15	12
	Noticeable	9	10	11	13	18	13	22	22	14	12
	Make you look mentally slow	6	5	7	6	8	9	15	12	10	11
	Make you look old	11	12	11	12	17	15	25	23	14	11
	People make fun of you	5	5	7	8	12	11	16	10	9	11
	Too proud to wear	6	8	10	10	15	13	21	24	16	11
	Make you look weak and feeble	7	7	7	7	9	11	17	16	11	10
Stigma	**Total stigma**	**17**	**21**	**24**	**24**	**32**	**28**	**36**	**39**	**29**	**27**
Trust	Do not trust audiologists	4	3	5	3	6	10	10	5	6	12
	Do not trust dispensers of HA	7	5	7	6	10	13	14	8	9	12
	Do not trust doctors	3	2	4	2	5	7	10	4	8	8
Trust	**Total trust**	**8**	**6**	**9**	**7**	**11**	**15**	**15**	**8**	**12**	**13**

(Figure 4d). More than half the respondents (53%) indicated that they hear well enough in most situations and that they have more serious priorities than getting hearing aids (52%). Four out of ten (42%) indicated that their hearing loss is not disruptive to their life.

Approximately 3 out of 10 indicated they do not need fine hearing, their occupation does not require hearing better than what they have, or they do not socialize enough to warrant using hearing aids. In evaluating the validity of these claims as well as the earlier report that "their hearing loss was mild" or "not severe enough," the reader should recall that this population reported (using the unaided APHAB) communication difficulty 54% of a typical day on average. The average unaided APHAB of America's hearing aid owners is 55%. Given their lower age and the fact they are more likely to be in the workforce, it would seem that untreated hearing loss would have a more deleterious impact on their lives than on older demographic segments.

Attitudes toward hearing aids

In Figure 4e, respondents indicated whether any of 18 characteristics of hearing aids impacted their decision not to purchase them. More than two-thirds of respondents (68%) indicated that some aspect of hearing aids was a barrier to adoption. The top barriers were the perceptions that hearing aids: do not work well in noise (48%), do not restore hearing to normal (47%), pick up background noise (45%), whistle and feed back (44%), perform poorly in crowds (42%),

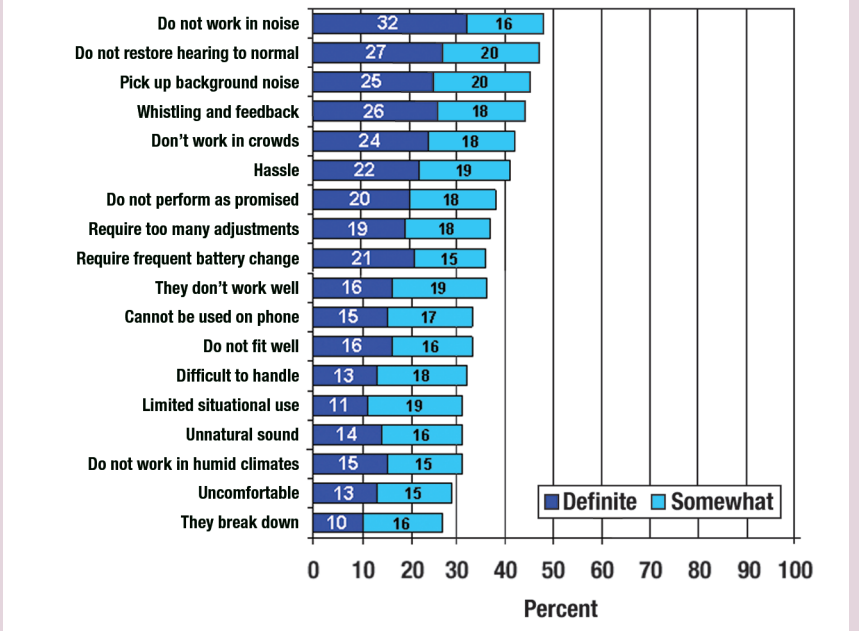

Figure 4e. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = Attitudes toward hearing aids.*

