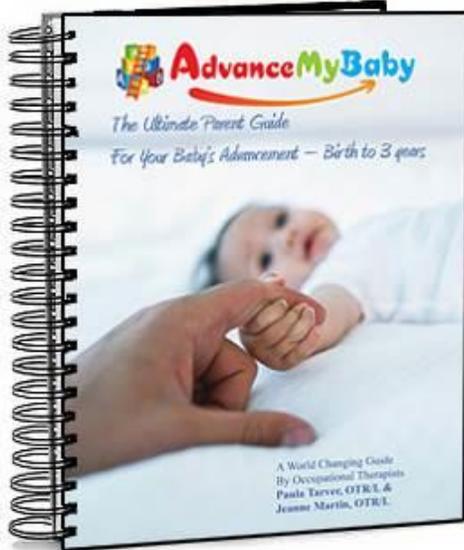


# A Reflection on Mirror Neurons

## And Why They Are so Important to Development!

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If you stick your tongue out at a newborn, they will automatically stick out their tongue back at you. This is because their mirror neurons are firing and it helps them to imitate what they are seeing. Humans learn through watching and observing other humans. Mirror neurons are important for understanding the actions and intentions of other people, and for learning new skills by imitation. They are involved in planning and controlling actions, abstract thinking, and memory. As children observe an action, their mirror neurons fire and form new neuro-pathways as if they were performing the action themselves. Efficient mirror neuron activity leads to good overall development in all areas and leads to higher emotional intelligence and the ability to empathize with others.

Ever wonder why you cry at movies when you watch someone on screen crying, or laugh when someone is laughing? It's those mirror neurons again. Recent studies have found that people who appear to have more active mirror neurons also tend to be more empathetic. The old myth 'yawning is contagious' comes from your mirror neurons firing without you realizing it. When someone smiles at you, it is hard to resist smiling back.

Mirror neuron dysfunction is linked to children with delays in emotional & social skills, language skills, cognitive skills, and gross motor skills. They have difficulty reading non-verbal communication, gestures, referencing facial expressions for information, and staying in-sync by matching a partner's actions by co-regulating their behavior and attention in direct response to their partner's actions. Co-regulation is the ability to know when it is your turn in the activity to respond appropriately to your partner's gestures and vocalizations.



Parents can start promoting their babies mirror neurons early on. From birth to 2 months, face-to-face emotional connection with others is the main focus of the infant's attention. A good way to promote mirror neuron activity, at this age, is to place the infant lying on their stomach over a yoga ball with the baby facing the adult. The adult places their hands around the baby's elbows to support shoulder and elbows in a 90 degree angle. Slowly rock baby back and forth and then side to side, this will activate the muscles of the back, neck, and shoulders to encourage the infant to raise their head up and look into the face of the adult. Next, you can place the infant in upright sitting position, hold the baby with two hands placed on each side of their trunk. Gently bounce baby on ball while talking and singing to them. You will then, slowly rock baby back and forth and then side to side. Lastly, you can lay the infant on their back and slowly rock back and forth, side to side, and in a circular motion. This provides vestibular input which

stimulates neural activation and connectivity. The more neural activation that occurs, the more aware the baby becomes of their environment and the more they want to explore and interact with it. Because of the face-to-face time and the learned trust that the baby develops, there is generally a strong bonding that happens between baby and caregiver.

From 3 to 5 months of age, the baby learns to reference and interpret an adult's face and body language for information; 70% of language is interpreting nonverbal communication. Emotion and experience-sharing are the glue that bonds relationships and promote reciprocal communication. This back-and-forth dance between caregiver and the baby is the first dynamic interchange that the baby encounters.

Peek-A-Boo is a great game to promote emotion sharing and social interaction. It promotes an emotional dance that goes on between the baby and caregiver. This stimulates the mirror neurons to fire, helping to promote eye contact and facial referencing. A baby needs to be able to reference a familiar adult's face during times of uncertainty and read the adult's emotional reactions and gestures to know if they are safe or in danger. Social referencing is when a baby observes an adult's facial reaction for approval, safety, and security. This is the foundation for emotional security. Babies learn they can judge the state of their world through visual cues they observe on the caregiver's face.

Around 10 to 12 months, the baby begins to synchronize actions during back and forth simple games like Pat-A-Cake, Itsy Bitsy Spider, and Peek-A-Boo. The baby watches to see when it is time to do their part so that they can stay coordinated with a partner. They crave novel stimulation for excitement sharing. It is important for parents to exaggerate their facial expressions, gestures, and tone of voice for increased excitement and engagement for learning the sequence and steps of the game. During these activities the baby is able to practice the feeling of being in-sync with their partner by matching the partner's actions. The baby learns what it feels like to fall out of sync and then, how to jump back in-sync. A good example of this is when you are at a wedding dance and you want to join the "Congo" line, you have to jump in and quickly get into sync with the rhythm and timing of the dance to match everyone else dancing in front of you. As the children reach kindergarten, they will want to match

what they see the other children doing whether it is coloring or lining up for lunch.

By providing activities and exercises early on that stimulates the mirror neurons, many of the developmental issues most commonly found in Autism Spectrum Disorders, can be avoided, minimized, or in some cases, completely eliminated. When parents take a proactive, preventive, and natural approach to raising their children, they are better equipped to help them reach their full potential. You can find all the activities and exercises to help promote the mirror neurons from birth to 3 years, in our Advance My Baby handbook.



Paula Tarver, OTR/L and Jeanne Martin, OTR/L are co-authors of *Advance My Baby*. Babies are not born with a how-to manual, but this is what you have with *Advance My Baby*. You can now put into place the building blocks that lead to academic success, athletic prowess, emotional balance and social acceptance. For the first time, instruction is provided for the first 36 months of life that create the ultimate foundation for your baby.

*Advance My Baby*, is the first parent-friendly manual to address all areas of development. Each chapter covers developmental areas of gross motor, fine motor, cognitive, language, emotional/social, and self-care skills with color photos, graphics, and activities/exercises for your baby. It is a self-help manual for parents that will empower and equip them with the developmental knowledge necessary for their child to reach their full potential. **AMB On-Line Assessment** is designed to track your baby's development from birth to 36 months. It will measure your baby's progress of developmental milestones in six categories: Gross Motor, Fine Motor, Cognitive, Language, Self-care, and Social/Emotional skills. Please visit our website at [www.advancemybaby.com](http://www.advancemybaby.com).