Official Title of the study: Effects of Altered Auditory Feedback on Speech Fluency

NCT Number: [NCT ID not yet assigned]

Date: 05/01/2023

Study Details:

The Mumble Melody Longitudinal Study is a month long online study in which we will be investigating the longer term effects of using the Mumble Melody app for people who stutter. During the course of a month, eligible participants will use the Mumble Melody app undirected daily. Additionally, we will be sending an online platform for participants to conduct at-home testing sessions, in which they will be asked to record their voice during various speech tasks, both with and without the Mumble Melody app.

Participants eligible for this study must:
- (1) Identify as a person who stutters (PWS)
- (2) Be 18 years or older
- (3) Be a US permanent resident
- (4) Have one of the following Apple devices which are compatible with the Mumble Melody application:
    - (a) iPhone with iOS 12.0 or later
    - (b) iPad with iPadOS 12.0 or later
    - (c) iPod touch with iOS 12.0 or later
    - (d) Mac with macOS 11.0 or later and an Apple M1 chip or later
- (5) Have a SEPARATE browser-supporting device with a microphone
- (6) Be able to conduct the study in English
- (7) Qualify based on the initial screening evaluation

Data we will be collecting from participants includes:
- Which modes subjects use each day, and for how long
- Voice recordings for each testing session
- Survey data

Hypotheses that we are testing include:
- 1. Speech fluency will increase significantly from baseline compared to modes within one testing session
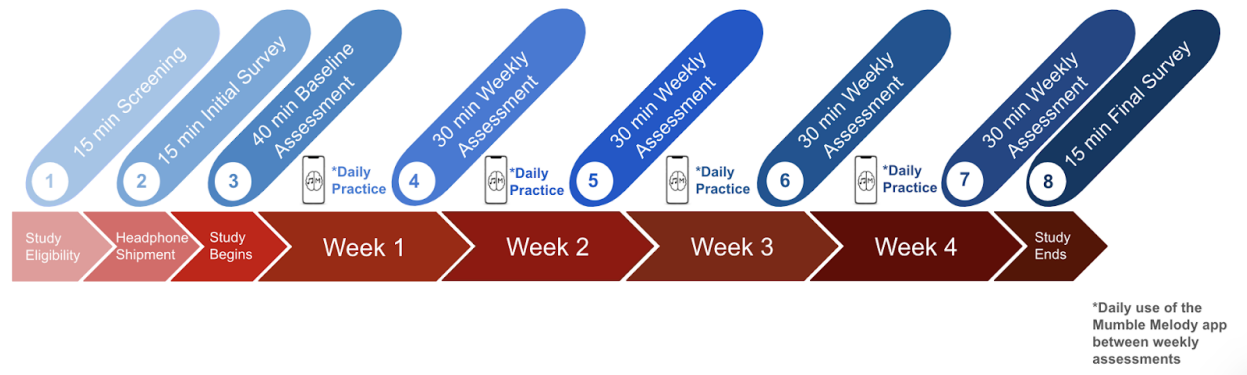- 2. Speech fluency will increase significantly over time (from each session to the next one)

Study Flowchart:
Below is an outline of all steps involved in this study:

Step 1: Participant Signs Consent Form

Protocol Details:

*Daily use of the Mumble Melody app between weekly assessments

Each testing session will be laid out as below.
For the Screening Session, a shortened version will be given with no modes and a reading passage will be included.
For the Baseline Testing Session, a quick tutorial on downloading and using the Mumble Melody app will be included.
For the Final Testing Session, a reading passage will be included.

TESTING SESSION #N:
Home Page:

Welcome to the Week N Testing Session for the Mumble Melody Longitudinal Study on Stuttering

Total Session Time: ~30 MINUTES

About this Session
Here is how the session will take place today:

Step 1: Initial Questions
Step 2: Audio Check
Step 3: Initial voice recording tasks (open-ended questions)
Step 4-7: Voice recording tasks using 4 auditory feedback modes on the Mumble Melody app, which will change the way you hear your voice
Step 8: Final voice recording tasks to share your experience with us

Materials Needed
1) Apple device to use the Mumble Melody app
2) Additional browser-supporting device with a microphone (used to conduct this session)
3) Wired headphones (shipped to you for the study)
4) Lightning-to-headphone jack adapter (shipped to you for the study)

Ready to Get Started?
Click the Join button below:

Join

Questions (1 min):

TIME REMAINING: ~27 min

Please answer the following questions:

How would you describe your speaking fluency today, compared to your usual fluency?
- My stutter is more severe today
- Same
- My stutter is more mild today

During this step, we will link your submission for this session to your Mumble Melody User ID. In order to do this, please enter the Mumble Melody app on your Apple device and tap the "User ID" button on the home page. The 8-digit ID User ID will be displayed.
- Input your 8-digit User ID below: _____

Submit

Click "Next" below:
Next

Voice Check (1 min):
TIME REMAINING: ~26 min

For each speaking task, you should click the Record button before speaking and speak for the entire duration. When speaking, try your best to avoid using word replacements or other strategies you typically may use to mask or reduce your stutter. Feel free to stutter freely while speaking.

Before we start, let's test your microphone. Click on the Record button below and say something out loud like "Testing 1, 2, 3". Recording will stop automatically after 5 seconds. Click Play to hear your recording. If you hear background noise, please go to a quieter place and try again by selecting Redo recording. If it sounds good, click Next above.
- Subject Records (5s)

Click "Next" below
Next

Testing Session (4 min x 6):
Baseline (no AAF mode), Unaltered, Whisper, Reverb, Harmonize, Final (no AAF mode)

For each speaking task, you should click the Record button before speaking and speak for the entire duration. When speaking, try your best to avoid using word replacements or other strategies you typically may use to mask or reduce your stutter. Feel free to stutter freely while speaking.

We will be asking you a set of open questions. For some questions, you may have the option to select the question you would most like to answer. For each task, record your voice using the Record feature. You will see a countdown and are required to speak for the ENTIRE time of the countdown. If you run out of content towards the prompt, please continue speaking until the countdown ends. Please be aware that researchers will be reviewing these recordings
- I am ready to begin

In this section, we will be testing the _____ mode.

On the device in which you are using Mumble Melody, please:
(1) Attach your headphones to your Apple device
(2) Wear your headphones
(3) Open the Mumble Melody app
(4) Select the "Modes" button
(5) Select the "_____" mode
(6) Test the mode by repeating a few words out loud (for example, "Testing 1, 2, 3") and adjust your volume until you comfortably can hear the mode being used.
If you would like to hear what this mode should sound like, here is a link to our demo beginning at this mode: _____

When you are able to hear the Mumble Melody mode, click Continue below.
- Continue

Which of the following two questions would you like to answer? Please think about your answer prior to clicking Record, and speak for the ENTIRE duration:
- Question 1: Subject Records (90s)
Which of the following two questions would you like to answer? Please think about your answer prior to clicking Record, and speak for the ENTIRE duration:
- Question 2: Subject Records (90s)

Submit Responses (1 min):
Thank you for completing the N testing session for this study!

When you are ready, click "Finish" to send us your results. If you have any issues at all, click the "Download" button on the sidebar to export a file with your submission and email us at mumblemelody@mit.edu so we can troubleshoot and get the files sent our way.

Please click "Finish" below to submit your responses. You can additionally click the "Download" button on sidebar if you wish to download a personal copy of your data.

Finish

INITIAL SURVEY:
The below survey will be provided.
An additional option to take the "Overall Assessment of the Speaker's Experience of Stuttering (OASES™)" will also be provided.

Questions:
1. What is your age? _____
2. What is your sex at birth?
    a. Female
    b. Male
3. What is your gender?
    a. Woman
    b. Man
    c. Trans woman
    d. Trans man
    e. Non-binary
    f. Prefer not to disclose
    g. Other, please specify

   i. Please specify your gender: _____
4. Is English your main spoken language?
  a. Yes
  b. No
   i. What is your main spoken language? _____
   ii. What is your proficiency in English?
    1. Basic: I know vocabulary words and am able to speak simple phrases or sentences, but I have some difficulty understanding native speakers.
    2. Conversational: I can ask and answer questions and participate in simple conversations on topics.
    3. Proficient: I am skilled in the language but am at a less-advanced level than a native or fluent speaker.
    4. Fluent: I have a high level of language proficiency in the language
5. Do you stutter? Or have you ever stuttered?
  a. Yes
  b. No
  c. Maybe
  d. Yes in the past but not anymore
  e. Other, please specify
   i. Please specify: _____
6. Do you currently have any other conditions that may affect speech, voice, or language?
  a. No
  b. Aphasia
  c. Amusia
  d. Apraxia
  e. Parkinson's disease
  f. Any language disorder
  g. Any learning disability
  h. Dyslexia
  i. Attention Deficit Hyperactivity Disorder (ADHD)
  j. Other, please specify
   i. Please specify: _____
7. If you answered yes to any of the previous conditions, how long have you had them?
  a. Since before 2 years old
  b. Since 2-5 years old
  c. Since 5-7 years old
  d. Since 7-10 years old
  e. Since 10-18 years old
  f. Since after 18 years old
  g. I don't know
8. Have you previously ever had any other conditions that may affect speech, voice, or language?
  a. No
  b. Aphasia
  c. Amusia
  d. Apraxia
  e. Parkinson's disease
  f. Any language disorder
  g. Any learning disability
  h. Dyslexia