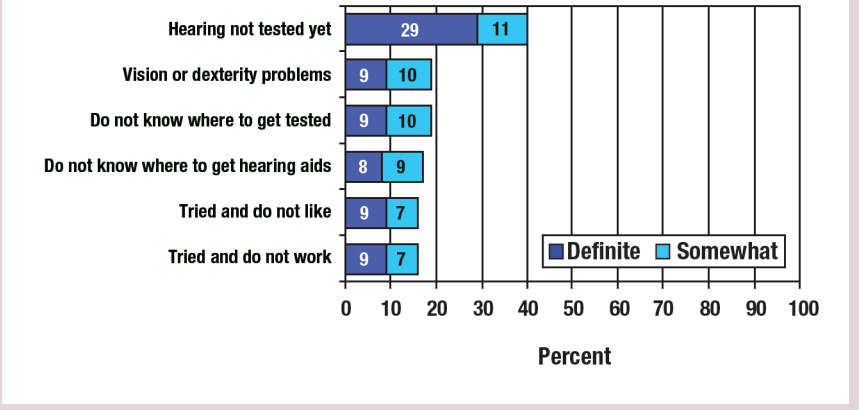

Figure 4f. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = knowledge and experience.*

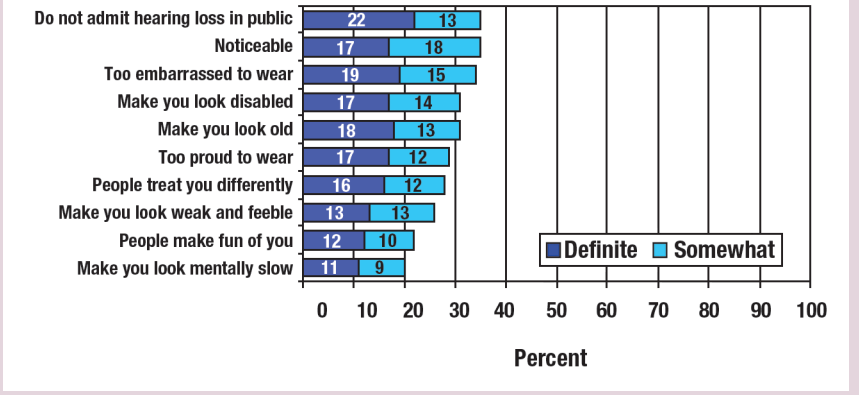

Figure 4g. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = stigma.*

and are a hassle (41%).

About a third indicated that hearing aids do not perform as promised, require too many adjustments and frequent battery change, have limited utility, cannot be used on the phone, are difficult to handle, fit poorly, have unnatural sound, and are not reliable in humid climates. About one quarter believed that hearing aids are uncomfortable or unreliable *(e.g., they break down)*.

Positive attitudes toward hearing aids are, of course, important drivers in adoption of hearing aids as a solution to hearing loss. To what extent is there a gap between reality and perception with respect to hearing aids? Are these perceptions based on old analog technology (e.g., their grandmother's hearing aid)? And, since only a minority of this population has tried hearing aids, how did they acquire their attitudes? Was it from family doctors, the news, or their social network?

Knowledge and experience

Nearly half (46%) of respondents indicated that they have not purchased hearing aids due to insufficient knowledge about either their hearing loss, where to get tested, or where to purchase hearing aids (Figure 4f). Four in ten non-adopters reported they have not purchased hearing aids because they have not had their hearing tested; slightly fewer than 20% indicated being unsure where to get their hearing tested or where to get hearing aids. Two in ten indicated that vision or dexterity problems have impacted their decision not to try and use hearing aids. Sixteen percent of non-adopters indicated they have tried and do not like hearing aids or tried them and found they did not help their specific hearing loss.

Referring back to Table 4, 12% of the total non-adopter population and 20% of the top 50% hearing loss group indicated that a past hearing aid trial was either "somewhat" or a "definite" reason for their decision not to use hearing aids. This means that 2.76 million people with hearing loss have tried and rejected hearing aids. Referencing Table 5, we have documented past hearing aid trial by decile. Close to a third of the group with the most serious hearing loss (decile 10) report a past hearing aid trial was a "definite" reason for rejecting hearing aids.

