



ADAPTIVE TESTING TECHNOLOGIES



THE K-CAT™

A New Paradigm for Screening and Measurement-Based
Care in Youth

For additional information, please visit our website at www.adaptivetestingtechnologies.com,
send an email to info@adaptivetestingtechnologies.com, or call us at (312) 878-6490 ext. 303.

At least half of youths with mental disorders are unrecognized and untreated. Rapid, accurate assessment of child mental disorders could facilitate identification and referral and potentially reduce the occurrence of functional disability that stems from early-onset mental disorders. Child psychopathology screening and measurement has been based primarily on subjective judgment and classical test theory. Typically, impairment level is determined by a total score requiring that all respondents be administered the same items. This traditional approach weighs equally the responses to items such as “Do you feel sad?” and “Do you feel like everyone would be better off if you were dead?” Clearly, this approach is far from optimal. An alternative to full scale administration is adaptive testing in which different individuals may receive differently symptom items that are targeted to their specific impairment level.

What is the K-CAT™? The K-CAT™ is a suite of 10 computer adaptive tests (CAT) that represents a fundamental scientific breakthrough in child psychopathology screening and measurement based on the combination of child self-report and parent ratings of the child. Its applications in mental health measurement are widespread and can lead to dramatic savings for our healthcare system based on identifying high utilizers of physical healthcare services and providing a stepped care approach to treatment. The K-CAT™ can identify youth ages 7 to 17 with a wide array of mental health disorders and concomitant high risk of suicide leading to the saving of human life. The K-CAT™ was developed by Adaptive Testing Technologies, a leader in the design, testing, and implementation of large-scale mental health adaptive testing systems. Our tools have been validated against semi-structured research interviews and published in top-tier peer-reviewed journals such as JAACAP.

How does the K-CAT™ work? The K-CAT™ is based on multidimensional item response theory (MIRT). Within computer adaptive testing (CAT), individuals’ initial item responses are used to determine a provisional estimate of their standing on the measured trait to be used for subsequent item selection. Based on MIRT procedures, estimates of items (e.g. difficulty, discrimination) and individuals (e.g., severity of depression) can be obtained to more efficiently identify suitable item subsets for each individual. MIRT weighs more severe items more heavily than less severe items in deriving a test score. MIRT also provides an estimate of uncertainty that can be used to assess the significance of change. The K-CAT™ adaptively selects a small set of items from a large bank of approximately 1,060 items. Instead of fixing the items and allowing the precision of measurement to vary, we fix the precision of measurement and allow the items to vary. The result is a dramatic increase in the precision of measurement with the same and in some cases even lower burden of measurement for the patient and the complete elimination of clinician burden.

What K-CAT™ modules are available? The K-CAT™ is a suite of child and adolescent CATs for depression, anxiety, mania/hypomania, suicidality, ADHD, conduct disorder (CD), and oppositional defiant disorder (ODD). These modules rapidly and accurately assess child psychopathology dimensions based on parent and child ratings of 1,060 items each. Average completion times for the child and parent are 7.56 and 5.03 minutes, respectively, with an average of 7 items per domain.

What are the advantages of the K-CAT™? We can dramatically increase precision while eliminating clinician burden and minimizing subject burden. The K-CAT™ provides constant precision of measurement throughout the entire severity continuum for any disorder that we measure. The adaptive nature of the K-CAT™ targets a patient’s specific level of severity at that point in time. The K-CAT™ is ideal for longitudinal assessments essential for measurement-based care. The K-CAT™ is cloud-based and scalable to any size population via a HIPAA secure Amazon Web Services (AWS) platform, meaning patients can be screened, measured, and monitored in or out of the clinic.

What are the potential applications of the K-CAT™? The K-CAT™ is ideal for a variety of clinical settings. In specialty mental health care, our tools help conserve clinician assessment time and prove useful for ongoing monitoring of treatment response. Our tools are also ideal for clinical research by facilitating the recruitment of a large number of potential participants for phenotypic characterization and for pragmatic clinical trials. The K-CAT™ could be used to identify patients who may need specialty care and/or hospitalization. Finally, our tools could be used to develop clinician support tools that could help formulate recommendations that best fit patient needs.

Can you integrate with the Electronic Health Record? We have fully integrated the CAT-MH™, the adult version of the K-CAT™, into the Epic EHR at the University of Chicago and developed clinical workflows designed around their integration. This enables screening and measurement in the clinic using computers, and remote screening and assessment via the patient portal, with results immediately displayed in the EHR.