Onset Patterns in Autism: Correspondence Between Home Video and Parent Report

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Objective: The onset of autism is usually conceptualized as occurring in one of two patterns, early onset or regressive. This study examined the number and shape of trajectories of symptom onset evident in coded home movies of children with autism and examined their correspondence with parent report of onset. **Method:** Four social-communicative behaviors were coded from the home video of children with autism (n = 52) or typical development (n = 23). All home videos from 6 through 24 months of age were coded (3199 segments). Latent class modeling was used to characterize trajectories and determine the optimal number needed to describe the coded home video. These trajectories were then compared with parent reports of onset patterns, as defined by the Autism Diagnostic Interview–Revised. **Results:** A three-trajectory model best fit the data from the participants with autism. One trajectory displayed low levels of social-communication across time. A second trajectory displayed high levels of social-communication early in life, followed by a significant decrease over time. A third trajectory displayed initial levels of behavior that were similar to the typically developing group but little progress in social-communication with age. There was poor correspondence between home video-based trajectories and parent report of onset. **Conclusions:** More than two onset categories may be needed to describe the ways in which symptoms emerge in children with autism. There is low agreement between parent report and home video, suggesting that methods for improving parent report of early development must be developed. J. Am. Acad. Child Adolesc. Psychiatry, 2011;50(8):796–806. **Key Words:** autism, regression, onset, parent report

The onset of behavioral signs of autism is usually conceptualized as occurring in one of two ways: an early onset pattern, in which children show abnormalities in social and communicative development in the first year or so of life, and a regressive pattern, in which children develop typically for some period and then lose previously developed skills. The vast majority of children who experience a regression lose behaviors related to social interest and engagement, such as eye contact and response to their names.[1-3] Some children also lose spoken language, although this is less universal.[4]

Although the autism community has operated on a dichotomous onset classification model for many years, recent studies of larger cohorts, using multiple methods, have suggested that two categories are insufficient to cover all the ways that symptoms emerge.[5] Some studies have described a "plateau" pattern, in which early development appears typical, but then more advanced skills, such as language and joint attention, fail to develop.[5-8] Other studies have identified a mixed pattern, in which mild, nonspecific early delays are followed by later regression.[3,8] The present study focused on these definition and measurement issues, examining the optimal number of onset classifications and correspondence between methods of defining onset.

This article is discussed in an editorial by Dr. Geraldine Dawson on page 744.

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The most common procedure for collecting information about early symptoms is parent report. Different factors can influence report validity, including awareness of the child's eventual diagnosis and knowledge of developmental milestones. Retrospective reports are subject to problems of memory and interpretation[9,10] and are especially problematic when precision in estimating event dates or frequencies is needed.[11,12] When people are asked to recall particular episodes, they often report them as having occurred more recently than they did, an error called "forward telescoping."[13] This phenomenon has been described in investigations using parent report to study autism onset.[2]

Analysis of home movies of children later diagnosed with autism spectrum disorders (ASDs) is another method to examine symptom onset. Video analysis is a labor-intensive but more objective procedure than parent report for collecting information about early development,[14] making it critical to understand the correspondence between the two methods. Given potential recording biases (e.g., tendency of parents to film positive behaviors), the approach taken in the present study was to focus on social-communication behaviors that are typically present very early in life, rather than atypical or negative behaviors. If the analysis of serial videos can document the presence of key social-communicative behaviors, such as eye contact and social smiling, early in life and then demonstrate a decrease in frequency over time, then one can be reasonably certain that a regression has taken place and that this was not due to a recording bias.

Two studies have examined the correspondence between home video and parent report. One coded home video of first and second birthday parties of children with typical development or ASD.[15] Children whose parents reported regression demonstrated levels of joint attention and communication at 1 year that were similar to the typically developing infants and higher than the children with parent-reported early onset of symptoms. At 2 years, there were no differences between the two ASD groups, both of which displayed significantly lower levels of social-communicative behaviors than the typically developing sample. Interestingly, all children with ASD, those with and without parent-reported regression, showed worsening social gaze over the 12- to 24-month period. This study concluded that parent report of onset was generally valid because children with parent reports of regression did indeed lose skills over time. However, it also suggested that decreasing social and communication behavior occurred in many children who also had early symptoms but was not reported by parents.

Another study[16] examined individual concordance between parent report and home video using the same coding system.[15] Video was categorized as documenting loss (50% decline in a behavior over time) or no loss in language and nonlanguage domains. Concordance between the video and parent report was much higher for language than for nonlanguage loss (85% versus 49%). Inconsistent findings occurred most often when parents reported no loss in nonlanguage areas. In two thirds of these cases, parents reported no loss in behaviors such as social gaze and social initiations, yet losses could be documented on video. This result is consistent with the finding of Werner and Dawson[15] that many children with parent-reported early onset autism in fact showed significant declines in social gaze on video between 12 and 24 months.

One limitation of prior research is the use of observational data simply to evaluate the validity of preconceived onset patterns. Advances in statistical modeling provide the opportunity to empirically derive distinct onset patterns from longitudinal behavioral data with minimal *a priori* assumptions about what type and how many onset trajectories exist. Such a technique does not simply examine the validity of traditional onset patterns but allows the data itself to dictate the categories.

The present study examined home movies of 75 children with autism or typical development. The same social-communication coding system used in previous studies was employed,[15] but behavior was sampled much more densely, coding all video from 6 through 24 months of age. Latent class modeling was used to characterize the developmental trajectories of social-communication behavior in the children with autism.[17] Bayesian information criterion (BIC) was employed to compare competing models that included different trajectory numbers (e.g., traditional two-group model versus three- or four-group models) and shapes (e.g., linear versus quadratic) to select the best fitting model. The categories derived from the latent class analyses of home video were then compared with parent report to examine the