

1. This document was created to support maximum accessibility for all learners. If you would like to print a hard copy of this document, please follow the general instructions below to print multiple slides on a single page or in black and white.
2. This handout is for reference only. Non-essential images have been removed for your convenience. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.
3. Copyright: Images used in this course are used in compliance with copyright laws and where required, permission has been secured to use the images in this course. All use of these images outside of this course may be in violation of copyright laws and is strictly prohibited.
4. Social Workers: For additional information regarding standards and indicators for cultural competence, please review the NASW resource: [Standards and Indicators for Cultural Competence in Social Work Practice](#)
5. Need Help? Select the “Help” option in the member dashboard to access FAQs or contact us.

#### How to Print Handouts

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>▪ On a Mac<ul style="list-style-type: none"><li>▪ Open PDF in Preview</li><li>▪ Click File</li><li>▪ Click Print</li><li>▪ Click dropdown menu on the right “preview”</li><li>▪ Click layout</li><li>▪ Choose # of pages per sheet from dropdown menu</li><li>▪ Checkmark Black &amp; White if wanted.</li></ul></li></ul> | <ul style="list-style-type: none"><li>▪ On a PC<ul style="list-style-type: none"><li>▪ Open PDF</li><li>▪ Click Print</li><li>▪ Choose # of pages per sheet from dropdown menu</li><li>▪ Choose Black and White from “Color” dropdown</li></ul></li></ul> |
|--|---|

*No part of the materials available through the continued.com site may be copied, photocopied, reproduced, translated or reduced to any electronic medium or machine-readable form, in whole or in part, without prior written consent of continued.com, LLC. Any other reproduction in any form without such written permission is prohibited. All materials contained on this site are protected by United States copyright law and may not be reproduced, distributed, transmitted, displayed, published or broadcast without the prior written permission of continued.com, LLC. Users must not access or use for any commercial purposes any part of the site or any services or materials available through the site.*



# Leveraging Smartphone Applications to Improve Communication, presented in partnership with Seminars in Hearing

Lori Zitelli, Au.D.

Grant Rauterkus

## Lori Zitelli, AuD

Lori Zitelli joined UPMC as an audiologist in 2012. She became Managing Audiologist in 2021. She received her clinical doctorate in Audiology from the University of Pittsburgh. She is a part-time lab instructor at the University of Pittsburgh and teaches a Clinical Procedures Lab for first year AuD students. Her special interests include amplification, tinnitus/decreased sound tolerance evaluation and treatment, clinical education, clinical research, and interventional audiology. She is an active fellow of the American Academy of Audiology.



## Grant Rauterkus, BS

Grant Rauterkus is a medical student at Tulane University. In his capacity as an Albert Schweitzer Fellow, he has set up a program to address untreated age-related hearing loss by connecting older adults with freely available non-hearing aid communication solutions. Grant is particularly interested in the growing number of hearing healthcare pathways, and the barrier hearing loss plays in accessing care.



# Disclosures

- **Presenter Disclosure:**
  - Financial: Lori Zitelli is employed by University of Pittsburgh and UPMC. She received an honorarium for this presentation. Non-financial: Lori Zitelli is a trustee, AAA Foundation; member/volunteer of AAA and ASHA.
  - Financial: Grant Rautkers received an honorarium for this presentation. Non-financial: Grant Rautkers has no relevant non-financial relationships to disclose.
- **Content Disclosure:** This learning event does not focus exclusively on any specific product or service.
- **Sponsor Disclosure:** This course is sponsored by Seminars in Hearing.

# Learning Outcomes

After this course, participants will be able to:

1. Define the term “m-health”.
2. List at least 3 categories of smartphone apps that may be applicable for users with auditory complaints.
3. Describe 3 situations where a person with auditory complaints may find this type of technology beneficial.

# What are we (LZ & GR) doing here?



- 2020 Seminars in Hearing article
- Leveraging smartphones in New Orleans:
  - Schweitzer Fellows are professional students who design, implement, evaluate and plan for the sustainability of a community-based health intervention.
  - The New Orleans People Program is a non-profit that provides older people with creative ways to spend leisure time, share valuable wisdom and enjoy community.

# The era of electronic health (e-health) began in the late 1990s

- “e-health” = healthcare that is:

Evidence-based

Efficient

Empowering

Easy to use

- “m-health” = care accessed via mobile devices





# The Pew Research Center estimates that **96%\*** of American adults own a cell phone...

- ...with **81%\*** reporting that they own a smartphone.

\*slightly higher in 2021

- What about children and elderly adults – can they use smartphones?

11/10/2012	84%	46%
12/9/2012	87%	45%
12/16/2012	88%	
1/6/2013	89%	51%
5/19/2013	91%	56%
7/14/2013	90%	53%
7/28/2013	91%	53%
9/16/2013	89%	54%
9/30/2013	91%	55%
10/6/2013	92%	58%
1/5/2014	92%	55%
1/12/2014	90%	58%
1/26/2014	91%	55%
2/18/2014	90%	
4/27/2014	92%	
9/21/2014	91%	
12/21/2014	89%	59%
4/12/2015	92%	67%
7/12/2015	92%	68%
11/15/2015	91%	69%
4/4/2016	92%	72%
5/3/2016	92%	70%
11/6/2016	95%	77%
1/10/2018	95%	77%
2/7/2019	96%	81%

# Children gradually learn to use mobile apps beginning at 2 years of age.

---

2 year olds	Drawing zigzag lines, single colors, tapping on an intended spot, single colors
-------------	---

---

3 year olds	Drawing distinct lines, irregular curves, simple closed shapes, multiple colors
-------------	---

---

4 year olds	Drawing identifiable figures, explaining them, moving objects, tapping and holding
-------------	--

---

Older kids	Sliding, dragging and dropping, pinching and zooming
------------	--

---



# An estimated 61% of older adults are smartphone users.

## Cost

Perception that the device is something that they cannot afford

- [Participant P8, 74 years old, housewife]:
- “New smartphones are very expensive, yet are not even durable. It would be a big loss if it accidentally falls off my hand and crashes.”

