

## 1. First and Last Name(s), Organization of author/group of authors \*

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## 3. Could you briefly describe the research project(s) relevant to this workshop and that you'd want to share? (overall timeline, methodology, children involved)

Background Evidence suggests that almost ten percent of primary school-aged children present with a language disorder. In England alone, this could be characterised in up to a quarter of a million children by a vocabulary difficulty restricting the ability to find the words to express wants, needs and ideas. Around a third to half of these children may have co-occurring wellbeing issues resulting from problems with emotional, psychological and/or social aspects of behaviour. Without specialist help, issues can escalate and persist into adulthood. Despite this, there is little research simultaneously considering impact of support provisions on language and wellbeing. This is likely due to low awareness across health, education and social care of the co-morbidity leading to poor multidisciplinary collaboration during both intervention and research design. Intervention studies showing greatest potential for improving vocabulary with some mention of behaviour gains are those employing word-webs i.e. diagrams resembling mind-maps for organising sound and meaning information and those delivered on mobile tablets. Whilst both approaches support multi-sensory learning, as preferred by children with language disorder, there are no therapies combining techniques by using interactive digital word-webs to search, record and store information. Aims This project aims through service-user co-design to develop and test the feasibility of a digitally-enhanced vocabulary intervention and explore tools for

measuring impact on language and wellbeing. Study objectives and methods (time frames are TBC depending on wider COVID19 response) 1. Review intervention studies with primary school-aged participants employing vocabulary and wellbeing outcome measures (9 months: Jan 20–Sept 21). Systematic review to compare effectiveness of existing interventions & identify outcome measures used. 2. Co-create a research website aimed at the general public by working with young people aged 9-18 years from diverse backgrounds including those with language disorder (6 months: May 2020-Oct 2020) Explore and implement remote engagement methods to enable young people to design the research website. 3. Create intervention protocol using logic modelling (1 month: Sept 20) Use systematic review findings to inform core components of the novel intervention. 4. Develop intervention software with service-users (10 months: Oct 20-July 21) Run co-design workshops involving children aged 9-10 years with a language disorder 5. Refine intervention with stakeholders (11 months: Oct 20-Aug 21) Analyse feedback from parents, academics & practitioners from health, education & social care and use to improve the intervention. 6. Plan and implement feasibility study (15 months: Aug 21-Oct 22) Two-arm trial involving children aged 7-8 years with a language disorder allocated randomly to 6-weeks digital (n=12) or paper-based (n=12) vocabulary intervention delivered by Speech and Language Therapists. Collect data to investigate:

- Process evaluation:
  - o Reach (recruitment/compliance/follow-up rates),
  - o Fidelity,
  - o Impact of delivery mode (digital/paper-based).
- Intervention outcome measures:
  - o Primary vocabulary and secondary behaviour measures analysed at pre-intervention, postintervention and 6-week follow-up for sensitivity to and direction of change.
  - o Primary outcomes to guide sample-size estimates for subsequent randomised controlled trial.

Impact and dissemination Project outputs will encourage multidisciplinary management of co-occurring language and wellbeing needs: provide a model of co-designing with service-users give a clear route for future work evaluating intervention impact and cost-effectiveness. Dissemination will be through website and social media channels; community/public-service meetings in conjunction with the Project Steering Group (parents and professionals); peer-reviewed journal publications and presentations at professional events.

#### 4. If you have already published about this(ese) project(s), what types of contributions have you made?

- Artifact-centered
- Methodological
- Design space/Implications (intermediate-level design knowledge)
- User-study
- Theoretical implications/frameworks
- Documents to improve practices of people working with the children (social workers, educators, therapists, teachers...)

Patent

Other

5. Which type of venues have you published/are you planning to publish in?

HCI

Non-HCI

Both

6. If you have published/are planning to publish in non-HCI venues, what kind of fields did you aim to contribute to?

Digital Health, Speech and Language Therapy Practice, Education

7. What kind of insights do you think research with marginalised children bring to the field of Children-Computer Interaction?

For tech solutions to truly address the needs of all children, the design process has to actively involve children from as diverse backgrounds as possible including in terms of cognitive/physical ability, socioeconomic status, race, culture and gender preferences. Not doing so runs the risks of creating products that are only accessible to some children and not others leading to bias and inequalities. On the flip side, an inclusive design approach means that a larger section of the population is likely to engage with products thus reaping greater benefits for all. Research insights are crucial for supporting an inclusive design approach. Studies that compare and explore approaches for involving marginalised children in tech design can provide specific, practical steps that can be replicated and adopted widely allowing inclusive approaches to become the norm. Furthermore, research can provide marginalised children with a voice to express their wants, needs and preferences which can garner understanding and empathy from industries thus motivating them to adopt an inclusive approach.

8. Are there challenges you have experienced / are experiencing regarding formulating the contributions of your research?

There are a few challenges I have encountered during my research: >The dearth of existing research/researchers in this field makes it difficult to identify best practice, models to base own research on or an established peer group that can be accessed for mutual support and guidance. >The very fact that the research involves marginalised children means that extra time and cost considerations are required when planning the research. My research involves working with children who have language and learning difficulties in conjunction with their school which is located in an area of high socioeconomic need and where for the majority of families English is an additional language. Factors to consider include the need for coordinating demands on the children's time due to multiple education, health and social professionals being involved, need for interpreters in order to engage and liaise with families – this also has implications for gaining consent, issues with reimbursement as can impact on benefits that parents/carers are receiving, travel issues restricting where research can be done (families generally reliant on public transport). > There are a large number of factors to consider when applying for ethical approval for research as the population is vulnerable because of their age, additional learning needs and language-barrier that is common with parents/carers - thus makes gaining ethical approval a long complex process. Furthermore, recruitment is through NHS caseloads meaning ethics reviewers may be from medical backgrounds despite the research being more behavioural and social in nature.

9. In terms of workshop organizing, what type of participation modalities would you prefer?

- Primarily a synchronous discussion (skype, zoom etc) of challenges, recommendations, and your research, supported by shared documents
- Primarily an asynchronous discussion (slack, discord) of challenges, recommendations, and your research, with synchronous moments to meet and network (such as virtual coffee breaks)
- A publication of all submissions based on this form as workshop contributions online
- No publication of these submissions
- Write-up of a summary of all submissions by the organizers on the website and on social media
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