There is extensive debate over whether children’s mathematical learning difficulties are the result of deficits in the inherent system for nonsymbolic representations of quantity or in their ease of learning quantitative symbols, such as number words. The present study tested whether poor approximate number system (ANS) acuity (a measure of children’s nonsymbolic quantitative knowledge), children’s understanding of cardinality (the quantity represented by a number word, a measure of symbolic knowledge), or some combination of both, contributes to risk of poor long-term outcomes in mathematics. Preschool children (n = 138) were administered a battery of quantitative tasks, including a measure of ANS acuity and a measure of children’s cardinal knowledge. Children also completed measures of executive function (EF), intelligence (IQ), preliteracy, and a mathematics achievement test. There was evidence that poor ANS acuity does contribute to lower mathematics achievement, after controlling for EF, IQ, and early preliteracy skills, but the overall results suggested that children’s emerging understanding of cardinality was relatively more important to early mathematics achievement than the ANS. Thus, it may be important to target understanding of number words and the quantities they represent in interventions for children who are at risk for poor mathematics achievement.