We asked all respondents who have

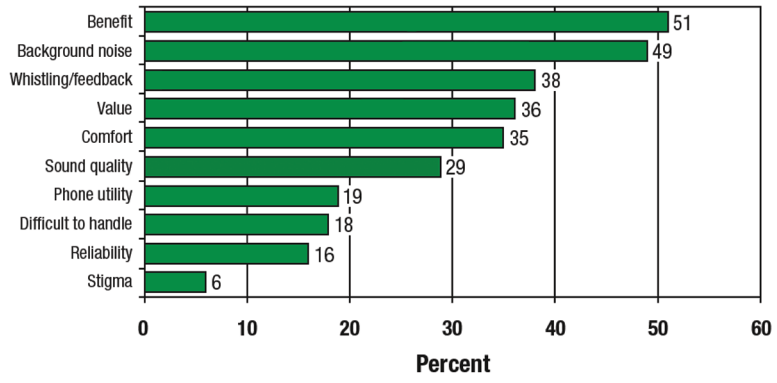

Figure 6. *Reasons for hearing aid return (n = 237).*

tried hearing aids in the past to tell us why they chose not to purchase and use hearing aids. They were presented with 10 reasons why some people may reject hearing aids and asked to respond "yes" or "no" to each item.

Figure 6 presents the 10 most common reasons for rejecting hearing aids based on responses from 237 respondents. Nearly half indicated that the hearing aids provided poor benefit or amplified background noise. These are also the top reasons that consumers purchase hearing aids and then place them in the drawer.[8] About four out of ten complained of whistling and feedback, thought the hearing aids offered poor value (i.e., benefit relative to price), or said that the instruments were uncomfortable; fit/comfort is also one of the top three reasons for hearing aids in the drawer.

Approximately two out of ten returned the hearing aids because they didn't work on the phone, were difficult to handle, or were unreliable. Only a small minority (6%) returned the hearing aids because of stigmatization. Apparently the vast majority of people who have purchased and tried hearing aids have personally resolved the issues of stigma.

Stigma

We asked non-adopters to report if stigma was a reason for non-adoption by presenting them with 10 "stigma" statements (see Figure 4g). Nearly half (48%) indicated that stigma contributed to their desire not to wear hearing aids. About a third of respondents said they did not want to admit their hearing loss in public, that hearing aids were too noticeable, they would be embarrassed to wear them in public, or that they make you look disabled or old. One out of three indicated they were too proud to wear hearing aids or expressed concern that other people would treat them differently. About one in four reported that hearing aids denote weakness and feebleness to the outside world, while about 20% thought people would make fun of them or think that they were mentally impaired.

Recommendations and trust

Nearly half of respondents (46%) reported that a professional such as a family doctor (29%), ENT (35%), audiologist (32%), or hearing instrument specialist (20%) influenced their decision not to get a hearing aid (see Figure 4h). And, as shown in Figure 4i, the respondent's spouse was reported to be the person most likely to recommend that the hearing-impaired person not get a hearing aid (28%), followed by a known hearing aid user (26%), friend (23%), or child (18%). Extrapolating these findings to the entire non-adopting hearing loss population shows that nearly one in five (19% or 4.4 million) non-adopters were influenced not to purchase a hearing aid based on the experience of an acquaintance who is a hearing aid user.

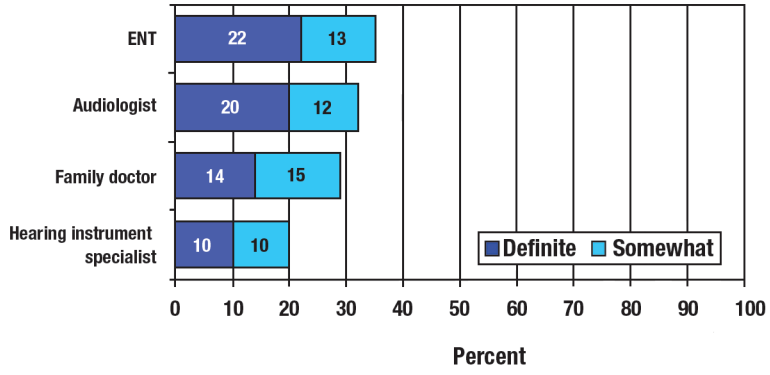

Figure 4h. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = Professional recommendation.*