## Age-related disabilities

E.g., vision impairment, cognitive impairment, hearing loss

- [Participant P20, aged 65, housewife]
- “My eyes cannot see clearly. I cannot read texts. Even to make a call, my children set a shortcut for me, like this.” (Shows interviewer by pressing number 1 to call her first son, and number 2 to call her daughter).

## No interest

Perception that it is not necessary

- [Participant 11, 72 years old, former caterer]
- “Actually my children wanted to give me a smartphone, but I said that I don’t want it; I am too lazy to learn to use it”.

## Lack of knowledge

Perception that they were too old to learn, and even if they learned how to use it, they would forget the instructions over time due to mild dementia

- [Participant P19, aged 66, former factory worker]
- “I’m interested but I think I’m too old for that. My brain cannot accept it anymore. I would forget later.”

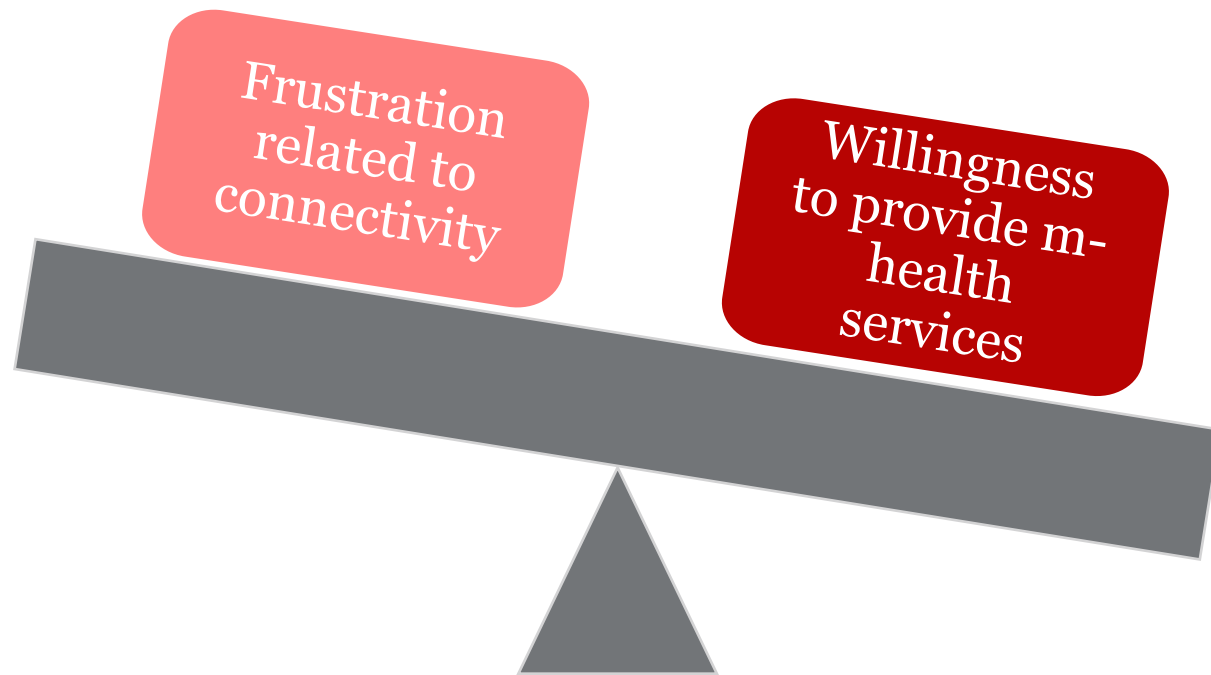
## Motor impairment

Perception that the touchscreen keypad was difficult to use

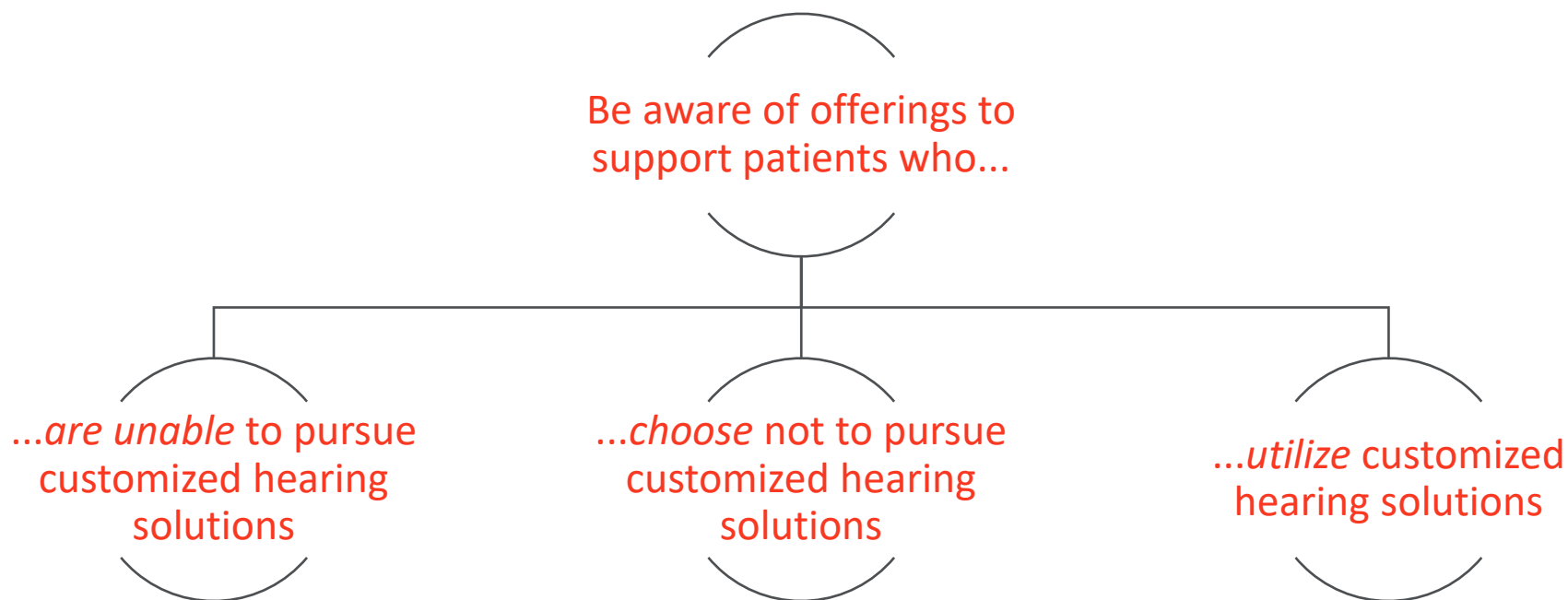
- [Participant P3, aged 65, housewife]
- “I didn’t know how to type SMS. The touchscreen keypad is really hard to use. The ‘old phone’ is much easier.”

