DOI: 10.1002/ajs4.138

ORIGINAL ARTICLE

WILEY

# School readiness is more than the child: a latent class analysis of child, family, school and community aspects of school readiness

**Daniel Christensen**[1] **Catherine L. Taylor**[1,2] **Kirsten J. Hancock**[1] **Stephen R. Zubrick**[1,2]

[1]Telethon Kids Institute, The University of Western Australia, Perth, WA, Australia

[2]Centre for Child Health Research, The University of Western Australia, Perth, WA, Australia

**Correspondence**
Daniel Christensen, Telethon Kids Institute, The University of Western Australia, Perth, WA, Australia.
Email: daniel.christensen@telethonkids.org.au

Received 22 June 2020. Revised 4 September 2020. Accepted 8 September 2020

**Funding information**
Australian Research CouncilCE140100027

**Abstract**

In this paper, we aim to contribute to the understanding of the multidimensional nature of school readiness. In a sample of over 4,000 Australian children in their first year of school, we used latent class analysis to examine patterns of school readiness based on child, family, school and community characteristics, and examine the relationship between these patterns of school readiness and subsequent outcomes (reading comprehension, school absence and emotional and behavioural difficulties). We identified four distinct groups: a Developmentally Enabled group (70 per cent of children), a Parenting Risk group (16 per cent of children), an Emotionally Immature Risk group (7 per cent of children) and a Language and Developmental Risks group (7 per cent of children). The four profiles showed differential patterns of association with low reading comprehension and emotional and behavioural difficulties at age 8, but no association with school absence. The study highlights the importance of family, school and community factors when considering school readiness.

**KEYWORDS**

clusters, ecological, person-centred, profiles, school readiness

# 1 | INTRODUCTION

School entry is a particularly important transition in the life course. The capabilities that children possess at the start of their formal schooling career are associated with a range of outcomes, including academic and social competencies, language and literacy development, health and socio-emotional well-being (La Paro & Pianta, 2000; Hair et al. 2006; Britto 2012; Brinkman et al. 2013; Williams et al. 2019). Conversely, children who start school with fewer of the skills and attributes for success are at increased risk of falling further behind with each year of school, which can then lead to worse long-term outcomes in areas such as educational attainment, employment, risky behaviours, mental health and crime (Rouse et al., 2005; Heckman 2007; Marmot et al. 2010; Britto 2012; Brinkman et al. 2013; Britto 2017).

There is a broad consensus that school readiness includes a variety of capacities that will support a child at school, such as early academic ability, learning engagement, social-emotional skills and low aggressive–disruptive behaviour (Abenavoli et al. 2017), although conceptualisations of school readiness vary across contexts (Barbarin et al. 2008; Gullo & Miller, 2018).

In this paper, we aim to identify patterns of school readiness based on child, family, school and community characteristics, and examine the relationship between these patterns of school readiness and subsequent outcomes of reading comprehension, school absence and emotional and behavioural difficulties. In doing so, we aim to contribute to the literature which considers school readiness a multidimensional construct including child, family, school and community characteristics.

## 1.1 | Background

The capacities children have at the start of formal schooling are important to their future success, and predict subsequent academic achievement. In a summary of the literature, Santos et al. (2012) note that the strongest specific predictors of academic achievement include math and reading skills, attention skills, language and cognitive development, general knowledge, fine motor skills, social and emotional behaviours, and physical health and well-being. This predictive approach is typified by studies that have used multiple regression to isolate the strongest predictors of later school achievement (Duncan et al. 2007; Claessens et al. 2009; Pagani et al. 2010).

There is growing recognition that school readiness needs to be considered in a broader ecological context (Britto 2012; Britto 2017; Williams et al. 2019). In a technical report from the American Academy of Pediatrics, Williams et al. (2019) argue that a full conceptualisation of school readiness should consider the various environments relevant to the child's learning and development. In other words, school readiness is not just a question of whether the child is ready for school, but also whether the child's family, school and community are ready to support the child in going to school.

There is an extensive literature confirming an association between school readiness and characteristics of the home environment (National Institute of Child Health & Human Development Early Child Care Research Network 2000; Melhuish et al. 2008; Forget-Dubois et al. 2009). These characteristics comprise inter-related components, including resources, behaviours, attitudes and knowledge regarding caregiving, stimulation, responsiveness and safety (Hess et al. 1984; Brooks-Gunn et al., 2005; Britto 2012; Britto 2017).

School factors and neighbourhood social capital are also important for supporting children upon school entry. School factors that promote readiness skills and later academic success include explicit instructional supports, emotionally supportive interactions and well-managed classrooms

(La Paro et al. 2004; Cross & Conn-Powers, 2011). Low social capital is hypothesised to adversely influence child school readiness through lower expectations, fewer opportunities for children to interact with other children before the start of school and as a barrier to parental engagement with the school community (Lapointe et al. 2007; Woolley et al. 2008; Jones & Shen, 2014). For example, Jones and Shen (2014) found that, independent of household characteristics and neighbourhood economic characteristics, social capital characteristics of neighbourhoods have significant associations with children's vocabulary test scores at age 5.

The recognition that school readiness comprises multiple dimensions has led some researchers to consider how different elements of school readiness combine, and whether distinct groups or categories of children can be defined, based on patterns of observed characteristics (Konold & Pianta, 2005; Sabol & Pianta, 2012). For example, in a sample of high-risk, low-income kindergarteners Abenavoli et al. (2017) examined profiles based on academic ability, learning engagement, socio-emotional skills and aggressive–disruptive behaviours. The study found several unexpected profiles. One profile was an aggressive–competent group that included children who exhibited aggressive behaviour as well as strong academic performance. A second profile included an academically disengaged group that had low academic engagement and poor academic results, but who did not possess other risk characteristics such as disruptive behaviour. Rather than directing attention to all children with aggressive behaviour or with low academic performance, the identification of these groups showed that children had differential patterns of strengths and weakness that would require different mechanisms of support from the education system.

The mix of cognitive and non-cognitive child characteristics is a recurrent theme in person-centred approaches to school readiness. Mendez et al. (2002) confirmed distinct profiles based on a mix of temperament, emotional regulation, autonomy and language capabilities. These profiles showed differentiated patterns of capabilities, with the verbally competent and task persistent group showing similar levels of adaptability and approach/withdrawal but substantially different receptive and expressive language skills.

Although health is not typically considered a component of school readiness, a study of over 17,000 children entering kindergarten found four profiles of school readiness (Hair et al. 2006). These profiles included a comprehensive positive development profile, a social-emotional and health strengths profile, a social-emotional risk profile and a and health risk profile. These children showed not just distinct patterns of strengths and weaknesses, but a differential association with academic, health and social outcomes in the first grade, with the social-emotional risk profile having lower teacher-rated self-control, and the health risk profile having lower math scores. In a cohort of 781 Latino/kindergarten children, Quirk et al. (2013) defined six profiles, based on 16 measures of child social-emotional/behavioural, physical and cognitive domains of child school readiness. Latent class membership was associated with reading fluency and academic achievement in English and mathematics in the second grade.