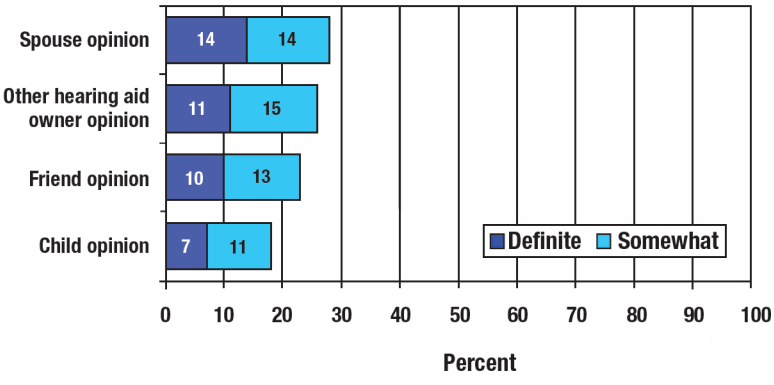

Figure 4i. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = social network recommendations.*

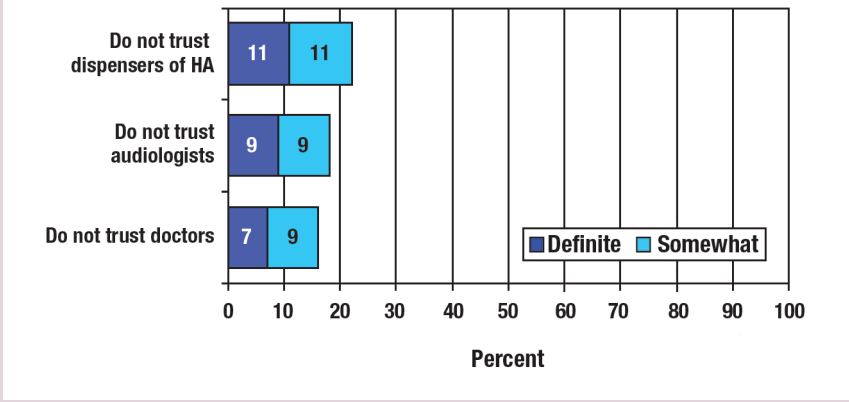

Figure 4j. *Reasons for non-adoption of hearing aids: top five deciles of hearing loss. Factor = trust.*

Finally, among obstacles to purchase, potential consumers were asked if distrust of physicians, audiologists, or dispensers of hearing aids influenced their decision not to purchase (Figure 4j). One in four (24%) indicated that lack of trust of at least one of these professionals impacted their decision not to purchase, 13% "definite" and 11% "somewhat." There were only very small differences in perceived trustworthiness of these three professionals. In other words, if they mistrusted one profession, they mistrusted all.

Future purchase intent

All non-adopters were asked to rate the likelihood they would be purchasing hearing aids in the next 6 months, year, or 2 to 4 years. The responses by hearing loss decile are shown in Figure 7 and the top portion of Table 6. One in four (26%) reported they intend to purchase hearing aids in the next 4 years, while 3% indicated an intent to purchase hearing aids in the next 6 months. Not surprisingly, intent to purchase is correlated with degree of hearing loss.

Next we asked potential hearing aid users to indicate whether or not each of eight features of hearing aids would increase their likelihood of purchasing hearing aids in the future. We did not

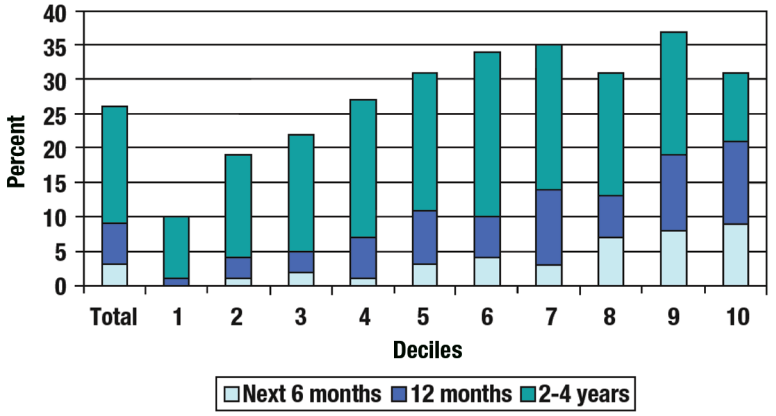

Figure 7. *Hearing aid adoption intent by hearing loss decile.*

Table 6. *Likelihood (%) of purchasing hearing aids in the next 4 years and percent greater likelihood with specific hearing aid enhancements.*