“We believe that the elderly would be most likely to adopt smartphones if they found the smartphone not only easy to use but also *beneficial to them*.”

Children, adults, and elderly adults  
can use smartphones.  
How about audiologists?



# Hot Take: Audiologists should be involved in this process, even when hearing aids are not...



*...but assistants are critical in the provision of these services.*

Hundreds of apps specific to hearing have been identified and sorted into 4 categories:

Screening / Assessment	Intervention / Rehabilitation	Education / Information	Assistive Tools
<ul style="list-style-type: none"> <li>• Pure tone tests</li> <li>• Speech in noise tests</li> <li>• Temporal resolution tests</li> <li>• Tinnitus matching</li> <li>• Questionnaires</li> <li>• Etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Hearing aid services</li> <li>• Auditory training</li> <li>• Speech/language rehab</li> <li>• Remote consultations</li> <li>• Tinnitus treatment</li> <li>• Sound enhancement</li> <li>• Etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Information &amp; knowledge</li> <li>• Simulations of HL and HA</li> <li>• Noise level meters</li> <li>• Educational tools</li> <li>• Service finders</li> <li>• Etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Communication services</li> <li>• Captioning &amp; transcription</li> <li>• Sign language support tools</li> <li>• Alerts</li> <li>• Etc.</li> </ul>

An individual with hearing loss may be better served by purchasing a smartphone and data plan than hearing aids.

---

## Smartphone Applications

Amplifiers

---

Video Call

---

Phone/Video Call (with Captioning)

---

Live Communication Captioning

---

Television

---

Alerting

---

Tinnitus Relief

---

Noise Measurement

---

American Sign Language

---

Hearing Screening

---

Others?

---

The best solution for any given communication challenge is the one that works best for *each individual user!*

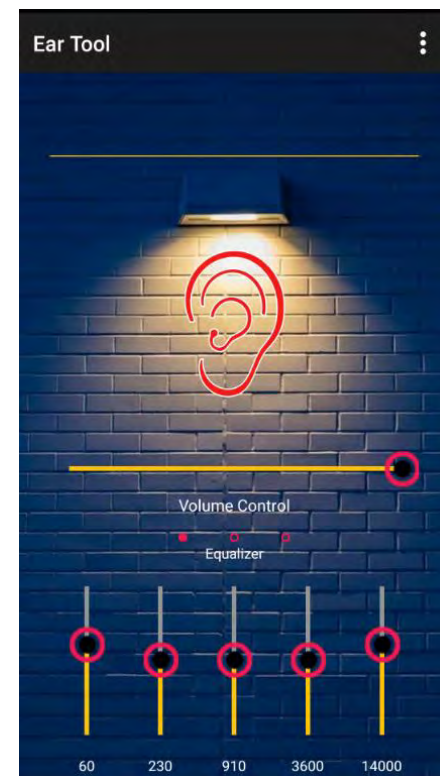
**Sound Amplifier Apps** utilize a microphone of the listener's choice (phone, headset mic, external mic) and amplify sounds to that are delivered to the listener through headphones or earbuds.

■ Example of a free app = Super Ear Tool

- Android



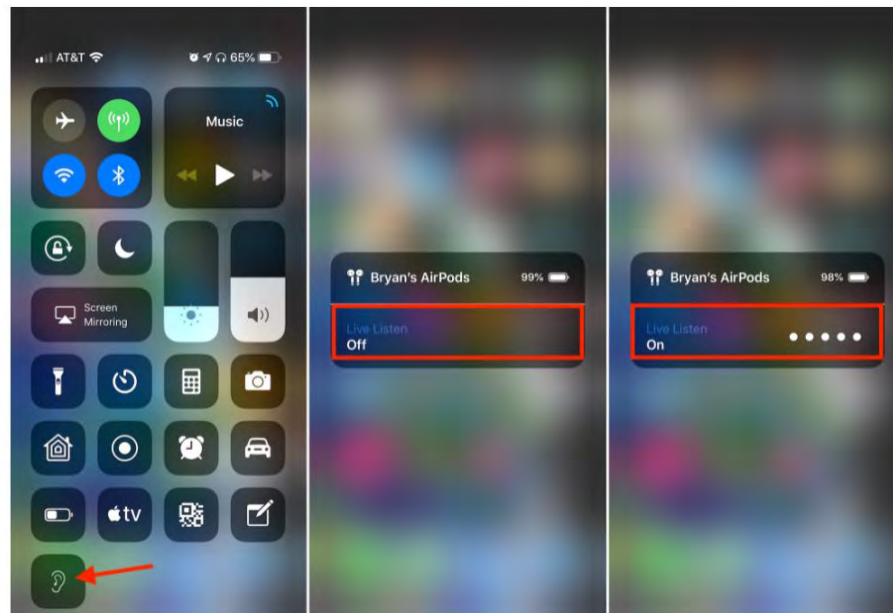
- Wired or wireless headphones are compatible
- No way to choose mic input (if using headphones, must use a set that does not have an inline mic or else there will be an echo!)



