In this symposium, several presentations will provide new insights on individual differences in the development of self-regulation. The different presentations have in common an emphasis on the importance of attention-related cognitive processes in the development of effortful control and emotional regulation, including distraction, inhibitory control, and conflict processing. The impact of children temperament and familial socio-economic status, as well as implications for behavioral problems, will be also discussed.

**Title:** Negative Affectivity and Inhibitory Control: Children's Self-Regulation in Negative Emotional Challenges  
**Authors:** Andrea Berger and Tali Farbaish  
**Affiliation:** Department of Psychology and Zlotowski Center for Neuroscience, Ben-Gurion University of the Negev, Israel.  
**Presenting author:** Andrea Berger  

**Abstract:** Inhibitory control is an essential aspect of the ability to self-regulate in daily situations. This ability is challenged when experiencing negative emotions. One of the factors that contributes to this ability is the temperamental tendency of negative affectivity. This study investigated 1) individual differences in kindergartners’ IC-related brain activity and behavior, when facing a lab-induced, negative emotional challenge and 2) whether IC longitudinally predicted the ability to cope with a real-life emotionally challenging situation. Seventy-seven children, aged 5.5-6.5 years, performed an emotion-induction Go-NoGo task while recording their electrophysiological brain activity. Additionally, mothers rated children’s temperament negative affectivity. About two years following this lab assessment, these children were exposed to a stressful period of ongoing rocket attacks. We had the opportunity to contact 51 of them and examine their posttraumatic stress symptoms. The lab assessment revealed that higher levels of negative affectivity were associated with children’s efforts to exert IC while experiencing negative emotions, reflected by larger N2 amplitudes and theta power, measured in frontocentral areas of the scalp. Moreover, kindergartners’ theta power predicted their later posttraumatic symptoms. These results demonstrate that children who tend to experience negative emotions recruit more neural resources to inhibit prepotent responses under negative emotional circumstances. These children seem at greater risk because they pay a higher cognitive and emotional price to regulate their emotional experience and still effectively function.

**Title:** Real Animal Size Test in children: links with effortful control, personality, and problem behavior  
**Authors:** Nadezhda B. Bairova, Andrey V. Bocharov, Alexander N. Savostyanov, Evgenia N. Petrenko, Elena A. Kozlova, Alexander E. Saprygin, and Helena R. Slobodskaya  
**Affiliation:** State Scientific-Research Institute of Physiology and Basic Medicine, Russia.  
**Presenting author:** Nadezhda B. Bairova  

**Abstract:** One of the main dimensions of temperament is effortful control, which includes the abilities to voluntarily manage attention (attentional regulation) and to inhibit behavior (inhibitory control) or activate behavior (activational control) (Eisenberg, 2012). Many researchers investigate children’s attention and inhibitory control using Stroop-like tests, but it is still unknown with which component Stroop-like tests correlate mostly. The purpose of this study was to examine the associations of Stroop-
like test indicators with age, gender, effortful control and its components, and with personality and problem behavior in Russian children. The study included 202 children aged 5-12 years. We used Real Animal Size test (RAST, Catale & Meulemans, 2009), which requires the child to respond according to the real size of animals displayed in congruent or incongruent size on the screen. Correct responses, reaction time (RT) and standard deviation (SD) were calculated for each condition. Effortful control (EC) and its components, attention focusing, inhibitory control and activation control, were measured by caregiver report on the Temperament in Middle Childhood Questionnaire. Personality was measured by the Inventory of Child Individual Differences; problem behavior was measured by the Strengths and Difficulties Questionnaire. The results showed significant age effect for RAST measures: children older than 11 years made fewer errors than children younger than 7 years (83% and 92%, respectively) and had shorter RT. Both RT and SD in the RAST were associated with EC, activation control, inhibitory control and attention focusing. RAST performance correlated significantly with personality traits, mostly within Conscientiousness domain, and with problem behaviors, externalizing problems and hyperactivity-inattention. The findings showed that RAST performance in children 5-12 years had a clear developmental pattern, both in girls and in boys. The links with questionnaire measures suggest that RAST performance can be used as a measure of Effortful Control. RAST indicators can be also useful in research on the biological base of Conscientiousness and in clinical research on ADHD.

