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- Click Print
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- Click layout
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LISTENING INTENT REDEFINED: ARTIFICIAL INTELLIGENCE IN HEARING HEALTHCARE & WHY IT MATTERS

Jodi Sasaki-Miraglia, AuD
Director of Education & Training –West



SPEAKER DISCLOSURE

Relevant Financial Relationships:

Jodi Sasaki-Miraglia is an employee of Widex USA and receives financial compensation

Relevant Nonfinancial Relationships:

None

- Loves SPAM
- Born & Raised in Kona, Hawai'i
- Never gets tired of Audiology
- Wife/Mom/Ramen lover
- Dog whisper- Rex
- Mayo Clinic-Scottsdale/Private Practice/Industry 18+yrs

Favorite Audiology Moment of 2022:
Hearing my daughter hit her 1st softball homerun

Jodi Sasaki-Miraglia, AuD

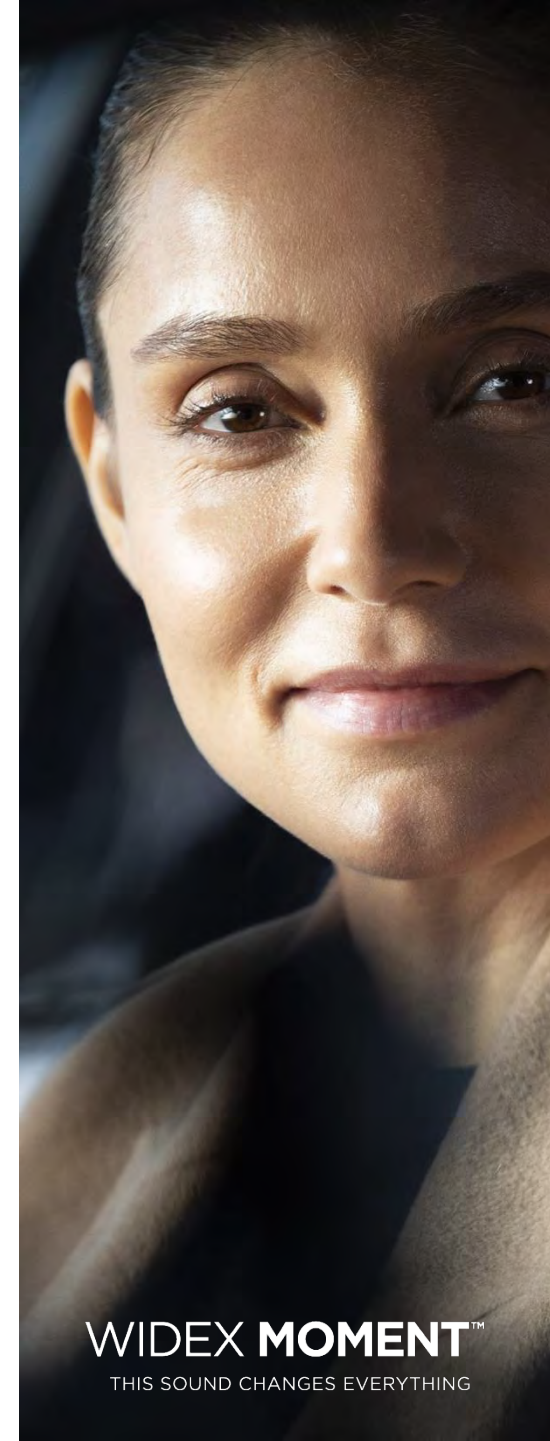
Widex USA

Director, Education & Training West Region



AS A LICENCED HEARING CARE PROFESSIONAL:

- Do no harm
- Improve the quality of people's lives
- Patient-centered care
- Communicate clearly the reason for moving forward
- Making a strong recommendation as a medical professional
- Continue to learn and elevate our skills and practice at the TOP of our license



PERSON CENTERED CARE IS...

“The best audiologists will provide a road map and set of tools that patients can use to manage their hearing loss successfully. These will not be the same for every person, but must be tailored to each patient’s priorities and communication challenges.”

Shari Eberts, MBA

Hearing-health advocate



Source: Understanding the Patient in Patient-Centered Care. Audiology Today Nov/Dec 2019

WIDEX MOMENT™
THIS SOUND CHANGES EVERYTHING

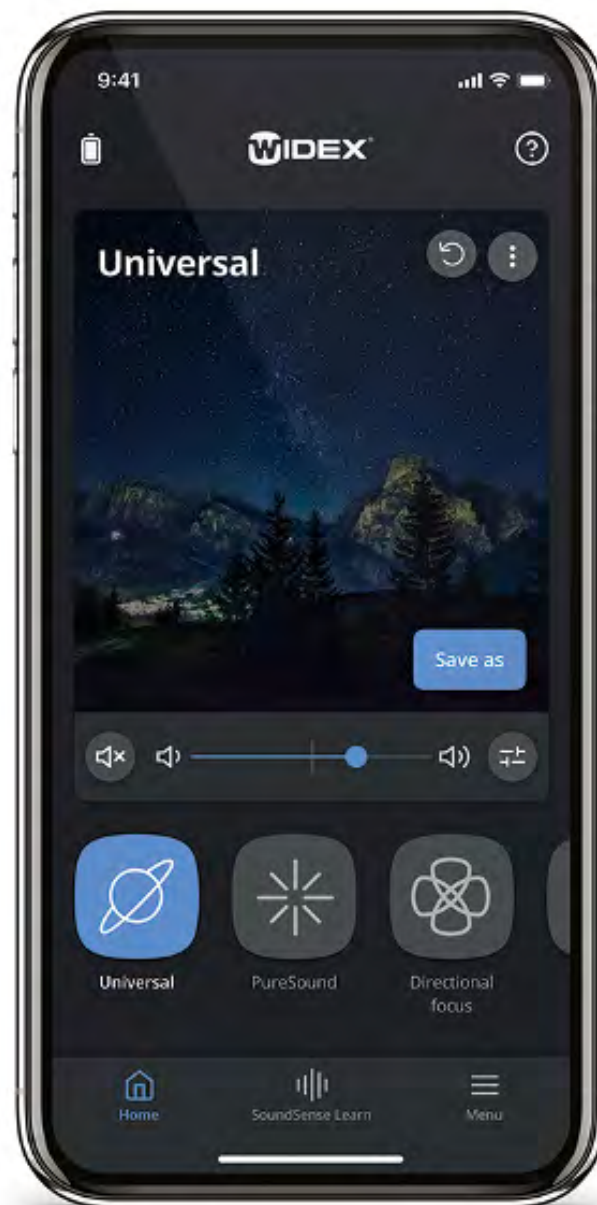


AGENDA

- AI apps in hearing healthcare
- Clinical applications of AI in hearing healthcare

iPhone

SCAN ME



Android

SCAN ME



86 million

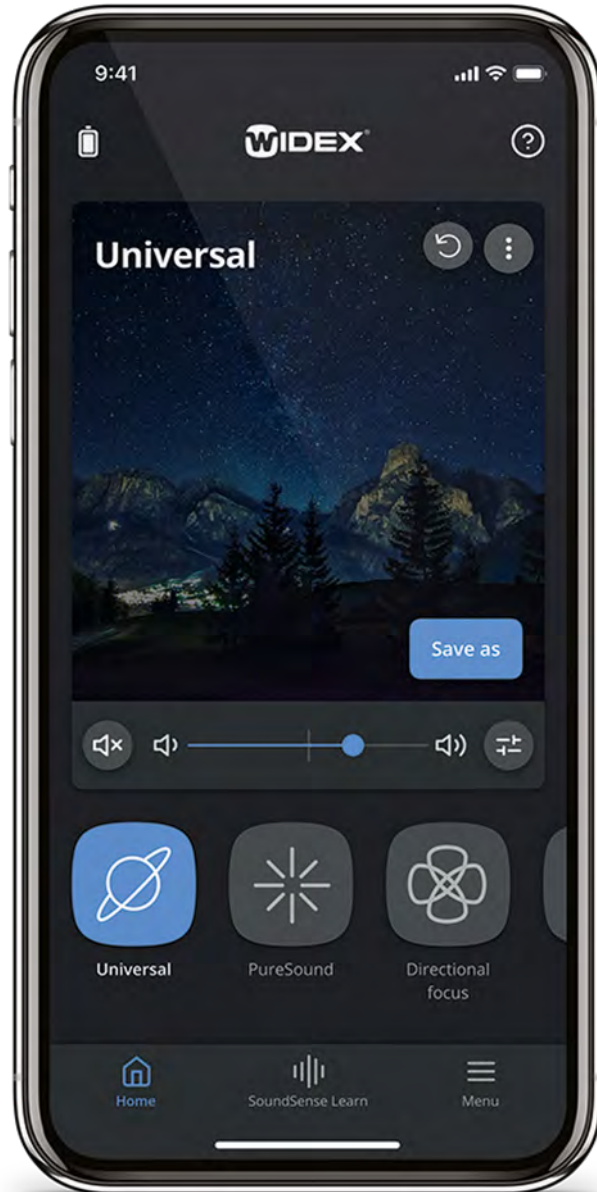


WHY ARE WE STILL TRYING TO SOLVE WEEKEND PROBLEMS ON MONDAY MORNING?



