

# Broad Developmental Screening Misses Young Children With Social-Emotional Needs

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## Abstract

Many pediatricians use a broad developmental screening test as part of well-child care, but do not specifically screen for behavioral and emotional disorders. Parents at 2 urban community agencies completed both the Ages and Stages Questionnaire (ASQ-3) and the Ages and Stages Questionnaire: Social Emotional (ASQ:SE) for 608 children, ages 2 to 60 months; 51.8% in Spanish. Less than half of the children with a positive screen on the ASQ:SE would have been identified as needing additional assessment or intervention if only the ASQ-3 had been administered. Younger children with positive ASQ:SE screens were significantly less likely to be referred for mental health services compared with older children. Physicians should consider screening all young children for social-emotional and behavioral needs, and referring those identified for infant and early childhood mental health services.

## Keywords

developmental screening, social-emotional, infant mental health

A persuasive body of evidence demonstrates the lasting effects of early social and emotional experience on brain architecture, biological stress reactivity, and child behavior. Early-onset emotional and behavioral problems can have serious consequences to school functioning, response to adversity, and immunologic resistance throughout life.<sup>1</sup> Timely identification can lead to interventions that ameliorate these problems.<sup>2-4</sup>

In the United States, between 9.5% and 14.2% of children from birth to 5 years of age experience social-emotional problems that cause distress to the child and family.<sup>5</sup> It is widely recognized that behavioral and emotional problems are not being reliably identified or treated in the US health system.<sup>6</sup> The Bright Futures Periodicity Schedule Workgroup in 2014 recommended a general psychosocial/behavioral assessment at every visit.<sup>7</sup> Research on the surveillance of behavioral problems by directly asking parents about behavioral concerns has yielded limited results when compared with standardized behavioral screening tools.<sup>8,9</sup> A comprehensive literature search demonstrated that surveillance becomes enhanced with periodic screening with evidence-based measures.<sup>10</sup> Using research to inform policy and practice, the National Center for Children in Poverty recommended that developmental screening should be supplemented by *standardized* tools, designed specifically for the social-emotional domain, such as the Ages and Stages Questionnaire:

Social-Emotional (ASQ:SE).<sup>11</sup> Screening infants and toddlers with a standardized tool has the capability to identify children who will benefit from intervention<sup>12</sup> and the potential to identify the majority of children who exhibit significant emotional/behavioral problems in early elementary school.<sup>13</sup>

The American Academy of Pediatrics (AAP) Task Force on Mental Health in 2010 published guidelines proposing that pediatricians screen children from birth to 5 years of age for social-emotional concerns if a broad developmental screening or autism-specific screening indicates delays or the provider or parent has psychosocial concerns.<sup>14</sup> A subsequent clinical report from the AAP Section on Developmental and Behavioral Pediatrics noted the need for social-emotional screening, in addition to broad developmental screening.<sup>6</sup> Research has not explored whether the approach recommended by the AAP Task Force on Mental Health (as opposed to universal social-emotional screening) is adequate for

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identifying young children with social-emotional needs requiring further assessment. Given the barriers posed by limited time and reimbursement pressures,<sup>6</sup> many providers use broad developmental screenings (such as the Ages and Stages Questionnaire-3 [ASQ-3]) and focused autism screening (such as the Modified Checklist for Autism in Toddlers, Revised [M-CHAT-R]), but do not screen for social-emotional and behavioral functioning.

The primary aim of this study was to determine whether primary care providers can rely on broad developmental screeners to adequately identify young children with social-emotional needs who require further follow-up, or whether a more specific tool is required. To test this question, we examined retrospective data on young children screened with both the ASQ-3 (a widely used broad developmental screener) and the ASQ:SE (a measure designed to identify children at high risk for social-emotional or mental health disorders). Data from the study would help determine whether the addition of the ASQ:SE to screening protocols provides sufficient benefit to justify the time and expense of administering another measure and whether the ASQ-3 could serve as an adequate first-line screener for social-emotional problems. A secondary aim was to determine if screening for social-emotional difficulties led to referrals for early childhood mental health services.

