



timssa

spotlight on

EARLY LEARNING

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Prepared by the
TIMSS South Africa
authors

Enquiries:
timssa@hsrc.ac.za

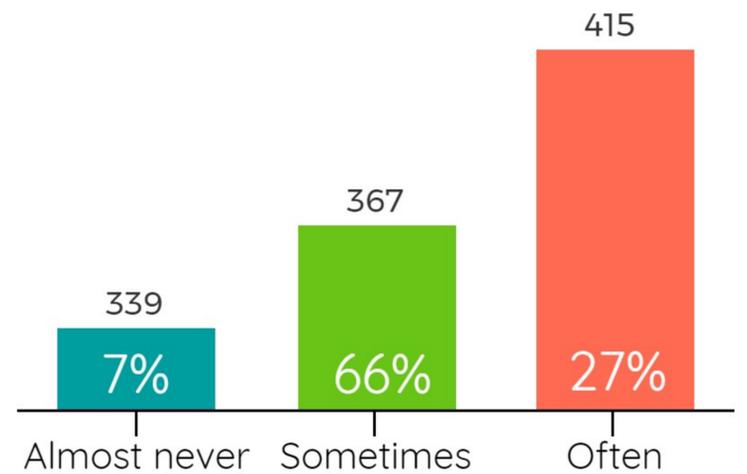
The early experiences of learners at home and prior to entering the formal schooling system are crucial for their development. Findings from the 2015 Trends in International Mathematics and Science Study (TIMSS)¹, and other studies conducted in South Africa on pre-primary education, give unique insight into the pre-Grade 1 educational experiences of learners.

The first five years of a child's life are fundamentally important as the human brain develops the majority of its neurons, and is at its most receptive to learning during this period. Early experiences provide the basis for the brain's organizational development and functioning throughout life. They have a direct impact on how children develop learning skills, as well as social and emotional abilities. Children enrolled in Early Childhood Education programmes are better behaved and have higher IQ scores upon enrolling in preschool than their peers without formal education². In this TIMSS SA Spotlight, we explore pre-grade 1 educational activities of learners and the relationship with mathematics achievement.