## 1.2 | Aims

In this paper, we aim to contribute to the understanding of the multidimensional nature of school readiness. We use latent class analysis (LCA) to identify patterns of school readiness based on child, family, school and community characteristics, and examine the relationship between these patterns of school readiness and subsequent outcomes (reading comprehension, school absence and emotional and behavioural difficulties). We explore a range of indicators of school readiness encompassing child, family, school and neighbourhood social capital characteristics that are proximal to the child. The selection of risk factors is based on evidence from longitudinal and cross-

sectional studies, drawn from general population samples. Reading comprehension, school absence and emotional and behavioural difficulties were selected as outcome measures because they are important to school success.

## 2 | METHODS

The Longitudinal Study of Australian Children (LSAC) is a national longitudinal study that commenced in 2004 with six biennial follow-ups to date. The study design is described in detail elsewhere (Soloff et al. 2006). Briefly, the LSAC comprises two cohorts: an Infant cohort, including children recruited in the first year of life, and a Child cohort that includes children recruited aged 4–5 years. A two-stage clustered sample design was used: approximately 10 per cent of all Australian postcodes, stratified by state of residence and urban versus rural status, were selected; then, the number of children randomly selected was proportional to population size within each postcode using Australia's universal health insurance (Medicare) database.

This study used data from the baby cohort, collected at waves three (age 4–5 years) and five (age 8–9 years) of the LSAC, linked to administrative Australian Early Development Census (AEDC) data collected upon school entry and National Assessment Program – Literacy and Numeracy (NAPLAN) collected when the study children were in Year 3 of primary school. The ages of the children at each wave are described in Table 1. Wave 3 overlaps closely with Year 1 of school and wave 5 overlaps closely with Year 3 of school. For simplicity, we refer to the children as aged four (Wave 3), five (AEDC) and 8 years (Wave 5 and NAPLAN).

Consent for AEDC linkage was obtained at the Wave 4 interviews; the majority of LSAC parents returned consent forms for AEDC data linkage (97 per cent, 4,110 children). These forms were then reviewed for their validity. After removing forms which were filled in incorrectly ($n$ = 188) and families who had opted out the study by the time of linkage ($n$ = 108), 3,814 valid consents remained (Bandara et al. 2018).

The AEDC sample eligible for linkage was further reduced to only include children in their first year of primary school. Overall, there were 2,765 children with valid consents at the time of linkage who were in their first year of primary school in 2009.

Data linkage and matching of LSAC and AEDC data involved the Social Research Centre (SRC), the Australian Bureau of Statistics (ABS), the Australian Institute of Family Studies' Data Linkage and Integrating Authority (DLIA) and the Australian Institute of Family Studies' Data Management team (LSAC-DM).

**TABLE 1 Sample size and children's ages at each wave of data collection**

| Collection point | Range (year; month–year; month) | Median age (year; month–year;month) | Years | *n* |
|---|---|---|---|---|
| Wave 3 | 4;1–6;8 | 4;10 | 2008–2009 | 4,386 |
| Australian Early Development Census (AEDC) | 5;3–6;7 | 5;9 | 2009–2010 | 2,459 |
| Wave 5 | 8;2–9;10 | 8;11 | 2012–2013 | 4,085 |
| National Assessment Program – Literacy and Numeracy (NAPLAN) Year 3 | 7;10–10;1 | 8;7 | 2010–2013 | 3,790 |

Matching variables consisted of first name, surname, gender, date of birth, school name and school address. Following linkage and matching, there were 2,459 children, a match rate of 89 per cent for the 2,765 eligible children with valid consents.

The LSAC-AEDC cohort was less likely to be assessed as developmentally vulnerable when compared to national AEDC results (17 per cent versus 24 per cent), suggesting that children in the LSAC-AEDC linked cohort have slightly stronger early developmental outcomes than children across the general Australian population (Bandara et al. 2018).

Consent to link NAPLAN was obtained at the same time as consent to link AEDC. The match between NAPLAN student results and LSAC children was based on: child's first name; child's surname; child's date of birth; school name; and school postcode. Although linkage rates for the B cohort are not specified in the LSAC technical paper series, a linkage rate of approximately 98 per cent was estimated with a previous wave of collection (Daraganova et al. 2013). Similar to the AEDC, children in the LSAC score above the national average in NAPLAN tests.

The LCA includes all 4,386 children who participated in the study at age 4, while the analysis of later child outcomes varies based on item-level missingness (see Table 1).

## 2.1 | Ethics

The study has ethics approval from the Australian Institute of Family Studies Ethics Committee. Separate ethical approval was also obtained for data linkage. As the study children were all minors at the time these data were collected, written informed consent was obtained from the caregiver on behalf of each of the study children. The signed consent forms are retained by the field agency (the ABS).

## 2.2 | Measures

### 2.2.1 | School readiness indicators

This paper uses thirteen binary indicators of school readiness. The indicators comprised five measures of child developmental vulnerability, five family indicators and three school and community indicators.

The child school readiness indicators used in this paper were derived from the 2009 Australian Early Development Census (AEDC). The AEDC is a nationwide data collection of early childhood development at the time children commence their first year of full-time school (Australian Department of Education & Training 2019). The AEDC is held every 3 years, with this paper using data from the 2009 collection.

The AEDC is an adapted version of the Early Development Index developed by the Offord Centre for Child Studies at McMaster University, Canada (Guhn et al. 2016), and licensed by the Australian Government.

The AEDC data were collected from teachers of children in their first year of primary school. In every AEDC checklist, children receive a score for each domain. The AEDC assesses each child across five domains: physical health and well-being, social competence, emotional maturity, language and cognitive skills (school-based), and communication skills and general knowledge (Australian Department of Education & Training 2017).

Children were classified as Developmentally Vulnerable on an individual domain of the AEDC if their scores fell below the 10th percentile for that domain. The cut-off scores are based on all

children who participated in the first national AEDC data collection in 2009 (Australian Department of Education & Training 2016; Australian Department of Education & Training 2017).

The family indicators (parent–child book reading, parenting consistency, parenting efficacy, parent psychological distress and parent health) and school and community indicators (quality of school environment, teacher–child relationship and neighbourhood social capital) were all assessed in the LSAC and taken from the Wave 3 collection when children were aged 4–5 years. The following factors were selected as proximal aspects of school readiness.

Study children who were not read to at all in the last week ($n$ = 251, 5.7 per cent) were considered at risk.

Maternal parenting consistency was measured in a self-complete form developed for the LSAC (Zubrick et al. 2008; Zubrick et al. 2014). Responses to each item were on a 5-point Likert scale, ranging from "almost never" to "always/almost always." Items for each measure were summed to create a composite score with higher levels representing more positive parenting characteristics. Mothers in the lowest quintile of parenting consistency ($n$ = 543; 14.3 per cent) were considered at risk.

The parenting efficacy of the mother was measured in a self-complete form developed for the LSAC (Zubrick et al. 2008; Zubrick et al. 2014). Responses to each item were on a 5-point Likert scale, ranging from "almost never" to "always/almost always." Items for each measure were summed to create a composite score with higher levels representing more positive parenting characteristics. Mothers in the lowest quintile of parenting efficacy ($n$ = 533; 13.9 per cent) were considered at risk.

