

SocioLinx Customer Discovery in Atlanta

UW Sociolinguistics Lab Meeting 04/26/24

Roadmap

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5. Highlights
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1. Acknowledgements

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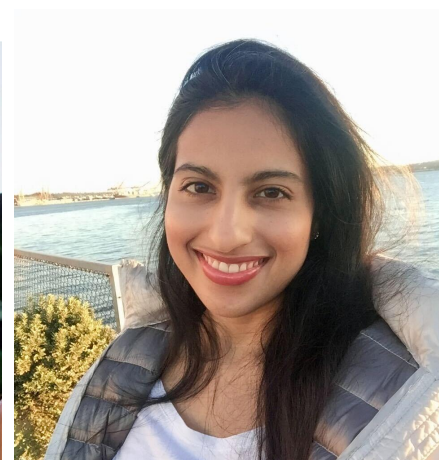
Amina Venton



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2. Project Introduction



Dialect-rich acoustic model support



The Human Problem



UX research shows that **trust in ASR is low** in underrepresented communities


People believe tech firms developing AI are **unethical**

Unfair burden: 23% of Black people reported code-switching to use ASR

The Impact of (repeated) misrecognition

Non-white people feel Voice Assistants are not
“made for them”

Psychological harm: anxiety, anger, feeling
“othered,” internalized sense of failure

...and worse! 



Project Approach

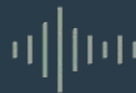
Community-
based UX data



Dialect-rich
datasets



Fine-tuning with
phone error
assessment



Better dialect
handling



3. Fieldwork + Aims: March 17-23, Atlanta, Georgia

Customer discovery:

Learn about experiences and challenges in using voice-enabled technologies

Question our assumptions:

- Do underrepresented dialect speakers really have trouble with ASR?
- If so, what can we do to mitigate bias in a meaningful way?



Locations:

NSBE: National Society of Black Engineers Conference

Greater Atlanta general population

Georgia Tech

Greek Organizations

4. Survey + Interview Prompts

0. Consent & Demographics

Consent

Self-identifiers: state of residence, age, identify as Black American or African American based in the US?, gender identity

Option: online as survey vs in-person as interview

Option: record voice sample after interview

1. Speech

Describe the way you speak

Speech challenges
(impairments or disabilities)

2. Use & Experience with SR tech

Use of voice assistants:
Devices?
Purposes or Functions?

3. Challenges & Narratives

Time when had a challenge with dialect or accent being understood

Challenge type

Strategies used to fix or deal with a challenge

Feelings when misunderstood

Q5: You are now going to see some different types of Small and Large Vocabulary technologies. Please select the ones that you use or have used.



Stand-alone Smart Speakers e.g., Amazon Echo, Google Home, Siri Homepod

Q7: You are now going to see some different types of Conversational technologies. Please select the ones that you use or have used.



Video conferencing apps with auto-generated transcription e.g., captions and transcripts on Zoom, Microsoft Teams, etc.

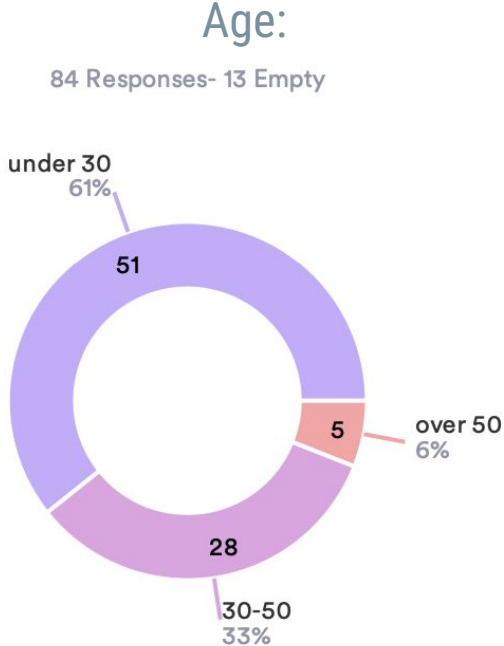
Respondents (n=97)

Ethnicity | 95 (99%) identify as African American or Black American (in the US)
1 (1%) identified as Asian