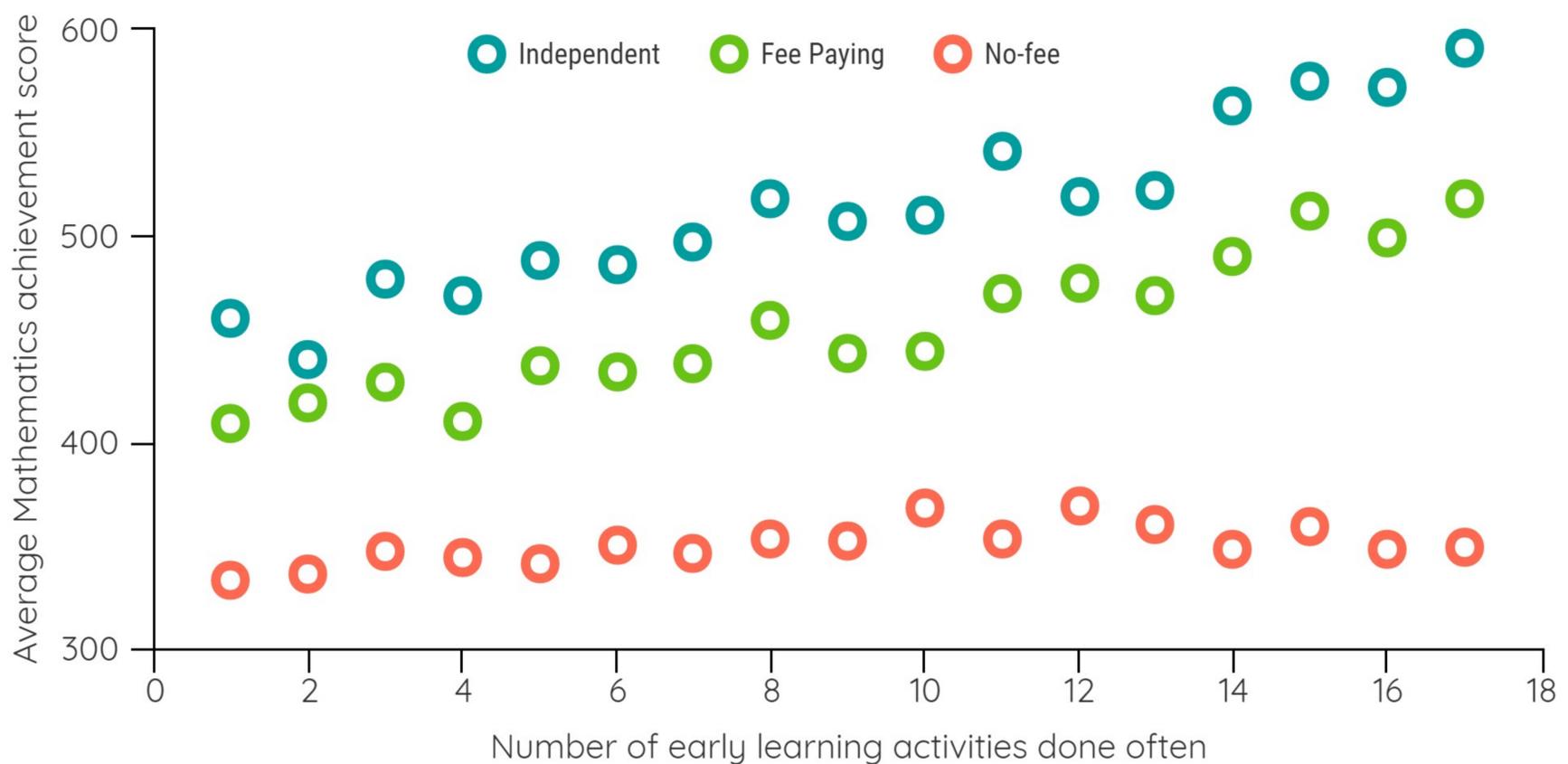
Educational Activities at Home

TIMSS asked parents³ and caregivers about a range of early educational activities which their child may have been involved in at home. In total, parents of learners responded to 17 different types of early educational activities which included: reading books, playing with alphabets, singing counting songs and playing with number toys. The responses were condensed into a single index of early literacy and numeracy activities in the home. The graph on the right illustrates that only 7% of learners were not exposed to learning activities in the home. The graph also shows that there is an improvement in TIMSS scores as the frequency of engaging in these activities increases.

TIMSS Maths scores by frequency of home activities



The overall picture changes when looking at the relationship between the number of activities done in the home and Grade 5 Mathematics achievement by school type. We can see that the strength of the relationship differs between socio-economic contexts, with the positive relationship being more pronounced for those learners who attended fee paying and independent schools in Grade 5.



SOMETHING TO THINK ABOUT

How can we account for the patterns that emerge in the graph above? Possible explanations include:

- a possible difference in the quality of home activities that learners were exposed to, where learners who go on to fee paying and independent schools are exposed to mediated play rather than routinised behaviour;
- no-fee primary schools may be unable to build on the cultural capital which learners possess when entering Grade 1;
- parents may have answered the questions in a socially desirable manner.

