

STAGE OF CHANGE RELATED TO APPOINTMENT TYPE

By

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As members of the Audiology Doctoral Project Committee, we certify that we have read the Audiology Doctoral Project prepared by: Emily Leedy titled:

STAGE OF CHANGE RELATED TO APPOINTMENT TYPE

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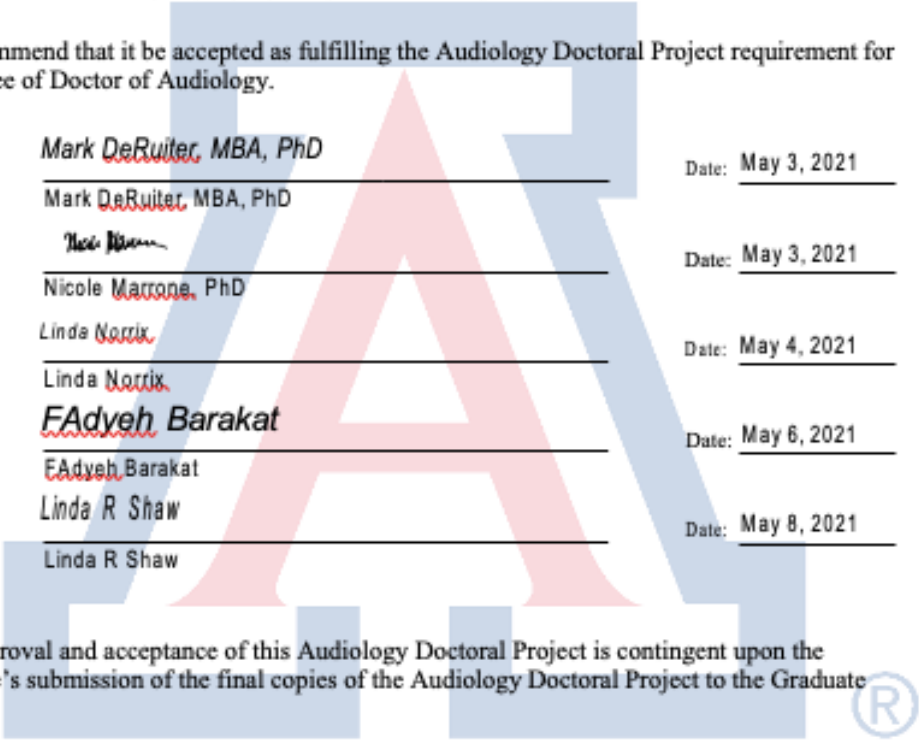
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Final approval and acceptance of this Audiology Doctoral Project is contingent upon the candidate's submission of the final copies of the Audiology Doctoral Project to the Graduate College. 

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ABSTRACT

The transtheoretical model of behavior change has been adapted for a variety of different health behavior changes. In audiology, the transtheoretical model has been adapted for the readiness to pursue amplification. An audiologist can use the transtheoretical model of behavior change as a counseling tool for patients. There are five stages of change: pre-contemplation, contemplation, preparation, action, and maintenance. Previous research conducted outside the United States has focused on the patient's stage of change at the initial appointment with an audiologist. The objective of the current study is to assess the stage of change that patients are in across different types of audiology appointments. There were 50 participants recruited at the University of Arizona Speech and Hearing Clinic. Participants completed an anonymous survey that included two different stage-of-change questionnaires: The Staging Algorithm, and the Line. Additional questions were asked that focused on a participant's personal experience with hearing loss and use of hearing aids. The results of this study showed that the majority of participants were in the maintenance stage of change across multiple types of appointments. However, for any given appointment type, there was variation in the stage-of-change reported and a wide range of scores in self-reported importance of improving hearing and motivation. Based on these findings, it is suggested that the clinical use of The Staging Algorithm and The Line can help audiologists guide the appointment based on a person's stage of change.

CHAPTER 1: INTRODUCTION

There are an estimated 22.9 million older adults with hearing loss in the United States that could benefit from hearing aids but do not take the steps needed to acquire them (Chien & Lin, 2012). The lack of hearing aid uptake can lead to negative consequences on a person's ability to communicate successfully. The prevalence of hearing impairment is continuing to grow in the older population (Ekberg et al., 2016). However, there is evidence that only half of the patients who go to their initial audiology appointments commit to hearing aids (Grenness et al., 2015). Taken together, these results suggest that when a patient goes to their initial audiology appointment, they may not be ready to obtain hearing aids. If clinicians had a way to better be able to assess a patient's readiness for hearing aid uptake at the beginning of their appointment, this could help guide the appointment. Clinicians would be better prepared to counsel the patient based on their readiness for hearing aid uptake.

One way that clinicians could predict a patient's readiness to manage their own hearing health is through identifying their stage of change (Saunders et al, 2012). The transtheoretical model of behavior change is used to assess a person's readiness to change in adopting and maintaining healthy behaviors (Prochaska & DiClemente, 1983). The transtheoretical model was developed in the early 1980s and the model was first used to examine the process of change for smoking cessation (Prochaska & DiClemente, 1983). The transtheoretical model has further been adapted for behaviors such as weight control, safer sex, and quitting cocaine. The transtheoretical model views behavior change as a process that focuses on a person's attitudes, behaviors, and intention to change (Ekberg et al., 2016).

The transtheoretical model has six stages of change: pre-contemplation, contemplation, preparation, action, maintenance, and relapse (DiClemente et al., 1991). The pre-contemplation stage is when a person claims that their behavior is not a problem, and they have no intention of

changing. The contemplation stage is when a person is more aware of the benefits of making a change and they now have an intention to make a change within the next six months. The preparation stage is when a person is starting to make small changes in their behavior and is planning to change in the next 30 days. The action stage is when a person starts to take action in changing their behavior and starts to accomplish their goals. The maintenance stage is when they have successfully changed their behavior and have maintained the healthy changes. The termination or relapse stage is when a person starts to go back to their old behavior (DiClemente et al., 1991).