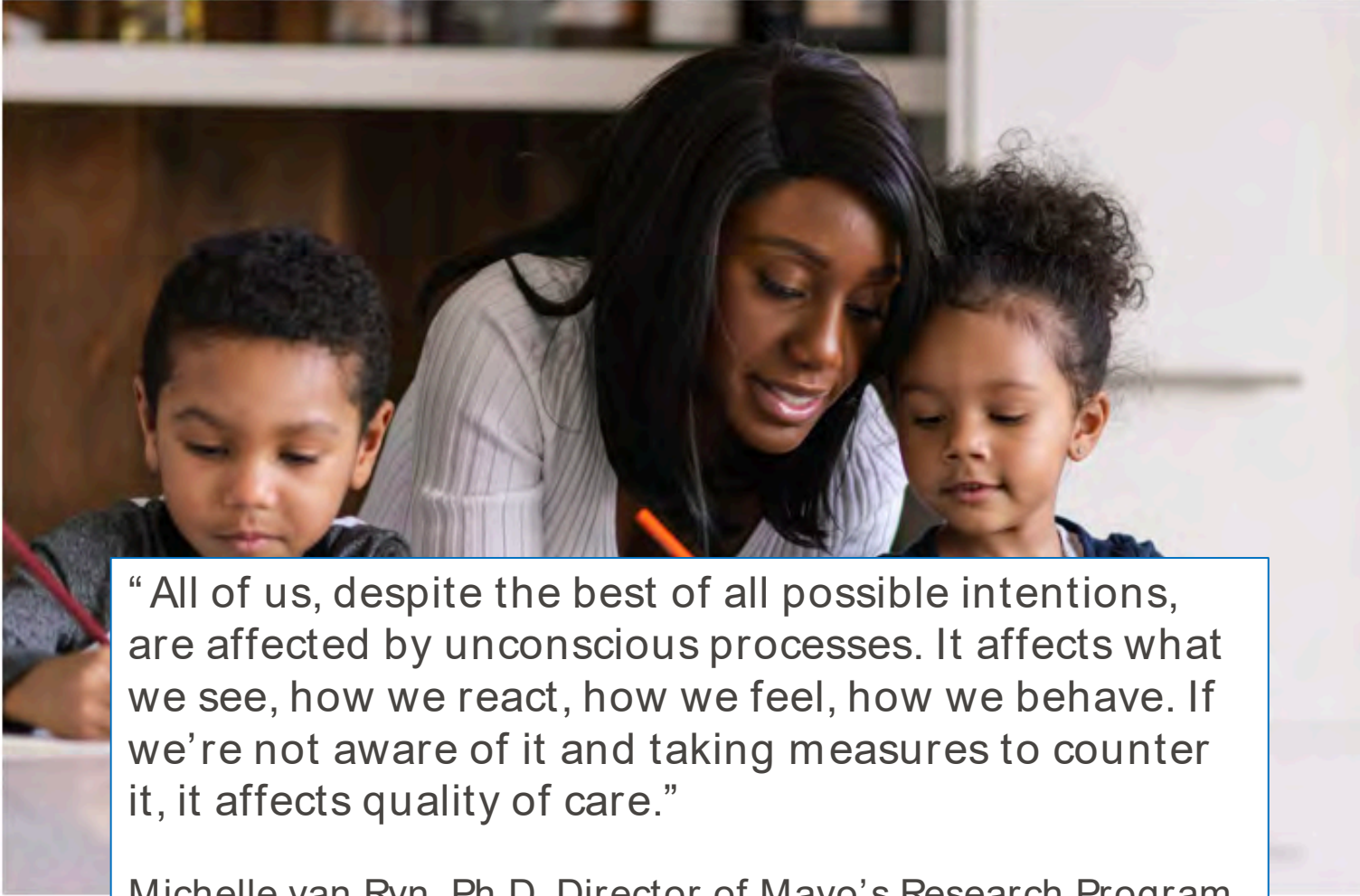


I WISH I HAD MORE TIME TO...



AI: An extension of
YOUR professional WHY

UNCONSCIOUS BIAS IN HEALTHCARE



“All of us, despite the best of all possible intentions, are affected by unconscious processes. It affects what we see, how we react, how we feel, how we behave. If we’re not aware of it and taking measures to counter it, it affects quality of care.”

Michelle van Ryn, Ph.D. Director of Mayo’s Research Program on Equity and Inclusion in Health Care.



IMPLICIT BIAS

Occurs without conscious awareness and is frequently at odds with one's personal beliefs (Devine and Plant, 2012)

IMPLICIT BIAS MAY CONTRIBUTE TO:

- Health care disparities
- Influencing provider behaviors
- Differences in medical treatment
- Bias in clinical decision making
- Race
- Gender
- Ethnicity
- Culture
- Stereotypes

WOULD YOU FIT THEM THE SAME WAY?



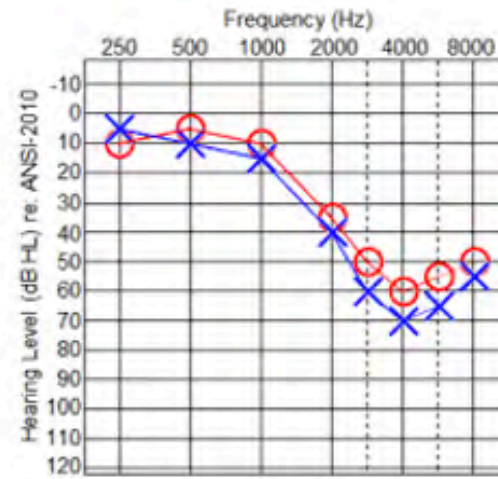
Age: 45yrs
QuickSIN: 8dB
HHIA: 40%
Anatomy: very narrow and small ear canals
Wore hearing aids since he was 8yrs old
Google Pixel 6 phone



Age: 67
QuickSIN: 3dB
HHIA: 20%
Anatomy: exostosis, hx of melanoma on pinna
First time user & reports tinnitus
iPhone 13



HEARING HEALTHCARE TODAY



TREAT THE WHOLE PERSON

CUSTOMIZE

PERSONALIZE

EMPOWER

EDUCATE

BE THE DIFFERENCE



- Professionally Guided Healthcare
- Person-Centered Plan
- QuickSIN (5min)
- COSI/ HHI-A (5min)
- Real-Ear (7min)
- Quick Repeat Recall Test (6min)
- **App based education, control, and empowerment (5min)**

28 minutes

DEFINITIONS

- **Artificial Intelligence**

“Artificial intelligence leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind.”

-Source: IBM cloud education 6.3.2020

- **Machine Learning**

“Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.”

-Source: IBM cloud education 7.15.2020

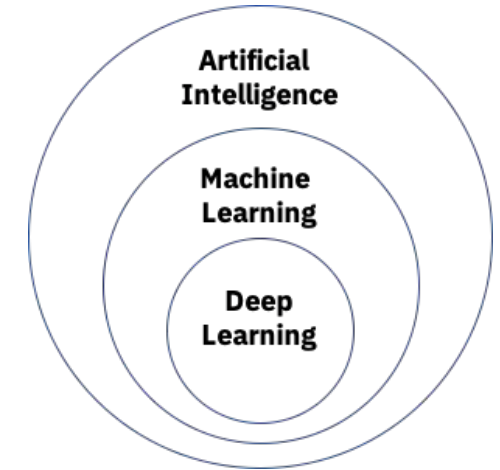
EXAMPLES

Artificial Intelligence

- Google Maps
- Autocorrect/ Auto text editors
- Search and Recommendation Algorithms (Netflix, Amazon)
- Chat bots (airlines, hotel apps)

Machine Learning

- Ride share apps
- Virtual Personal Assistants (hey Siri, Alexa, Google now)
- Social Media (you may know..., you might like)



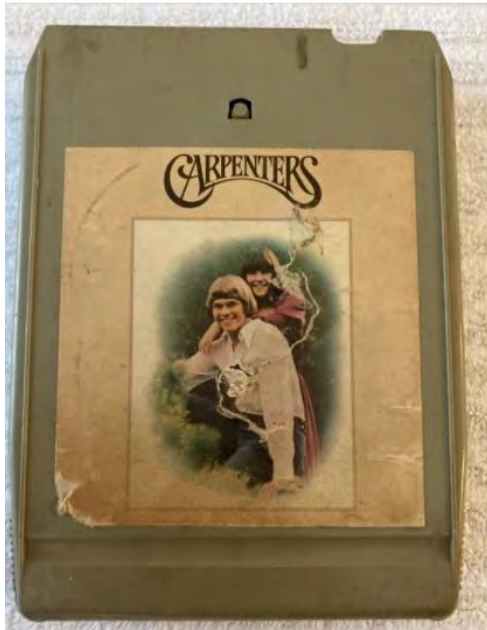


Image Source: Valuworld
60's & 70's



Image Source: MediaObsolete
70's & 80's



Image Source: Cargogear.com
90's



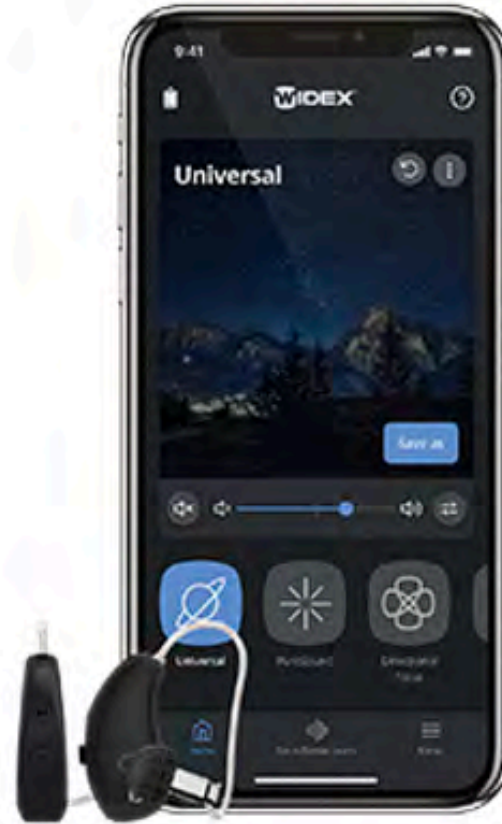
Image Source: Etsy
Fall 2001

You might like...





