

Pathways to early school success: Self-regulation and executive function

Key messages

The known: Self-regulation and executive function (SR-EF) skills are regarded as foundational for a child's development of competencies to achieve early school success.

The new: Our study confirmed the importance of SR-EF for all NT children but suggested that there are different pathways for Aboriginal and non-Aboriginal children. For non-Aboriginal children, SR-EF and academic performance in Year 3 are linked through early literacy and numeracy skills. For Aboriginal children, SR-EF and academic performance in Year 3 are linked through both early literacy and numeracy skills and school attendance.

The implications: There is a need for investigation of successful programs and policies that support SR-EF skills in diverse Australian education contexts. Preschool and school attendance are critical to the positive educational outcomes of Aboriginal children.

What do we mean by self-regulation and executive function?

Self-regulation (SR) is a set of complex and integrated skills that enable us to encounter new or unexpected situations without having a 'melt-down'. More precisely, SR includes:

1. an ability to manage emotions, regain calm, interpret threats and respond appropriately
2. focused attention despite distractions and redirect focus
3. apply independent, effortful impulse control
4. problem solve, adapt and feel in control.

Executive Functions (EF) are often referred to as our 'air traffic control tower'. Like SR these skills are complex and inter-related:

1. planning, which is interdependent with several other skills
2. working memory for visual or verbal information
3. ability to change thinking or think about several things at once in response to situation changes
4. ability to control impulsive behaviours related to fear, fight or flight reactions.

Why are SR-EF important?

Early childhood is a critical time for developing SR-EF skills for life-long, healthy (and happy) development. We continue to expand these skills throughout life, but the brain is shaped at an early age with learned and patterned responses to new experiences, stressors and challenges.

In this study, we are interested in how SR-EF contribute to successful school participation and subsequent academic achievement. International SR-EF research identifies these skills as foundational for positive social and emotional interactions and engagement with learning throughout life. For many infants and toddlers these skills are developed through the typical experiences of loving and nurturing environments, regardless of culturally specific approaches to child raising.

What do we know about learning SR-EF in the schooling context?

Teacher education has emphasised the importance of children's social and emotional development for decades with attention to individual differences, classroom and behaviour management. More recently, teacher education and professional learning, policies and programs have promoted ways to provide safer and more supportive classrooms for children and young people continuing to develop SR-EF skills.

However, there are no systematic data on the impact such policies and programs have on classroom practice let alone children's outcomes. There is even less understanding about the impact of these policies and programs in culturally and linguistically diverse contexts, complex settings or working cross-culturally with Aboriginal and Torres Strait Islander children and families.

How can we measure SR-EF?

There are currently no systematic data for direct measures of SR-EF other than information collected in the Australian Early Development Census (AEDC). This national census occurs every three years with children in their first year of full-time school (usually age 5).

The AEDC provides a snapshot of how well children are developing in five domains: physical health and wellbeing, social competence, emotional maturity, language and cognitive skills (school based), and communication skills and general knowledge. The AEDC contains suitable measures across these domains to give the clearest picture of children's SR-EF at a population level.

Why is this study focused on the Northern Territory?

This SR-EF project grew from a group of Northern Territory (NT) schools investing in professional learning about teaching approaches to improve students' social, emotional and cognitive behaviours for "readiness to learn." This work is continuing and some results have been reported elsewhere. However, this collaboration led us to ask, "what do we know about the relationship between SR-EF and academic outcomes for all NT children?"

Other research on the pathway of SR-EF skills to academic achievement in middle childhood are limited and most studies don't account for contextual differences in pathways into early school achievement. This is a critical consideration for children and young people in the NT as schooling systems are organised at the state and territory level and the NT has distinct demographic distributions compared with other states in Australia.

The NT has a greater proportion of children at school entry in remote/very remote schools (48% compared with 3% nationally); with language backgrounds other than English (39% c/w 18%), and Aboriginal or Torres Strait Islander (40% c/w 5%). The majority of NT Aboriginal children have language backgrounds other than English and live in remote or very remote regions (i.e. 75-76%).

How did we do it?

The NT has a linked data repository which contains the de-identified data of children and young people. We selected the cohort of 3,199 NT children who had AEDC data from either the 2009 or 2012 censuses, attendance records for public preschool and school, and Year 3 National Assessment Program for Literacy and Numeracy (NAPLAN) test results.

What did we find?

This study confirms the expected importance of SR-EF for all children and suggests there are different pathways for Aboriginal and non-Aboriginal children.

For non-Aboriginal children, SR-EF and their academic performance in Year 3 are linked indirectly through early literacy and numeracy skills at age 5.

For Aboriginal children, SR-EF and their academic performance in Year 3 are linked indirectly through early years attendance as well as through early literacy and numeracy skills at age 5.

Implications

SR-EF are important to healthy growth and learning throughout life and particularly in pathways to positive academic learning and school engagement by Year 3. Supportive early learning and school policies and programs need to be inclusive and flexible to respond to available community and family assets.

Creating safer and more supportive learning spaces for improved preschool attendance for Aboriginal and Torres Strait Islander children will require more inclusion of first language, identity, culture and connection to country.

Conclusion

This study highlights the immediate need for further investigation of successful programs and policies that support SR-EF skills in diverse Australian education contexts. This knowledge and the importance of SR-EF skills for improving life-outcomes needs to be shared with children and young people, families, teachers and policy makers as a priority.

Improved measures of SR-EF across ages, stages and contexts need exploration to ensure responsive services, including safety and support to families, especially during transitions.

This study confirms the critical importance of preschool and school attendance for improved educational outcomes of Aboriginal children. The complexity of factors influencing non-attendance require multi-sector collaborations and community-based implementation design.

Source: He VY, Nutton G, Graham A, Hirschausen L, Su JY. Pathways to school success: Self-regulation and executive function, preschool attendance and early academic achievement of Aboriginal and non-Aboriginal children in Australia's Northern Territory. *PloS One*. 2021 Nov 11;16(11): e0259857. Available at:

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