

School Readiness in Children Attending Montessori Preschools Final Results **Dr. Jennifer LaBounty, Lewis and Clark College**

Last year I wrote an article for *Forza Vitale!* where I outlined the purpose behind our School-Readiness in Montessori Preschools study and provided our preliminary results from the first group of participating children. I am now thrilled to present the final results for this study. I also want to take this opportunity to thank all of the fantastic teachers and administrators at the Portland and Camas Montessori preschools we visited for their kindness and support, and of course, the wonderful children and families who participated in our study. We could not have done this research without you and we appreciate you so much. Thank you for sharing your time and your amazing, inspiring and talented children with us while we conducted our research.

Background for our study on school readiness in Montessori Preschools

The purpose of our study was to document the effects of Montessori education on development and school readiness in preschool-aged children. This study supports the Montessori educational philosophy by demonstrating that this pedagogical method teaches preschool children the social and academic skills necessary to succeed in elementary school. Our study is the first to focus deeply on Montessori preschool education by following children through two years of Montessori preschool education from age 3 to age 5.

The Montessori model of education is unique in that it encourages children to actively build or construct their knowledge of the world through self-guided exploration. In addition, the curriculum is tailored to the needs of individual children; this allows the model to be flexible and to respond to individual children, rather than broadly apply the same curriculum to all children. Montessori schools also spend more classroom time on social and emotional development than other models (Montessori, 1967; AMS, 2011).

In this way, Montessori educators facilitate the development of ‘soft skills’ in young children including internal (or intrinsic) motivation (Rathunde & Csikszentmihalyi, 2005), self-control, focused attention, emotion regulation, social problem solving, and empathy (Lillard & Else-Quest, 2006; Lillard, 2012). These ‘soft skills’ are important for both social and academic success in elementary school and beyond.

A few, informative studies have also shown that the Montessori method of education results in positive academic development in children. Dr. Lillard found that school-aged children (2006) and preschool-aged children (2012) in Montessori programs are more advanced in their reading, writing, and mathematics skills as compared with similar children in public schools. Similarly, high school students who had attended Montessori schools from preschool to fifth grade scored higher on tests of math and science (Dohrmann, Nishida, Gartner, Kerzner-Lipsky, & Grimm, 2007).

Design of the Current Research with Montessori preschool children

The research results presented in this article are part of a study conducted by Dr. Jennifer LaBounty, a Psychology Professor at Lewis and Clark College. This study was designed in collaboration with the board of the Oregon Montessori Association. Our study measured the social, behavioral, and academic development of children in nine

Montessori preschools in the Portland, OR metro area. 89 children and their families participated in our study. We interviewed children during their first year of preschool when most of the children were 3-years-old (Wave 1) and again at the end of the second year of preschool when the children were 4 or 5-years-old (Wave 2). The same assessments and questionnaires were administered at both Waves so we could directly compare children's scores at the beginning of preschool with their scores at the end of preschool. This design is what makes our study unique. Ours is the first to longitudinally track children's development through their entire Montessori preschool experience. We interviewed children for one-half hour on two separate days at each Wave (so that the children would only miss a half-hour of preschool each day). We followed two groups of children: 60 who began preschool in the 2011-2012 school year, and 29 who began preschool in the 2012-2013 school year (for a total of 89). We completed data collection in Spring of 2014 and have been analyzing our data during the past year. We included assessments of multiple domains of learning and development including language development (expressive and receptive vocabulary), early literacy and numeracy, cognitive development, social, emotional, and behavioral development. In addition, we included measures of social reasoning, behavioral and cognitive control and social problem solving skills.

The academic school-readiness assessments included a phonological processing, a rhyming, and a counting assessment from the Preschool Language Scale – 4 (PLS-4) (Zimmerman, Steiner, & Pond, 2002), an expressive and receptive vocabulary assessment from the Woodcock-Johnson III Tests of Cognitive Abilities (Mather & Woodcock, 2001), a number identification measure from the Test of Early Numeracy (TEN) (Clark & Shinn, 2002), and letter identification and letter-sound correspondence tasks from the Test of Early Literacy (TEL) (Shinn & Shinn, 2002).

