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Mealtime Assistant to Improve Eating Behavior of Children Using Magnetometer and Speech Recognition

PROBLEM & GOALS

"Children's problematic eating behavior is one of the biggest problems parents suffer from."



Observed in 80% of children with developmental disorders and in 20-50% of those without



40% of parents are stressed out by their children's mealtime behaviors

SOLUTION & DISCUSSION





We thank Hwajung Hong and members of ASSETS community. This work is supported in part by Korea Health Industry Development Institute, National Mental Health Center, and Seoul National University.

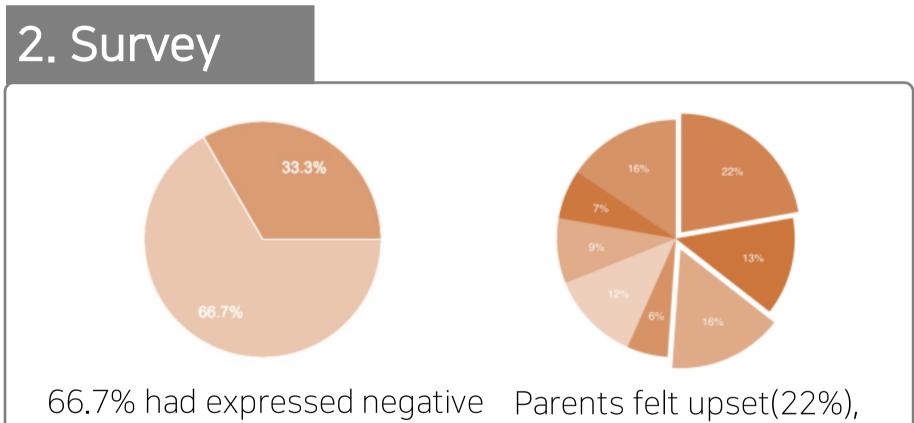


DESIGN PROCESS

. Expert Interview

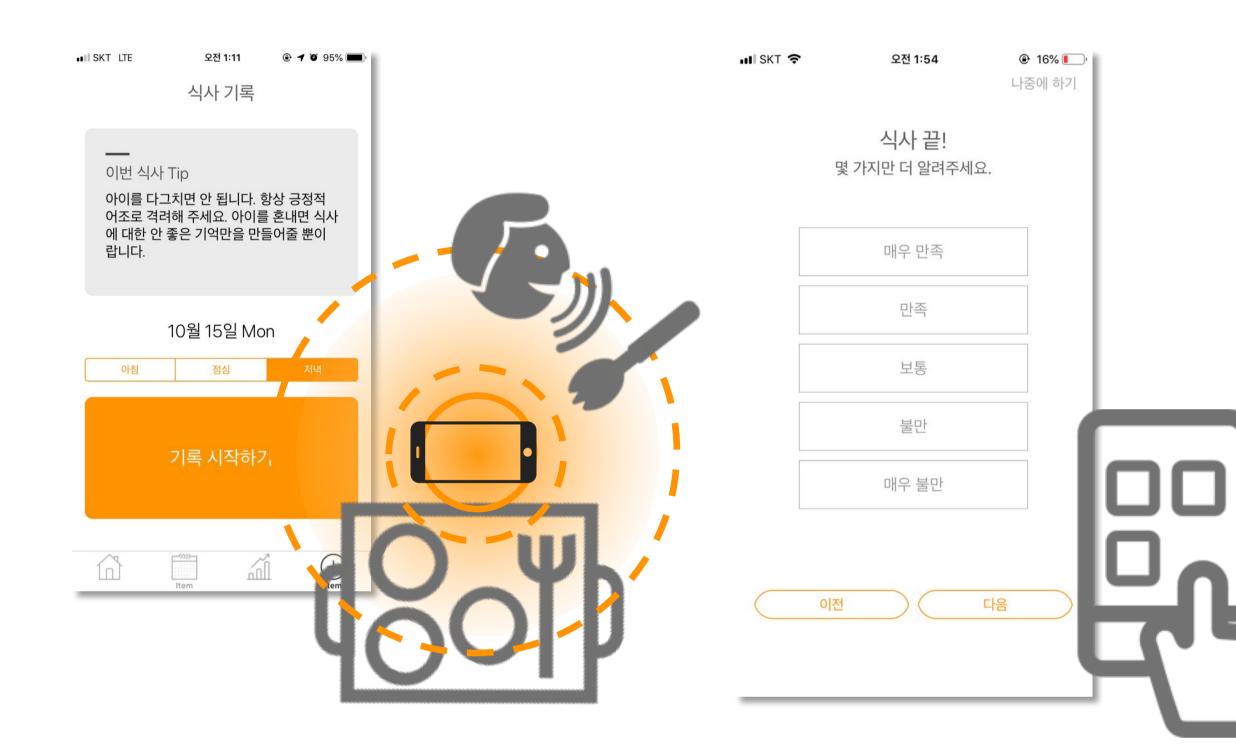
| No. | Job Title | Work Experience |
|---------|-----------------------|-----------------|
| Expert1 | Pediatrician | 22 (years) |
| Expert2 | Clinical psychologist | 29 |
| Expert3 | Psychiatrist | 20+ |

- We performed interview with **3 child eating** behavior experts
- Interview questions included major factors of \bullet mealtime habit formation



