

Psychological Factors that Influence Hearing Rehabilitation

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The Duck-Rabbit Illusion



Jastrow, 1899 (originally based on an illustration in *Fliegende Blätter (Oct. 23, 1892)*



How should the city Proceed?

Tversky & Kahneman, Science (1981)

A city of 600 people is likely to be attacked by a deadly disease, that might result in the deaths of its inhabitants. You've been asked to select a strategy out of these that will help the city combat the epidemic.

Option A: This program ensures that 200 people will be saved. 72%

Option B: With this program, 1/3 probability that all of them will be saved; 2/3 probability that none will be saved 28%

Option C: This program ensures that 400 people will perish. **22%**

Option D: With this program, 1/3 possibility that no one will die; 2/3 probability that all 600 will die. 78%



Which would you prefer?

Ariely, Predictably Irrational (2008)

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Ariely (2008). Predictably Irrational.

Non-audiological influences on hearing rehabilitation?

Hearing Rehabilitation: Complex, Multi-Stage Process





Hearing Rehabilitation: Complex, Multi-Stage Process





Can Framing influence Patient Outcomes?



What does previous research observe?

Individuals prefer hearing aids that are programmed in an interactive/consultive fashion with patients (re: non-interactive/diagnostic) (Naylor, Oberg, Wanstrom, & Lunner, E&H, 2015)

Can Framing influence Patient Outcomes?



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Individuals **report more** benefit when hearing aids are described as:

- "Digital" (re: analogue) (Bentler, Niebuhr, Johnson, & Flamme, E&H, 2003)
- "New" (re: conventional) (Dawes, Powell, & Munro, E&H, 2011; Dawes, Hopkins, & Munro, E&H, 2013)

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Individuals **perform better on a SIN task** when:

- Hearing aids are described as "new" (re: conventional)* (Dawes, Hopkins, & Munro, E&H, 2013)
- The task is described as "hard" (re: easy) (Hodgetts, Aalto, Ostevik, & Cummine, E&H, 2019)

*marginal effect size



RESEARCH ARTICLE: PDF ONLY

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Compartment



Descriptions of Hearing Aids Influence the Experience of Listening to Hearing Aids Current Issue November/December 2021 - Volume 42 - Issue 6 Rakita, Lori; Goy, Huiwen; Singh, Gurjit Editor-in-Chief: Brenda M. Ryals, PhD ISSN: 1538-4667 EAR and Frequency: 6 issues / yea September 22, 2021 HEARING Ranking: Otorhinolaryngology 3/42 Audiology & Speech Language Pathology 2/22 Impact Factor: 3.129 Þ 🕀 Abstract 🏠 Favorites 🗋 PDF 🕲 Get Content & Permissions Canana and Anna Subscribe to eTOC QuickSIN 2 Published Ahead-of-Print * 10 **Better** . . ٠ SNR (dB) 5 . ٠ 2 ۰. . . 0 ALLENGES -5 Positive Negative Neutral Behind-the-Ear (BTE) Device Microphone . Receiver "Measured in real-life situations, directional Volume Farhook Control microphones in hearing aids improve SNR by On/Off Battery

Christensen, Canadian Audiologist, 2017

approximately 3 dB."

Communication of a narrative was about 5 minutes

Can the context of care influence hearing rehab?

The Role of Others in Hearing Rehabilitation





N = 60,964 1st time patients of audiology clinics *participants were not randomly assigned to condition

Singh & Launer (2016). Trends in Hearing.

Study 2: N = 161 (M age = 33; SD = 13)

Singh, Lau, & Pichora-Fuller, 2015. Ear & Hearing.

Clinical outcomes improve markedly by considering significant others during the rehab process

Does the Type of SO in attendance at appointments influence HA adoption?

Blair Ellis, Stefan Launer, and Singh, *Trends in Hearing* (in press)

Sample: 57,106 patient records at Boots Hearing

Results:

- Relative to being alone, the odds of hearing aid adoption were significantly higher if a patient attended with their:
 - Child OR = 1.42; 95% CI [1.29, 1.57])
 - Parent OR = 2.44; 95% CI [1.46, 4.09])
 - Partner OR = 1.47; 95% CI [1.38, 1.56])
 - Sibling OR = 1.41; 95% CI [1.03, 1.94])



Proportion of HA Adoption by SO Type in Attendance



Hearing Rehabilitation: Complex, Multi-Stage Process





In general, what is the best predictor of hearing aid adoption?

Hearing Aid Adoption: Self-Perceived Hearing Ability



Figure 4. Probability of using a hearing aid vs. self-rating of hearing ability.

"On a scale from 1 to 10, 1 being the worst and 10 being the best, how would you rate your overall hearing ability?"

Self-reported hearing difficulty (OR ranges from 47.0 to 110.7) single best predictor of HA adoption

Hearing Handicap is WORSE for those who routinely experience Boredom

Carolyn Crawford, Kalisha Ramlackhan, Gurjit Singh, & Mark Fenske (Ear & Hearing, 2022)

Background:

- People vary in how easily they become bored
- Can boredom proneness explain why some people experience more subjective hearing loss from a given level of objective HL?

