“An automated, multi-modal tool for quantifying the autism phenotype”

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To advance knowledge about the causes of autism as well as how best to treat symptoms of autism, it is critical to have objective, quantitative measures of the behavioral phenotype alongside a better understanding of the genetic and biologic underpinnings of these diseases. The goal of this proposal is to develop a sensitive, automated tool that captures developmentally trackable behaviors relevant to ASD and provides quantitative measures of the autism phenotype. Toward this end, we propose to develop and validate a novel measurement tool, the Multi-modal Autism Phenotype Snapshot (MAPS). If successful, we will have developed a novel measure that has demonstrated validity for measuring ASD-specific impairments that co-vary with severity of ASD symptoms. The MAPS stimuli and algorithms we develop in this project will lay the foundation for important future steps such as creating multiple parallel versions for repeated assessments, expanding the age range and evaluating developmental change, and ultimately enabling in-home assessment. The current proposal is also part of a larger vision, whose goal is to obtain a large center or program project (U54/P50) aimed at understanding the associations between atypical brain development and genetic risk with core deficits in autism by identifying mechanisms that relate genes to brain functioning and brain functioning to behavior. This proposal, therefore, represents the "missing link" by advancing our ability to link the observable and objectively measured autism phenotype to underlying biological and neurological mechanisms.