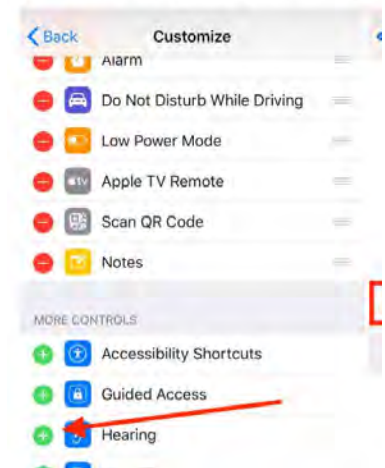


# “Live Listen” Capability allows iPhone users to turn their phones into a remote microphone with their AirPods...

- Position phone near the sound source!
- Settings → Control Center → Hearing
- AirPods:

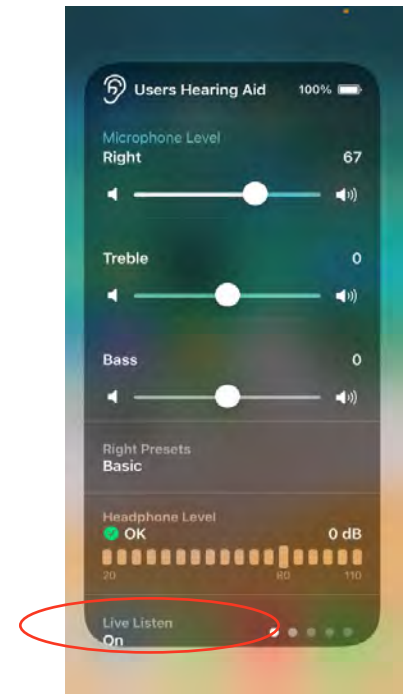
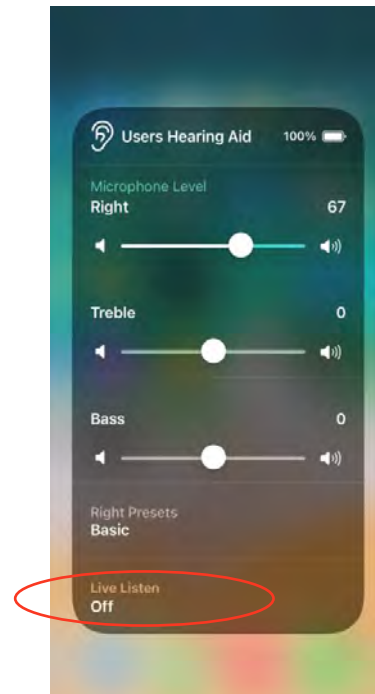


3) Scroll down and tap on the green “+” next to the H



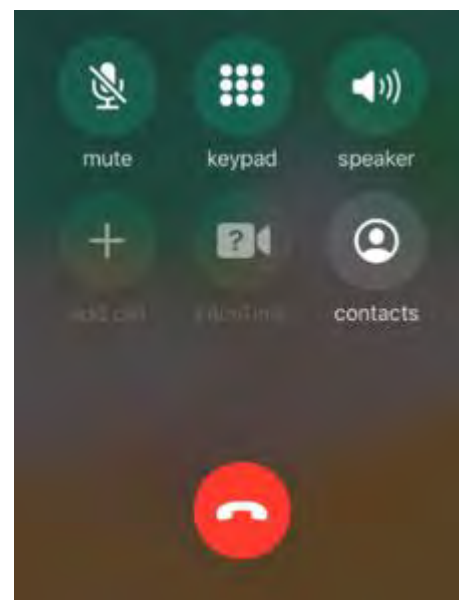
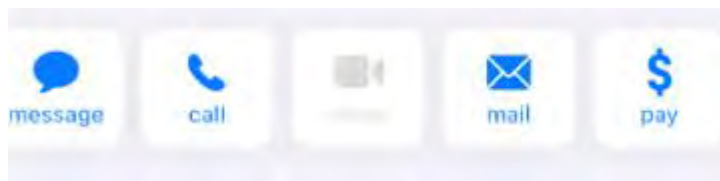
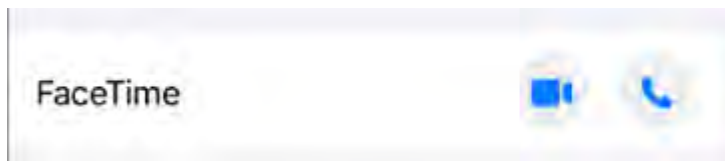
... or hearing aids.

- Position phone near the sound source!
- Hearing Aids must be paired to phone first.