	Hearing Loss Decile										
Purchase intent	**Total (%)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Next 6 months	3	0	1	2	1	3	4	3	7	8	9
12 months	6	1	3	3	6	8	6	11	6	11	12
2-4 years	17	9	15	17	20	20	24	21	18	18	10
No intent	74	90	81	78	73	69	66	65	69	63	69
Greater likelihood w/enhancement*											
$500 tax credit	40	27	32	40	42	45	43	45	43	46	47
Able to buy software upgrade	27	19	26	25	27	30	26	35	24	31	42
Built into fashionable eyeglass	20	14	14	19	20	22	20	27	23	27	30
Headset functionality to phone	19	12	14	16	15	23	19	25	17	28	34
Ability to self fit or adjust	19	12	15	19	16	19	21	25	18	28	27
MP3 connectivity	11	8	7	8	9	17	11	15	13	15	19
Built-in FM radio	11	8	6	11	9	17	12	12	14	15	21
Language translator	10	9	8	11	11	14	5	13	9	12	10

* Note: on a 5 point scale from "no impact" to "much more likely" to purchase respondents indicated if they were more likely to purchase hearing aids if these features were available. The number shown is the percent of respondent scoring the feature a 4 or a 5 on a 5 point scale.

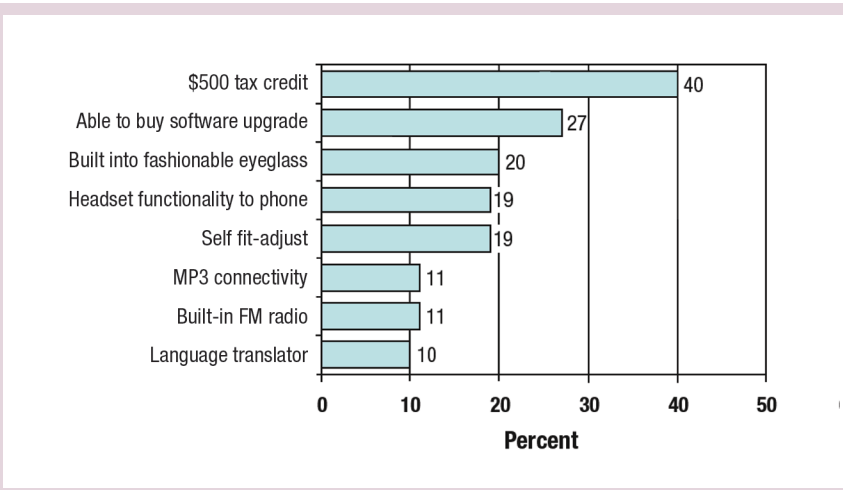

Figure 8. *Positive impact of hearing aid enhancements; total hearing loss population currently not using hearing aids.*

repeat all the variables previously presented under obstacles to hearing aid adoption on the assumption that enhancement of these features *(e.g., improved benefit, performance in noise)* would eventually lead to improved attitudes in the marketplace followed by positive word of mouth. The results for the total population are documented by hearing loss decile in Table 6. With the exception of the lowest hearing loss decile, these enhancements would positively impact each hearing loss decile in roughly the same proportion. Thus, we have shown the total impact (all decile groups) in Figure 8.

Four out of ten non-adopters indicated a $500 tax credit would increase their likelihood of purchasing a hearing aid in the future, while about one in four (27%) indicated the ability to buy software upgrades would be appealing. Two out of ten said they would be interested in hearing aids built into fashionable eyeglasses, headset functionality with phones, or the ability to self-fit or adjust their hearing aids. One in ten would be motivated by MP3 connectivity to their hearing aids, an FM radio in their hearing aid, or a language translator *(e.g., French voice-recognition software converted to English in the ear of the consumer)*.

