

He Whakaaro

EDUCATION INSIGHTS

What developmental resources do our pre-schoolers have approaching the transition to school?

These insights help us understand how children are tracking for further learning and development at school and they indicate some possible areas of concern.

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Summary

The transition to school is one of the most important periods of a child's life. A focus on their development as children approach this transition can help us understand how children are tracking towards further learning and development at school. It can also indicate possible areas of concern that we should be planning for.

This paper uses the data from 'Growing Up in New Zealand' (GUINZ) study¹ to answer the question - what resources do our pre-schoolers have for starting school? The GUINZ study measures some core development areas for pre-schoolers and this paper describes these core areas and comments on how development reflects what is valued by the early childhood education (ECE) curriculum (*Te Whāriki*), as well as the curricula at school (the New Zealand Curriculum and Te Marautanga o Aotearoa).

KEY FINDINGS

Multiple areas of children's development relate in complex and interacting ways to learning at school. But in general, developing skills in areas of social and emotional development, cognitive development and language development are important.² There are also aspects of physical development and motor control that matter too. The key findings are:

- » Children bring many 'resources' from their lives before school, in such areas as their language and in their social skills, which contribute to their well-being while at school.
- » Almost all mothers were very positive about children's readiness for school and had high expectations for what children would achieve at school and beyond. They were more positive about social skills than skills in literacy.
- » Most children were tracking well towards their transition to school and their development across the various areas clearly reflects the learning areas of *Te Whāriki*; for example, most children were very accurate at judging emotions of others or could count to ten.

1 Further information about the Growing Up in New Zealand study can be found in Morton, S.M.B, Grant, C.C., Berry, S.D., Walker, C.G., Corkin, M., Ly, K., de Castro, T.G., Atatoa Carr, P.E., Bandara, D.K., Mohal, J., Bird, A., Underwood, L., Fa'alili-Fidow, J., 2017, *Growing Up in New Zealand: A longitudinal study of New Zealand children and their families*. Now We Are Four: Describing the preschool years, Auckland: Growing Up in New Zealand.

2 Office of the Prime Ministers Chief Science Advisor (2017). Briefing paper to Secretary of Education. Children in the preschool years: areas of development and implications for measurement.

- » In every area there was a wide range in skills and knowledge; for example, children varied from not being able to name any letters of the alphabet to rapidly identifying many letters, and there was large variability in the measures of self-control
- » Differences between genders, ethnicities and socio-economic status (SES) were not apparent in some areas (for example, empathy and self-control), but there were substantial differences in others. For example, while the ratings of levels of hyperactive or inattentive behaviour were low, boys were more likely than girls to be rated by their mothers as having problematic levels.
- » There are specific areas where we could better promote children's learning through early childhood education (ECE) such as in literacy and self-control, and there is a need to be able to identify those children for whom more targeted guidance and support at school may be useful.
- » Having described profiles of children at 54 months of age, further systematic analyses remain necessary to examine how the various multiple influences contribute to children's development and how these influences interact with each other.



Most children were well on track and their development clearly reflects the learning areas of *Te Whāriki*. However in every development area there was a wide range in skills and knowledge.

The “Growing Up in New Zealand” (GUiNZ) study

GUiNZ is New Zealand's contemporary longitudinal study tracking the development of approximately 6,800 New Zealand children from before birth until they are young adults. The study is designed to provide unique information about what shapes children's early development and how interventions might be targeted at the earliest opportunity to give every New Zealand child the best start in life. The study used parent ratings, interviewer ratings and child responses across different developmental domains to collect the 54 months data.

The study provides descriptions of the skills and knowledge of the children in the sample who at 54 months old were approaching the transition to school. The profile they provide contributes to our understanding of developmental progress during the early childhood education years, by establishing descriptions of children 6 months before starting school.