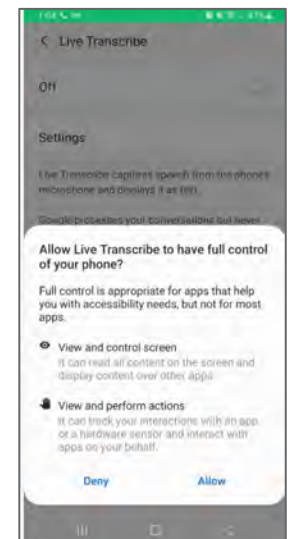
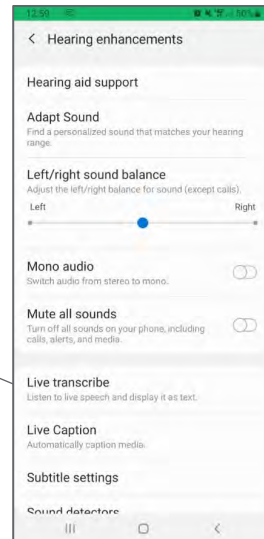
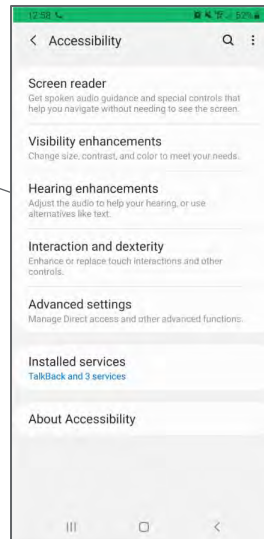
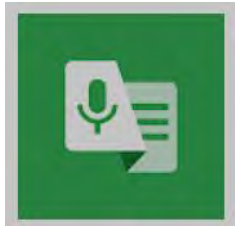
**Video Call Apps** allow users to communicate using both audio and video signals (making facial cues available).

- Example of a free app = Facetime
  - Apple-user to Apple-user only



# Speech-to-Text Apps allow users to follow conversations by reading live transcriptions of interactions.

- Example of a free app = Google Live Transcribe
- Android





# Captioned Phone Call Apps allow users to facilitate social connections by providing real-time transcriptions of interactions.

- Example of a free app = Innocaption

- Android



- Apple



InnoCaption Activation

**My Cell Phone Number**

Enter Your Cell Phone Number

**Password** [Forgot password](#)

Enter Password

**Log in**

[Register](#)

InnoCaption

Please enter the 4-digit authentication code sent to (412) 298-3626 via SMS text message

**Enter 4-Digit Authentication Code**

ex: 1597

**Submit**

If you do not receive a code right away, please wait 2-3 minutes before trying again. If you still have problems authenticating, please contact us for assistance at [support@innocaption.com](mailto:support@innocaption.com).

InnoCaption

Your cell phone number has been verified! Now we can set up your account and password

**Enter Your Email Address**

ex: youremail@address.com

**Re-enter Your Email Address**

ex: youremail@address.com

**Create Password (at least 6 characters long)**

**Re-enter Password**

**Submit**

We need your email address in order to send you a registration confirmation and to keep you informed about important updates to our service. We

InnoCaption

☒ I have read and accept the Terms of Use

- Terms of Use
- InnoCaption Privacy Policy
- Customer Proprietary Network Information

I certify under penalty of perjury that

- I have a hearing loss that necessitates use of captioned telephone service;
- I understand that the captioning on this captioned telephone service may be provided by a live communications assistant who listens to the other party on the line and provides the text on the captioned phone;
- I understand that the cost of captioning each Internet protocol captioned telephone call is funded through the captioned service.

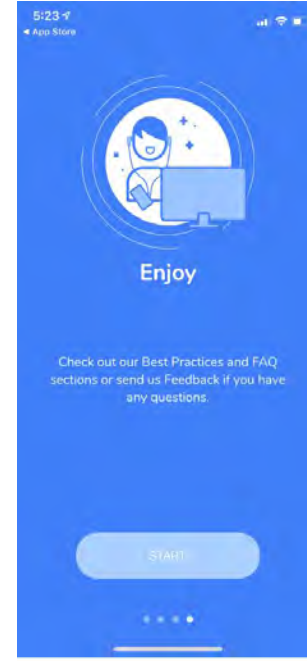
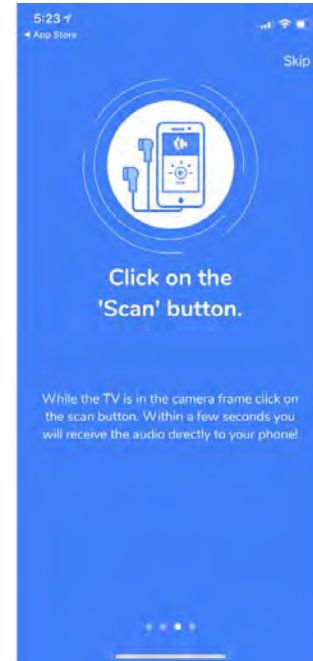
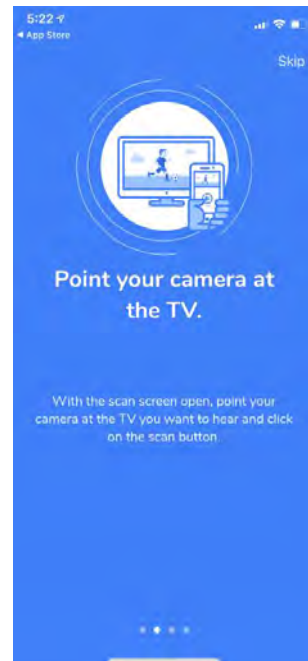
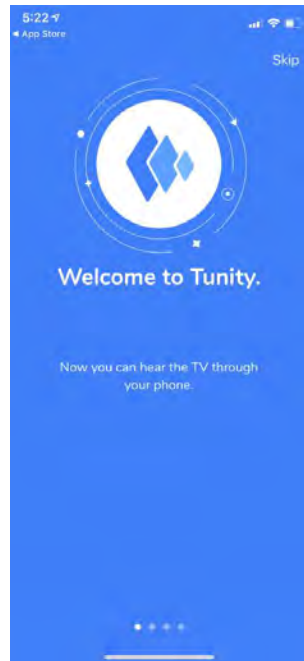
# Television Apps allow users to improve signal-to-noise ratio when listening to television audio or view subtitles.