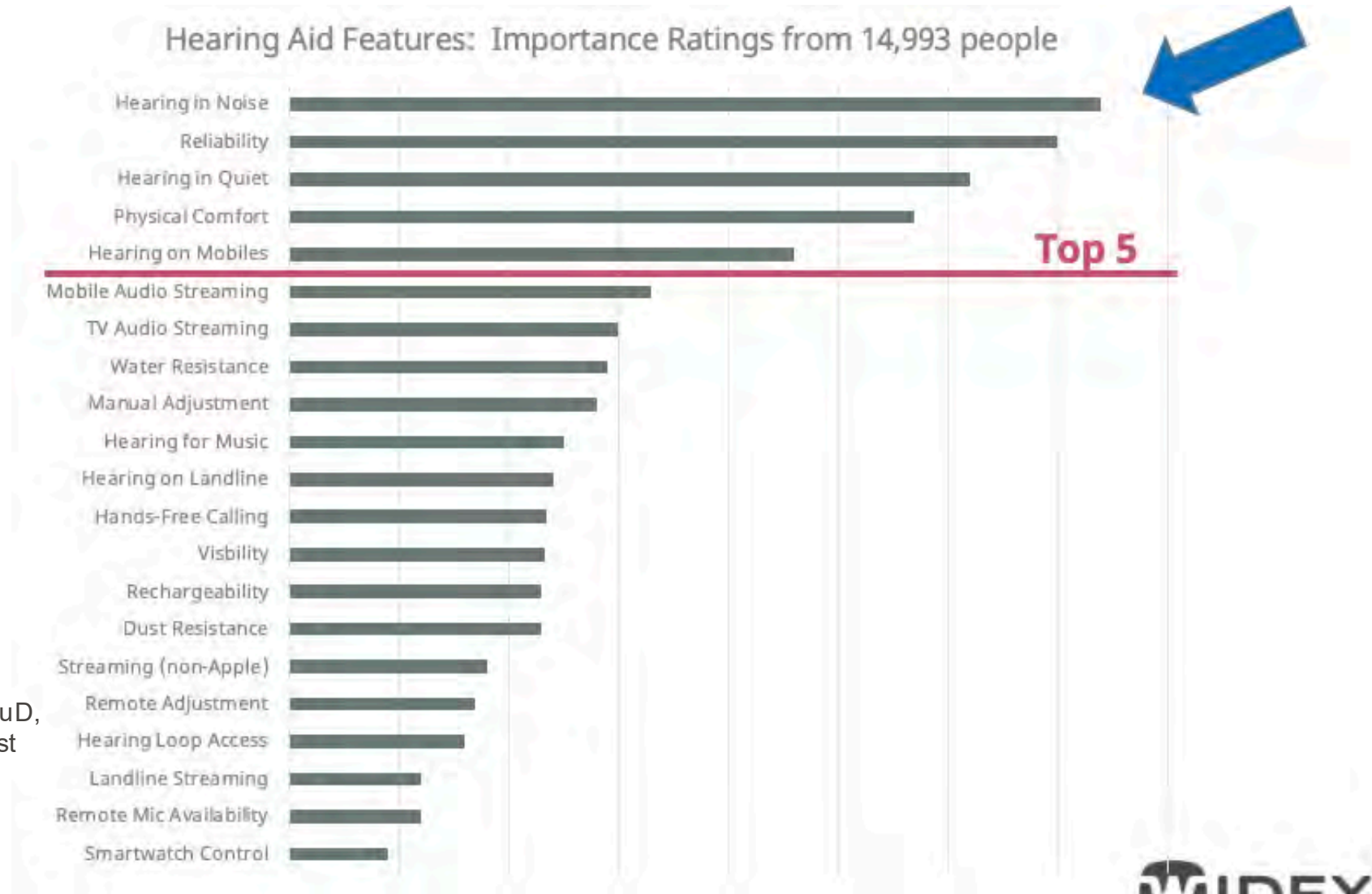
1996



2022

TOP RANKED ATTRIBUTES

TOP 5 “EXTREMELY IMPORTANT” FEATURES



Vinaya Manchaiah, Erin M. Picou, Abram Bailey, AuD,
Hansapani Rodrigo. Consumer Ratings of the Most
Desirable Hearing Aid Attributes.
JAm Acad Audiol 2021;32:537–546

LISTENING INTENT



back and forth visits/sessions

frustrating

time consuming

annoying



...AI can address and support HCP's today

LEVERAGE AI TECHNOLOGY TO ENHANCE PATIENT EXPERIENCES

AUTOMATICS

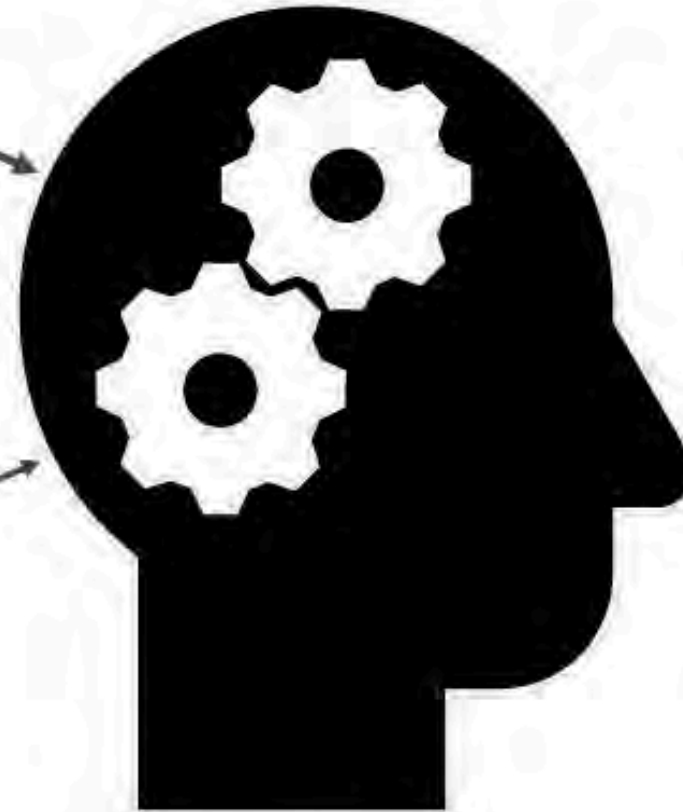
Trained in the real world to
address infinite
soundscapes

Hearing Aid (AI)

REAL TIME INTENT

When automatics
are not enough to anticipate
YOUR intent in a given
listening situation

Hearing Aid AI Apps



INTELLIGENCE

AI AUTOMATICS: IN THE HEARING AID



PERFORMANCE LEVEL/BENEFIT	SOCIAL	MUSIC		QUIET		PARTY		TRANSPORT		URBAN	
		-	Classical or contemporary	-	with speech	-	with speech	-	with speech	-	with speech
WIDEX MOMENT 440 11 Available Sound Classes											
WIDEX MOMENT 330 7 Available Sound Classes											
WIDEX MOMENT 220 4 Available Sound Classes											

AI AUTOMATICS: IN THE HEARING AID

PERFORMANCE LEVEL/BENEFIT	SOCIAL		MUSIC		QUIET		PARTY		TRANSPORT		URBAN	
				Classical or contemporary		with speech		with speech		with speech		with speech
WIDEX MOMENT 440 11 Available Sound Classes												
WIDEX MOMENT 330 7 Available Sound Classes												
WIDEX MOMENT 220 4 Available Sound Classes												

SESSION START SELECTION FITTING FINE TUNING LOG HANDLING

REMOTE CARE (Sign Up) Connect

Feature view

Views

Party

- With speech
- Without speech

Max Min

Overall loudness

Max Min

Impulse sound reduction

Audibility

Soft level noise reduction

Max Min

Sound level contrast

Audibility

Speech enhancement

Max Min

Noise reduction

Speech and noise mode

GAIN AND COMPRESSION SOUND CLASSES

Select sound class

- Quiet
- Transport
- Urban
- Social
- Party
- Music

Right ear (R) Left ear (L)

