

Exploring trans-diagnostic patterns of musical preferences, reward and behaviour to understand heterogeneity and complexity across neurotypes

This project explores musical preferences and behaviour in adults with varying traits of Autism and Attention Deficit Hyperactivity Disorder (ADHD) through neurodiversity-affirmative and trans-diagnostic perspectives. Autism and ADHD are associated with differences in attention, working memory, executive function, sensory sensitivities and social cognition. These neurotypes also tend to exhibit distinct perceptual processing in the auditory domain, idiosyncratic music use, and music-related reward experiences. By adopting a dimensional trans-diagnostic approach (Astle et al., 2022), the study aims to capture heterogeneity and overlap across neurotypes by deriving data-driven groups based on shared cognitive traits rather than traditional diagnostic categories. This method accommodates individual complexities and idiosyncrasies, avoiding a-priori binary categorisations and assumptions of “typical” listeners. A large sample of participants (N>600) has been recruited. Using unsupervised machine learning, diagnosis-agnostic clusters have been identified in multidimensional cognitive space. Then, the predictive validity of these groups is examined in the context of music. The analysis explores a wide range of music-related behaviour and preferences. More specifically, what types of reward people experience from music, the adaptive functions that music serves in their daily life, the emotions elicited by music in listeners, active engagement with music, perceptual abilities and auditory sensitivity, multi-sensory experiences such as synaesthesia, individual differences in the types of music preferred. Preliminary results suggest that data-driven groups may capture more individual differences in cognitive and musical profiles than diagnoses alone. These findings highlight the need for further research into the unique ways in which different neurotypes experience and engage with music in everyday life. Future work will employ naturalistic listening paradigms, EEG brain recordings, and computational models of musical expectation to investigate reward, emotion, and curiosity in greater depth.