## Methods

### Setting and Participants

The current study is part of a larger project aiming to increase access to developmental screening and linkage to services in underserved populations. The sample was composed of all children ( $n = 627$ ) who received developmental screenings at 2 of the project sites, a family service agency (children screened from April 1, 2014, to January 14, 2015) and a federally qualified health center (FQHC; children screened from September 8, 2014, to January 8, 2015).

The FQHC provides primary care to more than 60 000 low-income, medically underserved residents in an urban setting. Of these patients, 28% are from birth to 5 years of age, 96% live below 200% of the federal poverty level, and 85% are Latino. The family service agency provides early childhood education and child welfare programs to at-risk children and their families; 97% of families qualify as extremely poor, and the majority is Latino.

### Measures

The Ages and Stages Questionnaires are parent-completed measures that screen for broad developmental (ASQ-3)<sup>15</sup>

and social-emotional (ASQ:SE)<sup>16</sup> domains in young children, with specific items varying by age. The ASQ measures have been found to be reliable and valid screening tools with good sensitivity and specificity.<sup>17-20</sup> The ASQ-3 assesses children ages 1 to 66 months in communication, gross motor, fine motor, problem solving, and personal-social domains. The measure is completed by a parent or caregiver and yields scores for each domain indicating whether results are in the typical range, are of possible concern and should be monitored, or are an area of possible delay and should be referred for further evaluation.<sup>15</sup> The ASQ:SE screens social-emotional development of children ages 3 to 65 months including self-regulation, compliance, communication, adaptive behaviors, autonomy, affect, and interaction with people.<sup>16</sup> One raw score is derived, and scores above the cutoff for the child's age indicate the child is at risk for social-emotional concerns and referral for a mental health evaluation is recommended. Both measures are available in both English and Spanish, and parents completed the measures in the language of their choice.

### Procedures

**FQHC Screening Protocol.** The project coordinator for the screening project tracked the schedule for upcoming well-child visits for children aged 9, 18, or 24 months and mailed the ASQ-3 and ASQ:SE forms, along with a letter explaining their purpose, to all families scheduled for a visit 2 weeks in advance. When families arrived for their appointment, front desk staff collected the completed measures; if the family did not bring one or both measures, the front desk staff provided them blank ASQ-3 and ASQ:SE forms to complete. Medical assistants scored the measures and provided the scored measures to the medical provider at the beginning of the well-child visit. Medical providers were the primary care providers for the children and included pediatricians, physician assistants, and nurse practitioners. Providers discussed screening results with parents and made referrals based on results of the screening measures, their professional judgment, and a referral algorithm developed for the project in consultation with the medical director and nurse manager. The referral algorithm included recommendations for referrals to early intervention services for children below 3 years of age with possible delays based on the ASQ-3, and additional referrals to early childhood mental health services for children with positive screen on the ASQ:SE. Training for all staff and providers was conducted by licensed psychologists in the technical assistance team for the screening project. The front desk staff was trained in the purpose of developmental screening, how to select the

appropriate measure based on the child's age, and how to explain the screening to parents. The medical assistant staff was additionally trained in how to score the measures, including hands-on practice. Medical providers were trained on how to interpret the results of the ASQ-3 and ASQ:SE, referral resources available, and the referral algorithm designed to assist in determining appropriate referrals depending on the results of the screenings. Results of screening and notes regarding referrals were entered into the patients' electronic medical record by the primary care provider.

**Family Service Agency Screening Protocol.** The family service agency has a variety of programs serving children from birth to 5 years of age, including Early Head Start, preschool, family child care, family preservation, and adoption programs. The screening protocol included screening at intake with the ASQ-3 and ASQ:SE for all children from birth to 5 years of age across all programs. Screenings were administered to parents by the teacher or home visitor assigned to each family, either at the center (for center-based programs) or in the home (for home-based programs). The project director scored the measures, interpreted the results, and contacted the families to make referrals if the screening results indicated that a referral for further evaluation was needed. Training for all staff was provided by the licensed psychologists on the screening project training and technical assistance team and included information about developmental screening and how to explain it to parents; how to score the measures; how to interpret results; and referral options depending on screening results.