All sound classes

Transition speed

User preference

Party

Party with speech

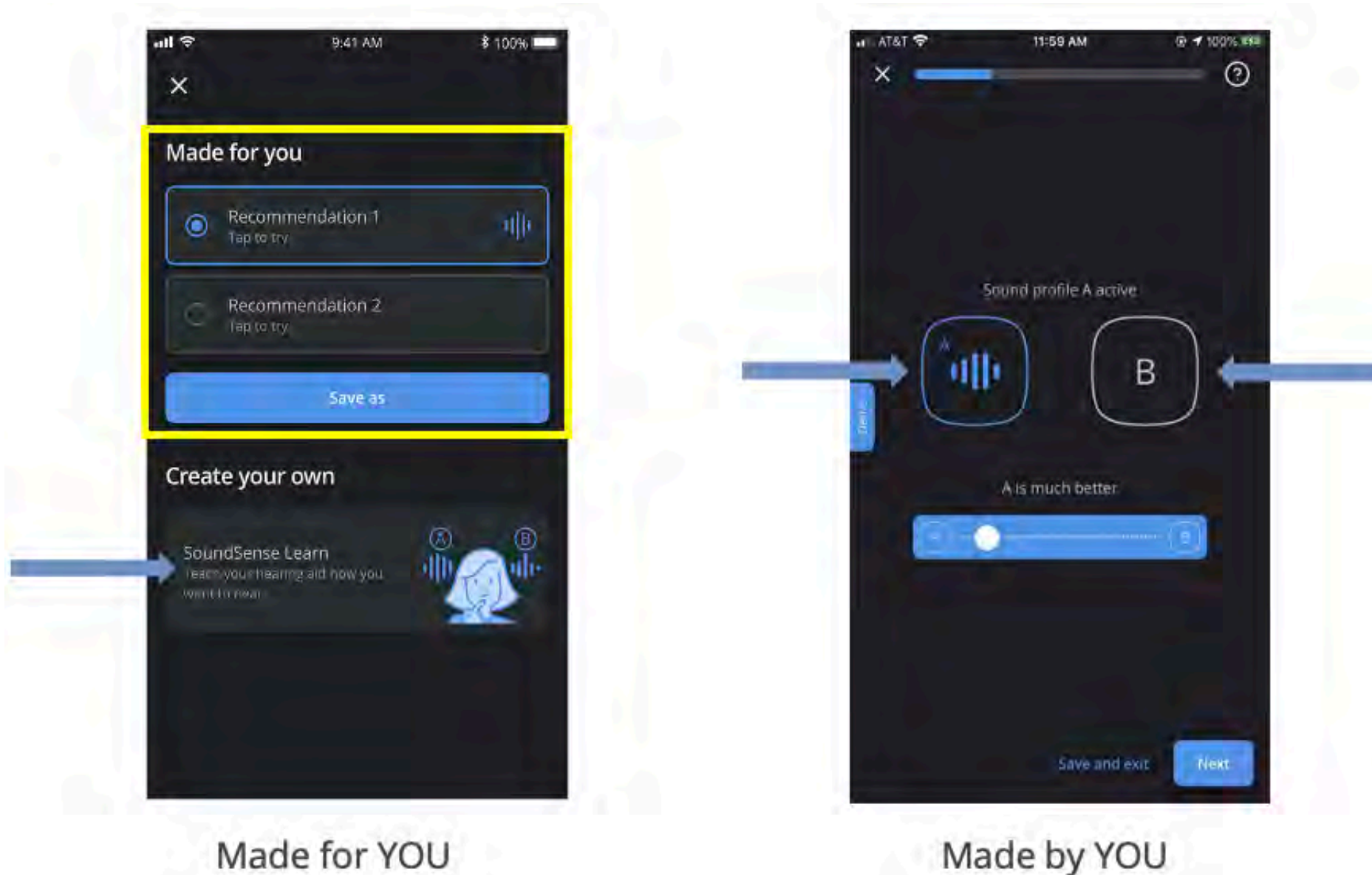
Party without speech

More comfort More audibility

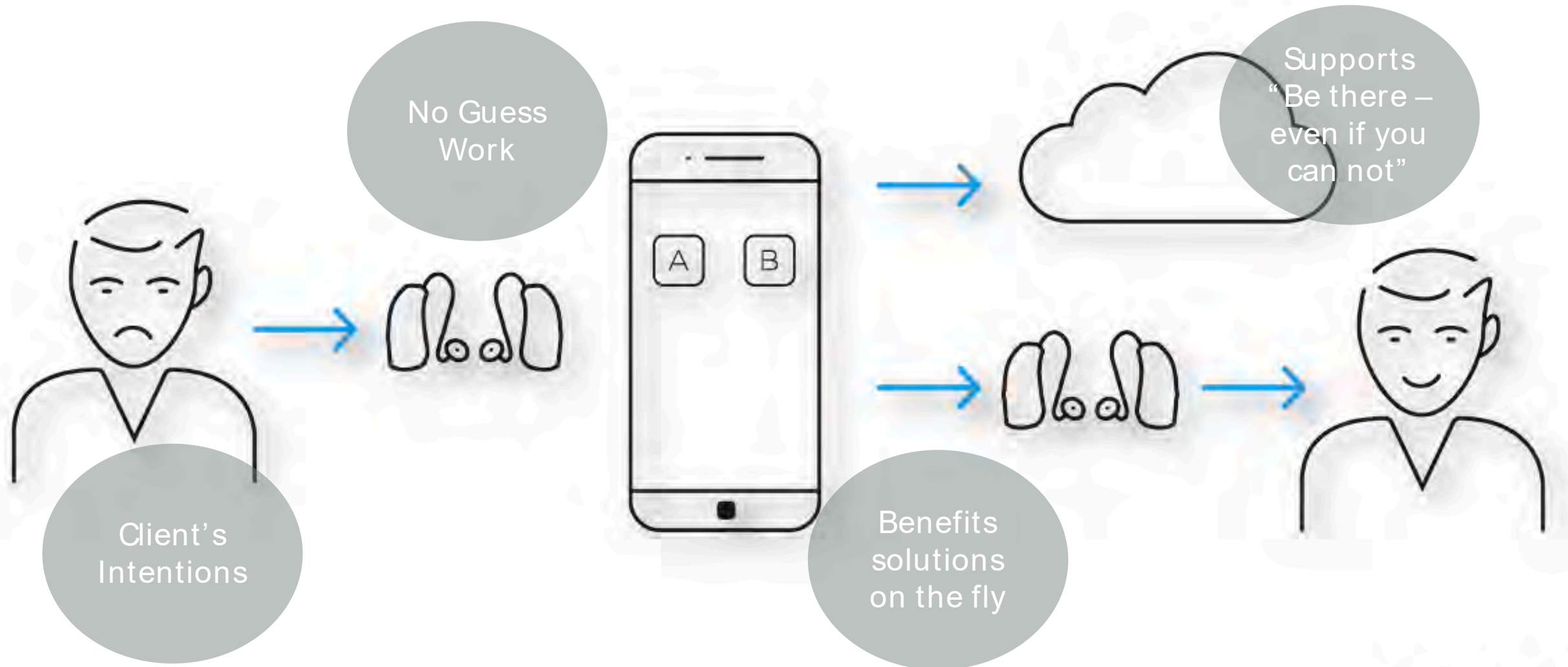
WIDEX MOMENT™

HCP can CUSTOMIZE THE ACTIONS FOR EACH PATIENT CASE

LEVERAGE APPS AND AI TO IMPROVE PATIENT EXPERIENCE

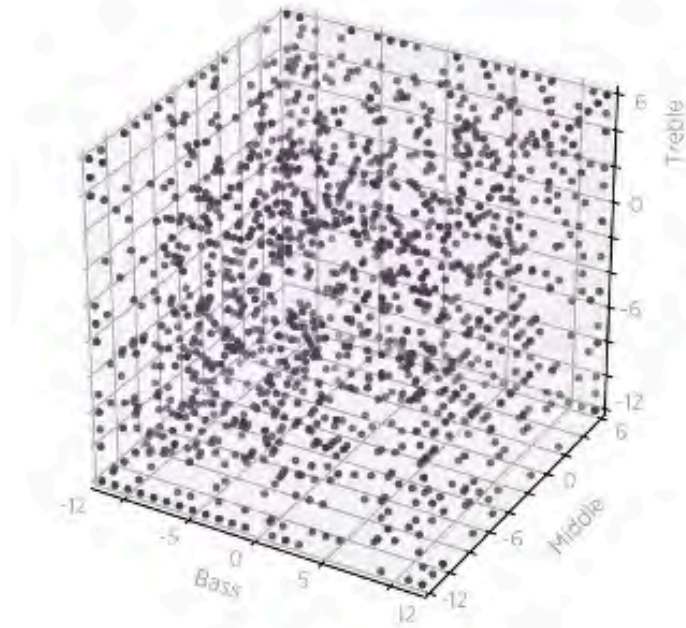


ARTIFICIAL INTELLIGENCE SINCE 2018

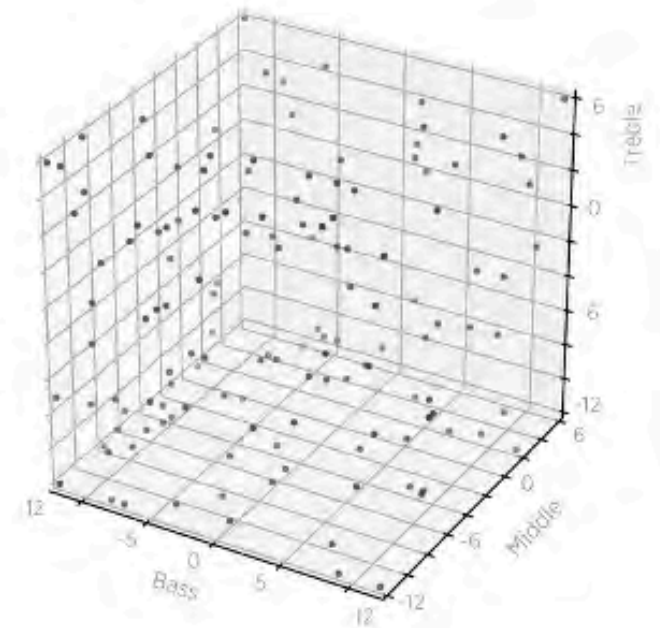


APP BASED REAL-TIME MACHINE LEARNING

2018
1st Generation
Machine Learning

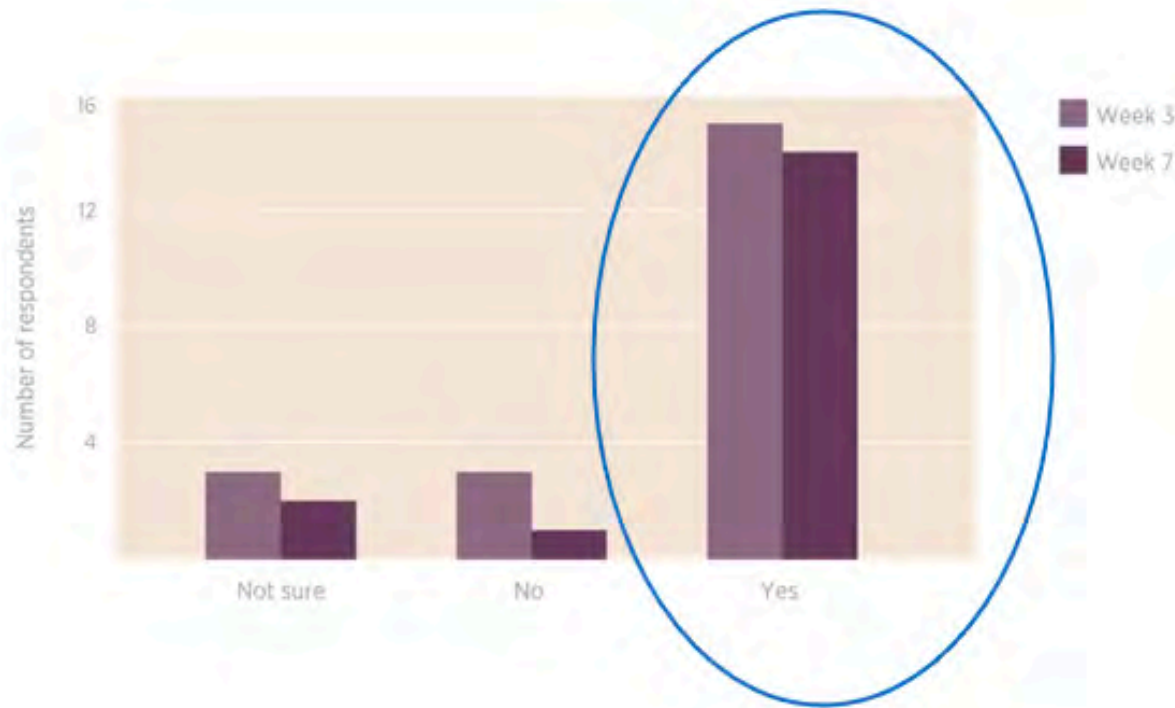


"Work Program"



PATIENT DRIVEN APP USE

REAL TIME MACHINE LEARNING



Jensen, N.S., & Townend, O.. (2019). Machine Learning in Widex Evoke: perceptual benefits of SoundSense Learn. *WidexPress*, 42.