The social, emotional, and behavioral school-readiness assessments included behavioral and inhibitory control measures including a child version of the classic Stroop task (happy/sad) (Lagattuta, Sayfah, Monsour, 2011), and a reward delay task where children were asked to wait to play with a car (Kochanska, 2001). We also included a social problem solving task (Denham & Bouril, 1994), and measures of theory of mind (Wellman and Liu, 2004) and emotion understanding (Pons, Harris, & deRosnay, 2007).

Results of our research with Montessori Preschool Children

The results of our study are exciting and clearly demonstrate that Montessori preschool programs prepare children for Kindergarten both socially and academically. The children in our study made significant strides in several areas of academic school readiness during the two years they spent in Montessori preschool programs. First, literacy skills improved dramatically. At three years old, the children could identify an average of 6 letters (both upper and lower case) in one minute. At 4/5 years old the average number of letters identified increased to 14. The result at the second time point is above the nationally normed *kindergarten* sample that averaged 13 letters in one minute using this same assessment. In addition, the children in our study showed significant advancement in their ability to correctly map letter sounds onto the appropriate letter (“what sound does this letter make?”), moving from an average of 4 in one minute at age 3 to an average of 11 in one minute at age 4/5. This is in stark contrast to the national sample, which on average could only correctly identify the sounds of two

letters at the beginning of kindergarten. The children in our sample also showed a statistically significant improvement in phonological processing skills (identifying the first sound in a word) from an average of 1 correct identification at age 3 to 3 correct identifications (out of a possible 4 correct answers) at age 4/5. In contrast, children in a national sample using this same measure could not correctly identify the first sound in a word until age 6. As for rhyming, a statistically significant development was shown, from the ability to rhyme one word at age 3, to two words (out of three) at age 4/5. We also saw an improvement in vocabulary from age 3 (correctly identifying 11 words) to age 4/5 (correctly identifying 13 words). Finally, the children in our sample grew in their ability to define words (“what is a jacket? Tell me two things about a jacket”) from defining two words at age 3 to three words (out of 3) at age 4/5.

In addition, the children developed their early numeracy skills; moving from the ability to identify 4 numbers in one minute at age 3 to the ability to identify 16 numbers at age 4/5. Moreover, they improved in their counting ability from only half of the children correctly counting 8 objects (“how many chicks are there?”) at age 3 to almost all of the students correctly counting all 8 objects by age 4/5.

The only academic measure that did not show statistically significant improvement throughout preschool was color recognition. This was because almost all of the kids knew all of their colors going in to preschool and all of them did by the end of preschool!

The Montessori preschoolers in our sample also improved in terms of their social, emotional and behavioral development. Children’s scores on measures of understanding of other people’s thoughts and feelings improved significantly over the course of the two years (for example: “how is the person in this story feeling?”). They also more consistently chose positive, prosocial responses to difficult social problems (“how would you respond if someone pushed you in the sandbox?”) as they grew through preschool. In addition, their ability to control their behavior (wait to touch a car) improved over time (marginally significant) as did their ability to cognitively inhibit their impulses (remembering the rules of a difficult game) (statistically significant). Finally, children were more likely to demonstrate prosocial behavior (for example, helped to pick up crayons that the experimenter “accidentally” spilled) and more often chose to help the experimenter as they got older (although this difference also failed to reach statistical significance).

In conclusion, the Montessori preschoolers in our study showed improvement over the course of their Montessori preschool experience in all of the important school-readiness domains including academic, social, emotional, and behavioral development. The skills they have acquired while in Montessori preschools will serve them well in the transition to kindergarten. These results show that the Montessori method works. This method prepares children for school and for life by teaching them the skills that they will need as they grow and develop. We will publish these results in an academic journal soon (the manuscript will be submitted this summer) and copies of the article will be sent to all of the participating schools and families.

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