       i.   Attention Deficit Hyperactivity Disorder (ADHD)
- j. Other, please specify
  - i. Please specify: _____
9. If you answered yes to any of the previous conditions, how long did you have them?
   a. Starting from before 2 years old
   b. Starting from 2-5 years old
   c. Starting from 5-7 years old
   d. Starting from 7-10 years old
   e. Starting from 10-18 years old
   f. Starting from after 18 years old
   g. I don't know
10. When did you start stuttering?
    a. Before 2 years old
    b. 2-5 years old
    c. 5-7 years old
    d. 7-10 years old
    e. 10-18 years old
    f. After 18 years old
    g. I don't know
11. How would you rate your fluency?
    a. Mild stutter
    b. Mild/moderate stutter
    c. Moderate stutter
    d. Moderate/Severe Stutter
    e. Severe stutter
12. What is your education level?
    a. No schooling completed
    b. Nursery school to 8th grade
    c. Some high school, no diploma
    d. High school graduate, diploma or equivalent (ex: GED)
    e. Some college credit, no degree
    f. Trade/technical/vocational training
    g. Associate's degree
    h. Bachelor's degree
    i. Master's degree
    j. Doctorate degree
13. What is your household composition?
    a. Single, never married
    b. Married or domestic partnership
    c. Widowed
    d. Divorced
    e. Separated
14. Are you right or left handed?
    a. Right handed
    b. Left Handed
    c. Ambidextrous
       i. If ambidextrous, what activities do you use each side for? _____
15. Have you ever been or are you currently going to speech therapy?
    a. Yes, currently
    b. Yes, in the past but not anymore
    c. Never

(a/b) Does your therapy focus more on accepting or reducing stuttering?
- Accepting
- Reducing
- Both
- Other, please specify
    - Please specify: _____
16. Do you stutter in your dreams?
    a. Never
    b. Rarely
    c. Occasionally
    d. Often
    e. Always
17. Does your inner voice/monologue stutter?
    a. Never
    b. Rarely
    c. Occasionally
    d. Often
    e. Always
18. Are there particular words or sounds for which you stutter more? _____
19. What are some instances in which you feel you stutter more?
    a. When talking with family
    b. When talking alone
    c. When reading out loud
    d. When talking to children
    e. When talking to pets
    f. When singing
    g. When talking with friends
    h. When talking with coworkers
    i. In social situations with strangers
    j. When talking to people of authority
    k. During interviews
    l. After having a couple of drinks
    m. When talking on the phone
    n. When talking on Zoom or another video call
    o. When talking in front of people
    p. When giving a presentation
    q. Other:
        i. Please specify: _____
20. What are some instances in which you feel you stutter less?
    a. When talking with family
    b. When talking alone
    c. When reading out loud
    d. When talking to children
    e. When talking to pets
    f. When singing
    g. When talking with friends
    h. When talking with coworkers
    i. In social situations with strangers
    j. When talking to people of authority
    k. During interviews
    l. After having a couple of drinks

m. When talking on the phone
n. When talking on Zoom or another video call
o. When talking in front of people
p. Other:
    i. Please specify: _____
21. Can you anticipate that you will stutter a short instant before stuttering?
a. Never
b. Rarely
c. Occasionally
d. Often
e. Always
22. How often do you use different words when you think you may stutter?
a. Never
b. Rarely
c. Occasionally
d. Often
e. Always
23. Do you have any other strategies to compensate for stuttering or to increase fluency? (i.e. choice of word, slowing down, whispering, preparation, pull-out, preparatory set, etc.?) _____
24. Do you try to hide your stuttering? In what ways? _____
25. Do you have relatives who stutter?
a. Yes
    i. If yes, how are you related to them? _____
b. No
c. I don't know
26. Do you sing or play a musical instrument?
a. Yes, I sing
b. Yes, I play a musical instrument
    i. What instrument do you play?
        1. Piano
        2. Recorder
        3. Guitar (classic, electric, folk, bass, etc.)
        4. Violin
        5. Percussion/drums
        6. Other:
            a. Please specify: _____
c. Yes, both
d. No
27. How many years of musical training do you have in singing?
a. None
b. Less than 1 year
c. 1-2 years
d. 2-5 years
e. 5-7 years
f. 7-10 years
g. Over 10 years
28. How many years of musical training do you have in playing a musical instrument?
a. None
b. Less than 1 year
c. 1-2 years