LITERATURE REVIEW

The transtheoretical model has been adapted for identifying a patient's psychological readiness for hearing rehabilitation at their initial audiology appointment (Ekberg et al., 2016). In Sweden, researchers studied the stage of change that people were in when they arrived at their first appointment (Ingo et al., 2017). This study compared patient responses on three questionnaires: the 24-item University of Rhode Island Change Assessment (URICA) and two different one-item assessments (Staging algorithm and "The Line"). The study sample included 224 adults who had a hearing screening and referred for follow-up care; they were asked if they would like to participate in the study. Researchers administered the three questionnaires at their initial appointment with the audiologist. The average age of the participants was 65 years old. The results showed that 87.9% of participants were in the contemplation and preparation (information seeking) stage at their initial appointment (Ingo et al., 2017). These results indicated that the majority of people are not ready to pursue amplification at their initial audiology appointment in Sweden.

A study in Australia looked at using the transtheoretical model in audiologic rehabilitation (Laplante-Levesque et al., 2013). The participants completed the 32 item URICA, the 12 item Hearing Handicap Questionnaire (HHQ), and the International Outcome Inventory (IOI). There were 153 adults included in the study. The participants were seeking help for the first time and completed the three questionnaires. The participants were offered different types of intervention: hearing aids, communication programs, or no intervention. Once the participants decided which intervention strategy they wanted to pursue, they were reassessed 6 months later and then three months after the intervention (Laplante-Levesque et al., 2013). The results showed that the majority of participants were in the action stage at their initial appointment. This study showed different results than in the study by Ingo et al. (2017). The participants were more likely to pursue amplification when in the action stage (Laplante-Levesque et al., 2013).

In the United States, there is little data on the stage of change patients are in when they first walk through the doors of an audiology clinic. Further, of the research done on stage of change and appointment type, it has only been considered for the initial appointment. Research has not focused on the stage of change related to all types of audiology appointments.

PURPOSE

For this study, the focus is on the patient's self-reported readiness to acquire hearing aids among adults in the Southwestern United States. The purpose of this study is to define which stage of change (related to readiness to pursue amplification) patients are in when they arrive at their appointment among the adult population seen at the University of Arizona Hearing Clinic. This study will be a partial replication and extension of the Ingo et al. (2017) study. The current study included 2 surveys from the Ingo et al (2017) study, the Staging Algorithm and the Line. However, instead of focusing on the initial appointment, all appointment types were included.

The stage of change was evaluated for individuals at all appointment types, not just the initial appointment. The hypothesis is that the results will be similar to the Ingo et al., 2017 study and that the majority of patients will be in the contemplation or preparation stage at their initial appointment. In theory, as people move through their hearing journey, it is expected that they will also make progress through these stages. Therefore, at appointments like hearing aid fittings and follow-up, it is predicted that patients would be in the action stage or later on The Staging Algorithm and report higher levels of motivation and importance to change their hearing on The Line than at earlier, pre-action appointments like initial hearing tests.

CHAPTER 2: METHODS

OVERVIEW

The study design was a cross-sectional survey. These questions were a part of a larger survey collecting data for two Audiology Doctoral Projects. For the current project, the participants completed two questionnaires and additional questions focusing on hearing health history and hearing aid use. The questionnaires were the Line and the Staging Algorithm, described further below. The additional questions focused on when the patient first noticed a hearing loss, how long they waited to seek help or testing, and information about their decision process once they sought help. The participants consented to being surveyed anonymously for research that was approved by the University of Arizona Institutional Review Board (exempt protocol). Approval was also obtained from the Speech, Language, and Hearing Sciences Privacy Officer for authorization to access clinical records to document their study participation following departmental protocol for clinical research.

PARTICIPANTS

Participants were recruited from the University of Arizona Hearing Clinic between January 28th, 2020 through February 28th, 2020. To participate in the survey, the participant had to be a patient within the clinic. Exclusion criteria included patients with a known diagnosis of dementia, patients who were non-native English-speaking, and patients who were seeking qualification appointments for Social Security disability benefits.

Table 1 shows the survey respondents' demographic information. There were 50 survey participants, 34 males and 16 females. The age categories reported ranged from 25-34 years, 35-44 years, 45-54 years, 55-64 years, 65-74 years, 75-84 years, and 85 years or older, with the majority of survey participants over the age of 65 years and retired. The majority of participants were married. Although there were many races represented, the majority of participants were

white. Most participants had a higher education degree, of either bachelors, masters, or doctorate. Most of the survey respondents had a household income of over \$100,000/year. During the survey period, we approached 54 patients, only four people declined to participate.

TABLE 1*DEMOGRAPHICS OF SURVEY PARTICIPANTS*

Factor	Total Sample (n=50)
Gender	
Male	68 %
Female	32 %
Age	
25-34	2 %
35-44	0 %
45-54	4 %
55-64	6 %
65-74	26 %
75-84	44 %
85 or older	18 %
Marital Status	
Married	74 %
Divorced	8 %
Widowed	10 %
Never Married	8 %
Race	
White	82.35 %
Black or African American	1.96 %
Asian	1.96 %
Decline to Answer	1.96 %
Other	11.76 %
American	
Latino	
Hispanic	
Highest Education Level	
Less than a high school degree	4 %
High school graduate (high school diploma or equivalent including GED)	8 %
Some college but no degree	8 %
Associate degree in college (2-year)	10 %
Bachelor's Degree (4-year)	16 %
Master's Degree	30 %
Doctorate Degree	20 %
Professional degree (JD, MD)	4 %
Employment Status	
Not working (retired)	74 %
Working	18 %
Not working (disabled)	4 %
Not working (other)	4 %
Household Income	
Less than \$20,000	8 %
\$20,000 to \$39,999	4 %
\$40,000 to \$59,999	12 %
\$60,000 to \$79,000	12 %
\$80,00 to \$99,000	4 %
\$100,000 to \$119,000	18 %
\$120,000 and above	30 %
Decline to answer	12 %

QUESTIONNAIRES AND SURVEY QUESTIONS

STAGING ALGORITHM QUESTIONNAIRE

The staging algorithm is a 1-item questionnaire that has been used across a variety of different health behavior changes such as smoking cessation, weight control, and sunscreen use (Prochaska, 1994). The algorithm can be applied to either cessation of negative behaviors like smoking or can be applied to the acquisition of positive behaviors like exercise. The staging algorithm was applied to stages of change in audiology by Ingo et al (2017). The staging algorithm is used here to categorize the person's own self-report of their current hearing status.