In this study, we used the Kessler-6 (K6) scale to measure maternal non-specific psychological distress. Women with scores of eight or more were classified as having psychological distress. This threshold is consistent with other studies (Strazdens et al. 2007; Strazdens et al. 2010; Lawrence et al. 2011) using the K6. 9.7 per cent of mothers ($n$ = 363) were considered at risk.

Parent medical conditions were assessed by the question "Does the family member have a medical condition or disability that has lasted, or is likely to last, for 6 months or more?" If either parent endorsed this question, this item was assessed as "at-risk" for school readiness. ($n$ = 284; 6.5 per cent) were considered at risk.

All indicators were dichotomised into an "at-risk" group and a reference, lower risk group. Risks ranged in prevalence from 5.2 per cent (AEDC language and cognitive skills domain) to 22.0 per cent (neighbourhood social capital, see Table 3 for population average). The total number of risks was defined as the sum of these risks, giving each child a potential number of risks from 0 to 13 (Table 3).

### 2.2.2 | Outcomes

The three outcome measures in this paper were the child's reading comprehension, emotional and behavioural difficulties, and school absences when the child was eight.

#### Reading comprehension

The NAPLAN is an annual assessment of literacy and numeracy skills for students in Years 3, 5, 7 and 9 (Australian Curriculum Assessment & Reporting Authority 2015). The assessments are conducted nationwide over 1 week, and results are used to monitor students' literacy and numeracy skills, and performance between schools, jurisdictions and states/territories (Daraganova et al. 2013; Australian Curriculum Assessment & Reporting Authority 2018).

Here, we used the student's performance on the NAPLAN Reading test in Year 3 as our measure of reading comprehension. Children in the study sample were aged 7 years, 10 months to 10 years and 1 month in Year 3. As children varied in their age as at their NAPLAN test, we divided our sample into five age groups; children were considered to have low reading if they were in the bottom 15 per cent of reading, relative to their same-aged peers. Adjustments for students with disability are made to support their participation in the NAPLAN tests.

### Emotional and behavioural difficulties

Children's emotional and behavioural difficulties were assessed using the Strengths and Difficulties questionnaire (SDQ) (Goodman 1997), as reported by the primary caregiver. The SDQ comprises 25 items that measure five subscales: emotional symptoms; conduct problems; hyperactivity/inattention; peer relationship problems; and prosocial behaviour. The SDQ total score is a sum of scores on 20 items (omitting prosocial items), with higher scores representing poorer psychosocial functioning. Each item is scored a 0, 1 or 2 based on the scoring key (not true, somewhat true, certainly true), giving a maximum score of 10 for each subscale and an SDQ total ranging from 0 to 40. Any score of 14 or above was considered an increased likelihood of emotional and behavioural difficulties (Goodman 2015).

### School absence

Children's school absence was assessed using parent 1 report in the LSAC, asking "During the previous 4 weeks of school, how many days has study child been absent?" School holidays were excluded from this count. For the purposes of this paper, we considered any study child who had missed three or more days in the last 4 weeks (that is an attendance rate of 85 per cent or less) as high rates of school absence. Fifteen per cent of children were classified as having high absence rates at Year 3.

## 2.3 | Statistical analysis

Data analysis proceeded in two phases. The first phase identified and described latent classes of school readiness profiles at age 4–5 years, and the second phase determined whether latent class membership at age 4–5 years was related to school outcomes at age 8–9 years.

Latent class analysis aims to identify unobserved classes based on a set of observed variables (Muthén 2004). Each class should be distinguishable from the others on the basis of the item response probabilities, no class should be trivial in size, and it should be possible to assign a meaningful label to each class (Lanza & Rhoades 2011). Model fit in LCA is guided by statistical measures of model fit and by the subjective interpretation of the assigned classes, including the research question, parsimony, theoretical justification and interpretability (Jung & Wickrama 2008). Akaike information criterion (AIC), Bayesian information criterion (BIC) and entropy were used as the statistical measures of model fit in this paper. When determining the number of classes, emphasis was placed on the utility and theoretical interpretation of a solution (Table 2).

Latent class analysis estimates the probability of an observation belonging to a class, and these probabilities are used to define class membership. LCA also estimates item response probabilities, which provide information on the probability of an individual in that class to endorse the observed measures (Nylund et al. 2007; Lanza & Rhoades 2011). All LCAs were conducted using SAS PROC LCA V.1.3.2 (Lanza et al. 2015) in SAS version 9.4 (SAS Institute Inc. 2002–2012).

The associations between latent classes and the distal outcomes were estimated using the Distal BCH SAS Macro (Dziak et al. 2017). This macro uses the BCH (Bolck et al. 2004) method

**TABLE 2 Model fit indices, latent class analysis ($n$ = 4,386)**

| Number of classes | *df* | AIC | BIC | Entropy |
|---|---|---|---|---|
| 1 | 8,178 | 2,595 | 2,678 | 1.00 |
| 2 | 8,164 | 1,627 | 1,799 | 0.67 |
| 3 | 8,150 | 1,403 | 1,665 | 0.58 |
| 4 | 8,136 | 1,330 | 1,682 | 0.63 |
| 5 | 8,122 | 1,289 | 1,729 | 0.65 |
| 6 | 8,108 | 1,268 | 1,798 | 0.67 |
| 7 | 8,094 | 1,252 | 1,872 | 0.66 |
| 8 | 8,080 | 1,246 | 1,954 | 0.71 |
| 9 | 8,066 | 1,232 | 2,030 | 0.70 |
| 10 | 8,052 | 1,230 | 2,118 | 0.72 |

and takes into account uncertainty in class membership. As the outcomes were binary, associations were estimated using odds ratios.

## 3 | RESULTS

Akaike information criterion, BIC and entropy were examined to determine the ideal number of classes in the model. AIC and entropy suggested a 10-class solution, and BIC suggested a three-class solution. Therefore, all options between three and 10 classes were considered. A four-class solution was selected on the basis that this model produced a clear distinction between interpretable classes.

Table 3 provides the item response probabilities by latent class membership. We also provide the estimated population probability average for each of the risks, which can be interpreted as the proportion of children within each class endorsing each risk factor.

The four classes differed in prevalence from 70 per cent of children in class one to 7 per cent in classes three and four. The average number and type of risks experienced by children in these groups differed considerably, and no group was defined exclusively by the presence or absence of a single risk factor (Figure 1).