Gender identity: | 57 (59%) identified as women
38 (40%) identified as men
1 (1%) identified as gender non-conforming

Speech (open-ended):

"well"	"city accent and use AAVE"
"fluent"	"incorporate AAVE"
"clearly"	"partial Ebonics"
"bit of an accent"	"AAVE and southern drawl"
"almost proper English"	"Southern black slang"

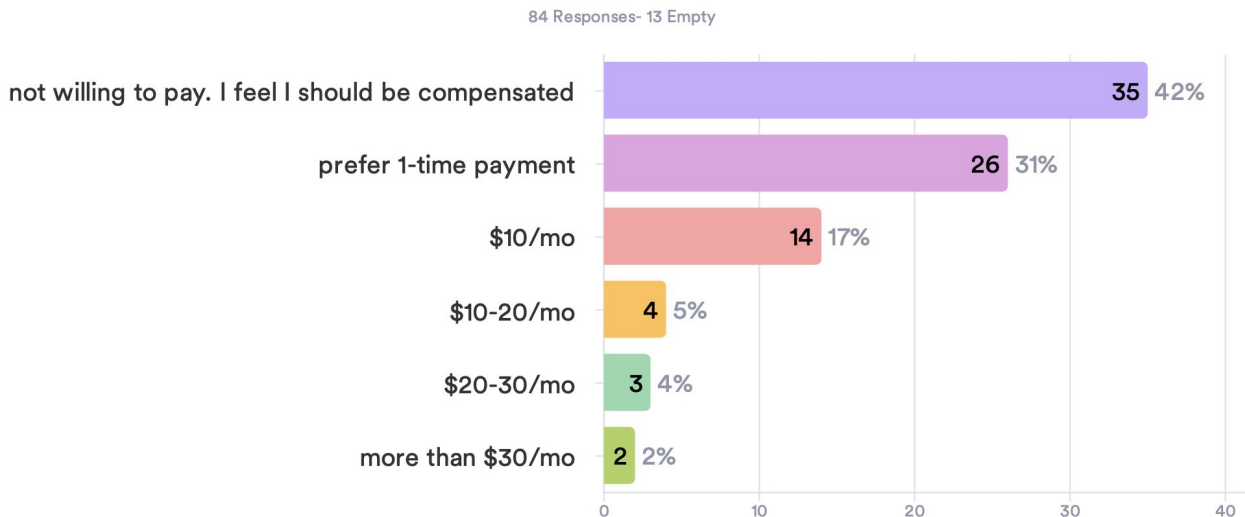


Do underrepresented dialect speakers really have trouble with ASR?

Yes, and...

Surprisingly, some are willing to pay for improved services.

Q19: Would you be willing to pay for a product/service that provides improved voice recognition for diverse dialects and helps in undoing bias? If yes, which describes how much you'd be willing to pay?



5. Highlights

Q13: Can you share a time where you had a challenge with your dialect or accent being understood by voice recognition systems?

Styles and registers:

“I need to basically repeat really slow and overenunciate. ”

“None. I use “**kings English**” when using voice recognition systems”

Southern & AAVE:

“‘men’ vs. ‘mint’

‘writer’ vs. ‘rider’ ”

“An Amazon Echo device not understanding me when I used a term in **AAVE** that isn't common for it to understand.”