For the purpose of this study, the adapted version of the staging algorithm was used. The staging algorithm consists of one question: "Which of the following statements best describes your view of your current hearing status?" (Ingo et al., 2017). The answer choices to this question address each stage of change: *I do not think I have a hearing problem, and therefore nothing should be done about it* (pre-contemplation); *I think I have a hearing problem. However, I am not yet ready to take any action to solve the problem, but I might do so in the future* (contemplation); *I know I have a hearing problem, and I intend to take action to solve it soon* (preparation); *I know I have a hearing problem, and I am here to take action to solve it now* (action); and *I know I have a hearing problem, and I've already taken action. I'm here for follow-up care* (maintenance) (Ingo et al., 2017). This question will help be able to address each stage of change in one question. The answer to this question will tell us what stage of change a person is in at their appointment.

THE LINE QUESTIONNAIRE

The Line is a 2-item questionnaire that is used as an indicator of readiness for change as well as a tool for motivational interviewing in counseling. Motivational tools have been created

by the Ida Institute to help facilitate communication within an appointment to help engage the patient in the rehabilitation process (Ferguson et al., 2017). The Line assesses a person's motivation to seek amplification and assess self-efficacy for hearing aids. Figure 1 illustrates the Likert scale that the participants rate their answer on a scale from 0 (not important at all) - 10 (highly important). The first question is, "How important is it for you to improve your hearing right now?". The second question is, "How much do you believe in your ability to use e.g., hearing aids, assistive listening devices, or communication strategies?".

FIGURE 1

AN EXAMPLE OF THE LINE SCALE



ADDITIONAL SURVEY QUESTIONS

The remaining survey questions consisted of questions regarding the person's personal experience with hearing aids, who their support system was, and what the deciding factor was in seeking help for their hearing.

PROCEDURE

We looked at the clinic schedule the morning of survey administration to see who could be recruited for data collection. TIMS is an audiology practice management software, that encompasses the schedule of appointments and chart notes.

APPOINTMENT TYPES

Appointment types included hearing test (new patient), hearing aid selection/consultation, hearing aid fitting, hearing aid follow-up, hearing aid check, a hearing test (established patient), drop off/audiology assistant, and different from appointment(appt) type in TIMS (Table 2). The different from appointment type in TIMS, includes participants who were seen for other reasons. One participant was an established patient with the clinic but was accompanying her husband for his appointment. The other participant was a patient that was scheduling an appointment with the front desk staff, who was not being seen that day.

SURVEY ADMINISTRATION

The participants were approached in the clinic and asked, “Would you like to participate in our survey it takes about 8 minutes to complete?”. If the person said yes, they were taken into a private room and the survey was administered using Qualtrics Experiment Management Software on an iPad. The participants were read each question and they indicated the answer to the question by using the iPad. If the participant was having trouble using the iPad, the survey administrator recorded the answer the participant provided. For the Line questionnaire, participants were asked to slide a dot on a bar to the number corresponding to their answer. If a participant had difficulty sliding the dot, then the survey administrator slid the dot until the participant said “stop”. No compensation provided to those that participated.

All prospective participants were approached, and their appointment type was documented. Since all medical, clinical and personal information of clients/patients is confidential, procedures also included documenting survey participation in TIMS. Participants consented to being surveyed for research purposes that was approved through the University of Arizona Institutional Review Board. After the participant completed the survey, the survey

administrators documented in TIMS, whether they participated, declined to participate, or were not approached to participate in the survey. Table 3 in the Appendix A shows the templates for chart review notes in TIMS.

TABLE 2*DESCRIPTION OF APPOINTMENT TYPES*

Appointment Name	Description
Hearing test (new patient)	A patient who has not been seen by our clinic before and are here to get there hearing tested.
Hearing Aid Selection/Consultation	The patient and clinician discuss different hearing aid options for the patient based on their hearing loss, needs, and goals.
Hearing Aid Fitting	The patient is fit with a hearing aid.
Hearing Aid Follow-Up	The patient comes in once to twice a year and the clinician will clean and maintain the hearing aid and address any concerns the patient may have
Hearing Aid Check	The patient thinks that there may be something wrong with their hearing aid, and the clinician check the hearing aid and addresses the problem
Hearing Test (established patient)	The patient is already an established patient and is here for an annual hearing test
Drop Off/Audiology Assistant	The patient sees our audiology assistant for a quick fix of the problem if a clinician is not available promptly.
Different from Appointment Type in TIMS	The patient was seen in the clinic without an appointment.

CHAPTER 3: RESULTS**RESULTS*****SURVEY DEMOGRAPHICS***

Table 4 shows the percent of survey respondents answers to the additional survey questions. Of the 50 survey respondents, the vast majority wore hearing aids (88%), and 12 % did not wear hearing aids. Of the 88% that wore hearing aids, 22.68 % wore them for 1-8 hours a day and 77.27% wore them for more than 8 hours a day. The majority of survey respondents had been wearing hearing aids for more than seven years (52.27%), 15.38 % for less than 1 year, 31.81% for 1-6 years. Most participants were influenced by their self (30.30%), family (27%), and significant other (24%) to seek hearing healthcare.

A majority of survey respondents have been experiencing hearing difficulties for seven or more years (66%). Survey respondents typically waited 1-2 years to seek help or testing (26.53%). The results showed that change in hearing (40.40%), family pressure (19.77%), and reduced participation socially (17.44%) were the main factors that made people decide to see an audiologist. The survey respondents were asked "Did you experience challenges seeking help for your hearing problem?", 80% said no, and 20% said yes. The challenges reported included financial issues, trouble contacting the clinic, emotional barriers, did not like other audiologist's practice, and healthcare barriers.