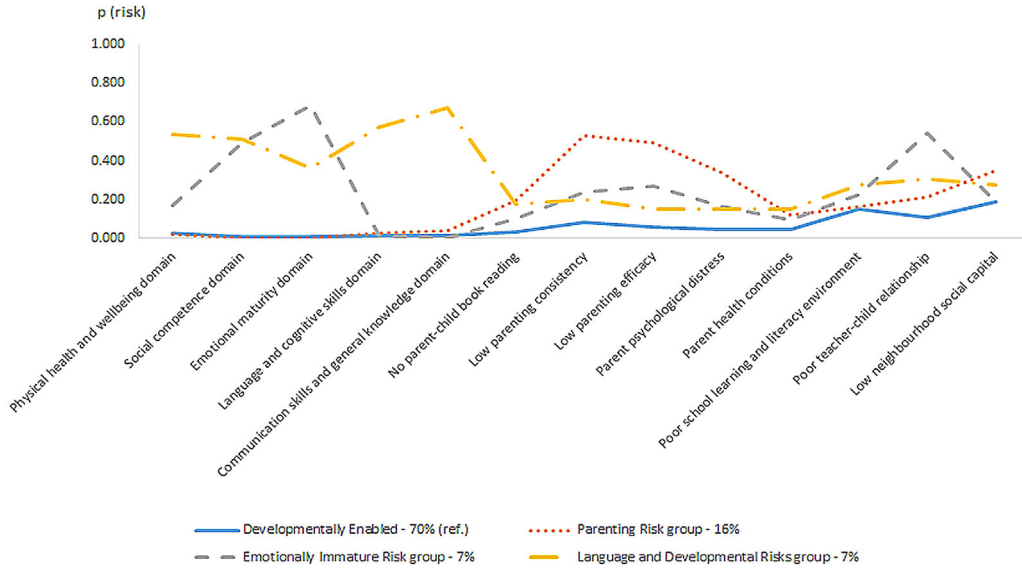
The first group (i.e. reference group) was typified as Developmentally Enabled and comprised 70 per cent of study children. On average, each child in this group was exposed to 0.8 risks. This group was distinguished by being lower than the population-average proportion across all the risk factors. Children in this group had very low likelihoods of being developmentally vulnerable on any of the AEDC child developmental vulnerability indicators (physical health and well-being, social competence, emotional maturity, language and cognitive skills (school-based)) ($p$ = .008–.026).

The second group was typified as the Parenting Risk factors group and comprised 16 per cent of study children. On average, each child in this group was exposed to 2.5 risks. This group was distinguished by an increased likelihood of the study child not being read to, low parenting consistency, low parenting efficacy, parent psychological distress and low parent-rated neighbourhood social capital. Children in this group were very similar to the Developmentally Enabled in their likelihood of vulnerability across all five AEDC child developmental vulnerability indicators.

**TABLE 3 Conditional probabilities and distributions of risks, four-class latent class analysis ($n$ = 4,386)**

| Class | Developmentally enabled (70%) | Parenting risk group (16%) | Emotionally immature risk group (7%) | Language and developmental risk group (7%) | Population average |
|---|---|---|---|---|---|
| Proportion | 0.70 | 0.16 | 0.07 | 0.07 | 1.00 |
| | Item response probabilities | | | | |
| Australian Early Development Census child developmental vulnerability indicators | | | | | |
| Physical health and well-being domain | 0.026 | 0.020 | 0.170 | 0.539 | 0.066 |
| Social competence domain | 0.008 | 0.000 | 0.493 | 0.510 | 0.069 |
| Emotional maturity domain | 0.011 | 0.000 | 0.686 | 0.361 | 0.074 |
| Language and cognitive skills (school-based) domain | 0.014 | 0.031 | 0.013 | 0.572 | 0.052 |
| Communication skills and general knowledge domain | 0.014 | 0.040 | 0.000 | 0.673 | 0.058 |
| Family indicators | | | | | |
| No parent–child book reading | 0.035 | 0.193 | 0.099 | 0.174 | 0.075 |
| Low parenting consistency | 0.081 | 0.530 | 0.238 | 0.201 | 0.170 |
| Low parenting efficacy | 0.059 | 0.493 | 0.272 | 0.152 | 0.148 |
| Parent psychological distress | 0.048 | 0.338 | 0.168 | 0.151 | 0.108 |
| Parent health conditions | 0.046 | 0.123 | 0.095 | 0.151 | 0.069 |
| School and community indicators | | | | | |
| Poor school learning and literacy environment | 0.153 | 0.165 | 0.225 | 0.275 | 0.167 |
| Poor teacher–child relationship | 0.110 | 0.211 | 0.545 | 0.305 | 0.165 |
| Low neighbourhood social capital | 0.187 | 0.352 | 0.192 | 0.274 | 0.220 |
| Mean risks | 0.79 | 2.50 | 3.20 | 4.34 | 1.44 |
| n | 3,083 | 713 | 294 | 296 | 4,386 |

**FIGURE 1 Probability of risk exposure by profile**




The third group was typified as the Emotionally Immature Risk group and comprised 7 per cent of study children. On average, each child in this group was exposed to 3.2 risks. This group was distinguished by an increased likelihood of developmental vulnerability on the AEDC child social competence and emotional maturity domains, and a poor teacher–child relationship. The Emotionally Immature Risk group was comparable to the Developmentally Enabled group in terms of developmental vulnerability on the language and cognitive skills (school-based) and communication skills and general knowledge domains.

The fourth group was typified as the Language and Developmental Risks group and comprised 7 per cent of study children. Relative to the Developmentally Enabled group, this group was distinguished by elevated risk on all the AEDC indicators, but particularly the Language and cognitive skills (school-based) domain ($p$ = .57) and Communication skills and general knowledge domain ($p$ = .67). Children in this group were also at elevated risk across all family, and school and community indicators and had the highest number of average risks per child (4.3).

Tables 4–6 show the results of fitting logistic regression models for each latent class against the outcome measures.

Relative to the Developmentally Enabled profile, children in the Parenting, Emotionally Immature and Language and Developmental Risks groups were all at increased likelihood of low reading comprehension at Year 3 (Table 4). The odds of a child having low reading

**TABLE 4 Low reading comprehension by latent class profile ($n$ = 3,544)**

| Class | % of class with low reading comprehension | Odds ratio | $p$-value |
|---|---|---|---|
| Developmentally enabled (70%) | 9.8 | 1 (ref.) | |
| Parenting risk group (16%) | 30.0 | 3.93 (2.66, 5.8) | <.0001 |
| Emotionally immature risk group (7%) | 18.4 | 2.07 (1.08, 3.97) | .04634 |
| Language and developmental risks group (7%) | 51.1 | 9.63 (5.86, 15.8) | <.0001 |

**TABLE 5 Emotional and behavioural difficulties by latent class profile ($n$ = 3,888)**

| Class | % of class with emotional and behavioural difficulties | Odds ratio | $p$-value |
|---|---|---|---|
| Developmentally enabled (70%) | 7.3 | 1 (ref.) | |
| Parenting risk group (16%) | 49.5 | 12.42 (8.85, 17.42) | <.0001 |
| Emotionally immature risk group (7%) | 39.2 | 8.19 (5.11, 13.12) | <.0001 |
| Language and developmental risks group (7%) | 28.5 | 5.06 (2.77, 9.24) | <.0001 |

**TABLE 6 High absence rates by latent class profiles ($n$ = 3930)**

| Class | % of class with high absence rates | Odds ratio | $p$-value |
|---|---|---|---|
| Developmentally Enabled (70%) | 14.7 | 1 (ref.) | |
| Parenting risk group (16%) | 20.6 | 1.50 (0.98, 2.30) | .12154 |
| Emotionally immature risk group (7%) | 19.3 | 1.38 (0.73, 2.62) | .35148 |
| Language and developmental risks group (7%) | 21.3 | 1.57 (0.85, 2.89) | .17790 |

comprehension in Year 3 were 3.9 times greater for the Parenting Risk group, 2.1 times higher for the Emotionally Immature group and 9.6 times higher for the Language and Developmental Risks group.