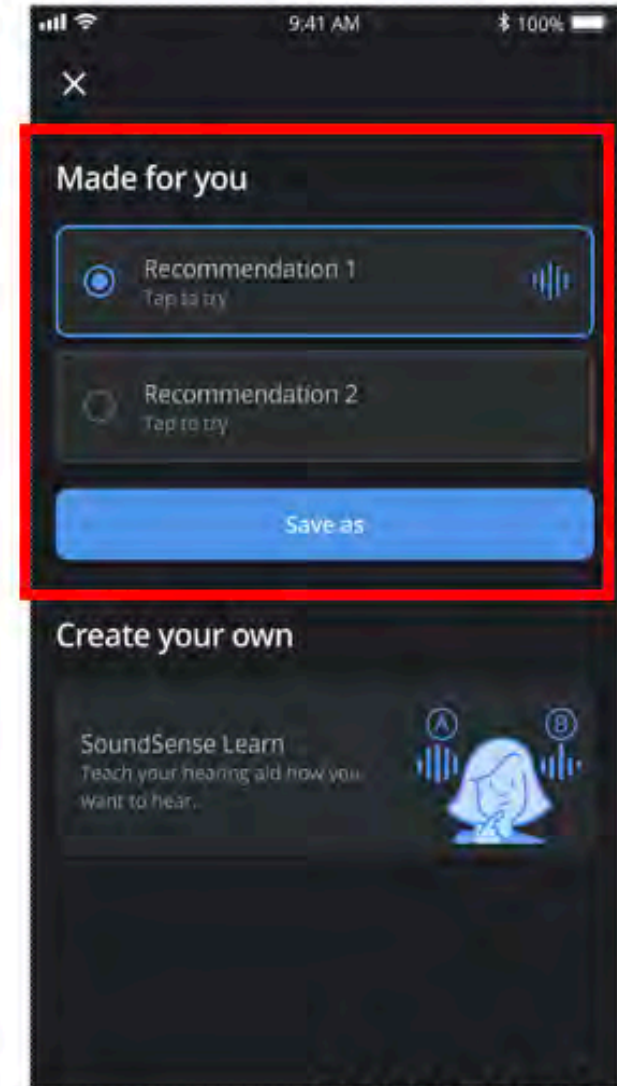
ARTIFICIAL INTELLIGENCE + HUMAN INTELLIGENCE

APP INNOVATION (2022)

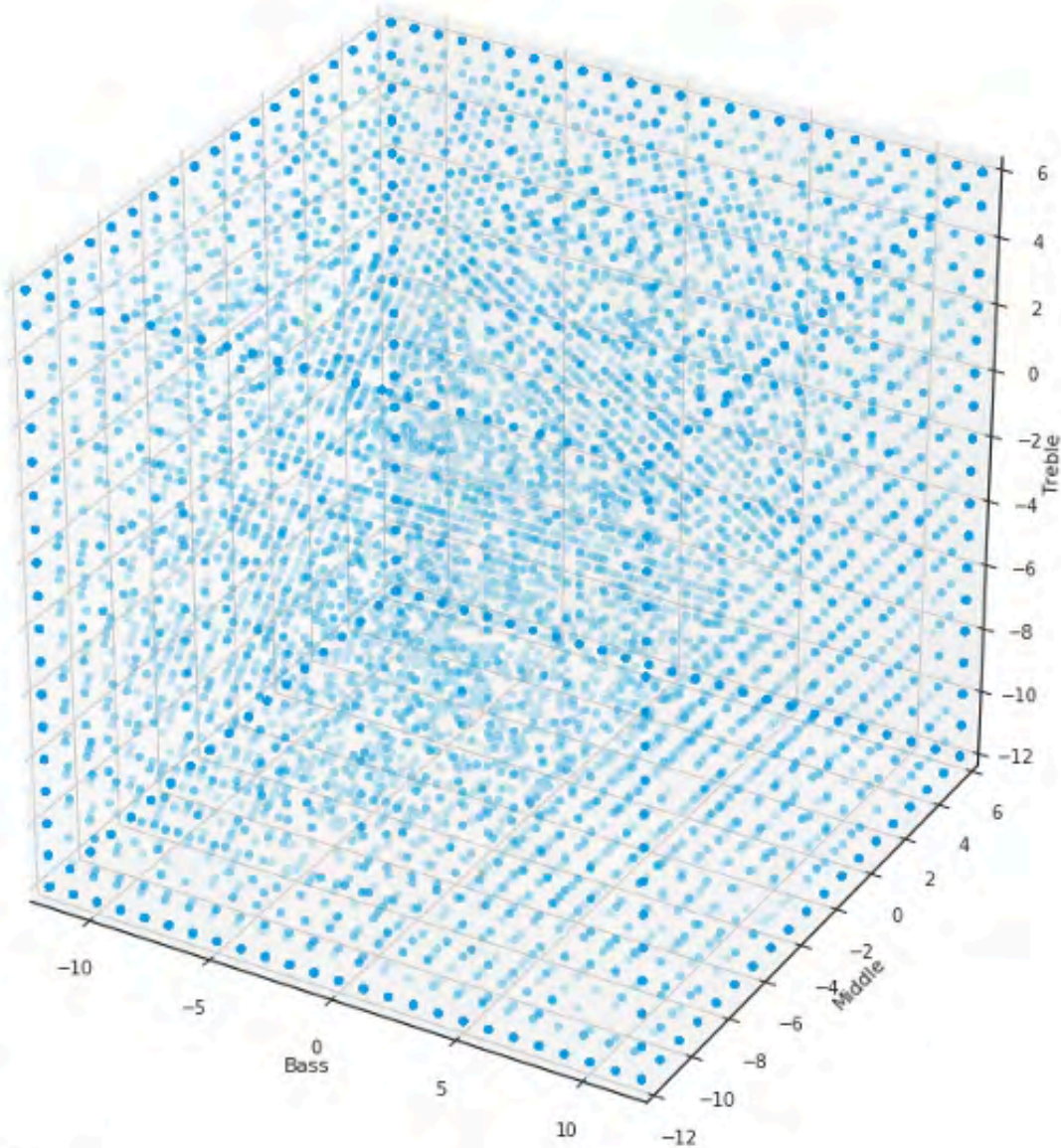
From minutes to seconds for real time customization

Offers the right amount of control at every moment

Leverages the power of dynamically changing cloud data



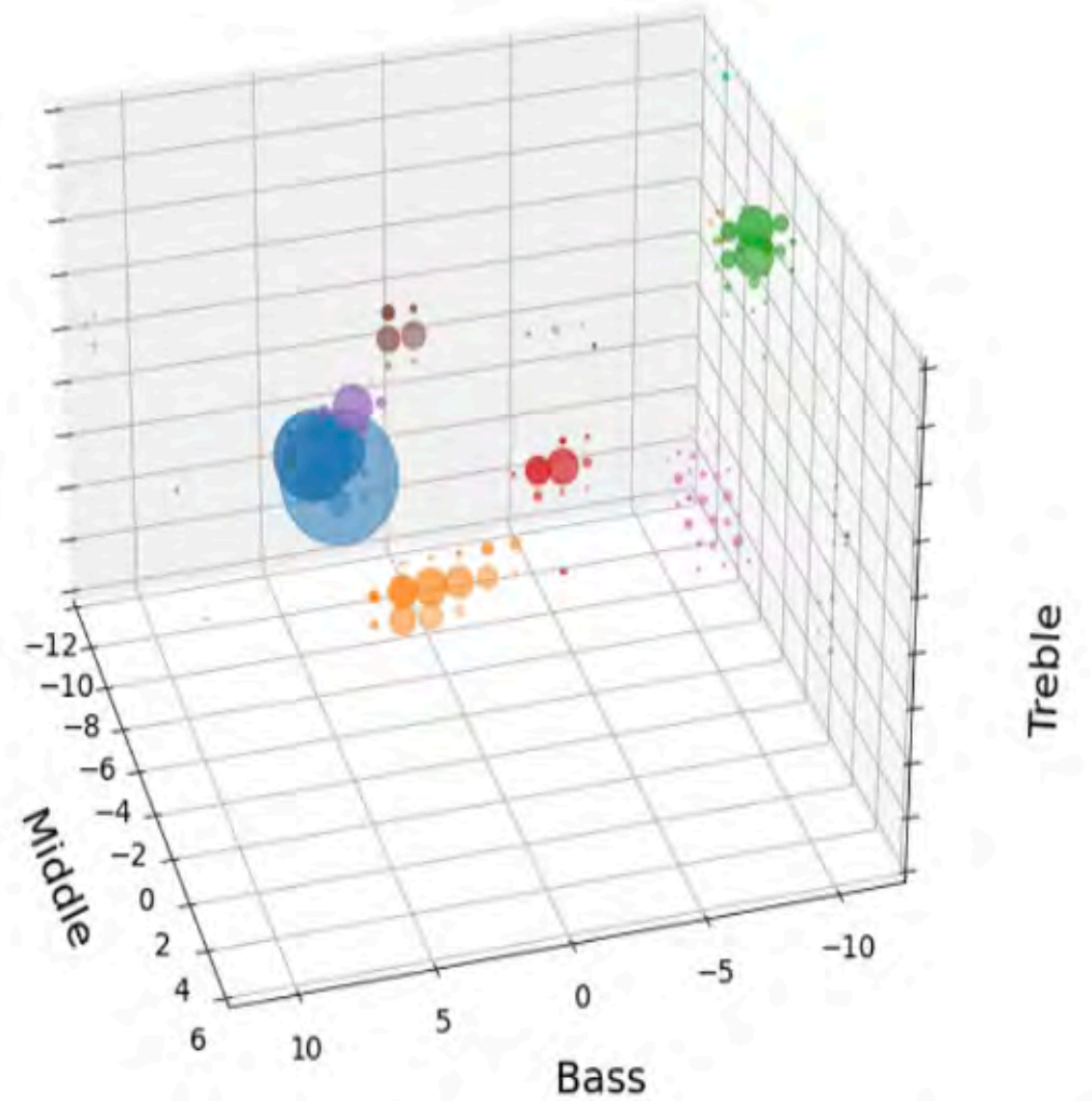
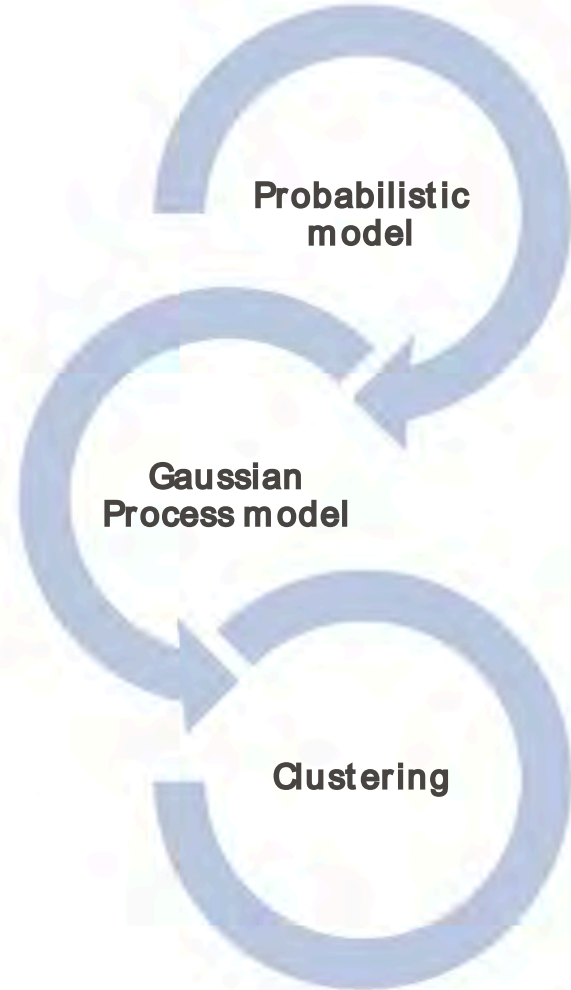
ARTIFICIAL INTELLIGENCE MEETS HUMAN INTELLIGENCE