TABLE 4*DISTRIBUTION OF RESPONSES FOR ADDITIONAL SURVEY QUESTIONS*

Factor	Total Sample
Do you currently wear hearing aid(s) or a cochlear implant(s)?	
n	50
Yes	88 %
No	12 %
How many hours a day do you typically wear your hearing aid(s)/cochlear implant(s)?	
n	44
1-4 hours	4.5 %
4-8 hours	18.18 %
8 or more hours	77.27 %
How long have you been wearing your hearing aid(s) or a cochlear implant(s)?	
n	44
Less than one month	4.55 %
Less than 6 months	4.55 %
Less than 1 year	6.28 %
1-2 years	11.36 %
3-4 years	9.09 %
5-6 years	11.36 %
7 or more years	52.27 %
Who is supportive in your decision to seek hearing health care?	
n	50
Self	30 %
Significant Other	24 %
Family (Children, grandchildren, etc.)	27 %
Friends	15 %
Other	3 %
Decline to answer	0 %
How long have you experienced hearing difficulties?	
n	50
1-2 years	16 %
3-4 years	12 %
5-6 years	6 %
7 or more years	66 %
How long did you wait to seek help or testing?	
n	50
less than 6 months	18.37 %
less than 1 year	18.37 %
1-2 years	26.53 %
3-4 years	12.24 %
5-6 years	2.04 %
6 or more years	22.45 %
What was the deciding factor(s) that made you come in? (for their initial appointment)	
n	50
Change in hearing	40.40 %
Family pressure	19.77 %

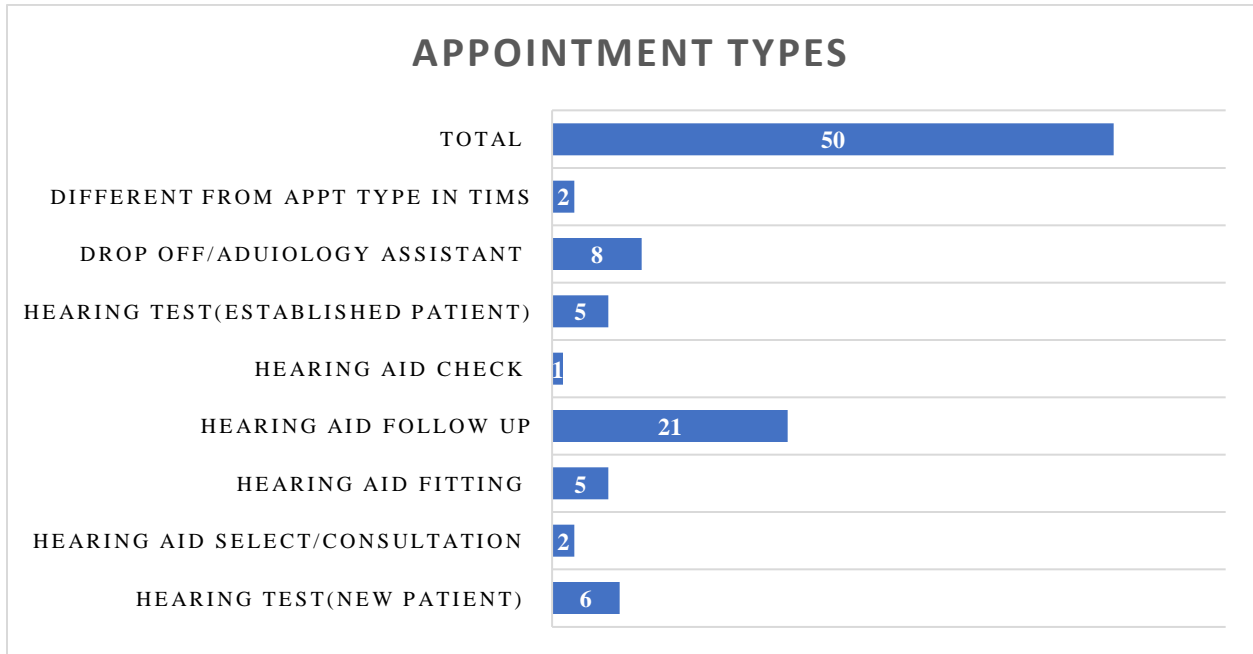
Factor	Total Sample
Reduced participation socially	17.44 %
Reduced participation at work	10.74 %
Change in financial status	1.16 %
Change in healthcare coverage	3.49 %
Other	6.98 %
Curiosity	
ENT recommendation	
Change in medical status,	
Speech therapist convinced me	
Tired of asking to repeat	
Did you experience challenges seeking help for your hearing problem?	
n	50
Yes	80 %
No	20 %

APPOINTMENT TYPES REPRESENTED

Figure 2 shows the distribution of patients across the appointment type. There were six hearing test (new patient), two hearing aid selection/consultation, five hearing aid fitting, 21 hearing aid follow-ups, one hearing aid check, five hearing test (established patient), eight drop off/audiology assistant, and two different from appointment type in TIMS.