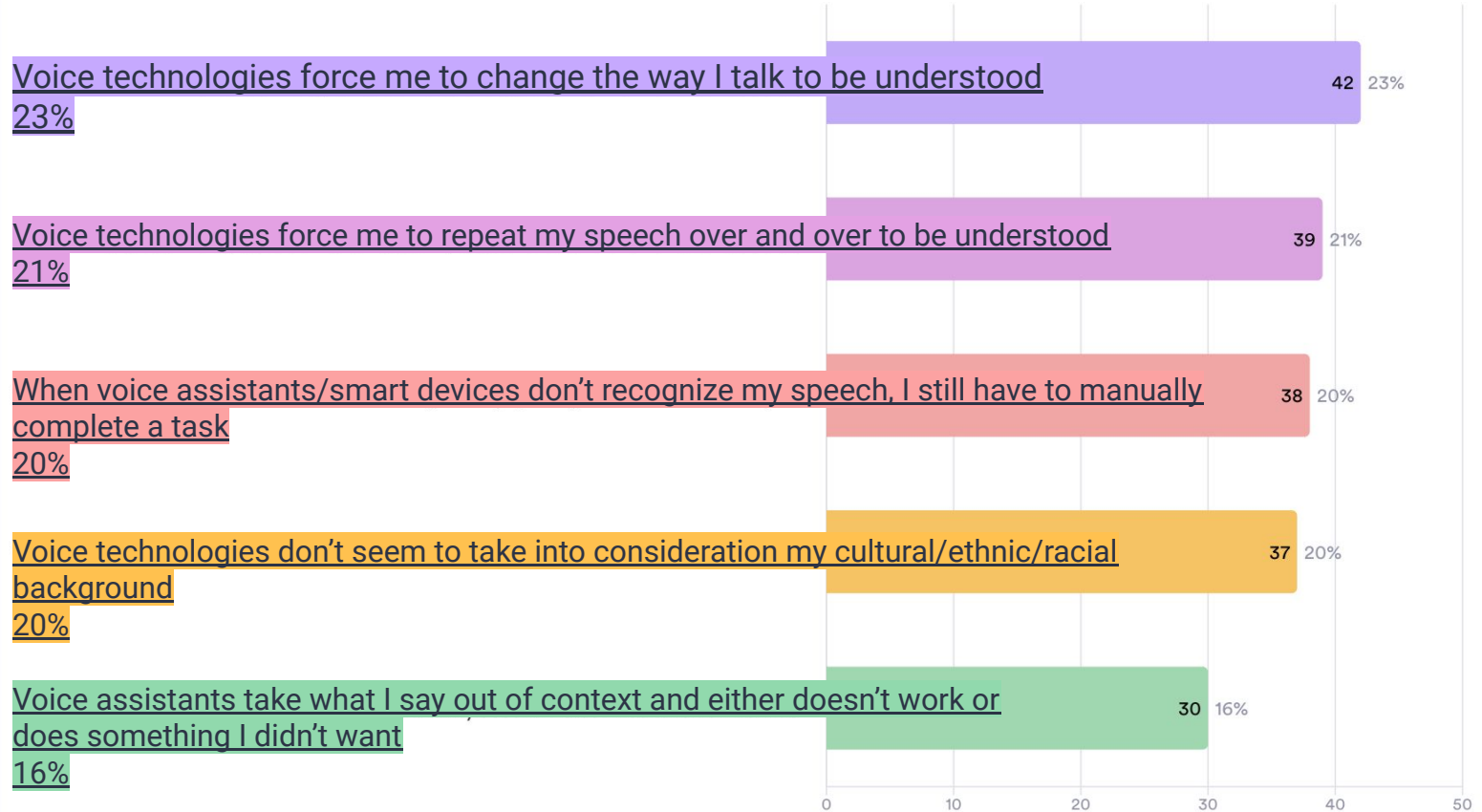
Names, names, names:

“I have found voice recognition systems having trouble with names that **aren't typical English names.**”

“the names of me, and all my family members are never able to be understood.”