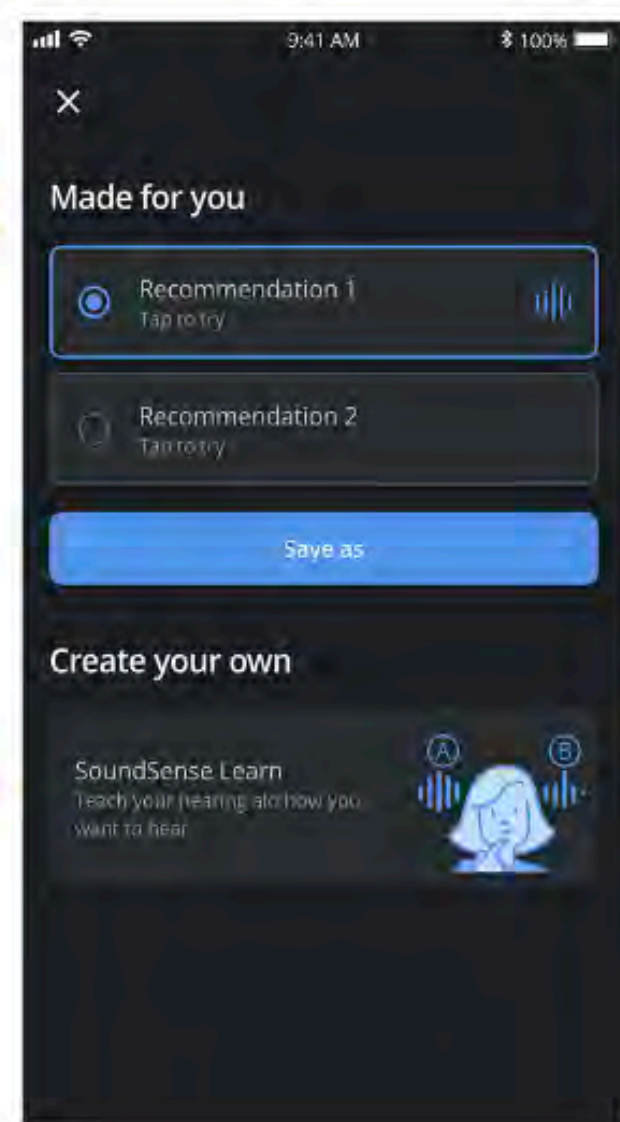
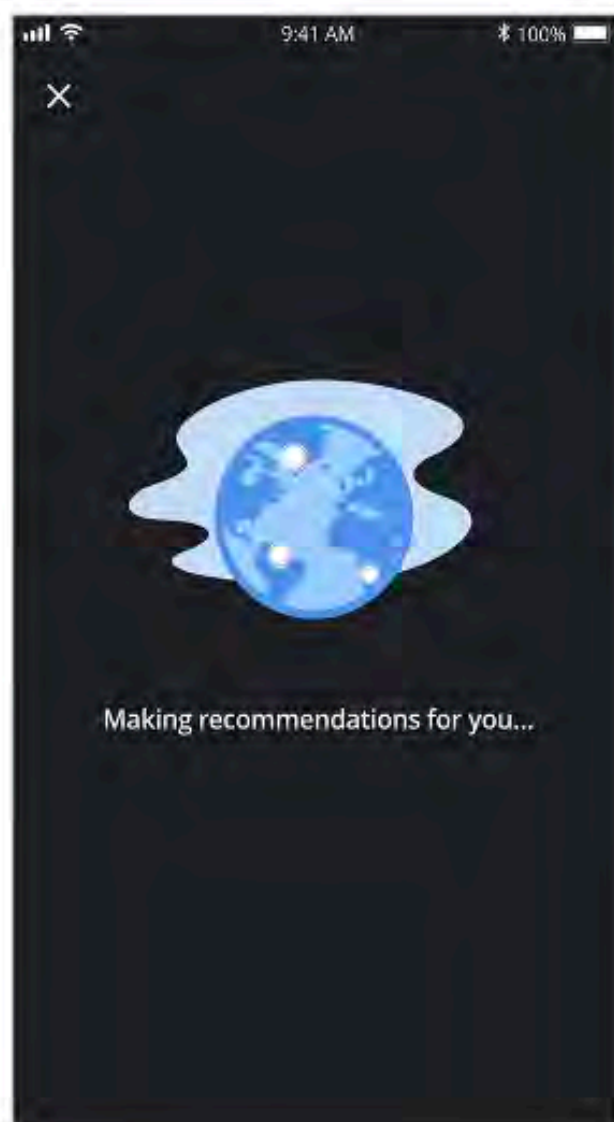
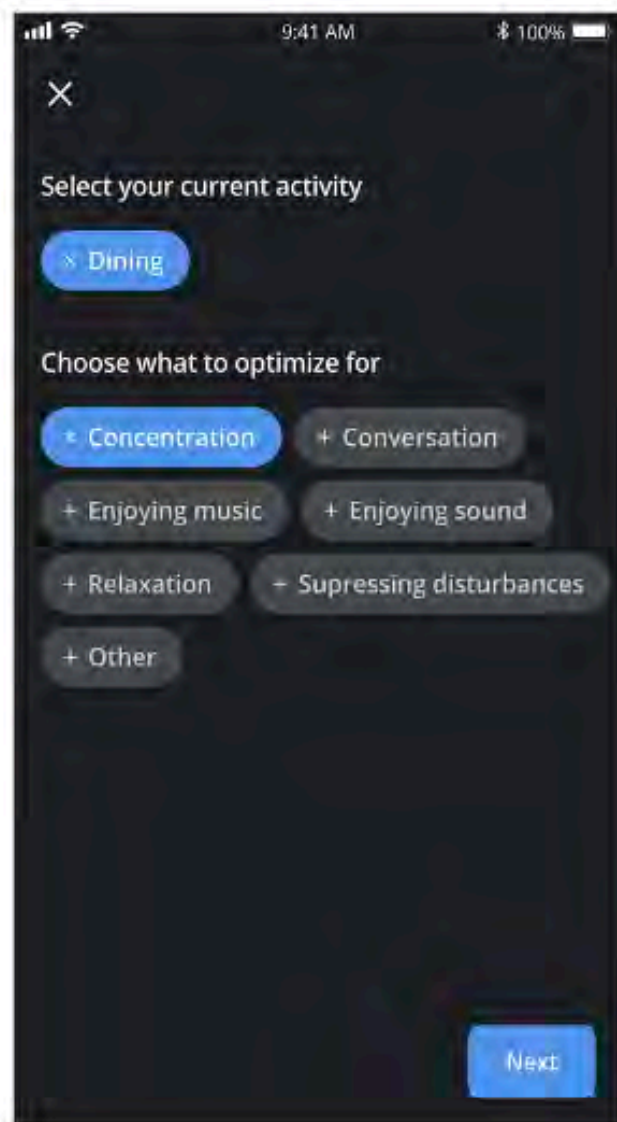