FIGURE 3

NUMBER OF PARTICIPANTS AT EACH TYPE OF APPOINTMENT

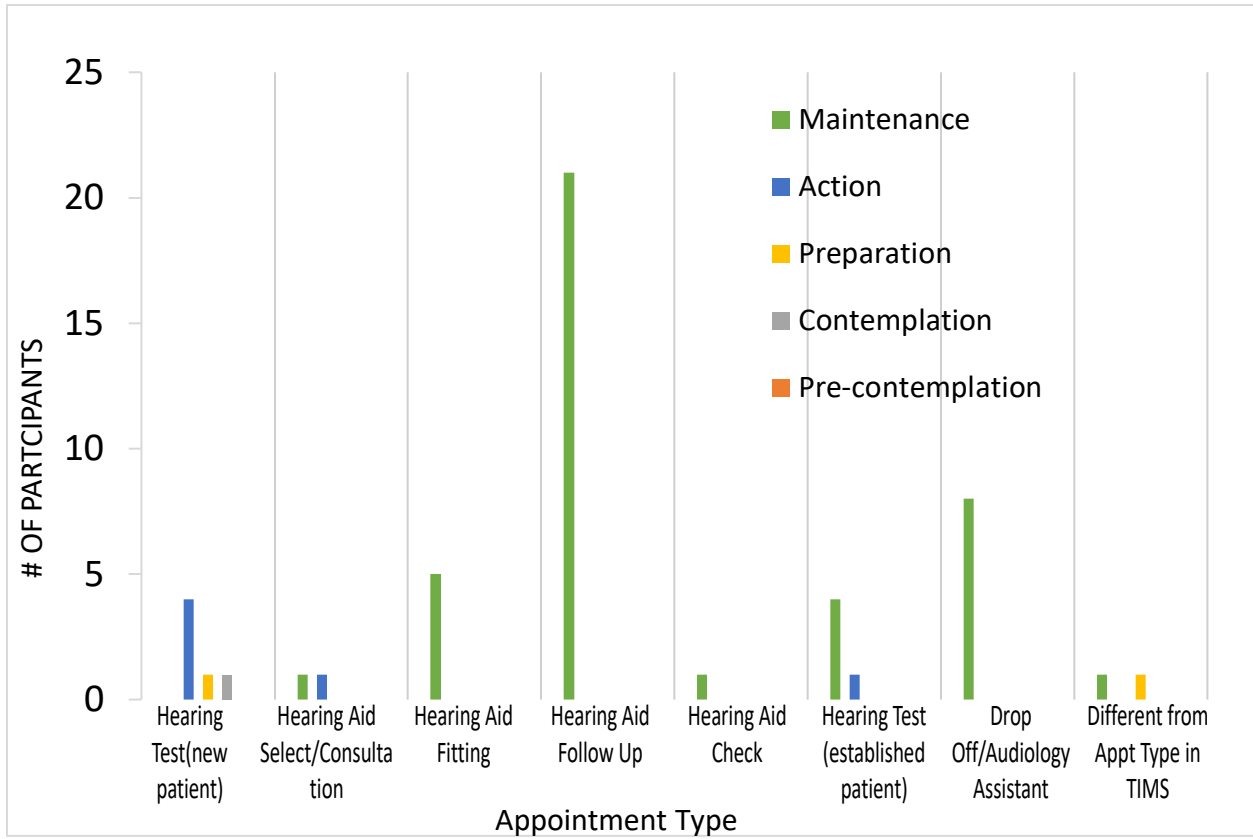


THE STAGING ALGORITHM

The results of the staging algorithm revealed that regardless of appointment type, majority of patients were in the maintenance stage of change. Figure 3 shows a graph of the stage of change distribution across the appointment type. The distribution of the stage of change among the participants who were seen as new patients for hearing tests (n = 8) were contemplation (16.66%), preparation (16.66%), and action (66.66%) stage. The hearing aid selection/consultation (n = 2) respondents were in the action (50%) and maintenance (50%) stage. The hearing aid fitting (n = 5) respondents were in the maintenance stage (100%). The hearing aid follow-up (n = 21) respondents were in the maintenance stage (100%). The hearing aid check (n = 1) respondent were in the maintenance (100 %) stage. Survey respondents seen for hearing test as an established patient (n = 5) were in the action (20 %) and maintenance (80 %) stage. The drop off/audiology assistant (n = 8) respondents were in the maintenance stage (100%). The different from appt type in TIMS respondents were in the maintenance (50%) and preparation (50%) stage.

FIGURE 3

STAGE OF CHANGE REPRESENTED ACROSS APPOINTMENT TYPE



THE LINE

The results of the Line were rounded to the nearest whole number and the mean was then calculated. The survey respondent's overall mean value on the Line was 8.79, with a standard deviation (SD) of 1.73. The overall mean for the Line question 1 was 8.73 (SD = 1.87). The overall mean for the Line question 2 was 8.65 (SD = 1.67).

Additional analyses examined the individual responses for each appointment type.

Figures 4a, 4b, 5a, and 5b show the distribution of individual responses by appointment types. While The Line response is taken at one point in time during a person's hearing journey, these individual data show that there is variation across appointment types. However, some appointment types had more representation of different responses and variation.

For the first Line question, "How important is it for you to improve your hearing right now?", the line rating may have more variation in response ratings because there were more unique responses represented. For example, of the six new patients seen for a hearing test, the mean of responses was 8.02 (SD = 1.91). Of the six participants, three rated that improving their hearing as highly important (10), one rated a "7", and two rated a "5". Of the two participants seen for a hearing aid select/consultation, the mean was 9.05 (SD = 1.34); one rated a "10", and one rated as an "8", they were more motivated to improve their hearing. These data are consistent with the prediction that in these earlier appointments in the hearing loss journey that a person is motivated to improve their hearing.

The patients seen for a hearing aid fitting had a mean of 10 (SD = 0), they all rated a "10" on the scale, it was highly important to improve their hearing. The greatest variation in responses to the importance rating was for the hearing aid follow-up appointments, the 21 participants who were seen for a hearing aid follow-up had a mean of 8.53 (SD = 2.17). Of the 21 participants, 12

rated a “10”, five rated an “8”, one rated a “7”, one rated a “6”, one rated a “5”, and one rated a “2”.

The survey respondent seen for a hearing aid check had a mean of 10 with no standard deviation, they rated them self as a “10”, it was highly important to improve their hearing. The participants seen for a hearing test as an established patient had a mean of 8.7 with a standard deviation of 1.5, two rated a “10”, one rated a “9”, and two rated a “6”. The survey respondents seen for a drop off/audiology assistant appointment had a mean of 9.02 (SD = 1.85), five rated a “10”, one rated an “8”, and one rated a “5”. The survey respondents that were seen for something that was different from an appointment type listed in TIMS had a mean of 7.86 (SD = 3.01), one rated a “6” and one rated a “10”. While the majority of participants were motivated to improve their hearing, there were some that were not as motivated throughout most appointment types.