Relative to the Developmentally Enabled profile, children in the Parenting, Emotionally Immature, and Language and Developmental Risks groups were all at increased likelihood of emotional and behavioural difficulties at age 8 (Table 5). The odds of a child having emotional and behavioural difficulties at age 8 were 12.4 times greater for the Parenting Risk profile group, 8.2 times higher for the Emotionally Immature group and 5.1 times higher for the Language and Developmental Risks group.

Although there were indications of an increased trend toward high rates of school absence in the Parenting, Emotionally Immature, and Language and Developmental Risks groups, there were no statistically significant differences between groups in the likelihood of high rates of school absence at age 8 (Table 6).

## 4 | DISCUSSION

This paper aimed to identify patterns of risk circumstances that describe how child, family, school and community social capital factors combine to support a child's school readiness. We identified four latent classes which provided a parsimonious depiction of the interplay between varying indicators of school readiness. The four classes differed substantively from one another in the number and type of school readiness risks, and no group was defined exclusively by the presence or absence of a single risk factor. Developmentally Enabled children, approximately 70 per cent of study children, had a low likelihood of risks across all indicators of school readiness. The Parenting Risk group (16 per cent) was typified by an increased likelihood of risk associated with parenting indicators of school readiness (e.g. parent–child book reading), but were similar to the Developmentally Enabled group in terms of AEDC risks. Children in the Emotionally Immature

Risk group (7 per cent) had probabilities of 0.49 and 0.69 of being vulnerable on the AEDC social competence and emotional maturity domains. However, they were at a similar level of risk for the language and cognitive skills (school-based) and communication skills and general knowledge indicators to the Developmentally Enabled group. Finally, the Language and Developmental Risks group (7 per cent) was typified by increased likelihood of developmental vulnerability on across all indicators of school readiness. On average, each child in this group was exposed to 4.3 risks, compared with 0.8 risks per child in the Developmentally Enabled group. Overall, it is noteworthy that in this sample of typically developing children, 30 per cent are at elevated risk across one or more domains of school readiness.

As there is little consistency in the indicators used across studies and child populations, comparisons with other person-centred analyses are not straightforward. Nonetheless, our findings are broadly consistent with the extant literature. Across different studies and child populations, a common finding in person-centred analyses is the existence of a low-risk or developmentally enabled group, and our low-risk "Developmentally Enabled" group finds an analogue in other studies. In another study that used data from the Longitudinal Study of Australian Children, Taylor et al. (2019) found 62 per cent of their children in a Developmentally Enabled group. In a study of typically developing 54-month-old children, Konold and Pianta (2005) found that nearly 50 per cent of their sample were in groups typified by high cognitive, or social and self-regulatory functioning.

The at-risk groups we identified were also broadly consistent with the extant literature. Previous person-centred studies of school readiness have identified profiles defined by social-emotional characteristics (Konold & Pianta 2005; Quirk et al. 2013; Abenavoli et al. 2017). Our "Language and Developmental Risks" group was at increased likelihood of all risks. This group too is consistent with previous work looking at patterns of child risks (Hair et al. 2006; Quirk et al. 2013; Abenavoli et al. 2017; Taylor et al. 2019).

We examined the associations between the four risk groups using indicators collected in kindergarten and the first year of primary school (child ages 4–6), and outcomes measured when children were in school years two and three (ages 8–10). Several aspects of these associations bear highlighting. First, the magnitudes of association between latent class membership and both reading comprehension and emotional and behavioural difficulties are larger than we would expect; the Language and Developmental Risks group had an odds ratio of 9.6 for reading difficulties when compared with the Developmentally Enabled group, and the Parenting Risk group had an odds ratio of 12.4 for emotional and behavioural difficulties when compared with the Developmentally Enabled group. Second, there was no statistically significant association between latent class membership and high rates of school absence. This was a somewhat unexpected finding, as we anticipated that the same mix of child, family, school and community factors that predicted reading difficulties and emotional and behavioural difficulties would also predict high rates of school absence. However, we note that the observed associations were in the expected direction (14.7 per cent high absence in the Developmentally Enabled group, compared with 19.3–21.3 per cent in the other groups), and we speculate that these associations may increase in magnitude as the children grow older.

The magnitude of associations we found for reading comprehension outcomes is in sharp contrast to those typical in the predictive literature, which has found weak or no associations between child social-emotional skills at school entry and subsequent school outcomes (Duncan et al. 2007; Claessens et al. 2009). In contrast, we find substantial associations. Other person-centred analyses, such Hair et al. (2006), also found large effect sizes for the association between latent class membership and academic, health and social outcomes in the first grade. This

difference reflects the difference between taking a single predictor, while controlling for all other factors, as opposed to looking at a subpopulation defined by a patterns of risk exposure. It could be argued that the approach taken here is closer to the phenomenological experience of children within families, schools and communities (Von Eye & Bogat 2006; Lanza et al. 2010).

The four patterns of school readiness showed differential patterns of association with reading comprehension and emotional and behavioural difficulties. The Language and Developmental Risks class had the strongest association with reading, but had the weakest association of the "at-risk" latent classes with emotional and behavioural difficulties. In contrast, the Parenting Risk group had the strongest association with emotional and behavioural difficulties. The association between the Parenting Risk group and subsequent emotional and behavioural difficulties was slightly stronger than the association between the Emotionally Immature Risk group and subsequent emotional and behavioural difficulties. We do not wish to overinterpret this finding, but speculate that parenting risk factors might be more enduring than indicators of early social-emotional development that capture emotional immaturity.

## 4.1 | Study strengths and limitations

The primary strength of a person-oriented analysis is the capacity to deal with the complexity of developmental circumstances in a way that is concise and interpretable. As Lanza et al. (2010) note, practitioners, policymakers, and developmental and clinical researchers are often overwhelmed by the sheer number and combination of developmental circumstances which affect children's development. A person-oriented approach enables a way of describing these complex circumstances, as well as an empirical basis for understanding how they relate to child development.

