HUMAN INTERACTION WITH VOICE-ASSISTANT AGENTS

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INTRODUCTION
PROBLEM DEFINITION

Creating a way to get high quality recordings of conversations to therapists and clinicians

Allowing them to more easily encode parenting manuals, including DPICS

Which will in turn will help prevent mental health issues developing in young people

DPICS = DYADIC PARENT-CHILD INTERACTION CODING SYSTEM

INTRODUCTION
AIMS AND OBJECTIVES

Information gathered must be useful for those analysing the conversations.

Must correctly identify when a specific type of conversation is occurring.

Anchor points be unique enough, so that those dissecting information are not overloaded with data.

Device must be in range of ‘good’ quality conversations.

Be placed in the home and be accepted as ‘part of the furniture’ and not be too intrusive on the home dynamic, so the conversations recorded reflect the real atmosphere in the house.

Must consider data protections laws.

INTRODUCTION
MOTIVATION

Current techniques are limited in quality of conversation that they are detecting

Many techniques still use in-lab experiments

Creating a device that captures conversations in a home environment that is less likely to influence participants actions

Limited research into links between SSP and DPICS

INTRODUCTION: BACKGROUND

- Many psychological studies into importance of parent-child interactions
- Approximately 1 in 4 people in the UK will experience a mental health problem each year (NHS, 2007)
- Prevention better than treatment
- Little amount of technology based products aimed at preventing mental health illnesses
- Work with antecedent and ensuing recording, but none focused on detecting mental health issues
- Social Signal Processing = future possibilities

NHS. (2007). ADULT PSYCHIATRIC MORBIDITY IN ENGLAND - 2007, RESULTS OF A HOUSEHOLD SURVEY. RETRIEVED FROM NHS DIGITAL: HTTPS://DIGITAL.NHS.UK/DATA-AND-INFORMATION/PUBLICATIONS/STATISTICAL/ADULT-PSYCHIATRIC-MORBIDITY-SURVEY/ADULT-PSYCHIATRIC-MORBIDITY-IN-ENGLAND-2007-RESULTS-OF-A-HOUSEHOLD-SURVEY

INTRODUCTION
DIFFICULTIES

- Correctly identifying a conflict with just audio
- Capturing information that is useful for clinicians
- Creating a device placed in-home without affecting participant's behaviour
- Getting participants & Testing

MAIN BODY ACHIEVEMENTS

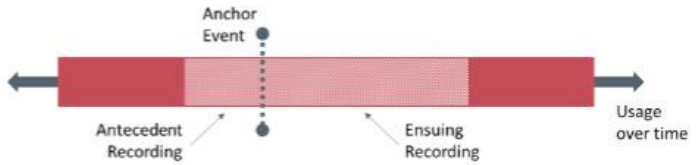


Figure 1 - Visualisation of antecedent and ensuing recording

RaspberryPi

Dropbox

- Created a system that is able to detect when shouting or an increased decibel level
- Created a system capable of recording antecedent and ensuing conversations surrounding a particular anchor point
- Exported said system to a medium that has potential to be placed inconspicuously in the home
- Uploaded files to a shared Dropbox space

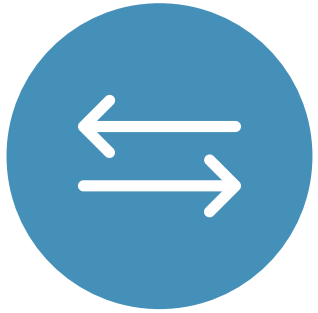
MAIN BODY
RESULTS (PRELIMINARY)

TESTING CARRIED OUT WITH PEOPLE IN OWN NETWORK DUE TO TIME RESTRICTIONS

SYSTEM WAS ABLE TO EXECUTE ALL FUNCTIONALITY

NO EVIDENCE FOR HOW EFFECTIVE SYSTEM IS IN THERAPY SESSIONS

MAIN BODY CONTRIBUTIONS



Comparisons between DPICS and SSP

Created device capable of bringing more concise and useful information to therapy sessions

SSP = SOCIAL SIGNAL PROCESSING

MAIN BODY
DEMONSTRATION

1. System can be activated by loud noise / shouting
    a) Subsequently showing device can save the file to local drive with date and time
2. System can continue recording the conversation if more voices are heard
3. System can record up to 5 seconds of conversation before shouting heard
    a) Include initial 5 seconds to recording
    b) Discarding initial 5 seconds if no shouting heard
4. Files uploaded to Dropbox space
5. Demonstration without screen/keyboard/mouse attached

CONCLUSIONS

- Created device that is placed at pre-treatment
- Device can correctly identify when certain types of conflict arise and records said conflicts
- Recordings have potential to be used in therapy sessions to identify poor parental techniques
- Have made initial comparisons between emerging technologies in SSP and techniques outlined in DPICS