Approval to perform a retrospective review of the medical charts/screening databases was obtained from each agency and from the lead agency's institutional review board. The institutional review board provided a waiver of consent because the study was based on retrospective data, collected for nonresearch purposes, and no identifying information was included in the research database. Retrospective data collection included the following variables: age of the ASQ-3 measure, language of screening (English or Spanish), child's gender, agency and program where the screening was conducted, ASQ:SE scores, ASQ-3 scores, response (yes/no) to the ASQ-3 question, "Do you have concerns about your child's behavior," and whether or not the child was referred for mental health services.

### Data Analysis

Descriptive analyses were conducted to summarize the sample characteristics and screening results. Chi-square analyses were conducted to compare screening results

**Table 1.** Ages and Stages Questionnaire: Social-Emotional (ASQ:SE) Findings and Mental Health Service (MHS) Referrals by Age.

Age (Months)	n (% of Sample)	ASQ:SE Above Cutoff (% Above)	Referred for MHS (of Those With ASQ:SE Above Cutoff) (%)
2-12	127 (20.9)	6 (4.7)	1 (16.7)
13-24	144 (23.7)	15 (10.4)	8 (53.3)
25-36	150 (24.7)	34 (22.7)	19 (55.9)
37-48	111 (18.3)	21 (18.9)	19 (90.5)
49-60	75 (12.4)	11 (14.7)	11 (100)
Total	607	87 (14.3)	58 (66.7)

by demographic variables. In order to test the hypothesis that the ASQ-3 would fail to identify a substantial number of children with social-emotional needs, we first identified the subset of children who had a positive screen on the ASQ:SE, and then reviewed scores for those children on each domain of the ASQ-3 to determine if the ASQ-3 had identified any areas of developmental concern. In addition, for the subset of children with positive screens on the ASQ:SE, we reviewed the parent's response to the ASQ-3 question, "Do you have concerns about your child's behavior?" to determine the proportion of children for whom this question was answered "yes."

### Results

The 2 agencies screened 627 patients, ages 2 to 60 months. More than half ( $n = 325$ ; 51.8%) of the screenings were completed in Spanish, with the remaining in English. Most of the screenings were conducted at the family service agency ( $n = 499$ ; 80%), and the remaining 128 were completed at the FQHC. Programs conducting screening at the family service agency included family child care ( $n = 151$ ), Early Head Start ( $n = 133$ ), preschool ( $n = 123$ ), family preservation ( $n = 64$ ), mental health ( $n = 15$ ), and foster care/adoptions ( $n = 6$ ). At the FQHC, 67.2% of screenings were completed by pediatricians ( $n = 86$ ), 25% by nurse practitioners ( $n = 32$ ), and the remainder by physician's assistants ( $n = 3$ ).

Of the 627 children screened, 608 parents (97%) completed both the ASQ-3 and ASQ:SE, following the screening protocol developed for the project. Eighty-seven children (14%) had a positive screen (over the cutoff) on the ASQ:SE. Table 1 displays results of the ASQ:SE screenings and mental health referrals by age group. There was a significant difference by age in the proportion of children scoring over the ASQ:SE cutoff ( $\chi^2 [4, n = 607] = 21.741, P < .001, \phi = .189$ ). There were no significant differences in the proportion of

**Table 2.** Concordance Between Positive Screens on Ages and Stages Questionnaire-3 (ASQ-3) and Ages and Stages Questionnaire: Social Emotional (ASQ:SE).