Despite the advances our study offers, several limitations need to be noted. First, LCA is a data-driven approach, and the identification of profiles is affected by variable selection, the study sample and the statistical criteria used to decide on the number of classes in the final model. Second, in considering indicators of school readiness, we have explicitly focussed on how things "are" and not what families "have." Therefore, income, education and other measures of socio-economic status were excluded in favour of more proximal indicators of school readiness. Had we taken a different variable selection strategy, study sample or statistical criteria, a different set of profiles may have resulted (Konold & Pianta 2005). For example, the indicators used in the paper are all comparatively brief measures, and if we had used more comprehensive measures, a different set of profiles may have resulted. Likewise, we note that there are potentially other important aspects of school readiness that we did not include in our analysis, and that a different mix of indicators may have led to different profiles or different interpretations of the profiles we did discover. In particular, we dichotomised our variables to treat aspects of school readiness as "risks" rather than "strengths," and a complementary analysis could examine strength-based profiles of school readiness. We also took a specific interest in indicators of school readiness proximal to the study child. As a result, we did not include any measures of socio-economic status, such as financial resources, employment conditions, parent education and occupation, or the different aspirations and values associated with social class. Nor did we include other early-life indicators of school readiness, such as the home learning environment, playgroup participation or care arrangements before the child was aged four. Third, person-centred approaches limit generalisations or comparisons between study populations. Whereas variable-centred approaches lend themselves to comparisons, such as between the United Kingdom, the United States and Australian study cohorts, the data-driven nature of LCA makes such generalisations much harder.

We also note that our measure of school absence does not measure regular non-attendance, but only considers the previous 4 weeks. Therefore, any student who happened to have an illness, or went on a family holiday during this time would be classified as having high absence rates. This is likely the reason for there being no significant association for the school absence outcome, and assessments of persistent low attendance over longer periods may have revealed different patterns.

Our study is affected by missing data, with the analytic sample varying from 3,544 to 4,386. Missing data on the latent class and latent status indicators are permitted in the SAS procedures used in this paper (PROC LCA and the Distal BCH SAS Macro), based on the Missing at Random assumption. That is, any systematic difference between the missing values and the observed values can be explained by differences in observed data (Sterne et al. 2009). This is the same assumption made in multiple imputation (conditional on auxiliary variables), and Allison (2012) argues the maximum likelihood estimation is often preferable to multiple imputation for missing data. Nonetheless, statistical approaches to missing data are inferior to having complete data. Given that the LSAC and other longitudinal surveys tend toward selective attrition of more disadvantaged participants, we speculate that the prevalence of the at-risk latent classes would be larger if we had complete data.

Finally, while latent classes provide an excellent heuristic for discussing the complexity of developmental circumstances, they are also a simplification (Sabol & Pianta 2012). Latent classes are probabilistic, and each child has a unique set of circumstances which could place them in one or more latent classes. As such, it is important to not reify these classes (Lanza & Rhoades 2011).

These limitations notwithstanding, we note several implications.

## 4.2 | Implications

These findings confirm that conceptualisations of school readiness should include child, parent, school and community social capital (Britto 2012; Britto 2017; Williams et al. 2019), and that combinations of risks matter for different child development outcomes (Hair et al. 2006). Much of the work on the ecological conceptualisation of school readiness is situated in the context of policies, interventions and advocacy, and is typically based on a synthesis of existing evidence, rather than original empirical investigations, for example (Britto 2012; Britto 2017; Williams et al. 2019). Our work extends on the framework used by the American Academy of Pediatrics (Williams et al. 2019) and the United Nations (Britto 2012; Britto 2017) by instantiating these concepts in a single empirical investigation.

These findings also confirm that while child capacities are important components of school readiness, they are not the only relevant factors that predict later child outcomes. A mix of child, parenting, school and community risks in combination was the strongest predictor of lowest reading comprehension in the third grade, and a mix of parenting risk factors was the strongest predictor of child emotional and behavioural difficulties at ages 8–9.

Including these broader contexts can help educators and practitioners synthesise information from multiple indicators of school readiness at school entry, and assist in matching children with the right programmes and services (Abenavoli et al. 2017). A corollary of this finding is that we need to be cautious in interpreting child-only measures of school readiness. For example, children in the Parenting Risk profile had an increased risk of lower academic achievement and emotional and behavioural difficulties at ages 8–9 years that would not have been identified based on their AEDC indicators alone. This finding is particularly important given the current emphasis on

psychometric screening of children, as we have identified a group of children at risk of negative outcomes in the absence of measured child vulnerabilities at school entry.

Likewise, our findings have implications for how progress and accountability at the school level is measured. At present, the mechanisms for ensuring accountability rely heavily on the assessment of children and their capabilities. Our study suggests that while helpful, such an approach is too narrow. As Williams et al. (2019) argue: "An emphasis on kindergarten readiness that only considers the skills of a child places an undue burden of proof of readiness on that child and is particularly unfair because of economic, experiential, and cultural inequities in our society."

This emphasis on easily measured child characteristics has led to an emphasis upon direct instruction to foster cognitive readiness and children's academic knowledge (Bierman et al. 2009). However, as La Paro, Pianta and Stuhlman (2004) note "This tendency to view child assessment as the only means for ensuring accountability of classrooms and schools may be limited in its capacity for improving educational outcomes and experiences, especially for young children." That is, a greater focus on the family, school and community factors that also support children improve assessments of school progress and accountability.

Finally, we note that risks occurring in combination may be closer to the norm than the exception. And as such, multidimensional approaches that cut across domains are necessary.

## 5 | CONCLUSIONS

This study shows that school readiness is a complex construct. We found variation and patterns in child, parent, school and community aspects of school readiness, and identified four distinct classes of children. Our findings suggest that models of school readiness need to shift from a focus on child capacities to one that includes factors "outside" the child, such as parent, school and community elements of school readiness. Such an approach offers the opportunity to refine theory, and improve policy and practice.

## ACKNOWLEDGEMENTS

Francis Mitrou contributed to early discussions on the conceptualisation of this paper. This study uses data from Growing Up in Australia: The Longitudinal Study of Australian Children and My School and NAPLAN data provided by the Australian Curriculum, Assessment and Reporting Authority (ACARA) and linked to the LSAC datasets. LSAC is conducted in a partnership between the Department of Social Services (DSS), the Australian Institute for Family Studies (AIFS) and the Australian Bureau of Statistics (ABS). Data collection for the LSAC is guided by a consortium of expert Australian researchers. We especially thank the children and families who participated in the Longitudinal Study of Australian Children.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## FUNDING

This study was supported by the Australian Research Council Centre of Excellence for Children and Families over the Life Course (CE140100027).

## Data Availability Statement

LSAC data are publicly available. Users may apply for an individual or organisational licence. Information about data access is available at http://www.growingupinaustralia.gov.au/data/dataaccessmenu.html. There is a fee for the licences and release of data.

## REFERENCES


Abenavoli, R.M., Greenberg, M.T. and Bierman, K.L. (2017) 'Identification and validation of school readiness profiles among high-risk kindergartners', *Early Childhood Research Quarterly*, **38**, 33–43.

Allison, P. (2012) 'Why Maximum Likelihood is Better Than Multiple Imputation', https://statisticalhorizons.com/ml-better-than-mi (accessed 4 September 2020).

Australian Curriculum Assessment and Reporting Authority (2015) *About NAPLAN*, Sydney, NSW, ACARA.

Australian Curriculum Assessment and Reporting Authority (2018) *Test Development*, http://www.nap.edu.au/about/test-development (accessed 5 March 2020).