Te Whāriki and the New Zealand Curriculum

Te Whāriki sets out the curriculum to be used in New Zealand ECE settings and provides guidance for its implementation. It describes a set of principles, strands, goals and learning outcomes for children. A number of the learning outcomes relate to the areas of development which the GUiNZ study used, and also to the key competencies or learning areas of the New Zealand Curriculum and *Te Marautanga o Aotearoa* used in schools. These learning outcomes include children being able to manage themselves and express their feelings and needs, and children recognising mathematical symbols and concepts and using them with enjoyment, meaning and purpose.

ECE is only one of multiple influences on children's development. The references to *Te Whāriki* are used to consider how the measures reflect what is valued in ECE (a form of validation) and also to tentatively raise questions about identifying and supporting children's development at ECE.

Interpreting the patterns

While links can be made with children's experiences through ECE, what children know and can do at 54 months reflects their wider socialisation through family/whānau and their neighbourhoods, communities, hapū and iwi and encompassing social conditions. Each of these are influences which contribute over time to children's development.

In what follows areas of strength are described. So too there are areas of concern. Precise estimates of concern 6 months before school are not generally possible. We do not have the relevant Aotearoa / New Zealand data to estimate 'risk' in many areas. Some widely-used tools have international comparisons that provide some comparisons. Also, after entering school normative expectations become available that can be used to predict the need for intervention, especially for literacy and numeracy.

Using these available sources, indications of possible difficulties, or of potentially lower than expected progress and achievement following the transition to school, can be identified, albeit tentatively. These issues are summarised here, not to emphasise deficits, but to indicate how we could use these sorts of measures to identify where more deliberate guidance or even targeted support before school might be needed for some children.

Where appropriate, Odds Ratios³ have been calculated to indicate the degree of difference between the groups that are being compared. Odds ratios are only given when they were statistically significant.

The children at 54 months of age

The cohort of children in the GUINZ study is diverse:

- Both single and multiple identities: 68% New Zealand European, 25% Māori, 21% Pacific people, 18% Asian, 16% New Zealander and 3% Middle Eastern, Latin American, African or another ethnicity;
- Mothers identified half of the children having one ethnicity (53%), One third with two ethnicities (32%) and 15% with three or more ethnicities;
- English was spoken by almost all the children (99%), followed by te reo Māori (10%), Samoan (5%), Tongan (4%), Mandarin (3%), and Hindi (3%);
- 88% of the children had at least one sibling;
- GUINZ respondents are more likely to be of low Socio-Economic Status than the population as a whole; One in seven (14%) were living in the most deprived decile of the New Zealand Deprivation (NZDep) index.

Almost all children (97%) were participating in some form of non-parental early childhood education (ECE) and almost all attended a formal ECE centre or had organised home-based care. The proportion in non-parental care had markedly increased from 35% at 9 months of age, and 55% at 24 months of age.⁴



Almost all mothers were very positive, as reflected in their high expectations for what their children would achieve at school and beyond.

Results

School readiness: mothers' views

Mothers were asked about their children's 'school readiness'; how ready their child was to start school in their social skills and their literacy skills. Mothers were also asked about their expectations for their children. Almost all the mothers were very positive, and this was reflected in their high expectations for what children would achieve at school and beyond (for example, almost 9 out of 10 mothers believed their child would complete a post-secondary diploma or higher degree).

- Social skills. Almost all mothers (9 out of 10) felt positive, or were not worried about how ready their children were in term of social skills for independence and mixing with peers. This result is consistent with the measures of children's social and emotional skills which are reported below.
- Literacy. Mothers were less sure about literacy. About two thirds believed their children had the pre-reading and writing skills necessary to start school. The percentage of mothers who were worried (38%) is similar to the percentage of children judged as possibly still at early stages of literacy learning reported below.

³ An Odds Ratio is a relative measure of an effect or difference, in the following examples calculated by comparing the percentage for one group (e.g. girls) with the percentage for another group (e.g. boys). A Confidence Interval (CI) indicates the upper and lower levels for the estimated outcome (i.e. the Odds Ratio) within which we can be 95% confident.

