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)

> At the beginning of 2018, we tested one sonic e-textile tangible interface, named Mazi, with a group of five children (1 girl, 4 boys) aged 6 to 9 attending a SEN school in the UK who liked music, against its benefits for social playful activities between autistic peers and for self-regulation because children's sensory processing abilities seem correlated to their level of participation in leisure activities. Hence it was important for us to develop a design strategy that addressed these points. The first phase of the study informed the design of Mazi. We observed children during school hours, collected information about them, interviewed school's experts i.e. occupational therapist, dance teacher (who facilitated the sessions of our study), the class teachers, the TAs and met with the parents of the participating children. Inspired by the children's likes we developed a semi-spherical (W700 x D400mm) TUI called Mazi. We aimed to address some of the challenges experienced by the children by a) exploiting the O-space paradigm, an imaginary space whereby social arrangements facilitate interactions, and b) findings from the literature that support the benefits of using soft haptic feedback (i.e. because it's preferred by some autistic children and/or because soft materials seem to decrease the sense of uncertainty), deep-pressure (because it has a calming effect) and music (i.e. to decrease anxiety levels and manage moods). We also focused our design on the concept of shareability. Mazi allows people to play up to five sounds polyphonically and was designed with entry and access points in

mind: the former represented by the shape of the piece, the type of interaction it offers and the colors used; and the latter denoted by characteristics such as the disposition of the colored bubbles, the polyphony of the instrument and its affordance. The study proper spanned over 5 weeks, on Thursday afternoon (30 mins c.a. per session) between April-May 2018 in the Dance Studio of the school. The design process was constructed to align with the scholastic curriculum with semi-structured sessions and an open-ended activity to enable children to do what they wanted most. We kept the same level of support that children received during school hours: two were accompanied by one TA (2:1); the other three were accompanied by one TA each (1:1). We adopted a user-centered design borrowing values from experience and ludic design (i.e. designing for pleasure and ambiguity) and welcomed some lateral co-design practices especially in regards to finessing the plans and the design of the TUI. We developed an evaluation framework, inspired by evidence-based practices i.e. SCERTS (some of the key areas tracked within the Social Communication domain of the Joint Attention section of the SCERTS), and the school's assessment measures. We extrapolated five main topics or themes and used them to track the children's experiences. The dance teacher and each TA weekly filled a tracking sheet independently (in relation to the five themes) by following a 5 point rating system already used at the school; and by giving more qualitative feedback in writing. We evaluated Mazi using a mix of data including pre/post-study interviews, children's documents, field notes, teachers' written feedback, and the annotations of the video analysis carried out using ELAN. Starting from a set of five themes (theory-driven) we then expanded the video analysis to include other recurring aspects that we thought contributed to a more in-depth analysis. The final evaluation contained 7 themes and several sub-themes (i.e frequency of behaviors, level of prompts, types of emotions, level of interest, rates of occurrences etc): T1 Look interested in the presentation of Olly (Attention Autism inspired) T2 Approach Olly with confidence T3 Pull to activate sounds T4 Play notes together with peers or partner T5 Show use of Olly for else than playing sound T6 Share emotions T7 Share attention

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?

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

We would like to think that by conducting research with marginalised children we expand the CCI design space to be more inclusive, accessible, perhaps more vulnerable but surely more sensitive to the diverse needs and goals of marginalised children. Research into marginalised children it's important for the society overall. As the most marginalised children have often more complex needs than the rest of society, by designing for them we speak to every child. This is done by addressing and responding to the diverse needs of a broad spectrum of needs and children through lowering the barrier of access and increasing participation. The aim is that of embracing and encourage diversity by designing technologies that promote social integration (instead of social exclusion) and contribute to creating mutual understanding and social inclusion. By designing for marginalised children we reduce the inequality created by technologies and extend the design space to be more appealing to everyone. We believe that what works for people with special needs is applicable across society and lack of access to basic services and research place children of all abilities, gender, religion, status etc. at risk of being marginalised.

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

Yes, it's difficult to formulate a clear idea or a supportive argument about why we think it's important to take a holistic view to design for i.e. children with autism. It's challenging to highlight the importance of the broader ecology in which the technological systems are deployed in i.e. the context, the environment, the people that facilitate the research as well as the people that support the children during the research, without nulling the validity of the tech itself. In our work, we tend to consider the technological artefacts as part of a broader context where flexible dynamics coexist between children, technology, and the environment that sustain and provide this child-computer interaction. Furthermore, we consider the level of knowledge, experience, and investment that a researcher can bring to the outcome of the research of extreme importance. Researchers are often far too removed from the lived experiences of the children they work with, and this can have a great impact on the overall research experience of the children (and stakeholders) but also on the evaluation of the findings. Children with autism often behave atypically but nonetheless they clearly express their emotional states. When collaborating with this population, especially with non-verbal children, researchers might often find themselves looking at nuanced changes in communication often perceived through behavioral cues. If a researcher is not attuned with the children's lives and with the various ways they manifest their emotional states it is obvious that this lack of knowledge will impact research outcomes as well as the children's experiences. Hence, it's important that researchers develop appropriate assessment and evaluative skills beforehand. In our humble opinion, we would always suggest researchers gain previous knowledge and or experience of the population of children they would like to collaborate with. We acknowledge that every child is different, however gaining experience with a varied group of individuals, will enable the researcher to develop a sensitivity towards the children that they want to work with which they might otherwise lack. Furthermore, the variety of evaluation methods, strategies, and approaches used in different contexts like schools, homes, hospitals, etc.. might also encourage researchers to make use of appropriate strategies and evidence-based assessment measures and contribute to the development of more comprehensive guidelines that could potentially be used across the CCI field. Lastly, it's also problematic to explain the importance of developing and nourishing relationships (including a high degree of trust) not just with the children we work with but also with the people within the institutions/environments/families we collaborate with i.e. teachers, families, therapists, social services, doctors, psychologists, clinicians etc. However, we are aware that the academic constraints we work within, do not allow much time for developing and nourishing deep human relationship. Hence it's sometimes difficult to make intermediate-level contributions that are feasible and replicable because it's difficult to explain how this balance can be achieved within the academic timeframe we all work in. We believe that these implications are fundamental in shaping children's experiences and the outcomes of our researches.

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

☐ | Other |