- Example of a free app = Tunity

- Android

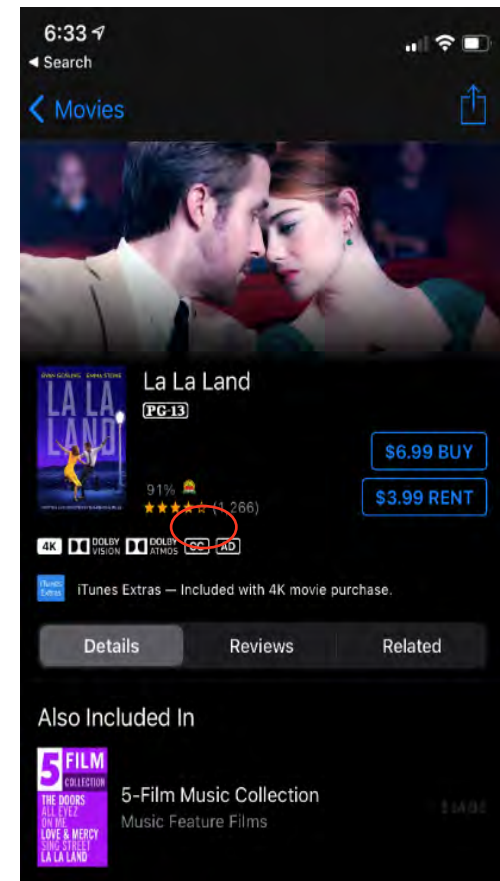
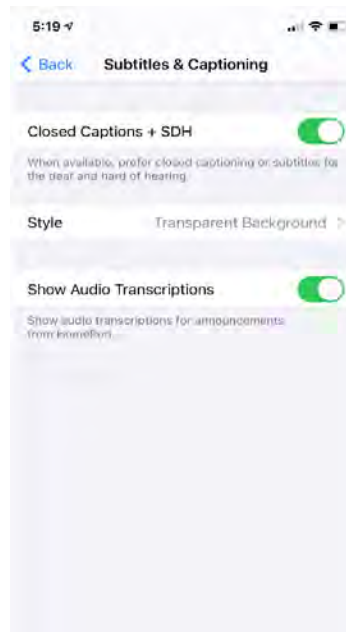
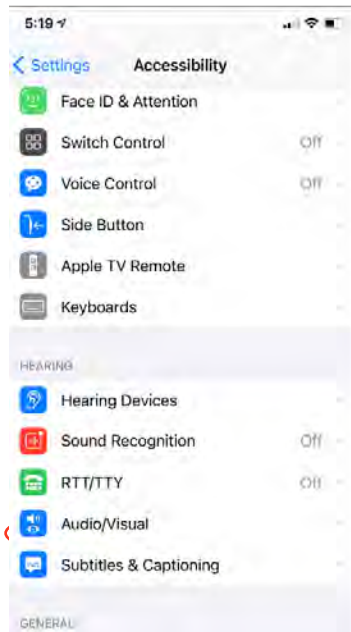


- Apple



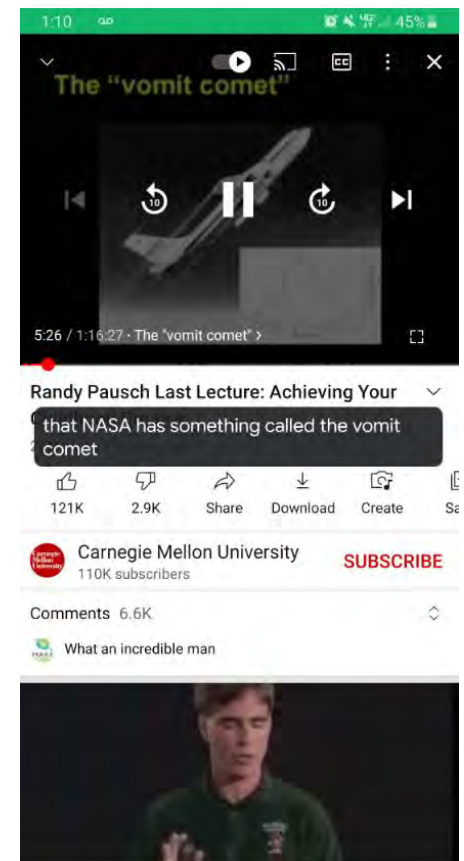
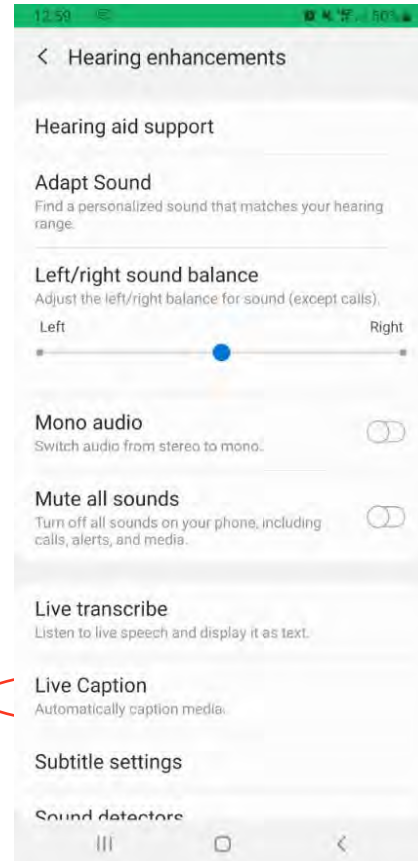
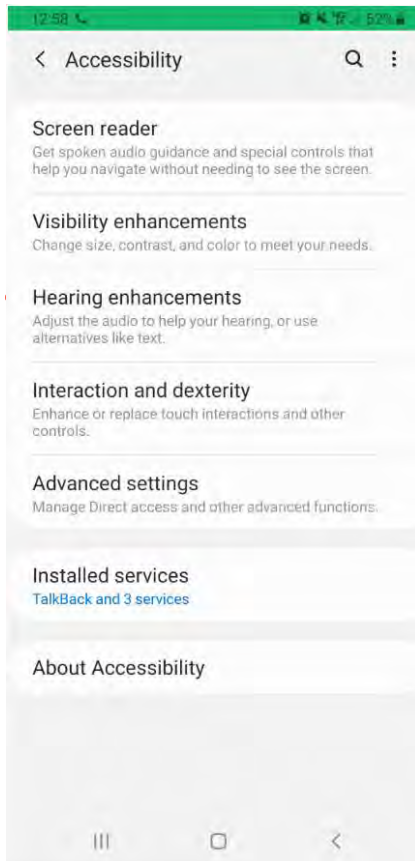
# Media Captioning Capability allows captions for videos being watched on the device.