ASQ-3 Domain/Question	Among Children With ASQ:SE Over Cutoff	
	No. With Positive ASQ-3 Screen	Percent With Positive ASQ-3 Screen
Communication (n = 85)	24	28%
Gross motor (n = 85)	10	12%
Fine motor (n = 86)	21	24%
Problem-solving (n = 86)	22	26%
Personal-social (n = 86)	11	13%
Any ASQ-3 domain (n = 84)	41	44%
Do you have concerns about your child's behavior: yes (n = 80)	41	51%

children with a positive ASQ:SE screen by language of questionnaire (Spanish: 15%; English: 14%), by gender (male: 16%; female: 12%), or by agency (FQHC: 14%; family service agency: 14%).

To determine if screening using the ASQ-3 alone would have identified children who had social-emotional needs, scores were compared on the ASQ-3 and ASQ:SE for those children (n = 87) with a positive ASQ:SE screen (see Table 2). Less than half of the children with a positive screen on the ASQ:SE also had a positive screen on one or more domains of the ASQ-3. When examining individual domains of the ASQ-3, concordance between a positive screen on the ASQ-3 and a positive screen on the ASQ:SE ranged from a low of 11% to 12% (Fine Motor and Personal-Social Domains) to a high of 28% (Communication). The ASQ-3 question, "Do you have concerns about your child's behavior?" was evaluated as a possible alternative method of screening for mental health needs. Among those children with a positive ASQ:SE screen, only about half of parents (51.3%) responded that they had concerns about their child's behavior. There were no significant differences found by age in terms of the sensitivity of the ASQ-3 in predicting ASQ:SE scores.

Finally, rates of referral for mental health services in those children with positive ASQ:SE screens are presented in Table 1. For this analysis, children were divided into 2 age groups so as to have sufficient numbers in each group to conduct  $\chi^2$  analyses. Children with positive ASQ:SE screens who were younger than 37 months were significantly less likely to be referred for mental health services (50.9%) compared with those older than 36 months (93.8%) ( $\chi^2 [1, n = 87] = 16.708, P < .001, \phi = .438$ ). Differences in rate of referral for mental health services did not differ significantly by

parent language (Spanish: 58.7%; English: 75.6%;  $\chi^2 [1, n = 87] = 2.791, P = .09, \phi = .179$ ), nor by whether or not the parent also expressed concern about behavior on the ASQ-3 ("no" concerns about behavior: 72.7% referred; "yes" concerns about behavior: 65.5% referred; ( $\chi^2 [1, n = 87] = 0.378, P = .54, \phi = .069$ ).

## Discussion

In this study of more than 600 low-income children ages 2 to 60 months, 14% screened positive for social-emotional problems on the ASQ:SE, a rate comparable to other studies in this age group.<sup>9,12</sup> The rate of positive social-emotional screens was similar across gender, language (Spanish or English), and setting (pediatric medical center or family service agency). The primary aim of this study was to determine whether the ASQ:SE identifies children who would be missed by screening broad developmental domains such as those included in the ASQ-3 (motor, communication, problem-solving, and self-help skills). We found that more than half of the children who screened positive on the ASQ:SE did not demonstrate any developmental concerns on any domain of the ASQ-3. Thus, the ASQ-3 did not adequately identify children at risk for social-emotional problems and thus should not be considered a first-line screener for emotional and behavioral disorders.

In addition, directly asking parents if they have concerns about their child's behavior (using the question from the ASQ-3) missed about half of the children who screened positive on the ASQ:SE. This finding is consistent with data from 2 prior studies. Sheldrick et al<sup>9</sup> asked parents if they had concerns about their child's behavior (using a different response format than the ASQ-3) and found that 57% of parents of children who screened positive on the ASQ:SE expressed concerns about their child's behavior; this result is very similar to the findings from the current study, with a sample that differs in ethnicity and income. Similarly, a primary care practice implementing universal screening with the ASQ-3 and ASQ:SE found that parents of children less than 3 years rarely expressed concerns about behaviors in infants and toddlers even when social-emotional screening indicated problems.<sup>8</sup> Various factors may explain these findings. Parents may fail to recognize social-emotional difficulties in young children. They may not realize that services are available to address these issues, and stigma may prevent them from answering a direct face-valid question about behavioral concerns.<sup>21</sup> The question "Do you have concerns about your child's behavior?" may miss subtle but important aspects of social-emotional development such as self-regulation, signs of challenges with attachment, or mood, which are targeted in the ASQ:SE.