Built on individual preferences

Honolulu, HI ↔ Buffalo, NY

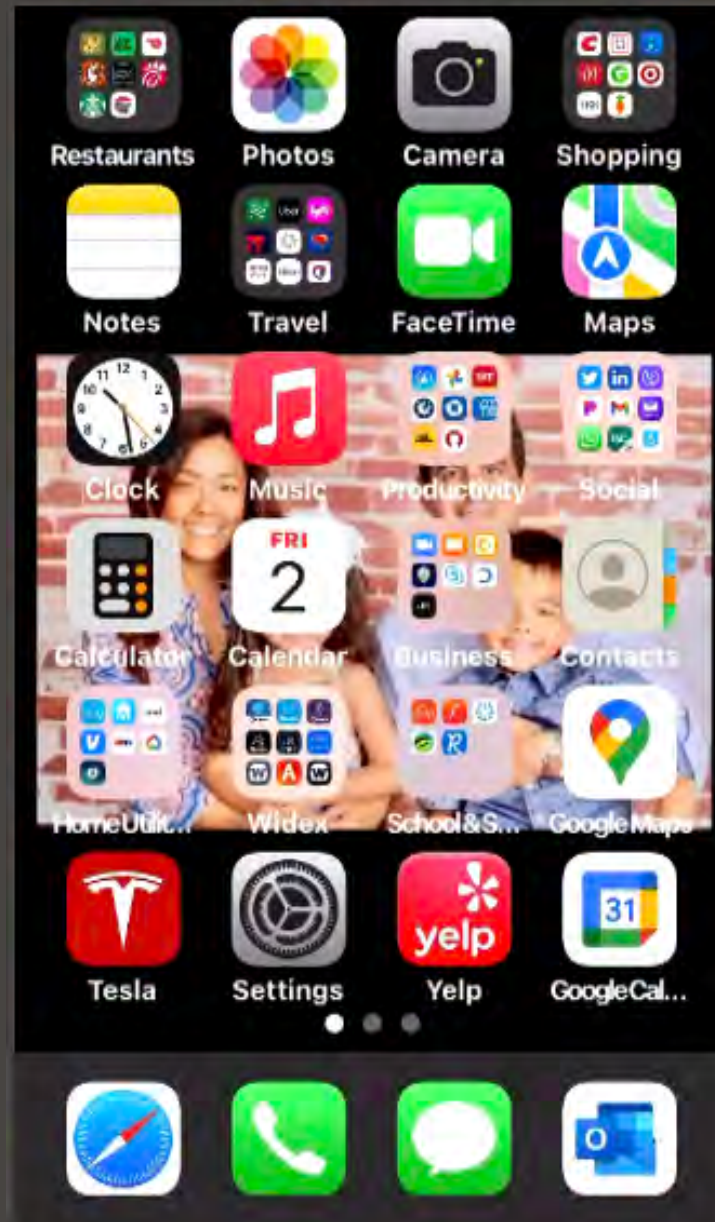






LIVE AI DEMO

MADE FOR YOU



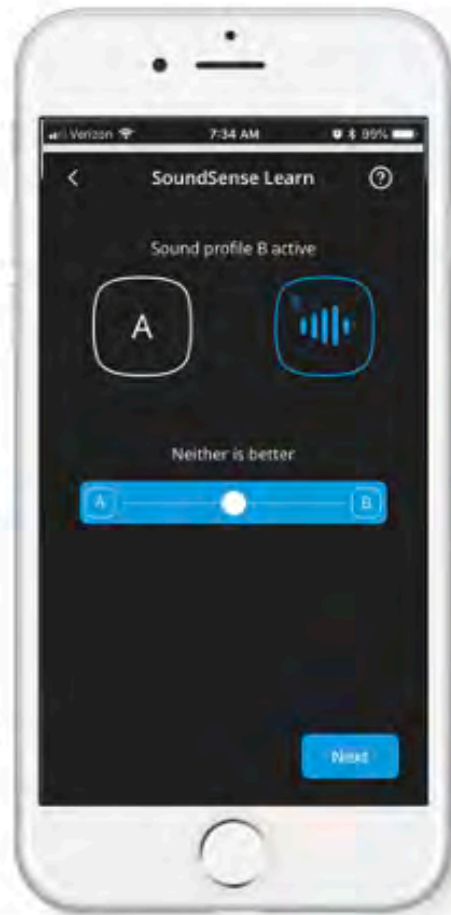
GUIDES THE END USER TO THEIR PERFECT SOUND

SOUND SENSE LEARN: MADE BY YOU

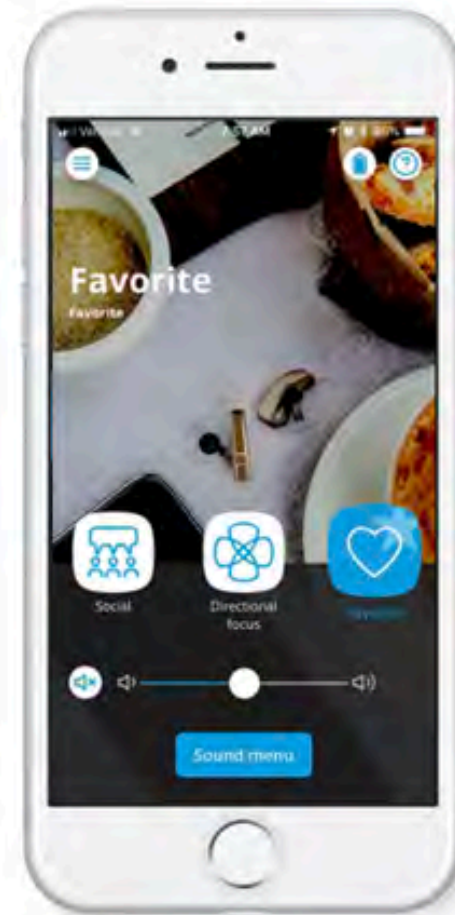
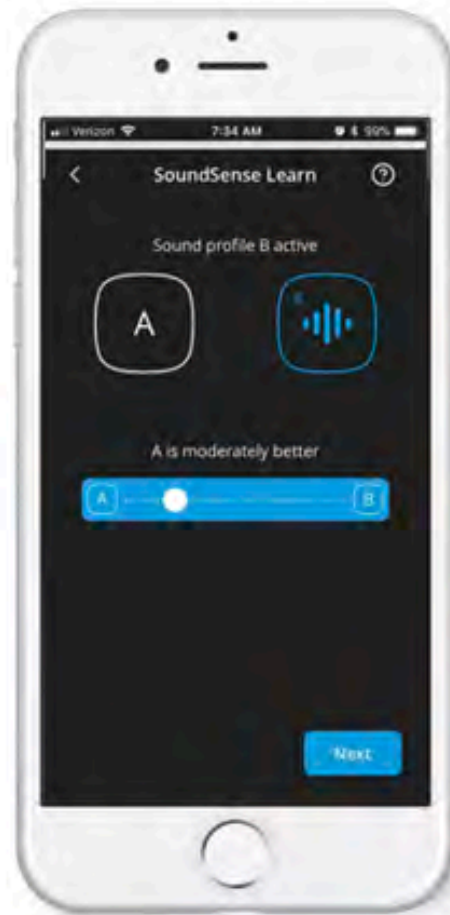
Step 1

Step 2

Step 3



2 million combinations



NEW! MYSOUND 2.0 – COMPRESSION AS A PARAMETER

Adjust Emphasis
Person-specific & Situation-specific



Focus on nearer/louder inputs



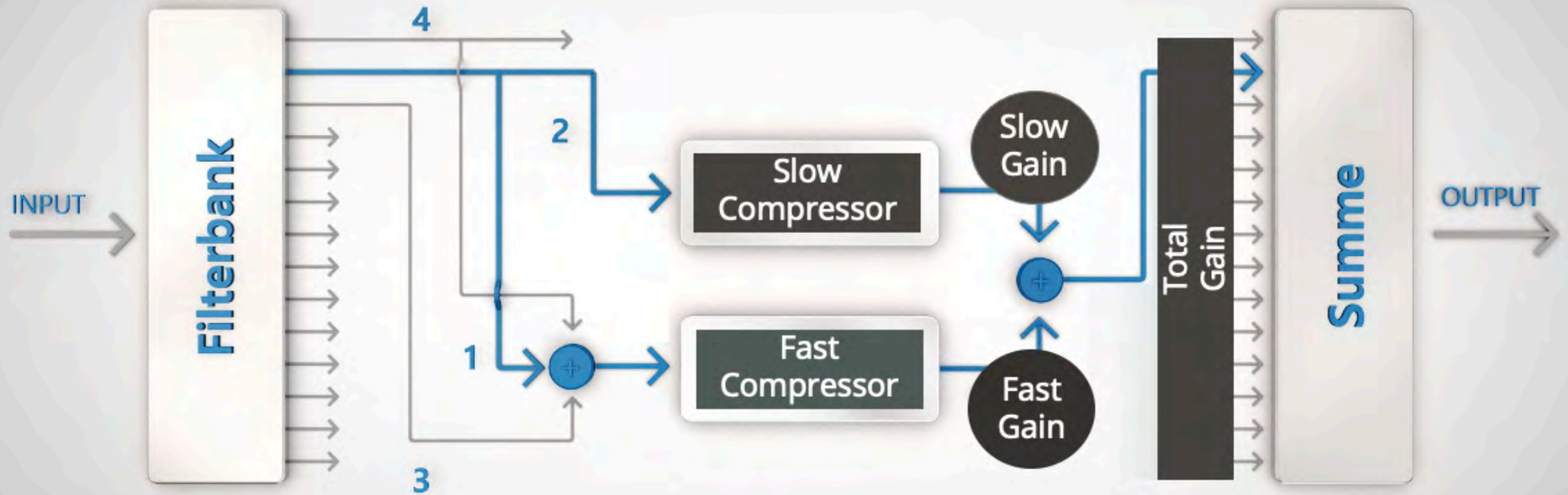
Open to softer/farther inputs

HEARING AID COMPRESSION & COGNITION



- People with **Good Working Memory** **accept loss of temporal information**
- People with **Poor Working memory** **rely more on temporal information**
- **A combination of both is preferable**

WIDEX VARIABLE SPEED COMPRESSION



MYSOUND 2.0 – ADDS COMPRESSION AS A PARAMETER

Adjust Emphasis
Person-specific & Situation-specific



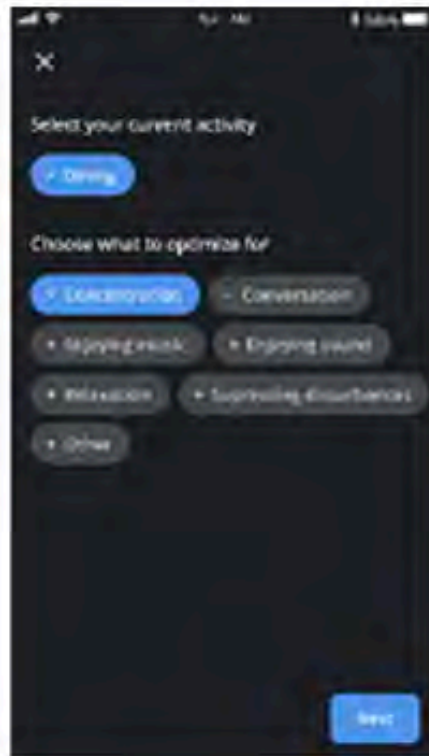
Focus on nearer/louder inputs



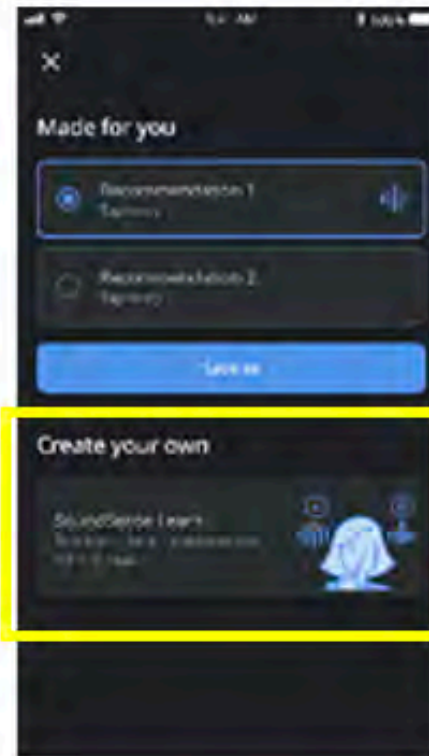
Open to softer/farther inputs

MOMENT APP – MYSOUND 2.0

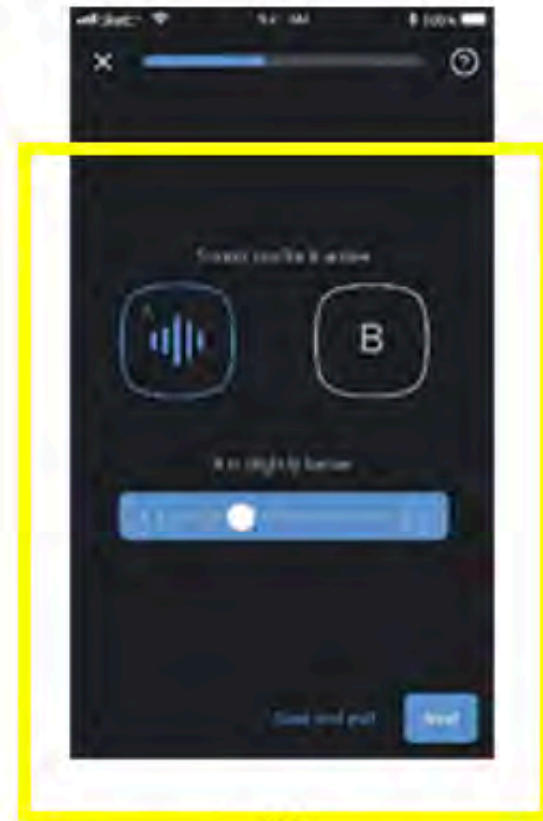
MADE BY YOU



(a)

