A Revised M-CHAT

A paper by Robins et al. appeared in the January 2014 issue of the journal *Pediatrics*, reporting the first published data for a revised version of the *Modified Checklist for Autism in Toddlers* (M-CHAT) screening instrument and follow-up interview. In this commentary, we examine the new version and consider the contribution it makes to the autism screening enterprise.

The original M-CHAT is a parent-report screening instrument that has been in use for over a decade and has become the most widely used screening device in the US. The instrument was introduced by Robins et al. (2001) as an extension of *The Checklist for Autism in Toddlers* (CHAT; Baron-Cohen, Allen, & Gillberg, 1992), in recognition of the fact that adoption of the CHAT in the US was severely curtailed by the demand it placed on health care professionals’ time.

The M-CHAT had 23 items and could be completed by a parent in just a few minutes. It had a reading level of approximate sixth grade and was intended to be used in primary care settings for routine screening. A companion interview instrument was designed for administration as a 5-15 minute follow-up (telephone) contact with parents of children who screened “positive” for autism and was found to improve specificity (i.e., reduce false positives).

The revised version, the *Modified Checklist for Autism in Toddlers, Revised With Follow-up* (M-CHAT-R/F) consists of 20 “yes/no” questions and is said to require less than five minutes to complete; as before, parents of children who screen “positive” are engaged in a follow-up interview with a health care professional.

... the actual screening performance of the M-CHAT-R/F does not appear to be much different than the original version, provided the follow-up interview is used as directed, and there is little urgency to replace the use of the original M-CHAT with the revised version.

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professional, requiring an additional 5-10 minutes. Like the original, the M-CHAT-R/F is intended for use at a child’s 18-month and 24-months well-child visit to a primary care provider.

Changes in the M-CHAT-R/F include:

- Three M-CHAT items were dropped because they reportedly “performed poorly” (peek-a-boo, playing with toys, and wandering without purpose).
- Items were “reorganized to remove agreement bias”
- The 7 items that best discriminated ASD from all other cases in the sample were placed within the first ten items on the checklist
- The language of the items was simplified to improve understanding.
- Examples were added to clarify the items and add developmental context.

Illustrating the last two changes noted above, Table 1 includes three example items as they appeared in the original M-CHAT and as they now appear in the M-CHAT-R/F.

**Table 1. Example Items**

<table>
<thead>
<tr>
<th>Original M-CHAT</th>
<th>M-CHAT-R/F</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Does your child take an interest in other children?</td>
<td>8. Is your child interested in other children? (FOR EXAMPLE, does your child watch other children, smile at them, or go to them?)</td>
</tr>
<tr>
<td>5. Does your child ever pretend, for example, to talk on the phone or take care of a doll or pretend other things?</td>
<td>3. Does your child play pretend or make-believe? (FOR EXAMPLE, pretend to drink from an empty cup, pretend to talk on a phone, or pretend to feed a doll or stuffed animal?)</td>
</tr>
<tr>
<td>14. Does your child respond to his/her name when you call?</td>
<td>10. Does your child respond when you call his or her name? (FOR EXAMPLE, does he or she look up, talk or babble, or stop what he or she is doing when you call his or her name?)</td>
</tr>
</tbody>
</table>

Completion of the M-CHAT-R/F yields one of three results, based on the total score for the instrument. A total score of less than 3 (“low risk”) suggests no need for further follow-up unless there are other indications of an autism spectrum disorder; if the checklist yields a total score of 3 to 7 (“medium risk”), the follow-up interview should be administered and if the total score on the follow-up is 2 or greater, the child should be referred for a diagnostic evaluation; if the total score is 8 or greater (“high risk”), the child should be referred immediately for diagnostic evaluation and early intervention.

The authors reported that the initial screen-positive rate was lower for the M-CHAT-R (i.e., 7.17% compared to 9.15% for the M-CHAT) while the positive predictive value for the two-stage process (checklist plus interview) was not significantly different. The implication of these findings is that, with the revised instrument, fewer cases were identified as needing the follow-up interview (i.e., a reduction in the overall effort and time required) but the rate of appropriate detection of ASD was not compromised.
The overall rate of detection of ASD was higher for the M-CHAT-R/F ("67 cases per 10,000 compared with the original M-CHAT/F, which detected 45 cases per 10,000"; p. 42); the authors attributed this increase to improved performance of the screening process, although they noted that they could not rule out the possibility that the change was a result of increased prevalence. While this rate (1 in 149) is below the currently accepted prevalence rate for ASD (1 in 88 children; Centers for Disease Control and Prevention, 2012), children who in later years have an Asperger-Syndrome-like presentation may not be detectable at age two years by any screening technology currently available.

The authors cited "simplified scoring" and "specific algorithms based on outcome" (i.e., the creation of low-, medium-, and high-risk subgroups based on initial screening result) as advantages of the revised instrument; improved wording of the items and the addition of examples would appear to be additional advantages. However, granting these apparent benefits of the revised instrument, the data suggest that the actual screening performance of the M-CHAT-R/F does not appear to be much different than the original version, provided the follow-up interview is used as directed, and there is little urgency to replace the use of the original M-CHAT with the revised version. The most widely-used on-line M-CHAT administration site (https://m-chat.org/) continues to use the original version at this time.

The M-CHAT-R/F is copyrighted but is freely available for clinical or research use and can be downloaded from http://www2.gsu.edu/~psydlr/M-CHAT/Official_M-CHAT_Website_files/M-CHAT-R_F_1.pdf. The original version of the instrument is likewise still freely available at http://www2.gsu.edu/~psydlr/Diana_L._Robins,_Ph.D._files/M-CHAT_new.pdf

References