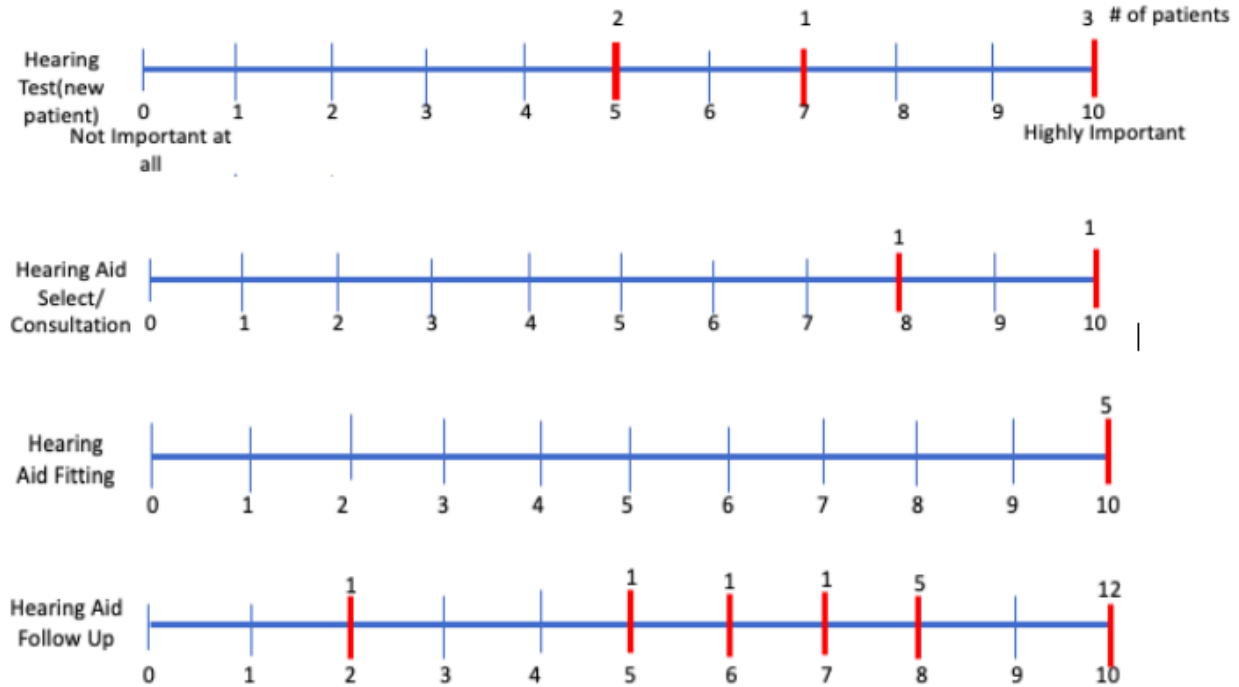
For the second line question, “How much do you believe in your ability to use a hearing aids/cochlear implant/assistive listening device/communication strategies?”, the survey respondents seen as a new patient for a hearing test had a mean of 7.87 (SD = 2.49), three rated a “10”, one rated a “7”, and two rated a “5”. Some were confident in their ability to use a hearing aid and some were not as confident, they may need more time counseling. The survey respondents seen for a hearing aid selection/consultation appointment had a mean of 10 with a standard deviation of 0, all participants rated themselves as a “10”, they were confident in their ability to use their hearing aid. Survey respondents seen for a hearing aid fitting appointment had a mean of 9.65 (SD = .73), one rated a “1” and four rated a “10”, a majority were confident in their ability to use their hearing aid.

The 21 participants who were seen for a hearing aid follow-up had a mean of 8.9 (SD = 1.45), one rated a “5”, two rated a “7”, four rated an “8”, three rated a “9”, and 11 rated a “10”. The only survey respondent seen for a hearing aid check had a motivation score of 10 and they

rated their ability to use their hearing aids as an “8.” Survey respondents seen for hearing test as an established patient had a mean of 8.36 (SD = 1.78), two rated a “10”, one rated a “9”, and two rated a “6”. The survey respondents seen for a drop off/audiology assistant appointment, seven rated a “10” and one rated a “7”. Of the survey respondents that were seen for something that was different from an appointment types listed in TIMS, one rated “7” and one rated a “6”.

FIGURE 4A

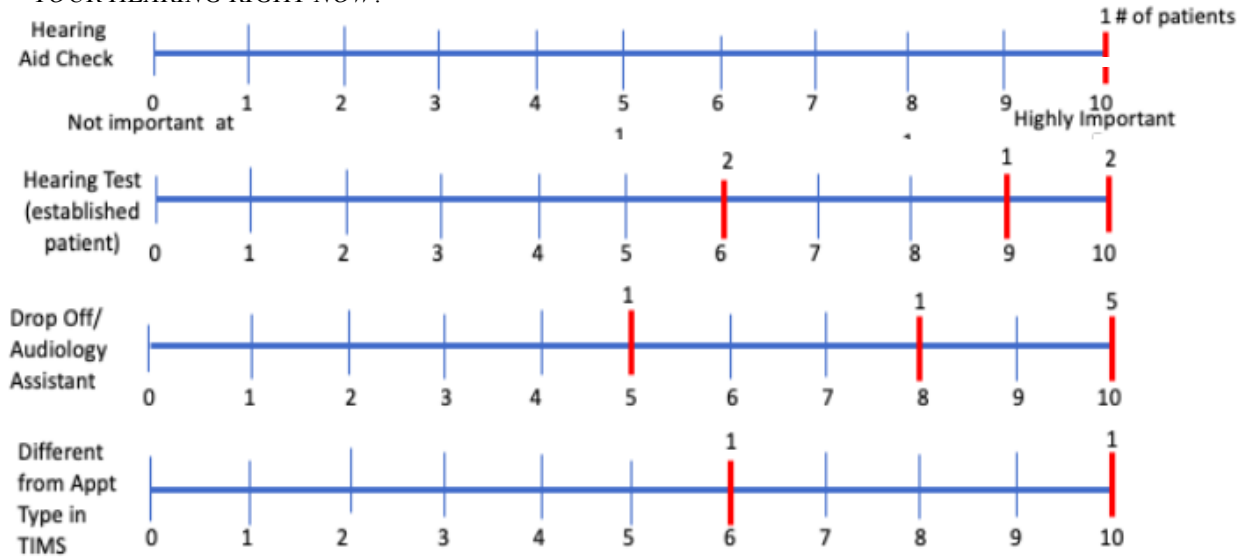
LINE RESPONSE DISTRIBUTION TO THE QUESTION "HOW IMPORTANT IS IT FOR YOU TO IMPROVE YOUR HEARING RIGHT NOW?"



Note. The top row of numbers corresponds to the number of participants who indicated a response at that point along the line. The bottom row of numbers corresponds to the rating scale. Appointment types included: hearing test (new patient), hearing aid select/consultation, hearing aid fitting, and hearing aid follow-up.