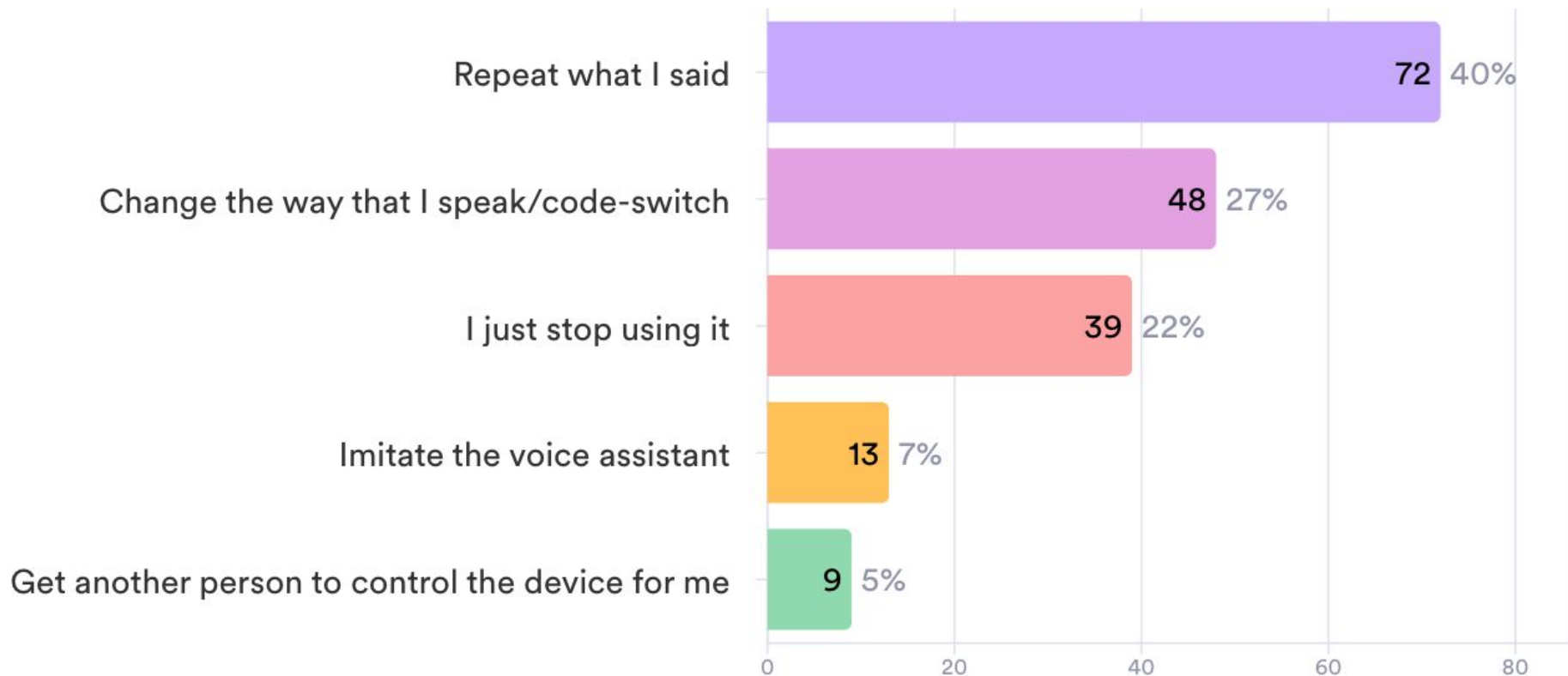
Q14a: Which, if any of the following reasons describe how you experience challenges or issues with using voice recognition technologies? If yes, select all that apply:

