Preventing psychosis relapse through crosslinguistic prediction models

June 24th-June 28th, 2024

Lorentz Center@Oort

Organization

Our workshop *"Preventing psychosis relapse through crosslinguistic prediction models"* was hybrid, with mostly onsite and some online attendees from several countries. The activities included pre-determined keynote lectures, thematic plenary discussion sessions, a demonstration and feedback session of a smartphone-based app currently in development, and *ad hoc* short presentations born from the activities and needs of the workshop.

Scientific

Our workshop was devoted to present and discuss current international scientific advances related to the development of AI-based statistical models that use speech and computationally derived linguistic features to prospectively predict psychosis relapse, while framing these efforts in the context of multidisciplinary research on multilingualism, cognitive neurosciences, computational sciences, and psychiatry. We addressed 4 main aims: **a)** to assess the validity and reliability of speech-derived features to prospectively predict psychosis relapse; **b)** to test the generalizability of speech-derived features across multiple languages when prospectively predicting psychosis relapse; **c)** to map the requirements of designing, developing, and implementing a remote monitoring system based on speech-derived features to prospectively predict psychosis relapse; and **d)** to identify challenges and solutions related to carrying out an international randomized control trial to test the clinical value of speech-derived features in prospectively predicting psychosis relapse.

Tangible outcome(s)

- A dedicated GitHub feedback group was formed. These people, including translators, will work to further the technical development in different languages of the speech-based smartphone application that is meant to predict psychosis relapse.
- A variation in defining psychosis relapse was identified, which helped to determine relevant definitions that will be workable in an international randomized clinical trial in this field.
- Baseline measures needed to use individual longitudinal data to predict relapse were identified, both for speech and other variables such as sleep, medication and drug use.
- Advancements (although not finalized) were made regarding the task design to best capture symptoms of relapse in speech remotely (e.g. story recall or picture description with ambiguous images and stories).
- A plan was made for a 52-day pilot study with attendees with the speech-based app.

Scientific breakthrough

- It was shown that acoustic speech measures are stable over time, making them suitable measures for longitudinal speech analysis in relation to psychosis relapse.
- Since it is known that psychiatric clinical judgement is noisy (i.e., vulnerable to variability in decisions by different clinicians), it was recognized that a stable clinical decision support system model could reduce this variability, even when prior measures are not entirely elucidated yet. After running a trial, the model performance could grow by identifying the features that contributed most to predict psychosis relapse.

“Aha” moments

- From Merel Keizer’s talk, there was an interdisciplinary insight: a probable good marker for psychosis relapse for non-native speakers/migrants might be code switching prevalence.
- From a user-friendliness perspective, using a picture description task is received as relieving and not boring, whereas some other tasks may be so. This is important for adherence!
- From Kenneth Hugdahl's talk, there was a neuroscience insight: hypo-frontality (reduced activation in prefrontal cortex) has been found in schizophrenia. Yet, it may be not hypo-frontality per se, but the ability to regulate/modulate inter network dynamics when environmental conditions change, what is impaired.

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