

The Importance of Self-Regulation in Early Childhood

By David Ayer

On April 21, 2010, the Montessori Institute Northwest hosted Dr. Kathleen Lloyd, a Montessori teacher with 18 years of classroom experience who is now the assistant director of the Center for Teaching and Learning of Oregon State University. Dr. Lloyd spoke on current research which supports Montessori educational philosophy, and what follows is a summary, however imperfect, of her inspiring and moving presentation.

Maria Montessori spoke and wrote passionately during her lifetime about the role of education in bringing about world peace: *“Preventing war is the work of politicians. Bringing about peace is the work of education.”* She regarded the development of the will, and the ability to make good choices, as a crucial element of this work. Dr. Lloyd had been a passionate advocate for children and Montessori for many years when she began to ask herself why we seem to be still so far from that goal after so many years. When she decided to enter the academic world of Human Development and Family Science, she began to ask how the will could be studied in that context. “The will?” she was told, “How can you measure that? Maybe you should ask the Philosophy department.”

But philosophy was not where she felt the work needed to be done, and certainly not the department where educational research and policy development took place. On further investigation, she found a psychological concept that seemed to relate to the same idea: that of *self-regulation*.

In the world of developmental psychology, self-regulation has been major field of study in the area of early childhood education for about 30 years. It brings together the ideas of executive function, impulse or ego control, and attention. Mary Rothbart and Michael Posner at the University of Oregon define self-regulation like this:

- the ability to control reactions to stress
- the capacity to maintain and focus attention
- the capacity to recognize and interpret the emotional states of others

Psychological research indicates that this capacity begins to develop in infancy and has its greatest growth during the pre-school years. (Readers familiar with Montessori will recognize some parallel elements to our work with children already.) Self-regulation is linked to nearly every human success or failure, and low self-regulation correlates with most negative outcomes, including drug addiction, criminal activity, relationship challenges, and much more. It is seen as essential to co-operation and peace.

The human development literature presents a received and accepted view of activity that supports the growth of self-regulation. Foremost are caring, loving, supportive relationships with children. We know that nothing can move develop well without respect, rapport, and connection. In addition, children have been shown to develop self-regulation through conflict and negotiation, especially successfully mediated and resolved conflict. Montessori does well in both of these areas, with its mixed-age classrooms which provide time for the development of relationships, and with its emphasis on conflict resolution within the classroom. ‘Play-based’ programs are also well-supported by educational research, and Montessori’s de-emphasis on dramatic play is one reason we are not well-represented in the academic mainstream.

New research is emerging, however, which adds to this picture. Functional magnetic resonance imaging (or fMRI) suggests that self-regulation is a complex behavioral system in the brain that can be activated through interaction with the environment. Further, a specific type of interaction and activity seems to activate this system. This activity is known as *effortful control*, which is itself a behavioral system which allows for voluntary control of emotions and behavior.



Five-year-old doing four digit addition with stamp game.

Effortful control itself is a new addition to the Rothbart and Derryberry’s model of temperament. Temperament is considered a framework that underlies human personality, and is thought to be biologically or neurologically bases and to some extent hereditary. Temperamental traits are thought to be fairly stable, although subject to some influence from environment. The effortful control trait is defined as “voluntary control versus automatic or recursive behavior,” or the ability to activate behaviors when necessary—even when you don’t want to.

Obviously, children are not always capable of activating or inhibiting behavior, even when it is in their own self-interest to do so. However, the development of this ability follows a well-established trajectory. Under 22 months of age, it is described as ‘modestly coherent.’ By 33 months, it is typically highly coherent; by 45 months it is stable, and robust differences can be seen between individuals; and by four years, it is stable over time and comparable to IQ.

A strong effortful control system brings many benefits. It has been shown to be protective against a range of behavioral disorders. Effortful control is associated with lower levels of psychopathology and maladjustment, with the development of empathy, and with less delinquent behavior, aggression, and depression in young adolescents. Effortful control is seen in this model as a key component of self-regulation, and low self-regulation is associated with a host of behavior problems.

So what can we do to support this aspect of temperament? It turns out that this aspect is supported by yet another behavioral system, the *executive attention network*. This is a system in the brain responsible for attention, focus, and decision-making, which experiences considerable development both naturally and in response to the environment between the ages of two and seven. In addition, Mihaly Csikszentmihalyi's research into *optimal experience theory*, popularized as *flow* in his book with that title, also relates to effortful control and hence self-regulation. Csikszentmihalyi's 'flow' state occurs when a subject is working at a high level of skill offering a high level of challenge, so control, focus, and the executive functioning systems of the brain are all called upon to function at their highest levels. The ability to sustain attention, as in the 'flow' state, supports self-regulation throughout the entire human lifespan. These findings spurred one researcher to suggest, a systematic training of attention might be an important addition to preschool education.

How does this all relate to Montessori? As part of her research, Dr. Lloyd conducted extensive interviews with AMI Montessori teacher trainers, the professionals with the fullest and most representative understanding of the Montessori approach. Without being prompted with terms from Lloyd's human development research, the trainers' description of the development of the first-plane child, and in particular the concept of *normalization*, resonated strongly with the research findings.



Five-year-old focusing on trinomial cube.

Research has indicated that children have an innate potential for effortful control, and hence self-regulation, as part of their temperament. Temperament is inborn, yet plastic in response to environment. Dr. Montessori observed that when the environment is appropriately prepared, a form of self-regulation spontaneously emerges which she termed *normalization*. According to the trainers,

Normalization is an observable phenomenon which occurs after children are given freedom to follow their interests, using their hands and minds to engage in purposeful work that results in an experience of deep mental concentration.

The conditions that promote normalization, according to Montessori, are opportunities for concentration, opportunities for purposeful work which is integrated into the life of the community, freely chosen activities, and activities with a good balance between challenge and skill. It's easy to see how this lines up with the executive attention network, effortful control, and optimal experience theory (flow). The hallmarks of normalization included concentration, a love of work, spontaneous self-discipline, and a refined sense of sociability and expressions of kindness. Again, this seems to match up fairly well with the correlation between self-regulation and positive behavioral outcomes.

It's not surprising to many of us in Montessori work to find her observations borne out by research—we see these effects in children every day. But it is critical to the expansion of Montessori *beyond* our own world to continue to tie her observations to concrete, reproducible, and theoretically grounded results. In addition, Montessori's unique contribution, once again decades ahead of her time, is the idea that the prepared environment itself can have such a profound influence on development. As we see the importance of the environment become a factor in conventional research, this could become yet another area in which the connections to Montessori are strengthened.

About David Ayer: David discovered Montessori through his daughter, Virginia, who attended Whole Child Montessori School, and his wife, Elise, who was teaching in the upper elementary at Montessori School of Beaverton. He earned his primary diploma at the Montessori Institute Northwest in 1995. David taught at Vancouver Montessori School before starting the Montessori Adolescent Project Northwest with Elise. He continued his Montessori adolescent work at the Hershey Montessori Farm School and the Franciscan Montessori Earth School before joining Sunstone Montessori School as Assistant Director.

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