- iPhone: need to be watching media from iTunes Store with “CC” symbol



# Media Captioning Capability allows captions for videos being watched on the device.

- Android

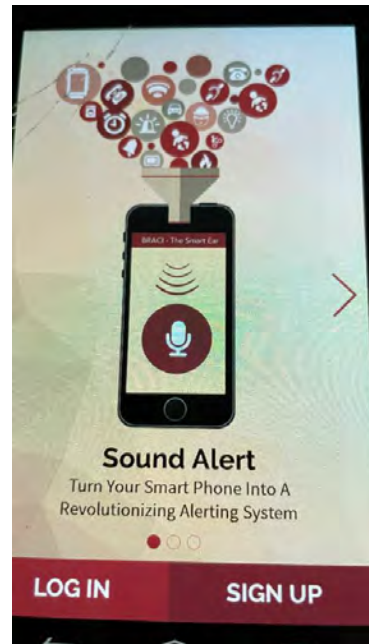




**Alerting Apps** warn users when their doorbell, smoke alarm, or alarm clock has been activated or when their phone is ringing.

- Example of a free app = Sound Alert

- Android

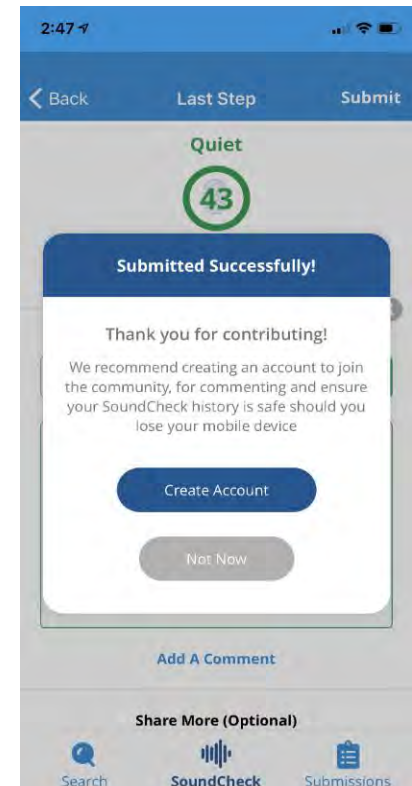
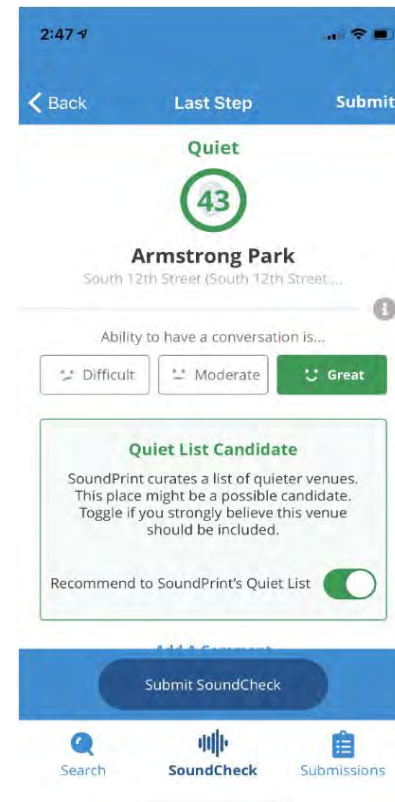
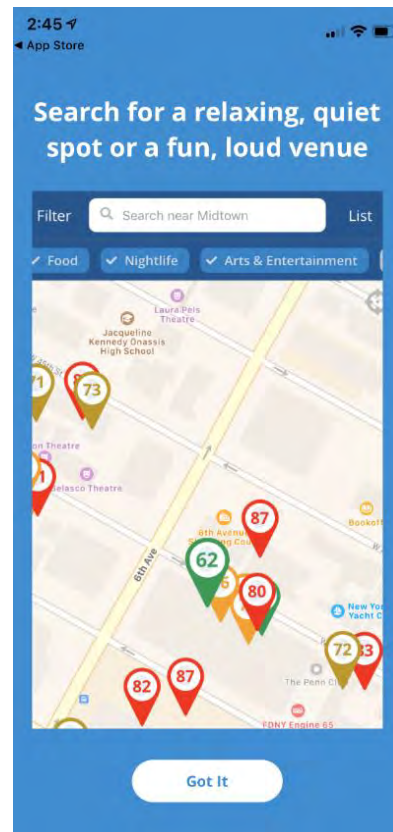


