Splash: Speech and Language Assessment in Schools and Homes

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Abstract

This paper presents a tablet-based app for Speech and Language Assessment in Schools and Homes (Splash) to provide a first screening for young children aged 4-6 years to assess their speech and language skills. The app aims to be easy-to-administer with an adult, such as a teacher or parent, directing the child through the tasks. There are 3 games which encourage children to make meaningful contrasts in words, for example word corresponding to a picture of an item. The emphasis is on collecting the sounds that the child produces. For example, word initial sounds e.g. /b/ in “banana” (Figure 3), /k/ in “cat”, and consonant cluster sounds e.g. /pl/ in “plate”, /g tr/ in “green”.

1. Introduction

The Speech and Language Assessment in Schools and Homes (Splash) app is motivated by the desire to detect children who may be at risk of speech and language difficulties early so they can get help. There are insufficient speech and language therapists to assess all children in the UK so Splash is aiming to act as a screening app for use at schools. The app aims to be easy-to-administer with a parent or other adult directing the child through the tasks. Three fun games have been developed to assess receptive language, expressive language and connected speech, respectively. Currently in proof-of-concept mode, when complete Splash will use automatic spoken language processing to give an instant estimate of a child’s communication ability and provide guidance on whether to speak specialist support. While not a diagnostic tool, the aim is for Splash to be used to provide immediate reassurance or direction to concerned parents, guardians or teachers as it can be administered by anyone, anywhere.

Index Terms: speech disorders, screening app

2. App modules

The Splash app will consist of the following modules initially:

1. Overview: introduction, who we are, basic terminology, scientific motivation and validity
2. Registration: collect information about child
3. Receptive Test: comprehension assessment
4. Expressive Test: speech sound production assessment
5. Connected Speech Test: connected speaking assessment

In the proof of concept stage the app finishes by thanking participants for taking part. When the assessment has been automated a Results Feedback stage will be added which will present information to the supervising adult on how the child has performed and whether further action should be taken.

The app is planned to be used on a tablet but as it has been implemented as a web application it is relatively device neutral.

2.1. Receptive Test

The Receptive Test checks a child’s comprehension. To test their sentence comprehension they are shown a set of 4 pictures and have to choose the correct one. For example “A small basket is full of apples” with Figure 2. In the second part of the test a single word will be played to test their word or vocabulary comprehension.

2.2. Expressive Test

The aim of the Expressive Test is to elicit a range of different speech sounds from the child. They are asked to produce a single word corresponding to a picture of an item. The emphasis is on collecting the sounds that the child produces. For example, word initial sounds e.g. /b/ in “banana” (Figure 3), /k/ in “cat”, and consonant cluster sounds e.g. /pl/ in “plate”, /g tr/ in “green”.

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2.3. Connected Speech

The child is shown a complex scenario-based picture such as in Figure 4. They are asked to describe the picture in as much detail as possible. To encourage the child, the adult can direct the child for example, to describe what each animal is doing, or how the animals are feeling. The adult might ask the child to describe the colours, foods and animals they can see. There are 5 pictures the child can choose from. To get sufficient data to assess the child’s speech they will need to talk for a minimum of 250 syllables [6]. The App will aim to let the adult and child know when they have provided enough speech.

3. Conclusions

This paper has presented an app, Splash, designed to allow easy-to-administer screening of young children aged 4-6 years for speech and language disorders. The app is in proof-of-concept mode and can be used for data collection and offline assessment. In the future automatic spoken language processing running in the cloud will be added to provide instant information and feedback to parents, guardians and/or teachers.

4. Acknowledgements

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5. References