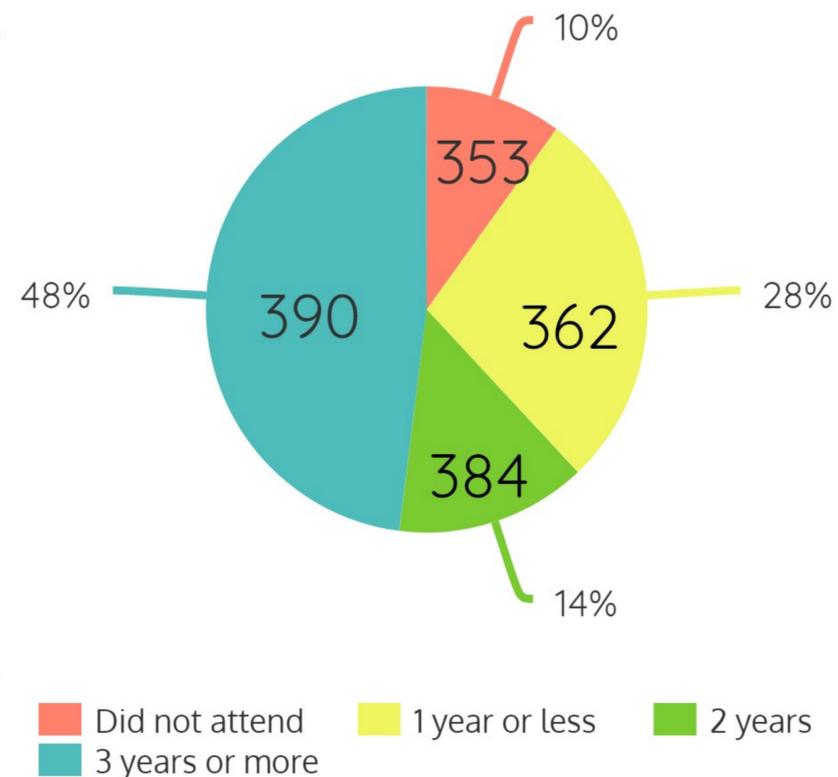
Preschool & Grade R Attendance

Grade R attendance is not compulsory in South Africa, and the classroom engagements are guided by Curriculum Assessment Policy Statements (CAPS). The daily programme comprises 3 main components: teacher guided activities, routines⁴, and child-initiated activities/ free play. Weekly guidelines for time allocations are 10 hours to Home Language, 7 to Maths and 6 to Life Skills⁵.

Good quality preschool settings offer an important boost for learners. Preschool attendance in South Africa is almost universal, with almost nine out of ten learners having some form of formal schooling prior to Grade 1. Overall, attending an educational facility prior to Grade 1 was found to be related to higher TIMSS maths achievement scores. The pie chart on the right illustrates that longer periods of time spent in preschool were positively related to TIMSS maths achievement. This is consistent with findings from SACMEQ⁶ and GHS⁷ data.

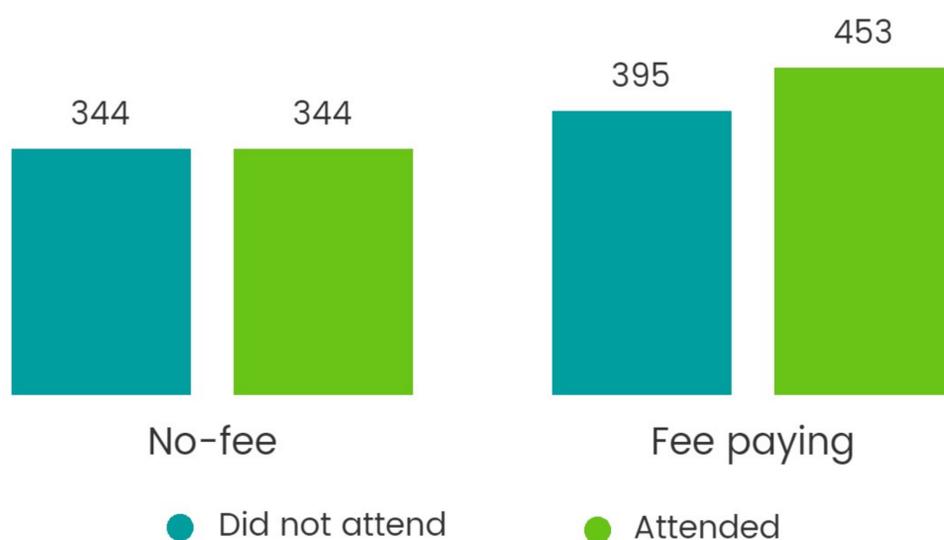
Previous studies conducted in the South African context have found that Grade R has a positive impact on later academic performance^{8,9}. These effects may be lasting, as the DPME impact study⁷ found little sign of fade-out (decay) in higher grades. In addition, this study found that the effects of attending Grade R were stronger for better performing provinces, and for quintile 4 and 5 schools. There were negligible effects in the bottom 3 quintiles. A similar pattern of incremental advantage emerged from the TIMSS 2015 data. Those learners in no-fee schools did not appear to get the same gains from attending preschool than those in fee paying schools. This could be an indication that the quality of preschool education available to those who go on to no-fee schools is not as high as that available to those who subsequently attend fee paying and independent schools¹⁰.

Length of preschool attendance and TIMSS Maths achievement



The quality of preschool education that learners receive needs attention especially for the most disadvantaged and most in-need learners