⁴ The New Zealand Deprivation (NZDep) index measures levels of deprivation in neighbourhoods. On this measure, the deciles are ranked opposite to how school deciles are ranked. In the NZDep, decile 1, reflects the most socioeconomically advantaged areas, while decile 10 reflects the most disadvantaged areas. Atkinson, J., Salmond, C. E. & Crampton, P., 2014, NZDep2013 Index of Deprivation, Wellington: Department of Public Health, University of Otago Wellington.



Most children were developing well in their social and emotional skills; 5-11% of children found the self-control tasks difficult; levels of hyperactivity and peer relationships were concerning.

In each of these areas there were some differences between groups of mothers. Mothers of Māori and Pacific Islands children and mothers from NZDep 9 and 10, rated their children as less well prepared in literacy than other mothers rated their children. This is also consistent with what is shown from the measures of children's development described below. Mothers of boys, of children from NZDep 9 and 10, of Pacific Island children, and of Asian children, were more likely to express concerns about how ready their children were to cope with school and/or be away from them.

Children's Social and emotional development

Te Whāriki sets expectations that children will develop dispositions and values associated with a range of social and emotional skills (for example, children are 'Managing themselves and expressing their feelings and needs'). The measures in the GUINZ study, some provided by mothers and others from GUINZ researchers, showed most children were developing well in their social and emotional skills. Importantly, in areas of empathy and self-control children showed similar levels of development; there were no major gender, ethnicity and NZDep differences. There were group differences on the measures of behaviour and conduct.

- a. **Self-control.** Most children (around 9 out of 10) performed well on the self-control tasks. But between 5 and 11% of children found some aspect of them difficult.
 - i. A '*Hand Clap Task*' assessed children's capability to clap the opposite pattern to one demonstrated. This task gives an indication of children's ability to inhibit a likely response, stay focused, and remember. These capabilities are related to aspects of self-control, which previous research has indicated has considerable developmental significance.⁵ Children were generally on track, on average completing accurately 11 out of 16 different patterns. Although there were no differences between different groups of children, there was wide variability within each group (between 5 and 10% of children found this aspect of self-control difficult). Other studies⁶ also have found variability in children's self-control at this age.
 - ii. A '*Gift Wrap Task*' measured children's ability to delay a response (peeking) in a highly engaging activity. The majority of children (72%) had perfect scores (they never peeked), indicating children were generally well on track, and this compares well with other studies using the same task. The results are consistent with the Hand Clap Task, with few differences across the various sub-groups. However, the wide variability within each group again indicates a number of children found it difficult to delay responses (11% continued peeking).
- b. **Child emotions, behaviour and conduct.** Most children (around 9 out of 10) performed well on the ratings of behaviour and conduct. About 3-13% of children might be of concern on the various measures of behaviour and conduct, but there were some areas of more substantial concern as identified by the test scores; notably, in hyperactivity or inattention, and peer relationship problems. These are described in greater detail below.
 - i. Affective knowledge. This measure examined how well children could recognise different emotions and be able to empathise with other people. The overall scores and the ranges indicate most children were well on track to participating at school, with little variation and with few differences between groups of children.
 - ii. Child Behaviour and Conduct. Mothers completed ratings based on the 'Strengths and Difficulties Questionnaire' (SDQ) which is a widely-used screening tool for five dimensions of behavioural difficulties. Most children were within what is considered the 'normal' bounds for emotional conduct or prosocial behaviour, but there were two areas of concern: in mothers' ratings of hyperactivity or inattention; and of peer relationship problems (for example, children being 'picked on').

5 Moffitt, T. E., L. Arseneault, D. Belsky, N. Dickson, R. J. Hancox, H. Harrington and A. Caspi, 2011, A gradient of childhood self-control predicts health, wealth, and public safety, *Proceedings of the National Academy of Sciences of the United States of America*, 108(7): 2693-2698.