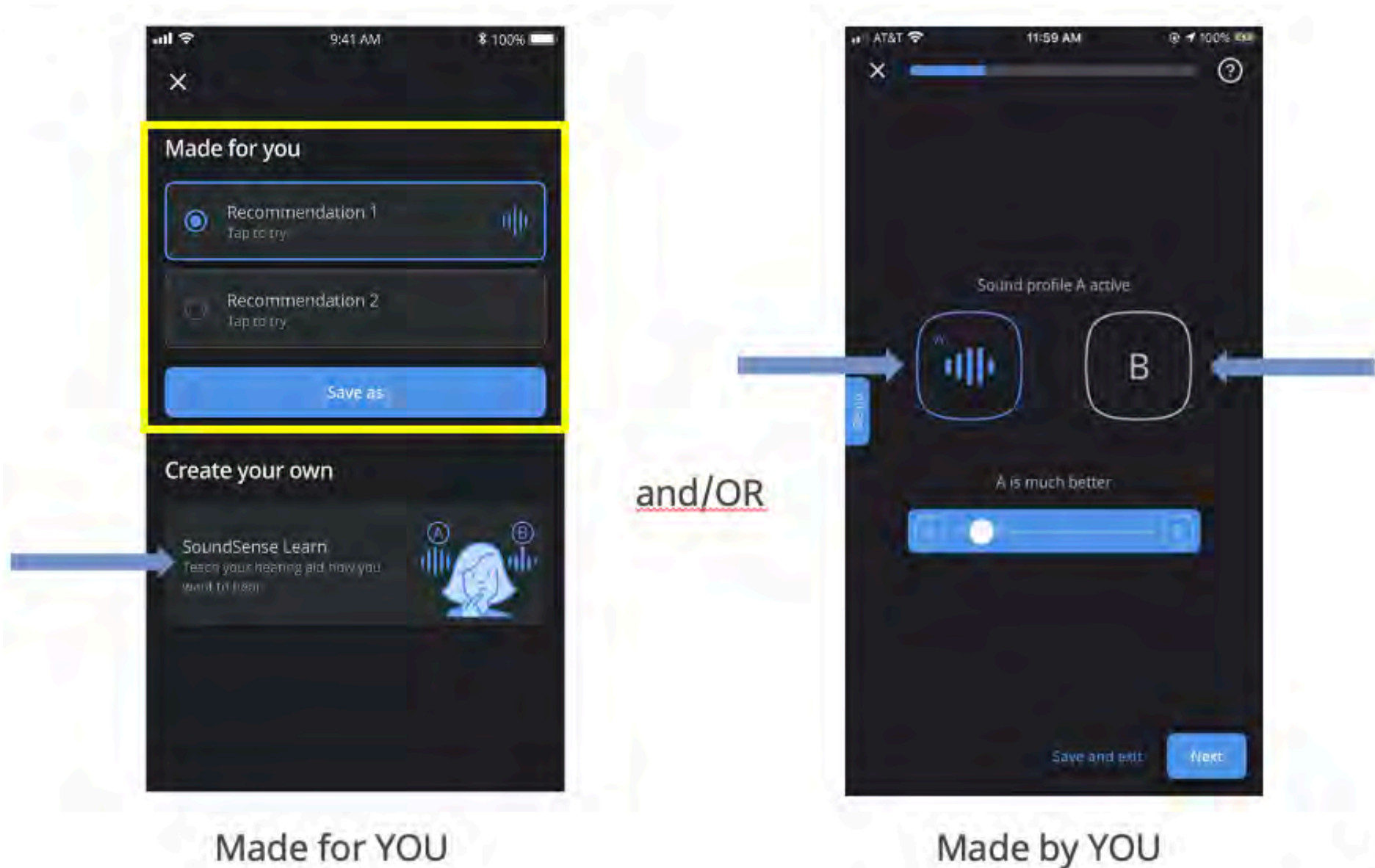


(b)



(c)

LEVERAGE APPS AND AI TO IMPROVE PATIENT EXPERIENCE

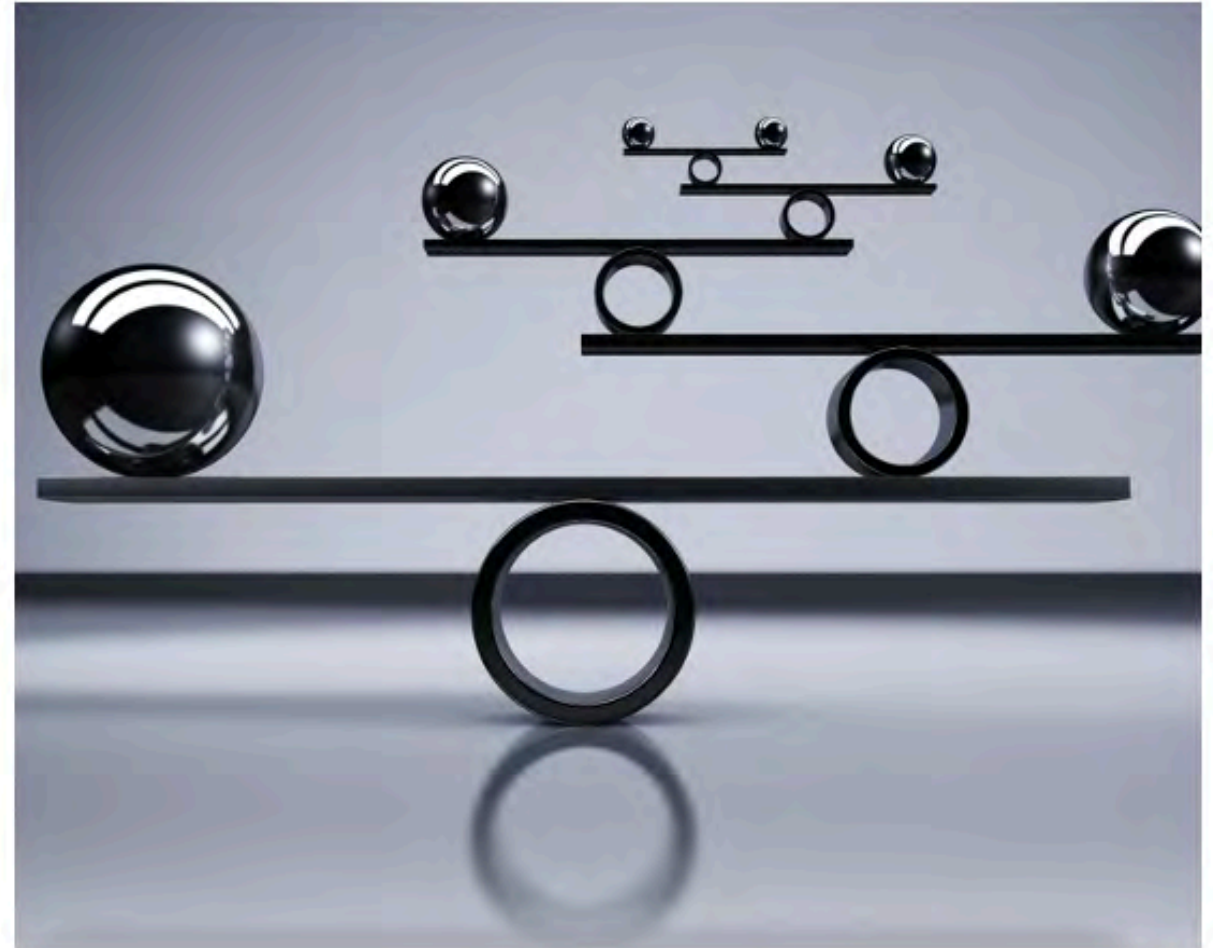


DO WE NEED SOLVE WEEKEND PROBLEMS ON MONDAY MORNING? OR LET THE PATIENT BE IN THE DRIVER SEAT



CASE STUDY: FIRST TIME USER

- Female: HF SNHL Mild-to-Moderate
- 50's
- Works in Movie industry in Los Angeles
- Mixing soundtracks
- Multiple studio locations
- Varied goals (music, conversation, evoke emotion)
- RIC Rechargeable
- Apple iPhone



EQ + SOUNDSense LEARN (AI MADE BY YOU)



- Reduce Frustration (HCP + End user)
 - Solutions ..RESULTS in REAL TIME
 - Shared Goals, Control, Ownership
- Empowerment**





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- Jensen, N.S., & Townend, O.. (2019). Machine Learning in Widex Evoke: perceptual benefits of SoundSense Learn. WidexPress, 42
- Kuk F, Slugocki C, Korhonen P, Seper E, Hau O. (2019). Evaluation of the Efficacy of a Dual Variable Speed Compressor over a Single Fixed Speed Compressor. JAm Acad Audiol 30:590–606
- Souza P, Arehart K, and Neher T (2015). Working Memory and Hearing Aid Processing: Literature Findings, Future Directions, and Clinical Applications. Front Psychol. 2015; 6: 1894.