Hypothesis: A stronger propensity to experience boredom will predict more intensely negative experiences of objective hearing loss.

Methods.

• 1840 older adults at CH Canada

Results:

- The subjective impact of hearing loss—both in terms of hearing handicap and strain when listening—was found to be more intensely negative for those who more routinely experience boredom.
- This relationship was mediated by self-reported differences in the ability to maintain task-focused attention.





Hearing Rehabilitation: Complex, Multi-Stage Process





Time of Day & Hearing Aid Adoption

- Retrospective analysis of 24,842 patient records of audiology appointments in Canada
- 1st time patients of the clinics with no reported HA experience





SOUONS

Does the Front Office Staff member influence HA adoption?



Jean Anne Schnittker & Singh

Methods:

- 76 front office staff members completed a brief questionnaire
- Compared responses on the questionnaire with the financial performance of the clinics
- 1. The Toronto Empathy Questionnaire (TEQ)- 16 question measure of empathy

Q1. When someone else is feeling excited, I tend to get excited as well. (5 point scale)

2. Workplace Engagement (Gallup 12)- 12 questions to predict employee and workgroup performance

Q1. Do you know what is expected of you at work? (5 point scale)

3. Ten Item Personality Measure (TIPI)- 10 question measure of the big 5 personality dimensions

Q1. (I see myself as...) extroverted, enthusiastic (7 point scale)

4. Inventory of Polychronic Values (IPV)- 10 question measure of preference to work on many things at once (researchers), rather than one task at a time (pilots)

Q8. I believe it is best for people to be given several tasks and assignments to perform

Does the Front Office Staff member influence HA adoption?



Jean Anne Schnittker & Singh

- TIPI Agreeableness & HI total
 - r = .253
 - p = .023
- TIPI Open-mindedness & Close rate
 - r = -.257
 - p = .022
- Empathy, workplace engagement = ns

(High) Agreeableness

- Characterized as being warm, friendly, tactful, and get along with others
- The presence of these prosocial characteristics may nurture an environment more conducive to HAs being sold

(Low) Open mindedness

- Characterized as preferring routines, consistency, and having difficulty with change
- Tasks completed by PCCs are often repetitive, and individuals who prefer such predictably would be more successful in this role
- Having a PCC who is a good fit to their job is associated with more positive business outcomes

Hearing Rehabilitation: Complex, Multi-Stage Process





Help-Seeking for Hearing Loss: Reports of those with Impaired Hearing



Gilliver, Alperstein, Edwards (NAL), Launer, & Singh

Objective for study: Identify perceived barriers and triggers of hearing help seeking (i.e. booking a hearing assessment) for older adults and better understand the context in which this decision occurs.

- What do patients report as facilitating help-seeking?
- What do patients report as barriers to help-seeking?

Methods

- 15 semi-structured interviews conducted
- Participants were asked questions about what their hearing difficulties are, how they feel about their hearing difficulties and how they think about potential treatment.
- Participants recruited based on age (60+), noticing changes in their hearing / difficulties (but not yet purchased hearing aids). A few participants have had a hearing screening/hearing assessment.

Help-Seeking for Hearing Loss: Reports of those with Impaired Hearing



Gilliver, Alperstein, Edwards (NAL), Launer, & Singh

Findings Organized into 5 Broad Themes

- Theme 1: Help is only something you get when your hearing difficulties become completely unmanageable
- Theme 2: The steps one takes to get hearing help are uncertain/unknown.
- Theme 3: The risks of hearing loss are not a current concern.
- Theme 4: Seeking hearing help and getting hearing aids are intertwined.
- Theme 5: It's time to get help when your hearing difficulties impact others.

Results consistent with:

- Vestergaard Knudsen, Öberg, Nielsen, Naylor, & Kramer (TIH, 2010)
- Laplante-Levésque, Hickson, & Worral (IJA, 2010)
- Meyer & Hickson (IJA, 2012)
- Meyer, Hickson, Lovelock, Lampert, & Khan (IJA, 2014)

Behavioural Economics





For a review of behaviour change theories that influence Hearing Aid Adoption, see lankilevitch, Singh, & Russo (in press, E&H)

One example: Prospect Theory

Tversky & Kahneman, Econometrica (1979)

- Assessments of losses and gains hold an asymmetric psychological value
- We 'feel' losses more than 'wins'



Literature on Gain- and Loss-Framed Messages



Gallagher & Updegraff, Annals of Behav. Med. (2012); O'Keefe & Jensen, Jn. Of Health Communication (2007)

- Gain-framed messages more likely to encourage prevention behaviours (re: loss-framed messages)
 - Small effect size
- No effect of framing for detection behaviours

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- Similarly found small effect sizes
- Low quality evidence
- Unexplained heterogeneity suggests framing under specific conditions

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- Similarly found small effect sizes
- Low quality evidence
- Unexplained heterogeneity suggests framing under specific conditions
- It is rare for studies to actually measure behaviour (mostly investigate attitudes/behavioural predictions)

Literature *cont*...