186 Responses- 20 Empty

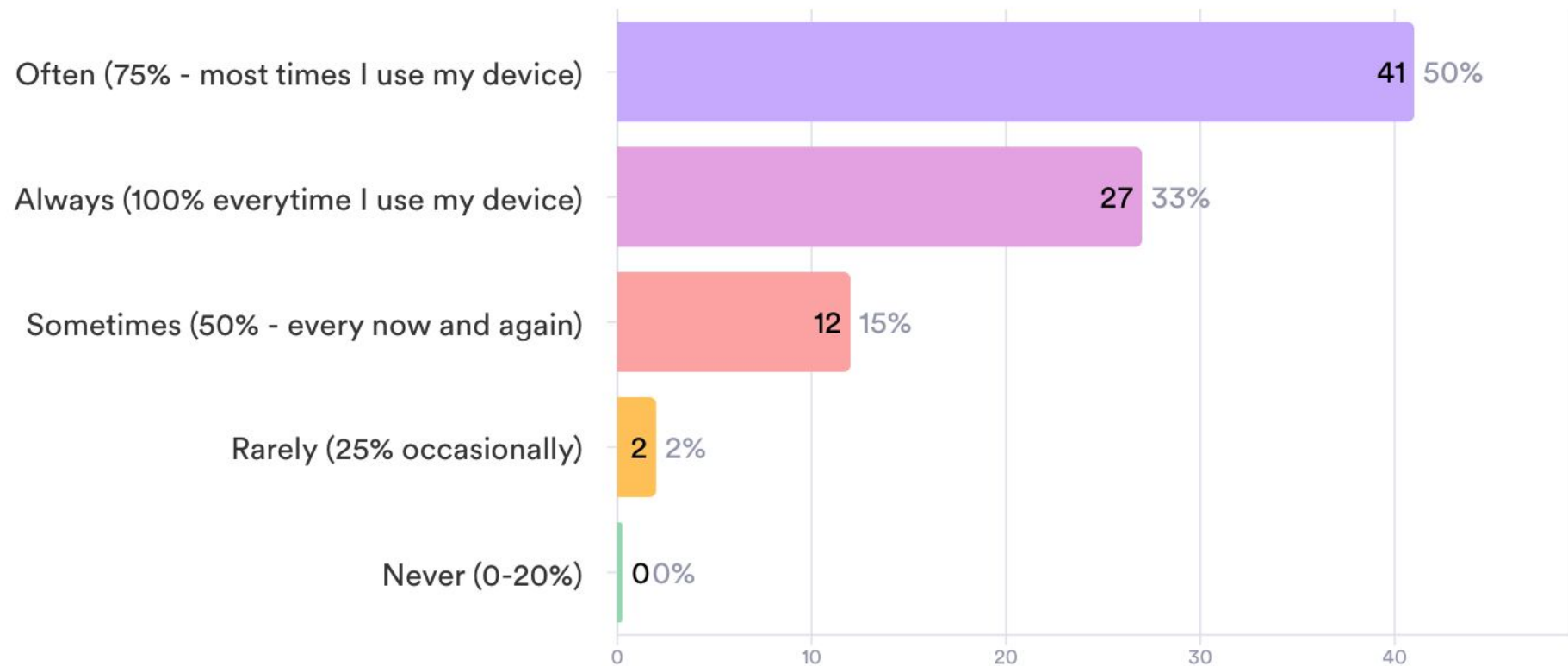


Q15a: If you have experienced challenges in using voice recognition, are there things you do to fix or deal with the challenge?

181 Responses- 15 Empty



Q17: How often do you expect voice recognition technologies to be able to understand your speech dialect or accent correctly?



Other strategies (n=27)

“Switch to typing” (3)

“Annunciate [sic] ...sometimes I yell.” (2)

“Speaking slower sometimes helps.” (2)

“Press a number or say representative over and over until the recording send me to a human.” (1)

“Rephrase what I said.” (1)

[+ other responses]

Felt Impacts

Goal: Discern by-respondent patterns in the impacts of the failure of ASR to recognize speech

Analysis Procedures:

1. Identify volunteered words that express internal emotional states, or reactions
2. Analyze narratives detailing times when participants experienced a challenge
3. Link feeling terms with participants' responses to usage and strategy questions
4. Group participants by status (continue to use/non-use decision) and impact type
5. Isolate several "case study" participants as exemplars of common felt impacts.

Case studies

Q6: What do you use automatic speech recognition for?	Q13: Can you share a time when where you had a challenge with your dialect or accent being understood?	Q14: How would you describe how you experience challenges or issues using automatic speech recognition?	Q16: How does it make you feel when your voice assistant doesn't understand your speech/makes frequent mistakes?
Time related tasks (setting alarms); checking weather; making calls; web browsing; sending messages; listening to messages	“When using the Echo dot and Echo show devices, I experience troubles with having to repeat my commands often.”	Voice recognition software not recognizing dialect/accent; ASR doesn't recognize speech; ASR misinterprets speech; ASR makes me feel self conscious about my speech	“I feel inadequate speaking my own first language.”
Time related tasks; checking weather; listening to music; controlling smart devices	“Yes, with the one on my phone it doesn't really pick up on my voice sometimes. Also my voice recognition on my speaker doesn't pick up my voice often”	Voice recognition software not recognizing dialect/accent; ASR doesn't consider my culture/ethnicity/race ; ASR makes me feel self conscious about my speech	“Annoyed, unseen”

Betancourt et al. (2024)

Liu, et al. (2022)

Future plans

1. Thematic analysis
2. Determine a responsible approach for categorizing and analyzing felt impacts.
3. Data analysis for Atlanta is ongoing.
4. Next location: Tucson, Arizona (Hispanic and Native American participants)