FIGURE 4B

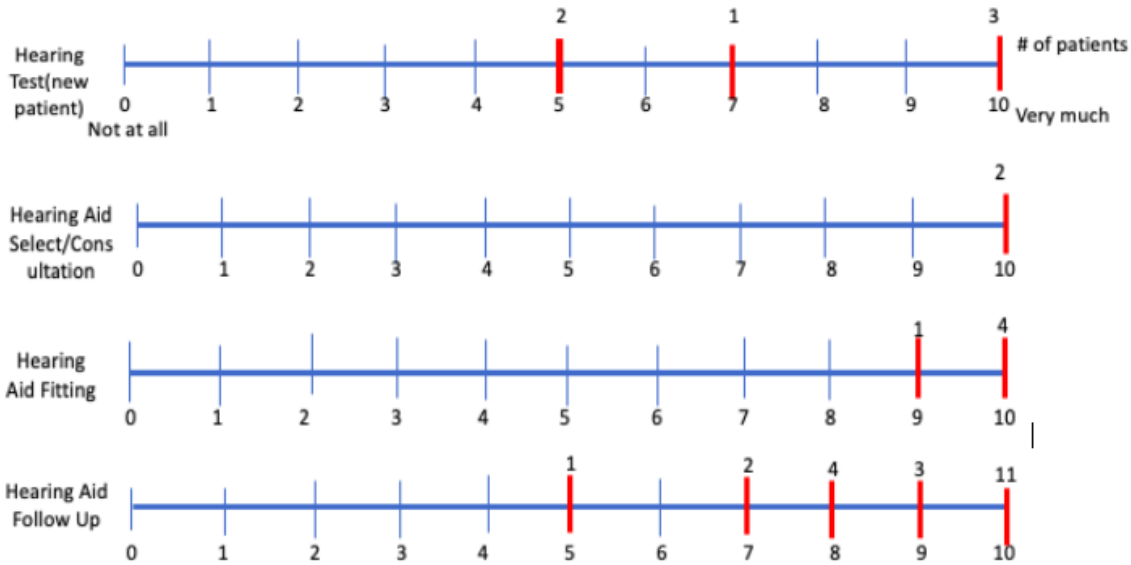
LINE RESPONSE DISTRIBUTION TO THE QUESTION "HOW IMPORTANT IS IT FOR YOU TO IMPROVE YOUR HEARING RIGHT NOW?"



Note. The top row of numbers corresponds to the number of participants who indicated a response at that point along the line. The bottom row of numbers corresponds to the rating scale. Appointment types included: hearing aid check, hearing test (established appointment), drop off/audiology assistant, and different from appointment type in TIMs.

FIGURE 5A

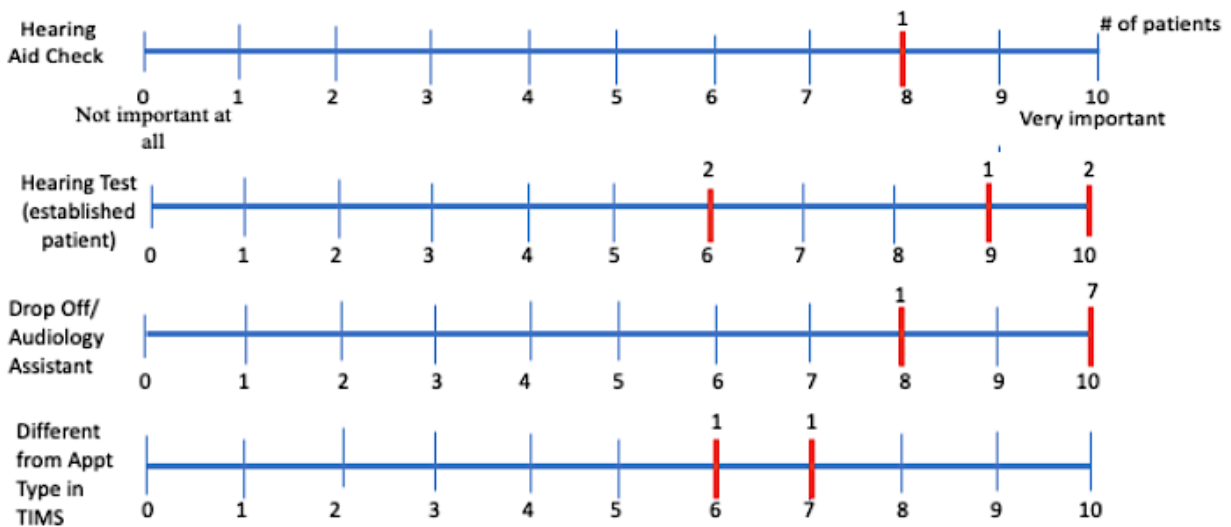
LINE RESPONSE DISTRIBUTION TO THE QUESTION " HOW MUCH DO YOU BELIEVE IN YOUR ABILITY TO USE HEARING AIDS/COCHLEAR IMPLANT/ASSISTIVE LISTENING DEVICE/COMMUNICATION STRATEGIES?"



Note. The top row of numbers corresponds to the number of participants who indicated a response at that point along the line. The bottom row of numbers corresponds to the rating scale. Appointment types included: hearing test (new patient, hearing aid select/consultation, hearing aid fitting, and hearing aid follow-up).

FIGURE 5B

LINE RESPONSE DISTRIBUTION TO THE QUESTION " HOW MUCH DO YOU BELIEVE IN YOUR ABILITY TO USE HEARING AIDS/COCHLEAR IMPLANT/ASSISTIVE LISTENING DEVICE/COMMUNICATION STRATEGIES?"



Note. The top row of numbers corresponds to the number of participants who indicated a response at that point along the line. The bottom row of numbers corresponds to the rating scale. Appointment types included: hearing aid check, hearing test (established appointment), drop off/audiology assistant, and different from appointment type in TIMS.

CHAPTER 4: DISCUSSION AND CONCLUSION

DISCUSSION

In the current study, the majority of survey respondents were in the action and maintenance stage of change across multiple appointment types. The results showed that survey respondents were further in the stage of change and further along on the Line when compared to the Ingo et al. (2017) study. When results were limited to responses for initial appointment types as in Ingo et al. (2017), the initial appointment was classified as hearing test (new patient) and hearing aid consultation/selection. Of the 8 participants seen for an initial appointment, the stage of change results was divided between maintenance (12.5%), action (62.5%), preparation (12.5%), and contemplation (12.5%). By contrast, in the Ingo et al. (2017) study, participants were in the contemplation and preparation stage. In the current study, the results showed that the majority of respondents were further along in their stage of change than in the Ingo et al. (2017) study.

What could be contributing to the differences between the two studies? Sweden and the United State of America have different healthcare systems. Sweden has a universal healthcare system. Hearing healthcare is publicly financed, and patients pay a small fee for hearing aid fittings and hearing aid follow up services. However, hearing aids are either partially or fully funded depending on the county where a person lives, analogous to state dependent access within the United States (Arbinger, Nordqvist, & Oberg, 2017).