d. 2-5 years
e. 5-7 years
f. 7-10 years
g. Over 10 years

29. How often do you experience verbalized mental thoughts (rehearsing talking in your head?)
    a. All the time
    b. A few times an hour
    c. A few times a day
    d. Less than once a day
    e. Never

FINAL SURVEY:
The below survey will be provided.

Questions:
1. After using it for a month I felt like this app affected my way of speaking/my speech:
    a. Negatively
    b. Positively
    c. Neutrally (it did change my speech but not in a way that felt good or bad)
    d. It didn't affect my speech at all
    e. Other
2. If it affected your speech, please explain how it did so and why you think this effect is positive/negative/neutral: _____
3. I feel like this app can make a positive impact on my fluency over a matter of days.
    a. Strongly Disagree
    b. Disagree
    c. Neutral/Unsure
    d. Agree
    e. Strongly Agree
4. Please elaborate on why you feel this way: _____
5. I feel like this app can make a positive impact on my fluency over a matter of weeks.
    a. Strongly Disagree
    b. Disagree
    c. Neutral/Unsure
    d. Agree
    e. Strongly Agree
6. Please elaborate on why you feel this way: _____
7. I feel like this app can make a positive impact on my fluency over a matter of months.
    a. Strongly Disagree
    b. Disagree
    c. Neutral/Unsure
    d. Agree
    e. Strongly Agree
8. Please elaborate on why you feel this way: _____
9. I feel more confident in my speech after using this app for 1 month.
    a. Strongly Disagree
    b. Disagree
    c. Neutral/Unsure
    d. Agree
    e. Strongly Agree

10. Please elaborate on why you feel this way: _____
11. This tool in comparison to other assistive technologies that I have used in the past is:
    a. Much less effective
    b. Slightly less effective
    c. About the same
    d. Slightly more effective
    e. Much more effective
    f. Not applicable
12. Please describe any other assistive technology that you have used and explain why this tool is more or less helpful: ____
13. Do you have any comments on the app's interface? _____
14. Do you have any comments on the app's convenience? _____
15. Do you have any comments on the app's effect? _____
16. Do you have any comments on the app's influence on your stutter? _____
17. Do you have any comments on the app's influence on your interactions with others? _____
18. Outside of the testing sessions, which situations did you find that you used the app the most? ___
19. What situations do you think that the app could be used the most? ____
20. Which of these situations do you find that the app could be useful for people who stutter? (check all that apply)
    a. Zoom calls
    b. Conversations while hanging out with friends
    c. At the workplace in person
    d. At the workplace virtually
    e. At home with family
    f. Speaking by yourself for practice
    g. Speaking while reading out loud
21. Overall I feel this app made me..
    a. Stutter less
    b. Stutter more
    c. Initially made me stutter less and then stopped working
    d. Initially made me stutter more and then starting making me stutter less
    e. Stutter the same amount as I usually do
    f. None of the above
22. Please explain further if you would like: ___
23. Do you think this app could be useful for people who stutter in general?
    a. Yes
    b. No
    c. Maybe
24. Do you think the unaltered mode could be useful for people who stutter in general?
    a. Yes
    b. No
    c. Maybe
25. Do you think the whisper mode could be useful for people who stutter in general?
    a. Yes
    b. No
    c. Maybe
26. Do you think the reverb mode could be useful for people who stutter in general?
    a. Yes
    b. No
    c. Maybe

27. Do you think the harmonize mode could be useful for people who stutter in general?
    a. Yes
    b. No
    c. Maybe
28. What features of the app would prevent you from continuing to use it? _____
29. How could you see this app being used in the future? _____
30. What barriers do you foresee in others using this app? _____
31. Mumble Melody is still in early stages of development and we would appreciate any feedback or recommendations. Do you have any suggestions for how we can improve the app? _____
32. Is there anything else you would like us to know? _____