6 Smith-Donald, R. et al., 2007. Preliminary construct and concurrent validity of the Preschool Self-regulation Assessment (PSRA) for field-based research. *Early Childhood Research Quarterly*, 22(2), pp.173-187.

Around a quarter of children (23% and 25%) would be considered as having levels of concern. This result was most apparent in the ratings for hyperactivity/inattention, as:

- › boys (27%) were 1.5 times more likely than girls (19%) to be rated as having abnormal or borderline levels of hyperactive or inattentive behaviour (OR = 1.5);
- › Pacific Island (35%) and Māori children (31%) were twice as likely as NZ European / Pakeha (19%) or Asian children (19%) to be rated by their mothers as having abnormal or borderline levels of hyperactive or inattentive behaviour (OR = 2.1); and
- › children in NZDep 9 and 10 (34%) were about 2.5 times more likely than children in NZDep 1 and 2 (16%) to be rated as having abnormal or borderline levels of hyperactive or inattentive behaviour (OR = 2.7).



The measures of literacy and numeracy show more differences between children from different family groups than the measures of children's social and emotional development.

Children's development in literacy and numeracy

The measures of literacy and numeracy show more differences between children from different family groups than the measures of children's social and emotional development. This may be due to the nature of learning in these areas which are more sensitive to specific guidance provided at home and in early childhood centres. Differences are reflected in mothers' reports of practices at home which are described here first.

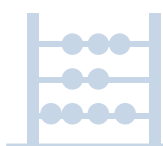
Family practices

Children's development reflects their socialisation through practices and activities in family / whānau settings as well as through educational settings. Some family practices are known to promote children's learning and development related to progress and achievement at school. Many parents engage frequently in these activities.

- a. **Parent-child media interaction.** Most mothers (85%) read books, sung songs or played music with their child several times a week or more. Fifty-eight per cent of mothers also told stories to their children several times a week or more. Many mothers encouraged their child to count (54%) or recognise numbers (43%) once or several times a day. And about a third of mothers also encouraged their children to print letters, words or numbers (35%), or to read words (35%), once or several times a day.
 - i. There were minimal differences by gender in these activities. But there were marked ethnicity and NZDep differences on some activities; especially for reading books to children and aspects of early numeracy, such as counting.
 - ii. Mothers of Asian children were 1.6 times more likely to encourage their child to recognise numbers (52%), once or several times a day compared to mothers of children of other ethnicities (OR = 1.6). Just under half of mothers of Asian children printed letters, words or numbers (48%) and read words with their child (44%) once or several times a day. Mothers of Asian children (33%) were also more likely to tell stories to their child once or several times a day (OR = 1.5). Mothers of Māori (57%) or Pacific Island children (53%) were almost one and a half times more likely to sing songs or play music with their children once or several times a day (OR = 1.4). Mothers of New Zealand European children were almost four times as likely to read books to their child once or several times a day (72%) as mothers of Asian, Māori or Pacific Island children (OR = 3.8).
 - iii. Mothers whose children were in NZDep 9 and 10 (38%) were less likely to read to their child once or several times a day, compared with mothers whose children were in NZDep 1 and 2 (74%) (OR = .32).



On average children were making good progress but there was a sizeable proportion of children still at early stages, with wide variability, and notable gender, ethnicity and NZDep differences.



Also, a sizeable percentage of children were still at early stages of numeracy skills with the possibility of achievement gaps persisting after the transition to school.

Children's Literacy

Te Whāriki sets an expectation that children will come to 'recognise some letters' and that 'thoughts, experiences and ideas can be represented as words'. In GUINZ two child measures, a simple (letter knowledge) and a more complex (writing words) assessment indicate on average children were making good progress, but there was a sizeable proportion of children still at early stages, with wide variability, and notable gender, ethnicity and NZDep differences.