Focusing on people with a 6-month purchase intent, we presented 22 aided awareness reasons why people purchase hearing aids. They were asked to indicate if one or more of these reasons influenced their intent to purchase in the near future. As seen in Figure 9, the top reasons were "hearing loss got worse" (67%) and "family recommendation or pressure" (62%). About one in five was influenced by an audiologist, safety concerns, or another hearing aid owner. One in six plans to purchase on the recommendation of an ENT or based on public relations and marketing material *(e.g., TV, radio, newspaper, direct mail, Internet)*. Finally, about 10% are going to purchase because of a favorable price for a hearing aid, a hearing instrument specialist's recommendation, receipt of a free hearing aid, improved finances, family doctor recommendation, or recommendations from their place of employment.

DISCUSSION

There is a wide continuum in the degree of hearing loss among adults who acknowledge having a hearing loss. In estimating obstacles to hearing aid adoption it is useful to derive a method that allows us to directly compare hearing aid users and non-adopters with a comparable degree of hearing loss. A significant covariate making it difficult to quantify "true" obstacles to hearing aid adoption in the past has been degree of hearing loss. Quite simply, people who purchase hearing aids have more severe hearing losses than non-adopters.

However, using hearing loss segmentation strategies we have derived a subjective method for directly comparing the relevant non-adopting hearing loss population with current users of hearing aids. Adults with hearing loss in deciles 6-10 equate most closely to current hearing aid users. Within this more serious hearing loss segment reside 83% of hearing aid users, but only 39% of non-adopters. While we have documented in detail each of 10 hearing loss segments for interested researchers, publicists, and strategists, we shall focus here on the obstacles to hearing aid adoption by those with the greatest degree of hearing loss (unless stated otherwise).

In our opinion, a clear understanding of obstacles among adults with the most serious hearing losses could be fruitful in devising strategies to change attitudes or behaviors that block them from an earlier search for a life-changing hearing solution. With opportunities for promoting better hearing in mind, here are our key observations:

Motivation

The key reason that new users and potential new users *(adults in this study with a*

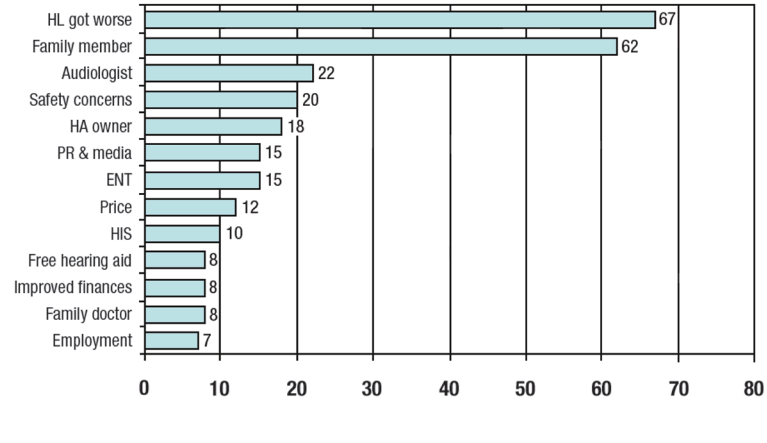

Figure 9. *Reasons for intent to purchase hearing aids.*

6-month purchase intent) buy hearing aids is the recognition that they have a problem; often motivation comes from the influence of family and friends. This is the same reason that people seek a solution for other problems, such as psychological problems, alcoholism, or drug addiction; namely, personal need recognition, whether internally or externally determined.

Any intervention designed to get people with hearing loss to comprehend their problem will perhaps be the most powerful motivator. This intervention could take many forms, including: greater involvement on the part of the physician in problem recognition, continued education on the signs of hearing loss, or quality-of-life public relations campaigns, such as the impact of untreated hearing loss on income and employability.

Testing

Only half the population has received an objective hearing test. Given the importance of problem recognition, the simple act of providing non-adopters with some form of hearing loss measure, whether objective or subjective, could have a powerful impact on their decision to seek a solution, especially if they have been simultaneously educated on the impact of untreated hearing loss on quality of life. Without personal knowledge of hearing loss it is unlikely that other interventions would be effective. You cannot search for a solution until you know you have a problem.