Australian Department of Education and Training (2016) *Australian Early Development Census National Report 2015: A Snapshot of Early Childhood Development in Australia*, Canberra, Department of Education and Training.

Australian Department of Education and Training (2017) *Australian Early Development Census Data Dictionary*, Canberra, Department of Education and Training.

Australian Department of Education and Training (2019) *About the AEDC*, https://www.aedc.gov.au/about-the-aedc (accessed 20 January 2020).

Bandara, D., Sipthorp, M., Sufi, F. and Daraganova, G. (2018) Australian Early Development Census (AEDC) data in the Longitudinal Study of Australian Children (LSAC). *LSAC Technical Paper No. 21*. Melbourne, Australian Institute of Family Studies.

Barbarin, O.A., Early, D., Clifford, R., Bryant, D., Frome, P., Burchinal, M., Howes, C. and Pianta, R. (2008) 'Parental conceptions of school readiness: relation to ethnicity, socioeconomic status, and children's skills', *Early Education and Development*, **19** (5), 671–701.

Bierman, K.L., Torres, M.M., Domitrovich, C.E., Welsh, J.A. and Gest, S.D. (2009) 'Behavioral and cognitive readiness for school: cross-domain associations for children attending head start', *Social Development*, **18** (2), 305–23.

Bolck, A., Croon, M. and Hagenaars, J. (2004) 'Estimating latent structure models with categorical variables: one-step versus three-step estimators', *Political Analysis*, **12** (1), 3–27.

Brinkman, S., Gregory, T., Harris, J., Hart, B., Blackmore, S. and Janus, M. (2013) 'Associations between the Early Development Instrument at age 5, and reading and numeracy skills at ages 8, 10 and 12: a prospective linked data study', *Child Indicators Research*, **6** (1), 695–708.

Britto, P.R. (2012) *School Readiness: A Conceptual Framework*, New York, United Nations Children's Fund.

Britto, P.R. (2017) *Early Moments Matter for every child*, New York, United Nations Children's Fund.

Brooks-Gunn, J. and Markman, L.B. (2005) 'The contribution of parenting to ethnic and racial gaps in school readiness', *The Future of Children*, **15** (1), 139–68.

Claessens, A., Duncan, G.J. and Engel, M. (2009) 'Kindergarten skills and fifth-grade achievement: Evidence from the ECLS-K', *Economics of Education Review*, **28** (4), 415–27.

Cross, A.F. and Conn-Powers, M. (2011) *A Working Paper: New Information about School Readiness*, Bloomington, Indiana University-Bloomington, Indiana Institute on Disability & Community.

Daraganova, G., Edwards, B. and Sipthorp, M. (2013). Using National Assessment Program — Literacy and Numeracy (NAPLAN) data in the Longitudinal Study of Australian Children (LSAC). *LSAC Technical Paper No. 8*. Melbourne, Australian Institute of Family Studies.

Duncan, G.J., Claessens, A., Huston, A.C., Pagani, L.S., Engel, M., Sexton, H., Dowsett, C.J., Magnusson, K., Klebanov, P., Feinstein, L., Brooks-Gunn, J. and Duckworth, K. (2007) 'School readiness and later achievement', *Developmental Psychology*, **43** (6), 1428–46.

Dziak, J.J., Bray, B.C. and Wagner, A.T. (2017) *LCA_Distal_BCH SAS Macro Users' Guide*, University Park, The Methodology Center, Penn State.

Forget-Dubois, N., Dionne, G., Lemelin, J.-P., Pérusse, D., Tremblay, R.E. and Boivin, M. (2009) 'Early child language mediates the relation between home environment and school readiness', *Child Development*, **80** (3), 736–49.

Goodman, R. (1997) 'The strengths and difficulties questionnaire: a research note', *Journal of Child Psychology and Psychiatry and Allied Disciplines*, **38** (5), 581–6.

Goodman, R. (2015) *Scoring the Strengths & Difficulties Questionnaire for Age 4–17*, http://www.sdqinfo.com (accessed 14 January 2016).

Guhn, M., Janus, M., Enns, J., Brownell, M., Forer, B., Duku, E., Muhajarine, N. and Raos, R. (2016) 'Examining the social determinants of children's developmental health: protocol for building a pan-Canadian population-based monitoring system for early childhood development', *British Medical Journal Open*, **6** (4), e012020.

Gullo, D.F. and Miller, M. (2018) 'Building a structural model for understanding school readiness', *European Early Childhood Education Research Journal*, **26** (5), 718–37.

Hair, E., Halle, T., Terry-Humen, E., Lavelle, B. and Calkins, J. (2006) 'Children's school readiness in the ECLS-K: Predictions to academic, health, and social outcomes in first grade', *Early Childhood Research Quarterly*, **21** (4), 431–54.

Heckman, J.J. (2007) 'The economics, technology, and neuroscience of human capability formation' *Proceedings of the National Academy of Sciences of the United States of America*, **104** (33): 13250.

Hess, R.D., Holloway, S.D., Dickson, W.P. and Price, G.G. (1984) 'Maternal variables as predictors of children's school readiness and later achievement in vocabulary and mathematics in sixth grade', *Child Development*, **55** (5), 1902.

Jones, C. and Shen, J. (2014) 'Neighborhood social capital, neighborhood disadvantage, and change of neighborhood as predictors of school readiness', *Urban Studies Research*, **2014**, 1–11.

Jung, T. and Wickrama, K.A.S. (2008) 'An introduction to latent class growth analysis and growth mixture modeling', *Social and Personality Psychology Compass*, **2** (1), 302–17.

Konold, T.R. and Pianta, R.C. (2005) 'Empirically-derived, person-oriented patterns of school readiness in typically-developing children: description and prediction to first-grade achievement', *Applied Developmental Science*, **9** (4), 174–87.

La Paro, K.M. and Pianta, R.C. (2000) 'Predicting children's competence in the early school years: a meta-analytic review', *Review of Educational Research*, **70** (4), 443–84.

La Paro, K.M., Pianta, R.C. and Stuhlman, M. (2004) 'The classroom assessment scoring system: findings from the prekindergarten year', *The Elementary School Journal*, **104** (5), 409–26.

Lanza, S.T., Dziak, J.J., Huang, L., Wagner, A. and Collins, L.M. (2015) *PROC LCA & PROC LTA users' guide (Version 1.3.2)*, University Park, The Methodology Center, Penn State.

Lanza, S.T. and Rhoades, B.L. (2011) 'Latent class analysis: an alternative perspective on subgroup analysis in prevention and treatment', *Prevention Science*, **14** (2), 157–68.

Lanza, S.T., Rhoades, B.L., Nix, R.L. and Greenberg, M.T. (2010) 'Modeling the interplay of multilevel risk factors for future academic and behavior problems: a person-centered approach', *Development and psychopathology*, **22** (2), 313.

Lapointe, V.R., Ford, L. and Zumbo, B.D. (2007) 'Examining the relationship between neighborhood environment and school readiness for kindergarten children', *Early Education and Development*, **18** (3), 473–95.