- a. **Letter naming speed.** Letter knowledge and naming speed, are simple early predictors of progress in literacy over the first one to two years at school.⁷ The large majority of children were well on the way to being ready for school, and this was true by gender, ethnicity and NZDep. On average, children correctly named 8.4 letters, but with wide variation. There is no agreed score that represents a given level of concern at this age, and letters are generally quickly learned once at school. But 31% of children could name no letters indicating possible later difficulty, and this was unevenly distributed. Of those in the bottom 20% of scores:
 - i. there were about 1.5 times more boys (22%) than girls (16%) (OR = 1.4) ;
 - ii. children who identified as Māori (33%) or Pacific Island (37%) were 3.5 times more likely than NZ European (14%) or Asian (10%) children (OR = 3.5) ; and
 - iii. children from NZDep 9 and 10 (30%) were also about 3.5 times more likely than children from NZDep 1 and 2 (11%) (OR = 3.6).
- b. **Writing.** The ability to write words is a more complex measure of early literacy. It also predicts progress in reading and writing after entry to school. The majority of children (57%) could write their name in a recognisable way. Again, precise estimates of risk are not available. However, the large number of children (43%) not able to write their name suggests some children may make slow progress in learning to write at school, because differences in levels on entry to school in more complex measures such as writing tend to remain. A child still not able to write a word in the first 6 months at school would be in the lowest 4% of students.⁸ There were group differences:
 - i. girls (68%) were more than twice as likely as boys (41%) to be able to clearly write their name (OR = 2.3) ;
 - ii. Asian children (68%) and NZ European children (63%) were almost twice as likely as Māori children (39%) or Pacific Island children (41%) to be able to clearly write their name (OR = 1.7); and
 - iii. children from NZDep 1 and 2 (68%) were three times more likely than children from NZDep 9 and 10 (41%) to be able to clearly write their name (OR=3.0).

Children's Numeracy

Te Whāriki sets an expectation that children will '[recognise] mathematical symbols and concepts and [use] them with enjoyment, meaning and purpose'. Counting tasks are used to assess numeracy, and early number knowledge predicts progress in mathematical learning.⁹ A large percentage of children were able to count to 10. As with the other learning domains, specific estimates of concern are not available. But like the literacy measures, there was a sizeable percentage of children still at early stages, with the possibility of achievement gaps persisting after the transition to school. There was wide variability, and notable gender, ethnicity and NZDep differences.

- a. **Counting up to and down from 10.** About three-quarters of children (78%) could count up all the way to 10 correctly, but fewer could count down and about a quarter (27%) could not count down correctly at all.

7 Stephen G. Schilling, Joanne F. Carlisle, Sarah E. Scott, and Ji Zeng, Are Fluency Measures Accurate Predictors of Reading Achievement? *The Elementary School Journal* 107, no. 5 (May 2007): 429-448, <https://doi.org/10.1086/518622>

8 Clay, M. M. (2013), *An Observation Survey of Early Literacy Achievement*, (3rd Edition), Auckland: GES Ltd.

9 Cowan, R., 2008, Why children differ in their mathematical attainment at primary school? *Anales de Psicologia/Annals of Psychology* 24, no. 2: 180-188.

- i. While many children in all deprivation groups could count up from 1 to 10 correctly, children living in high area-level deprivation (NZDep 9 and 10, 66%) were less likely to complete the task than children in NZDep 1 and 2 (88%), (OR = 0.26).
- ii. New Zealand European (84%, n = 2823) and Asian children (87%, n = 532) were 1.5 times more likely to be able to count up from 1 to 10 correctly than Māori or Pacific Island children (OR = 1.5).



Almost half of the children had some understanding of, or could use, te reo Māori.

Māori mothers were 7 times more likely to say their child often greeted or said farewell to people in te reo Māori, compared to New Zealand European mothers.

Between 1.5% and 3.0% of children were identified as not using te reo Pākehā well.