**Soundprint App** uses crowdsourced information that allows you search places to see data related to how loud they are.

■ Android

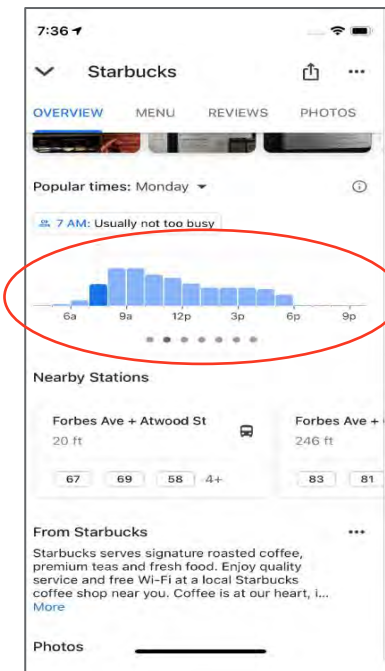
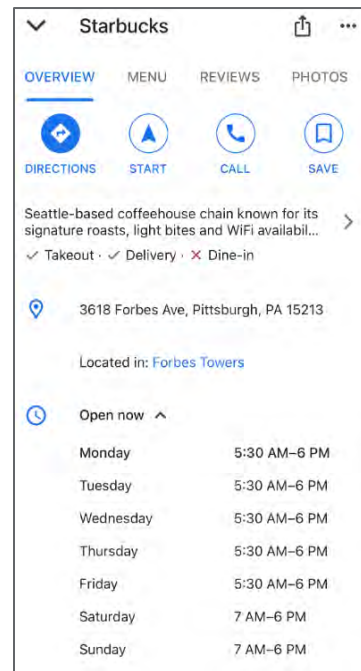
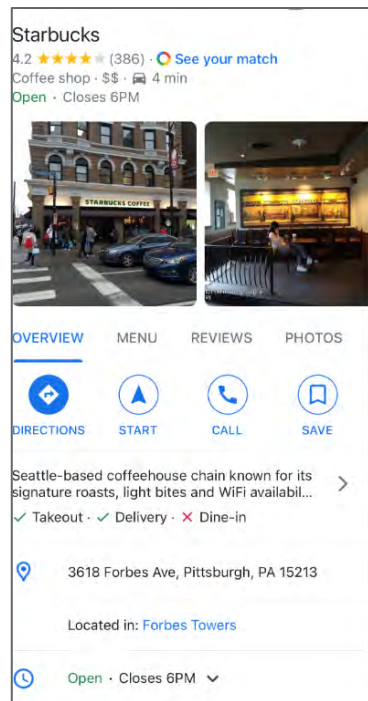


■ Apple



**Google Maps App** provides attendance patterns for public places for each day of the week, allowing users to determine the likeliest day and time that the location will be quiet.

- The busier a place is, the louder it usually is!



# Upfront considerations

- Phone/headset specifications & compatibility issues
- Gauging interest in the menu of solutions

Phone Type	Smartphone?	Tablet Type	Headset
<input type="checkbox"/> I own an iPhone. <input type="checkbox"/> I own an Android phone. <input type="checkbox"/> I'm not sure what kind of phone I have.	<input type="checkbox"/> My phone can connect to the internet and has Bluetooth capability. <input type="checkbox"/> I'm not sure if I own a Smartphone. <input type="checkbox"/> I do not own a Smartphone.	<input type="checkbox"/> I own an iPad tablet and plan to use it to run these apps. <input type="checkbox"/> I own an Android tablet and plan to use it to run these apps.	<input type="checkbox"/> I use a wireless headset or wireless earbuds with my phone. <input type="checkbox"/> I use a wired headset or earbuds with my phone.

# Considerations for an encounter

- Operating system
- Data/Wi-Fi
- Passwords (phone and app stores)
- Chargers
- Non-custom amplifier
- Headphones and adaptors
- In-app purchases



# References

- Eysenbach G. What is e-health? *J Med Internet Res*, 2001;3(02):E20
- Free C, Phillips G, Felix L, Galli L, Patel V, Edwards P. The effectiveness of M-health technologies for improving health and health services: a systematic review protocol. *BMC Res Notes*, 2010;3 (01):250
- Kimball SH, Singh G, John AB, Jenstad LM. Implications and attitudes of audiologists towards smartphone integration in hearing healthcare. *Hear Res*, 2018;369:15–23
- Mohadis, H. & Ali, N. A study of smartphone usage and barriers among the elderly. 3rd International Conference on User Science and Engineering. September 2–5, 2014:109–114
- Ng SL, Phelan S, Leonard M, Galster J. A qualitative case study of smartphone-connected hearing aids: influences on patients, clinicians, and patient-clinician interactions. *J Am Acad Audiol*, 2017;28 (06):506–521
- Paglialonga A, Tognola G, Pincioli F. Apps for hearing science and care. *Am J Audiol*, 2015;24(03): 293–298
- PEW Research Center. Demographics of Mobile Device Ownership and Adoption in the United States. Available at: <https://www.pewresearch.org/internet/fact-sheet/mobile/>. Accessed June 2, 2020
- Yadav S, Chakraborty P. Children aged two to four are able to scribble and draw using a smartphone app. *Acta Paediatr*, 2017;106(06):991–994
- Yadav, S., Chakraborty, P., & Kaul, A. (2020). Ability of children to perform touchscreen gestures and follow prompting techniques when using mobile apps. *Clinical and experimental pediatrics*, 63(6), 232-236

Don't forget to access the handout! It provide step-by-step information and additional considerations.

Thank you for attending this webinar.

Lori Zitelli, Au.D.  
[zitellild@upmc.edu](mailto:zitellild@upmc.edu)

Grant Rauterkus  
[grauterk@tulane.edu](mailto:grauterk@tulane.edu)