Lawrence, D., Mitrou, F. and Zubrick, S.R. (2011) 'Non-specific psychological distress, smoking status and smoking cessation: United States National Health Interview Survey 2005', *BMC Public Health*, **11** (256), 256.

Marmot, M.G., Allen, J., Goldblatt, P., Boyce, T., McNeish, D., Grady, M. and Geddes, I. (2010) *Fair Society, Healthy Lives*, London, The Marmot Review.

Melhuish, E.C., Phan, M.B., Sylva, K., Sammons, P., Siraj-Blatchford, I. and Taggart, B. (2008) 'Effects of the home learning environment and preschool center experience upon literacy and numeracy development in early primary school', *Journal of Social Issues*, **64** (1), 95–114.

Mendez, J.L., Fantuzzo, J. and Cicchetti, D. (2002) 'Profiles of social competence among low-income african american preschool children', *Child Development*, **73** (4), 1085–100.

Muthén, B.O. (2004) 'Latent variable analysis: Growth mixture modeling and related techniques for longitudinal data'. In D. Kaplan, (ed.) *Handbook of Quantitative Methodology for the Social Sciences*, Newbury Park, Sage, pp. 345–68.

National Institute of Child Health and Human Development Early Child Care Research Network (2000) 'The relation of child care to cognitive and language development', *Child Development*, **71** (4), 960–80.

Nylund, K.L., Asparouhov, T. and Muthén, B.O. (2007) 'Deciding on the number of classes in latent class analysis and growth mixture modeling: a monte carlo simulation study', *Structural Equation Modeling: A Multidisciplinary Journal*, **14** (4), 535–69.

Pagani, L.S., Fitzpatrick, C., Archambault, I. and Janosz, M. (2010) 'School readiness and later achievement: a French Canadian replication and extension', *Developmental Psychology*, **46** (5), 984–94.

Quirk, M., Nylund-Gibson, K. and Furlong, M. (2013) 'Exploring patterns of Latino/a children's school readiness at kindergarten entry and their relations with Grade 2 achievement', *Early Childhood Research Quarterly*, **28** (2), 437–49.

Rouse, C., Brooks-Gunn, J. and McLanahan, S. (2005) 'School readiness: closing racial and ethnic gaps: introducing the issue', *Future of Children*, **15** (1), 5–13.

Sabol, T.J. and Pianta, R.C. (2012) 'Patterns of school readiness forecast achievement and socioemotional development at the end of elementary school', *Child Development*, **83** (1), 282–99.

Santos, R., Brownell, M., Ekuma, O., Mayer, T. and Soodeen, R.-A. (2012) *The Early Development Instrument (EDI) in Manitoba: Linking Socioeconomic Adversity and Biological Vulnerability at Birth to Children's Outcomes at Age 5*, Winnipeg, Manitoba Centre for Health Policy.

SAS Institute Inc (2002–2012) *SAS for Windows Version 9.4*, Cary, SAS Institute Inc.

Soloff, C., Lawrence, D., Misson, S. and Johnstone, R. (2006). Wave 1 weighting and non-response. *LSAC Technical Paper No. 3*. Melbourne, Australian Institute of Family Studies.

Sterne, J.A.C., White, I.R., Carlin, J.B., Spratt, M., Royston, P., Kenward, M.G., Wood, A.M. and Carpenter, J.R. (2009) 'Multiple imputation for missing data in epidemiological and clinical research: potential and pitfalls', *BMJ Online*, **338**.

Strazdens, L., Shipley, M. and Broom, D.H. (2007) 'What does family-friendly really mean? Wellbeing, time, and the quality of parents' jobs', *Australian Bulletin of Labour*, **33** (2), 202–25.

Strazdens, L., Shipley, M., Clements, M., O'Brien, L.V. and Broom, D.H. (2010) 'Job quality and inequality: parents' jobs and children's emotional and behavioral difficulties', *Social Science and Medicine*, **70**, 2052–60.

Taylor, C.L., Zubrick, S.R. and Christensen, D. (2019) 'Multiple risk exposures for reading achievement in childhood and adolescence', *Journal of Epidemiology and Community Health*, **7**(5), 427–34.

Von Eye, A. and Bogat, G.A. (2006) 'Person-oriented and variable-oriented research: concepts, results, and development', *Merrill-Palmer Quarterly*, **52** (3), 390–420.

Williams, P.G., Lerner, M.A. and Council on Early Childhood and Council on School Health (2019) 'School readiness', *Pediatrics*, **144** (2), e20191766.

Woolley, M.E., Grogan-Kaylor, A., Gilster, M.E., Karb, R.A., Gant, L.M., Reischl, T.M. and Alaimo, K. (2008) 'Neighborhood social capital, poor physical conditions, and school achievement', *Children and Schools*, **30** (3), 133–45.

Zubrick, S.R., Lucas, N., Westrupp, E.M. and Nicholson, J.M. (2014) *Parenting Measures in the Longitudinal Study of Australian Children: Construct Validity and Measurement Quality, Waves 1 to 4*, Canberra, Department of Social Services.

Zubrick, S.R., Smith, G.J., Nicholson, J.M., Sanson, A.V., Jackiewicz, T.A. and the LSAC Research Consortium (2008) *Social Research Policy Paper No. 34: Parenting and Families in Australia*. Canberra, Australian Government Department of Families, Housing, Community Services and Indigenous Affairs.

**Daniel Christensen** is currently Research Fellow in the Centre of Excellence for Children and Families over the Life Course. Daniel's primary research interests are children's language and literacy development, and the impact of multiple disadvantage on children and their families.

**Professor Catherine (Cate) L. Taylor** is Senior Principal Research Fellow at the Telethon Kids Institute and The University of Western Australia and Adjunct Professor in the Menzies Institute for Medical Research at the University of Tasmania. Cate specialises in large-scale population-level longitudinal studies of children's health, development and education. In partnership with government agencies, she uses linked cross-sectoral government agency datasets to provide practical analysis and insights into early childhood service provision.

**Kirsten J. Hancock** is currently Research Fellow in the Centre of Excellence for Children and Families over the Life Course. Kirsten investigates a wide range of issues around child development, particularly for vulnerable children and those in families with multiple generations of disadvantage. Her focus is on education, school attendance, health and mental health issues for disadvantaged students.

**Professor Stephen (Steve) Zubrick** is Head of the Brain and Behaviour Research Focus Area at Telethon Kids Institute. Over the past 20 years, he has been instrumental in designing and implementing the leading Australian studies (national and state) of child and adolescent mental health. From 2000 to 2018, he chaired the Consortium Advisory Group for the Longitudinal Study of Australian Children and is presently a Member of the Steering Committee for the Longitudinal Study of Indigenous Children. In 2014, he was one of nine Chief Investigators who lead and won the funding to create an Australian Research Council Centre of Excellence for Children and Families Over the Lifecourse (The Life Course Centre) and is its Deputy Director.

**How to cite this article:** Christensen D, Taylor CL, Hancock KJ, Zubrick SR. School readiness is more than the child: a latent class analysis of child, family, school and community aspects of school readiness. *Aust J Soc Issues*. 2020;00:1–19. doi: 10.1002/ajs4.138.