Professional recommendation

Recommendations from physicians, ENTs, and audiologists regarding hearing aids have become significantly more positive over the last 20 years. Continued efforts to educate physicians and ENTs on the efficacy of hearing aids (e.g., evidence-based research) and the impact on their patients' quality of life could significantly reduce negative word of mouth among professionals and encourage more people to seek a solution for their hearing loss.

Surgery and HA trial

Nearly 12% of the unamplified population reported that they had either undergone surgery and were not hearing aid candidates, were candidates for surgery in the future, or had tried hearing aids with little or no success. The key reasons for returning hearing aids were poor benefit, background noise, whistling and feedback, and poor value (performance relative to price). On the assumption that these are not future hearing aid candidates, the available possible amplification population should be reduced by 2.75 million.

Attitudes toward hearing loss

By focusing on non-adopters in hearing loss deciles 6-10, which is the level of loss equal to or greater than that of the typical hearing aid user, we can rule out people who do not need hearing aids. A great proportion of those in deciles 6-10 must be experiencing communication difficulty, whether they recognize it or not.

From this survey it is difficult to determine the origins of their belief that their "hearing loss is too mild" or "not severe enough" for amplification. Certainly some of this is minimization of hearing loss or a level of denial. At least one in four consumers surveyed reported a "mild" hearing loss as a definite reason for non-adoption, and half of them reported either that they don't need to hear well, they get by in most situations, they do not socialize enough, or they don't need fine hearing for their job, etc.

Focus groups with non-adapters have shown that people with hearing loss tend to underestimate the severity of their loss.[9] To counter this misperception, educational efforts could be targeted at significant others, including medical professionals to assist them in communicating more accurate perceptions of the degree of hearing loss to the person with the loss.

Misinformation about candidacy

Some people do not try hearing aids because they have been given false information related to hearing aid candidacy. Specifically, people with high-frequency or low-frequency hearing loss, nerve damage (i.e., sensorineural hearing loss), or unilateral hearing loss were often told they were not candidates for hearing aids. Public awareness efforts to counter these myths could move more people toward considering hearing aids.

Tinnitus

About four people in ten who have a hearing loss indicated that their tinnitus was either "definitely" or "somewhat" a reason for non-adoption of hearing aids. While the efficacy of hearing aids in treating hearing loss is well established, the impact of amplification on people with concurrent tinnitus and hearing loss needs to be investigated further and reported to the public and the medical community. If there is concurrent tinnitus relief in addition to meaningful benefit for hearing loss, this could have a substantial impact on hearing aid adoption rates. If tinnitus is contraindicative of hearing aid usage then the viable amplification population could be substantially reduced.

Attitudes toward hearing aids

Half of those in the most serious hearing loss segment hold at least one negative attitude toward hearing aids. In rank order the most commonly cited negative beliefs are: They are unable to perform in noise, they cannot restore hearing to normal (like glasses), they whistle and feedback, they do not work in crowds, they amplify unwanted background noise (e.g., the refrigerator), and they are a hassle.

A useful exercise is to determine which of the 18 hearing aid attitudinal items in Table 4 are valid, invalid, and perhaps which ones are improving. Once a person has accepted his or her hearing loss, has overcome stigma, and can afford hearing aids, the person must also have a positive view of the product's ability to provide substantial benefit in typical listening situations. Myths about hearing aid technology can be overcome with educational efforts to both the potential end-user and the medical community.

Undoubtedly, negative attitudes toward hearing aids emanate from the consumer journey of friends and relatives, not to mention what is seen and heard in the press. Among this sample of non-adopters, 19% indicated that the experiences of other hearing aid owners influenced their decision not to get hearing aids; that's 4.4 million people affected by negative word-of-mouth reports.

In the most recent MarkeTrak customer satisfaction study,[10] one out of six people indicated that their hearing aids were in the drawer and half of these hearing aids were less than 5 years of age. Among hearing aid owners, only three out of four people said they wore their hearing aids more than 4 hours a day. In

addition, it should be recognized that the key driver to positive attitudes toward hearing aids is a substantial customer base deriving benefit at a perceived high value.