Our study findings indicate that the ASQ:SE had utility in identifying a substantial proportion of young children with social-emotional concerns who did not demonstrate other areas of developmental delay nor behavior problems that concerned their parents. These findings suggest that many young children with emotional or behavioral disorders may be missed when following the AAP Mental Health Task Force recommendation to conduct social-emotional screening in children from birth to 5 years of age only after a positive screen on a broad based or autism-specific measure, or if parent or provider concern is present.<sup>14</sup> The findings from this study contrast with those of similar studies comparing broad developmental measures and autism-specific measures, which have found that the ASQ-3 has reasonable sensitivity in predicting which children will need further autism evaluation.<sup>22,23</sup> It is notable that the recently published revision of the ASQ:SE was modified to increase identification of red flags for autism spectrum disorder (ASD).<sup>24</sup> If the revised ASQ:SE proves effective in screening for ASD, improved efficiency in screening practices might include replacing the recommendation for an autism-specific measure with screening for broader social-emotional concerns, including ASD red flags, together with a broad-based developmental screening measure.

As a secondary aim of the study, we explored whether use of the ASQ:SE led to referrals to a mental health program for further assessment and/or services. Results indicated that overall, about 67% of children with positive screen on the ASQ:SE were referred for mental health assessment or services. It is not known whether the rate of referral represents an inappropriate failure to refer, or whether practitioners were appropriately weighing the likely level of need for individual children based on other factors in addition to the screening results.<sup>25</sup> Mental health referrals were much more common in children ages 3 to 5 years compared with children younger than 3 years. Almost all children in the preschool age group who had a positive screen on the ASQ:SE were referred to a mental health agency, versus only half of the infants and toddlers. This finding highlights that even when providers are screening for social-emotional concerns in infants and toddlers, they may downplay the significance of screening findings in the youngest children, overlook mental health agencies as an appropriate referral for further assessment, or have difficulty finding appropriate infant mental health resources. Primary care settings integrating colocated infant mental health professionals have demonstrated some success in linking young children to effective mental health services.<sup>8,12</sup>

This study has several limitations to consider. First, data were not available to indicate whether children actually had a mental health assessment or services, and whether they were found to have social-emotional problems warranting

intervention based on a more thorough mental health assessment. Therefore, it is not known how many of the children who screened positive on the ASQ:SE actually needed or received mental health treatment. However, previous research has demonstrated that the ASQ:SE has good validity as a screener in detecting children with social-emotional concerns on more comprehensive evaluation.<sup>18</sup> Second, this study was conducted in a county in which infant mental health services have been a key focus of the county Department of Mental Health, leading to greater awareness of the need for and availability of these services compared with many cities. Therefore, it is likely that providers and parents in other geographic areas may have less awareness of or access to mental health services for young children. Finally, this study was conducted with a population of low-income families, with half speaking Spanish as a first language. It is not known to what extent the findings would generalize to other populations.

## Conclusion

Screening for social-emotional problems is a critical responsibility for professionals interacting with young children and their families. This study revealed that conducting broad developmental screening in the domains of motor, communication, cognitive, and self-help skills, and even directly asking parents if they have concerns about behavior, will miss many children who are likely to benefit from further mental health assessment and intervention. Therefore, practitioners should consider conducting specific social-emotional screening for children ages birth to 5 years of age.

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## Author Contributions

MEW took the lead in study design, data analysis, and data interpretation, with assistance in study design from all co-authors; AHC designed the screening program at Westside Children's Center and assisted in interpretation of study findings; IZ and MEW and OA led data collection; MEW, IZ, MKP, and OA wrote the manuscript.

## Declaration of Conflicting Interests

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