Language development

Language skills have wide significance, underpinning other developmental areas such as social skills and self-control, as well as early and later literacy development at school. Mothers were generally confident their children could express themselves often and make themselves understood to adults in a variety of situations. The GUINZ study asked mothers about children's oral language skills both in te reo Māori and in te reo Pakeha.

Te reo Māori

Almost half of the cohort children had some understanding of, or could use, te reo Māori. *Te Whāriki* expects that children will develop 'An appreciation of te reo Māori as a living and relevant Language'. NZDep differences were apparent, as were ethnicity differences.

- a. About two-fifths of mothers (43%) indicated their child could sometimes or often speak simple words in te reo Māori; or could recognise and respond to simple spoken words (38%).
 - i. There were few differences according to children's gender, but there were socio-economic differences; children in the most deprived areas (NZDep 9 and 10) were more likely to be able to sometimes or often speak te reo Māori (OR = 1.3), or use it to talk about themselves (OR = 6.0) than those in NZDep 1 and 2.
- b. Māori mothers were 7 times more likely to say their child often greeted or said farewell to people in te reo Māori, compared to New Zealand European mothers (OR = 7.2).

Te reo Pākehā

The curriculum (*Te Whāriki*) sets expectations that children will understand oral language and use it for a range of purposes. Curiosity and play with language, including with new words, are important attributes of language learning. On four aspects of oral language most children were rated by their mothers as progressing well, although initiating and extending conversation was seen as less well developed by mothers than other areas. Between 1.5% and 3.0% of children were identified as not using language well (for example, 'Child never or rarely asks adults questions' or 'Child never continues trying to be understood'). Importantly, there were few gender, ethnicity and NZDep differences.

- a. One language area judged lower, however, was whether children offered information and told experiences in a way that was nearly always complete, logical and understandable (only 38% of all mothers agreed with this statement). These skills are related to literacy development too, especially children's comprehension.
- b. There were few differences across the subgroups, but there were two relating to asking questions and trying out new words: Mothers of Māori and Pacific Island children were less likely than mothers of children from other ethnic groups to either try new words with their child often (52% and 66% respectively) (OR = .73), or ask questions (57% and 68% respectively) (OR = .67).

10 Dickinson, D.K., McCabe, A. & Sprague, K., 2001. *Teacher Rating of Oral Language and Literacy (TROLL): A research-based tool*, Center for the Improvement of Early Reading Achievement (CIERA), University of Michigan. Available at: www.ciera.org/library/reports/inquiry-3/3-016/3-016.pdf.

This profile establishes in detail that children bring rich ‘resources’ from their lives before school, contributing to facets of their well-being at school.



Conclusions

This profile of children's development just before starting school provides a basis for more detailed and nuanced analyses that consider relationships between the various learning areas, family / whānau characteristics, ECE experiences and social conditions. Detailed analyses of how these patterns change over time are needed.

However, the profile establishes in greater detail than we have had previously that children bring rich ‘resources’ from their lives before school. In many areas children had skills and knowledge which will contribute to facets of their well-being at school. An implication is that effective guidance before, and teaching over the transition to school will be based on a recognition of these resources and the capacity to build on them.

But there are also areas where we could better promote children's learning before school, and there is a need to be able to identify those children for whom more targeted guidance and support both before and at school may be needed. There were children in each of the areas who might face difficulties when starting school.

The GUIiNZ data will enable us to answer further questions of interest to parents, teachers and policy makers. There are questions about the precursors to and the longer term trajectories for different patterns described here, such as how significant are the patterns described here for effective transitions to school and beyond. We can look at relationships between features of ECE participation and these patterns, as well as the roles and relationships with family / whānau and neighbourhoods. Quite specific analyses are possible, such as the reported frequencies of book reading and literacy outcomes for children in the short and longer term. Given concerns for early intervention and prevention, questions remain about what promotes resilience and well-being.



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