Two large-scale studies[11-12] have demonstrated that the absolute benefit (unaided score – aided score) to consumers is approximately 28%, which equates to a median problem resolution of about 44% (i.e., benefit/unaided). Since benefit is so highly correlated with overall satisfaction with hearing aids, it is logical to ask if a median benefit of 44% is sufficient to dramatically increase the number of people with untreated hearing loss turning to hearing aids as a solution.

While tremendous advances have been made in hearing aid technology in the past decade, realistically, attitudes cannot change dramatically without a corresponding improvement in the current consumer's journey. We think that the Hearing Industries Association's current research on improving the consumer's journey should lead to meaningful improvements.

Stigma

Referring back to Table 4, about one-half of people with hearing loss (in deciles 6-10) choose not to try hearing aids due to stigma. The stronger issues are "hearing aids are a public admission of hearing loss," "noticeable," "embarrassment," and perceived societal connotation of "disability" and "aging."

In our opinion, the effects of stigma are stronger than admitted in this study when one takes into account hearing aid adoption rates controlling for age and degree of hearing loss as shown in Figure 1c. Given the same audiogram and speech discrimination we estimate that a 75-year-old is three to four times more likely to embrace hearing aids than a younger person, because hearing aids are still positioned in society as a product that only old people use. Yet MarkeTrak research demonstrates that 65% of people with hearing loss are below retirement age.[1]

The war on stigma should continue to be waged, but at a much more extensive level than in the past. Stigma can be alleviated by less conspicuous products such as open-fit BTES. While this may partially solve external stigma *(what other people see)*, it does not solve the individual's internal stigma *(what people with hearing loss feel about themselves)*.

Ultimately, massive public relations campaigns using famous or powerful celebrities and successful peers must be employed to break down the stigma barriers. The MarkeTrak population data can be used to refute the myth that only old people have hearing loss. Until younger people *(versus the average age of 70 for first-time users)* begin using hearing aids, the stigma of hearing aid use will remain; in short, the average age of first-time users must be reduced in the next generation.

Finances

Of those most in need of hearing aids, a significant number (64%) reported that the price was an obstacle to adoption. More than half were concerned about the ongoing expense and close to half questioned their value. In further investigation of people reporting that they could not afford hearing aids we found substantial income differentials—up to $40,000—controlling for age between the "can afford" and "cannot afford" hearing aid groups.

In addition, people in all age groups who reported that they could not afford hearing aids were below the national household income level. When asked to indicate if a $500 tax credit would increase their likelihood of purchase, four out of ten gave a resounding "yes." Clearly, initiatives such as tax credits, insurance, and Medicare coverage for hearing aids are needed to help them become affordable to all. Greater public education on available financial help through charities, the Veterans Administration, unions, and employers *(e.g., flex dollar spending programs, Americans with Disabilities Act)* may also help remove personal finances as an obstacle to hearing aid adoption.

CONCLUSIONS

The process of hearing aid adoption is complex, as Figure 3 demonstrates. For a person to seek out a hearing solution a number of concurrent events, both perceptually and in reality, must occur:

- First, the individual must recognize his or her hearing loss.
- Second, the individual must recognize that the hearing loss causes them problems. Without problem recognition there cannot be problem resolution.
- Third, assuming that the problem is sufficiently disruptive to the quality of a person's life or that of their family and that the disruption is comprehended, the person's search for a solution must result in the formation of a reasonable probability that the problem will be sufficiently solved and that the solution will be a good value *(e.g., I will get a better job, I will be safer, my relationships will improve, I will do better in school, my emotional life will improve)*. In other words, the cost of the problem must exceed the cost of the solution for there to be any expectation of movement toward a solution.
- Fourth, it should be recognized that there are many issues obstructing an individual's movement toward a hearing solution—some perceptual, some real.

If significantly more people are to discover the joys of better hearing the hearing healthcare industry will need to simultaneously improve perceptions as well as the reality of the consumer's journey.

Acknowledgment

This study was made possible by a special grant from Knowles Electronics, LLC, Itasca, IL.

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