The United States of America has a limited public hearing healthcare system. Health insurances typically do not cover hearing aids. In the United States, Medicaid coverage for hearing aids and audiology appointments vary by state (Arnold, Her, Chisholm, 2017). Arizona does not have any hearing aid benefits for adults on Medicaid. Medicare Part B will cover one

hearing test a year if a referral is provided by a physician but does not cover hearing aids. Private health insurances may cover for hearing aids for children, but adults are often not included (National Academies, 2016). The lack of hearing healthcare coverage in the United States, could be preventing people from coming in at an earlier time in the stage of change process.

Additionally, aspects of the study design and procedures could contribute to the differences in findings between the two studies. The Ingo et al. (2017) had a larger population sample and focused on just on the initial appointment type, the participants were recruited through online advertisements and completed an online hearing screening, if the participant referred on the screening then they were invited to participate in the survey online. In the current study, participants were recruited once they were already in the clinic.

FEASIBILITY OF DATA COLLECTION

Data collection for the survey using an iPad was a feasible way to collect data. The majority of those approached in the clinic waiting room were willing to participate and wanted to contribute to research. A challenge we had to overcome was that some of the oldest participants were not able to use the touch screen on the iPad. These participants could not record their answer by pressing the iPad screen or slide the bar to answer the Line questions. Therefore, the survey administrators had to record the answer that corresponded to the participants' answer if they were unable to use the iPad. In the literature, older participants often can struggle to use touch screen technology on their own, therefore making it difficult to do surveys using a touch screen (Jinn et al, 2007). These difficulties have been attributed to small button sizes, visual impairments, and dexterity problems (Jinn et al, 2007).

CLINICAL IMPLICATIONS

Stage of change can help audiologists understand a person's motivation and readiness for treatment at their appointment. The staging algorithm and the Line could be implemented into the case history at all audiology appointments. If a clinician knows the stage of change of their patient, it could help guide the clinician on how to counsel the patients about pursuing amplification (Manchaiah, Hernandez, and Beck, 2018). Based on stage of change, clinicians can better customize their counseling strategies. For example, if a patient is in a beginning stage of change then the clinician will need to focus more on why a person may be hesitant. The current data shows that the clinicians cannot assume stage of change based on appointment type. Similarly, for the Line, while an audiologist may expect a patient to have good self-efficacy at a hearing aid follow up appointment, data showed that not all patients follow this pattern.

Motivational interviewing can be useful for audiologists to promote open dialogue between the patient and audiologist. Motivational tools include the Line, the Circle, and the Box (WHO, 2012). Clinicians can ask patients why they chose their score and have them expand on their story. This allows the clinicians to be able to better focus on the patient's stories and their own struggles (Ferguson et al., 2017).

The Line was a motivational tool used in this cross-sectional study. Here, and in its clinical application, the Line is administered at one point in time in a patient's hearing journey. Patients will interact with an audiologist at different types of appointments, the study findings suggest that the pattern of responses differ across the appointment types (e.g., **Figures 4a, 4b, 5a, and 5b**). One interesting finding was that for the Line question, "How much do you believe in your ability to use a hearing aids/cochlear implant/assistive listening device/communication strategies?" the mean for the hearing aid fitting group was 9.65 with a standard deviation of .73, and 8.91 with a standard deviation of 1.45 for the hearing aid follow-up group. The participants

who were there for a follow-up appointment regressed in the ability to use hearing aids. This discrepancy between hearing aid fitting and hearing aid follow-up is an example of how the Line can be a useful counseling tool for clinicians, they can use the Line to facilitate communication about why a patient is struggling, and the clinician can help guide them to increase their self-efficacy with hearing aids.

Combining the staging algorithm and the LINE can be beneficial to clinicians. The staging algorithm can provide information about the stage of change the patient is in. The Line will provide information about the patient's motivation to pursue amplification. The clinician can use the rating to educate the patient on their apprehensions and help guide them on how to be more comfortable with amplification. If you know the LINE rating, you can use the rating as a basis for what counseling strategies to use to increase their line rating, therefore possibly improving their stage of change. The current data suggest that the staging algorithm and the Line could be good counseling tools to help patients.

LIMITATIONS AND FUTURE DIRECTIONS

In the current study, the survey population was relatively small compared to the Ingo et al. (2017) study. In the current study, there was an unequal representation of appointment types; therefore, it is hard to compare the results because there was not an equal amount of appointment types represented. The timing of survey collection did not coincide with a large number of patients at their initial appointment; in the future a longer survey duration may help to balance the number of responses across appointment types. Therefore, this data is preliminary, and there needs to be more focus on new patient appointment types in future research. The current study was done in one clinic, so it is also hard to generalize the results over an entire population.

This study provided evidence on how patients can be at different stages of change throughout different types of appointments. There are many different routes that future research can take. Future studies should focus on administering the stage of change survey over a broader population sample including different types of clinics and appointments. Another study could focus on recruiting only new patients and tracking their stage of change. A longitudinal study could be implemented using the stage of change model to follow patients throughout their whole hearing journey from realizing that they have a hearing loss to getting tested, receiving hearing aids and follow-up appointments. The patient's stage of change could be tracked at each appointment by using the staging algorithm and the Line. This research could provide information about how stage of change for readiness to pursue amplification evolves over time and if it will follow a path similar to other health behavior changes.

Appendix A

TABLE 3

TEMPLATE FOR CHART REVIEW IN TIMS

Type of Chart Review	Chart Note Template
Schedule/chart reviewed, not eligible:	Chart was reviewed by Emily Leedy and Ann Miller (indicate one or both names, 1131 E. Second St., Tucson AZ 85721) on (date and time).
Schedule/chart reviewed, eligible	<ul style="list-style-type: none"> - Chart was reviewed by Emily Leedy and Ann Miller (indicate one or both names, 1131 E. Second St., Tucson AZ 85721) on (date and time). - In addition, the patient was contacted by (indicate one or both names, 1131 E. Second St., Tucson AZ 85721) on (date and time) for the purpose of research project recruitment. - We discussed research eligibility and the project. - The patient chose to participate in the survey. OR The patient declined to participate in the survey.

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