Average Maths score by Grade R attendance and school type¹¹

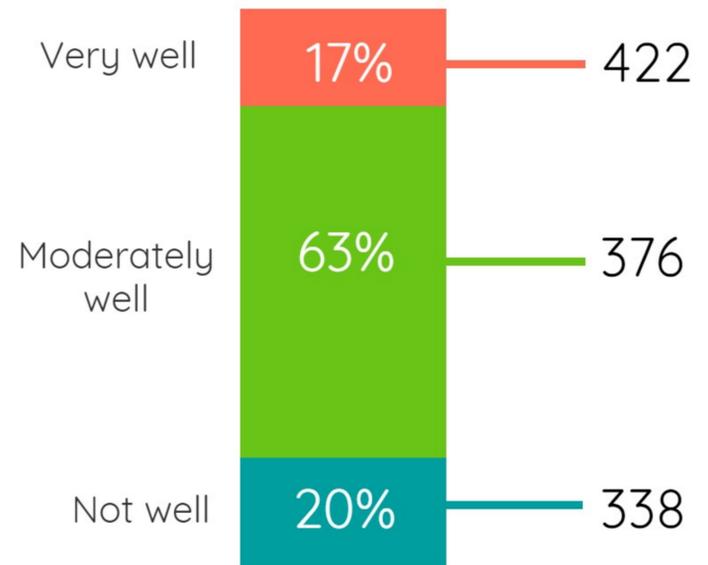


School readiness

Analysis of SACMEQ⁶, GHS⁷ and NIDS⁸ data has highlighted the role of good quality preschool education and home activities: learners who start school ready to learn perform better in maths and literacy in later grades. TIMSS asked parents the extent to which learners could perform literacy and numeracy tasks prior to entering Grade 1. Across a range of measures, learners who had a solid foundation in literacy and numeracy skills prior to Grade 1 (i.e those who could perform the tasks "very well") outperformed those with only minimal competencies by an average of 84 TIMSS points, the equivalent of two grades.

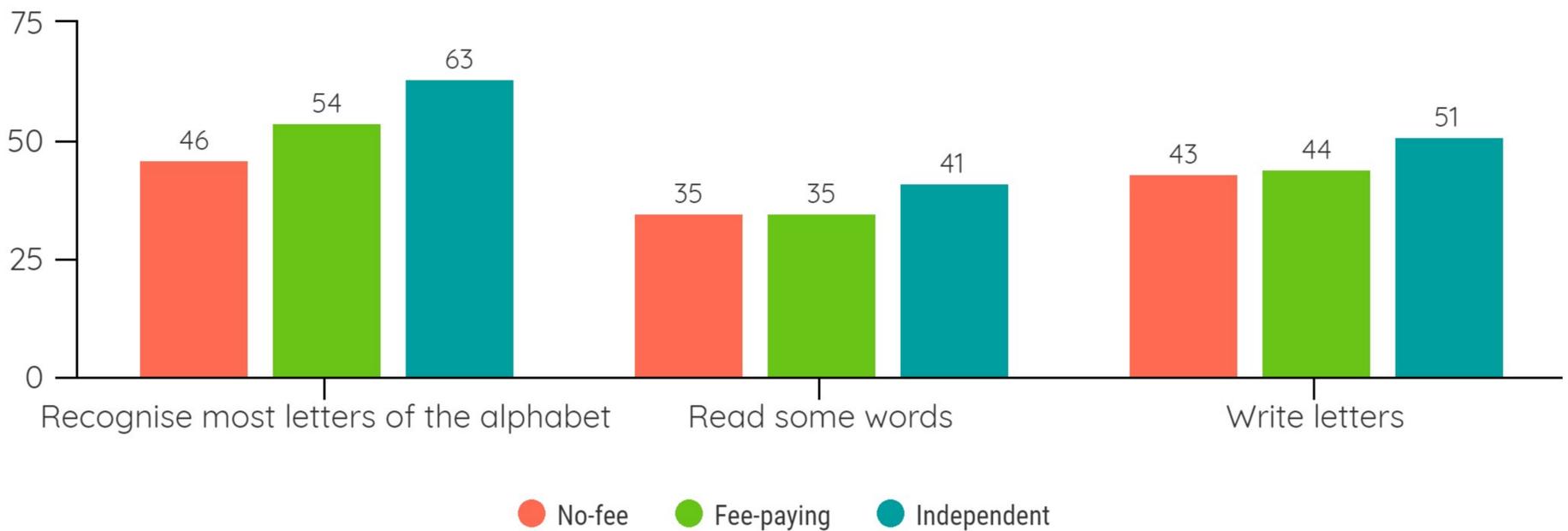
The variation between school types was again evident when examining the specific literacy and numeracy tasks in the graphs below¹².