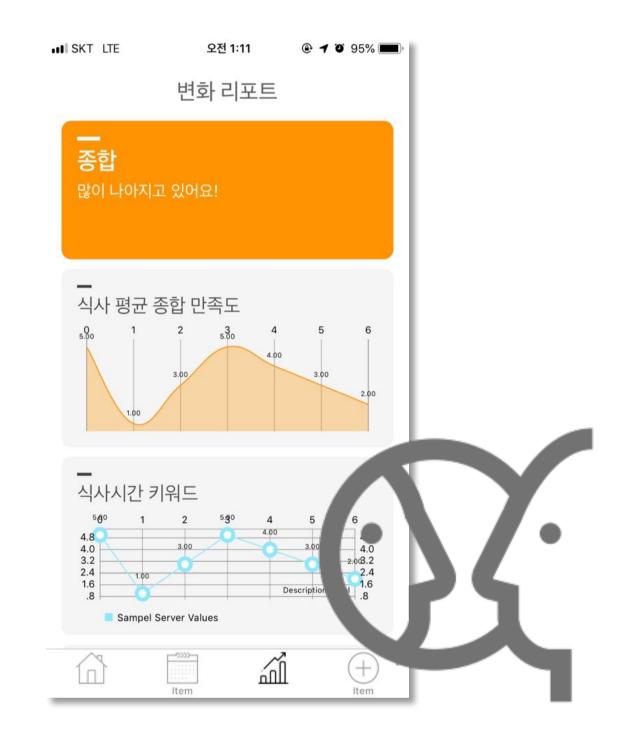
1. Noninvasive Tracking of Mealtime Data

During Mealtime



2. Self-reporting Data 3. Data-Assisted Collection Self-reflection After the Mealtime

Whenever & Wherever



feelings directly onto children anger(17%), and sad(13%)

- We surveyed 78 parents of children aging 1-6 \bullet
- Survey questions included 1) general information, 2) challenges, 3) behavioral patterns, and 4) sentiments regarding mealtimes with their children

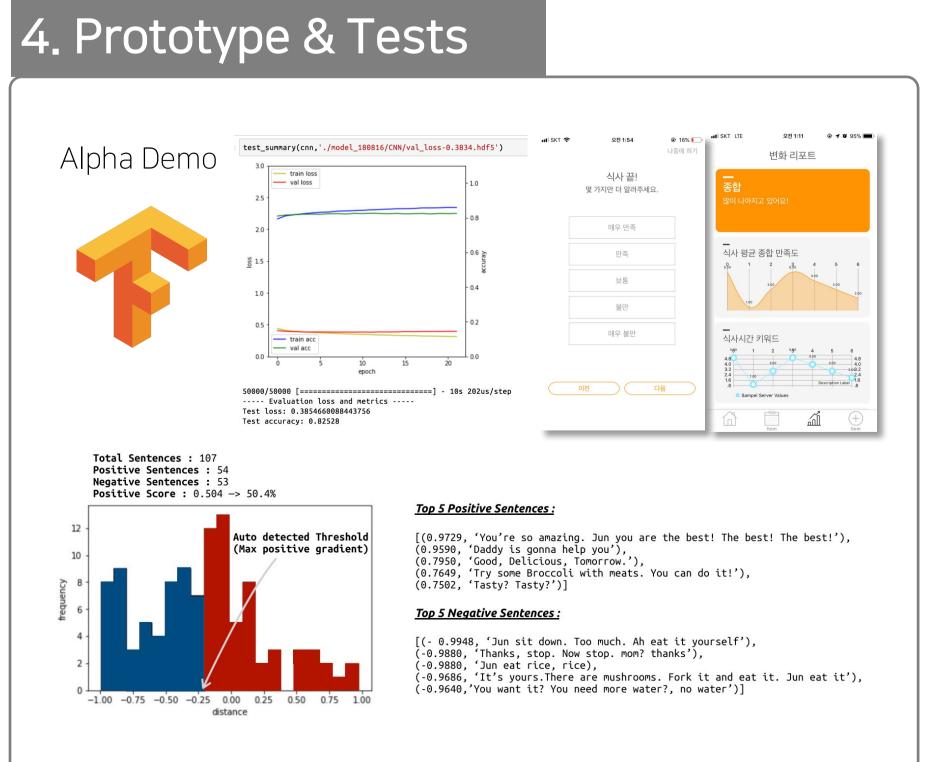
3. Findings

Critical factors of mealtime education

- Positive parent-child mealtime interaction
- Exclusion of all media distraction

Major challenges parents face

- Do not realize their own language habits
- Have to distract children to feed them
- Depressed and stressed out



- Smartphone magnetometer tracks child's intake of the 'challenge menu.'
- Smartphone microphone & *STT API* tracks parent's language habit.



- Short follow-up *questionnaire* is provided to...
- 1) validate data collected during mealtime
- 2) collect parent's satisfaction level and observation on the child, which cannot be tracked by sensors.
- Single-meal reports offer 1) brief encouraging summary of a meal and 2) visualization of quantified mealtime behaviors.
 - *Long-term reports* help parents review improvements on language habits and consumption of each 'challenge menu.'

DESIGN GUIDELINES

- Providing support and encouragement to parents 1
 - Parents were stressed out because
 - 1) the methods they were using were not effective.
 - 2) such methods harmed overall parent-child relationship.

Promoting parents' positive feedback 2.

- Based on design guidelines, we developed paper prototype, technical MVP, and an alpha demo.
- Alpha demo 1) examines language habits with deep-learning model and 2) runs on iOS.

- Parents' mealtime attitude towards children can be a critical factor of forming children's eating habits.
- However, over 60% of survey respondents said they had expressed negative feelings (e.g. • anger) on their children during mealtime.

Restricting sensory stimuli during mealtime 3.

- Existing solutions often use smartphones or tablets to distract children. •
- However, experts claim that children should not be exposed to external media, such as handheld screen.

EXPECTED EFFECT

- Improve parent-child mealtime interaction and their relationship
- Relieve parents' stress
- Promote healthier eating habits of children