Title: Toddlerhood self-regulation of emotion: Contributions of effortful control and behavioral attention strategies.
Authors: Cynthia L. Smith and Lin Tan.
Affiliation: Virginia Tech, USA.
Presenting author: Cynthia L. Smith

Abstract: Different approaches have been used to examine how children regulate emotions during toddlerhood when regulation shifts from external to internal control. One approach is to examine children's attentional strategies used during emotion eliciting tasks, such as distraction. Researchers also examine effortful control (EC) as a mechanism underlying children's emotion self-regulation. Because EC has been proposed as a foundation of emotion regulation, we hypothesized that it would predict specific regulation behaviors observed, which would then predict emotion. We examined both fear and anger because we hypothesized that behavioral strategies and EC may relate differently depending on the emotion elicited. Toddlers between 30-36 months of age (M=32.10 months; n=140; 72 boys, 68 girls) were observed in two tasks one to elicit fear and one to elicit frustration. Emotion was coded on a 4-point scale based on children's facial, vocal, and bodily indicators. Distraction and self-comforting behaviors were coded as absent/present. Both emotion and regulation were coded in 5-sec episodes, and mean scores were computed. Children also completed a delay task to measure their effortful control, where higher scores in the task indicated more effortful control because children were able to wait to receive an attractive snack. Regression analyses indicated that EC predicted anger above and beyond the effects of distraction and self-comforting, although both behavioral strategies did also predict anger. Self-comforting, but not distraction or EC, predicted fear. In SEM models examining relations among all variables, EC predicted self-comforting, which in turn predicted fear; however, EC, distraction, and self-comforting each directly predicted anger. To summarize, more EC was associated with more self-comforting, which was associated with more fear, but more EC, distraction, and self-comforting were associated with less anger. Effortful control and distraction, the two strategies more closely related to attention, predicted anger. Although self-comforting predicted both fear and anger, the direction of the relations differed, indicating the importance of examining negative emotions separately. Although EC did predict a unique amount of the variance in anger, support was not found for EC being an underlying mechanism in the relations of regulation behaviors to anger. We did find support for a path from EC to self-comforting to fear. Further implications of our findings as they relate to attentional mechanisms will be discussed.
Title: Understanding early development of self-regulation at two years of age: the role of temperament in modulating the influence of parenting and SES
Authors: Angela Conejero and M. Rosario Rueda
Affiliation: Centro de Investigación Mente, Cerebro y Comportamiento (CIMCYC), Departamento de Psicología Experimental, Universidad de Granada, Spain.
Presenting author: Angela Conejero

Abstract: Important changes in the ability of children to self-regulate occur during toddlerhood. Evidence suggests that both environmental factors and children’s temperament influence the development of self-regulation already by this age. Low socioeconomic status (SES), as well as coercive and inconsistent parenting strategies are generally associated to poorer inhibitory control. Individual differences in temperament are also associated with individual differences in self-regulation. More effortful and lower reactivity levels are related to greater self-regulation. In our study, we aimed to explore the contribution of both environmental aspects (SES and parenting) and temperament to the development of self-regulation at two years of age.

With this purpose, we measured ability of two-year-olds to self-regulate with a delay task. In this task, toddlers have to resist eating a tempting snack placed at a reaching distance. We also asked parents to provide information about children temperament, parenting strategies and SES throughout different questionnaires.

We run moderation analyses to test whether parenting, SES and effortful control interacted to predict self-regulation at two years of age. Analyses showed that ability of children to self-regulate in the delay task significantly decreased as a function of inconsistent/coercive parenting in the case of low-SES children that present low effortful control. However, performance in the delay task was unrelated to parenting for the rest of the cases.

Our results suggest that low-SES children with low effortful control were more affected by inconsistent/coercive parenting. In contrast, our results indicate that individual differences in effortful control may serve as a protective factor in the case of children at high risk for later behaviour problems. This is the case of children raised in low-SES contexts and whose caregivers tend to be more inconsistent and coercive. Results are discussed in terms of the importance of considering individual differences in the design of intervention programs fostering self-regulatory skills in children at risk for developing later problems associated with poor self-regulation.