Ability to perform tasks before Grade 1

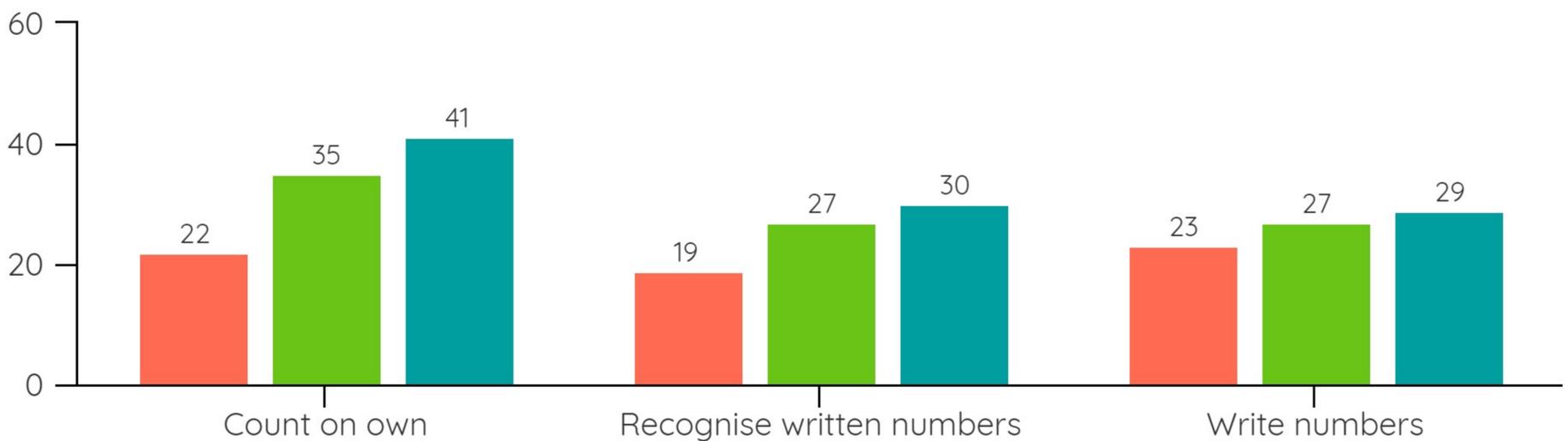


Average Maths achievement score

% of learners who could perform literacy tasks very well



% of learners who could perform numeracy tasks up to 100



What are the implications?

The studies have highlighted the importance of children engaging in learning activities prior to entering Grade 1. The implications thus relate to both the home and preschool environments:

- Parents need to be made aware of the importance of engaging their children in fun learning activities at home in order to help them to learn the skills necessary to succeed at school.
- Parents should be encouraged to enrol their children in preschool for at least 2 years, as the length of preschool attendance has an impact on achievement later on.
- The quality of preschool which children attend is a further factor which requires attention. It is necessary to ensure that all children attend preschools which provide a high quality of learning. Quality investment in the early years is particularly crucial for those most in need.

Notes:

- 1 Reddy, V., Isdale, K., Juan, A., Visser, M., Winnaar, L., & Arends, F. 2016. TIMSS 2015: Highlights of mathematics achievement in Grade 5 South African Learners. Human Sciences Research Council.
- 2 Shonkoff, J.P., & Phillips, D. (Eds.) 2000. From Neurons to Neighborhoods: The science of early childhood development. Committee on Integrating the Science of Early Childhood Development. Washington, DC: National Academy Press.
- 3 These learners would have been in preschool in 2009. We acknowledge the limitations of using retrospective data.
- 4 For example: snack time, arrival, home time and toilet routines.
- 5 Department of Basic Education (2011). Curriculum and Assessment Policy Statement: Foundation Phase Grade R. English Mathematics.
- 6 Spaul, N. 2011. A preliminary analysis of SACMEQ III South Africa. Stellenbosch Economic Working Papers No. 11/11.
- 7 Van der Berg, S, et al. 2014 The impact of the introduction of grade R on learning outcomes. Report commission by Department of Performance Monitoring and Evaluation in the Presidency in partnership with the Department of Basic Education.
- 8 Gustafsson, M. 2010. Policy note on pre-primary schooling: An empirical contribution to the 2009 Medium Term Strategic Framework. Stellenbosch Economic Working Papers No. 05/10.
- 9 Dawes, A., Biersteker, L., & Hendricks, L. 2011. Towards Integrated Early Childhood Development: An evaluation of the Sobambisana initiative. Cape Town. Ilifa Labantwana.
- 10 It is important to note that the small sample sizes of those learners in fee paying and independent schools who did not attend preschool resulted in high estimation errors.
- 11 Independent schools were omitted from the analysis as the percentage of learners in independent schools who did not attend Grade R is too small to accurately estimate scores.
- 12 Performing number tasks up to 100 was used as an indicator in the TIMSS, however the Grade R CAPS requires preschool learners to be able to work with numbers up to 10.

To reference this document:

Juan, A., Reddy, V., Hannan, S., Zulu, N. & Zuze, L. 2017. TIMSS South Africa: Spotlight on Early Learning. TIMSS SA Spotlight No. 01/17. Human Sciences Research Council

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