Potential reasons for the heterogeneity?

Age (Shamaskin, Mikels, & Reed, Psych & Aging, 2010)

• Messages effectiveness is age-dependent

Literature *cont*...



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Regulatory Focus (Higgins, American Psychologist, 1997; Lee & Aaker, JPSP, 2004; Wang & Wang, Front. Psychology, 2021)

• Prevention (losses) vs. Promotion (gains) focus*

Literature *cont*...



Potential reasons for the heterogeneity?

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• Prevention (losses) vs. Promotion (gains) focus*

Psychological Uncertainty (Huang & Liu, Science Communication, 2022)

• High uncertainty (losses) vs. Low uncertainty (gains, but effect is smaller)

One Question: What is the role of gain- and loss-framed messages in help-seeking?

Audiology Messaging During a Hearing Screening (Gain or Loss frame)



St. Jean, Cummine, Singh, & Hodgetts, E&H (2021)

- Objectives: Do attitudes toward hearing loss treatment vary as a function of message framing? Do attitudes also differ as a function of being led to believe they had failed a hearing screening?
- 64 younger adults (18-39 years old)
- In a sound booth, half the subjects were told they failed a hearing screening (half not)
- On the **wall of the booth**: Poster 1 of 2 possible messages:
 - Inclusionary (gain-framed message)
 - Exclusionary (loss-framed message)
- Results:
 - Greater interest in hearing treatment with the gain-framed message/positive (med to large effect size)
- Limitation: Only assessing attitudes
- Strength: The messages on the wall had an effect!



TABLE 1. Post hoc comparisons by poster type

	Mean Difference				
	(Inclusion – Exclusion)	Standard	Significance		
Questionnaire Statement		Deviation	t (df)	(2 tailed)	Cohen's d
1. If I were concerned about my hearing, I would seek help from a professional	1.36	1.44	3.63 (58)	0.001†	0.94
2. If I were concerned about my hearing, I would rather cope with it than try to do something about it	1.22*	1.81	-2.64 (59)	0.010	0.68
3. If I were concerned about my hearing, I would know where to get help	1.33	2.55	2.08 62)	0.042	0.52
4. Once you have hearing loss, there's not much you can do about it	0.29*	2.31	-0.49 (61)	0.628	0.13
5. I've heard you should get your hearing tested now and then	0.42	3.16	0.53 (62)	0.596	0.13
I don't think hearing aids are a good way to improve hearing	0.13*	1.65	-0.31 (59)	0.760	0.08
7. I would be willing to try a hearing aid if recommended by a hearing expert	1.43	1.64	3.34(58)	0.001†	0.87
8. I would think the costs of using hearing aids would outweigh the benefits	0.66*	1.76	-1.45 (59)	0.152	0.38
9. People with hearing loss would benefit from a hearing aid 10. People who have hearing problems should just forget about them	0.87 -0.01*	1.46 0.74	2.33 (60) 0.041 (59)	0.023 0.967	0.59
11. I think having a hearing loss would limit my daily activities	-0.50	2.50	-0.78 (59)	0.440	0.20

1. If I were concerned about my hearing, I would seek help from a professional

Strongly disagree	 Strongly
	 agree

Fostering Help Seeking via Messaging

Gilliver, Alperstein, Edwards (NAL), Crukley, Launer, & Singh

Problem: This research seeks to identify which messages are most effective at increasing older adults' help-seeking behaviours for hearing health rehabilitatio

- 1. Tested messages based on literature (and sor
- 2. Experiment on Amazon Mechanical Turk with

Control: Health Message

It's important to look after your health and get help when you notice any health issues

Control: "Common" Hearing Message

If you are experiencing hearing difficulties, you may want to get your hearing checked

Social Norm

8 out of 10 adults who notice hearing difficulties get their hearing checked. If you are experiencing hearing difficulties, you may want to get your hearing checked.

Risk to Cognition

If you delay getting your hearing checked (not looked at), there could be risks to your cognitive well-being over time. If you are experiencing hearing difficulties, you may want to get your hearing checked.



Attitudes, Behavioural Intentions, and Behaviour

Attitudes (A): How one thinks or feels about someone or something

Behavioural Intentions (BI): The prediction one makes about their future behaviour

Behaviour (B): The way in which one acts



Bechler, Tormala, & Rucker, Psychological Science (2021)



- Framing/Narratives influence patient preferences, subjective experience, speech-in-noise performance and help-seeking behaviours
- Involve Significant Others in Hearing Rehab
- Those who tend to experience more boredom also experience greater hearing handicap
- Avoid scheduling appts where people make decisions about hearing aids at noon or the end of the day
- Consider adding formal measures when assessing job candidates for Front Office Staff positions



Contributors

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