Relative age and the Early Years Foundation Stage Profile:
How do birth month and mean peer group age determine attribution of a 'Good Level of Development' –
and what does this tell us about how 'good' the
Early Years Foundation Stage Profile is?

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(Work in progress, under journal review)

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The Early Years Foundation Stage Profile (EYFSP)

- Statutory national teacher assessment at the end of primary Reception year, against prescribed 'national standards.'

- School year-group cohorts correspond to the structure of the academic year (September – August), so at this point, Reception children born in the summer months are turning five, and their classmates born in the autumn months are soon to be six.

- Children scored against criteria and scales spanning domains including communication and language; and personal, social, and emotional development.

- Key target and metric across revisions (since 2003): 'Good Level of Development' ('GLD') – binary threshold measure

Aims and intended uses of the EYFSP(1)

The Department for Education (DfE) states(1, 2) the EYFSP should:

- 'provide a reliable, valid and accurate assessment of individual children at the end of the EYFS'

- 'inform parents about their child's development'

- provide 'an accurate national data set relating to levels of child development'

- 'inform the dialogue between reception and year 1 teachers'

Aims and intended uses of the EYFSP(2)

The DfE states(1, 2) the EYFSP should:

- be used for policy-making 'both nationally and locally.'

National and area-level figures on proportions of children designated as having reached a 'GLD' are reported annually in the Department's statistical releases (National Statistics).

Longstanding knowledge that children who are younger in the school year-group (summer-borns) are less likely to be awarded a 'GLD': one aspect of 'relative age effects'

- DfE (2010a); DfE (2010b); DfE (2020)(4, 5, 6).

- August-born children are a year younger than September-born children in the same school-year cohort in summer of their Reception year...

- ...but criteria for the EYFSP (including the 'GLD') are not age adjusted.

- Younger children less likely to meet criteria and 'expected standards' simply because they are younger (Crawford et al, 2013; 2014 [7, 8])

Another aspect of 'relative age effects': Effect of age composition of a child's schoolmates on likelihood of 'GLD' attribution: Not previously explored

In this work, I look at whether a child's school year-group cohort averages more older or more younger children.

Previous research suggests peer average age will matter: but it points in two ostensibly contradictory directions.

Possibility one: As more older peers can be beneficial for children's development, an older year-group will boost chances of 'GLD' attribution

- Congruent with 'the broader peer effects literature,' which tends to document 'positive spillovers from higher scoring peers'(Cascio & Shanzenbach, 2007)(10)

- Given that most older children, by virtue of their age, are more skilled and developed, more older peers should facilitate development: scaffolding learning, and boosting progress, particularly in social and communication skills and language (which are covered by the EYFSP)

- Studies of young children around Reception age across the UK, US, and Europe support this possibility: more older peers related to higher scores in **standardised tests, cognitive assessments, and research instruments**

    (Cascio & Schanzenbach [2007]; Ansari et al [2017]; Moller et al [2008]; Guo et al [2014]; Borbelly et al [2021]; Barbetta et al [2019])(11-17)

Possibility two: More older peers will depress children's likelihood of being awarded a 'GLD'(1)

- Studies of the effects of peer composition **on teacher assessments within the school system (rather than on research study outcomes using cognitive tests / research instruments)** suggest equivalently skilled children tend to be judged lower if their peers are more skilled on average

  (Elder & Lubotsky [2009]; Meissel et al [2017]; Calsamiglia & Loviglio [2019]; Crawford et al [2013b])(17, 18, 19, 20)

- 'teachers grade on a curve, leading to negative peer effects…This puts forth a source of distortion' (Calsamiglia & Loviglio [2019])(19)

- Because absolute age is related directly and incrementally to children's skills, these studies suggest that children in schools with more older (and therefore more skilled) peers may have lower chances of being denoted by their teacher to have reached a 'GLD' in the EYFSP.

Possibility two: More older peers will depress children's likelihood of being awarded a 'GLD'(2)

- Children's actual skills as intended to be measured by the EYFSP are filtered not only through teacher (relative) judgements but also through 'moderation' processes.

- EYFSP assessment to be based on 'practitioner knowledge,' which 'isn't often formally recorded,' (DfE 2017) - but also a requirement that this internally held 'knowledge' and resultant attributions to the child must 'be subject to moderation to ensure national consistency and accuracy.'

- Bradbury (2011)(21): teachers alter scores to 'fit into a bell curve'; tactical compliance and amendment of scores in order to fit the distribution expected and required by 'moderation' for their school.

- Mechanically, if an individual child is in a year-group that averages more older children (who will be more likely to be attributed a 'GLD' due to their higher skills and maturity) then that individual child will have lower chances of attribution, as they will be 'pushed' down the curve.

Current study: Data and analyses

- Updates research on children's own birth month and attribution of a 'GLD', and explores association between average age of school year-group peers and 'GLD' ascription: separately for children born in the autumn (Sept-Dec), spring (Jan-Apr), and summer(May-Aug) – because effect of peers may vary for children who are themselves older or younger.

- De-identified National Pupil Database (NPD) Foundation Stage Profile and Spring School Census records for children with EYFSP scores 2008-2018 (total N=6 million+). Secure access data.

- Main samples: children in mainstream schools with 12+ Reception pupils who fall into 'standard' 12 month cohort range (Sept-Aug).

- Mean peer age within school Reception year-group: September = 12, November = 11…July = 2, August =1. Across years, mean = 6.5 ('mid-February')

- Descriptive analyses and logistic regression models (outcome: 'GLD' 0/1) controlling for child-level FSM, EAL, ethnicity; school proportion FSM, EAL, different ethnic groups, N pupils in year-group; clustered SEs at school-level. Main analyses separately for each year as e.g. FSM does not represent a consistent group over time (Campbell et al, forthcoming, 2021)(22)

Findings 1:

As expected, the younger a child is in the school year, the less likely they are to be attributed a 'GLD': 30pp average difference across all years

Systematically measuring age rather than individual 'development'

Findings 2:

The older the mean age of Reception year-group peers, the less likely the individual child to be attributed a 'GLD'
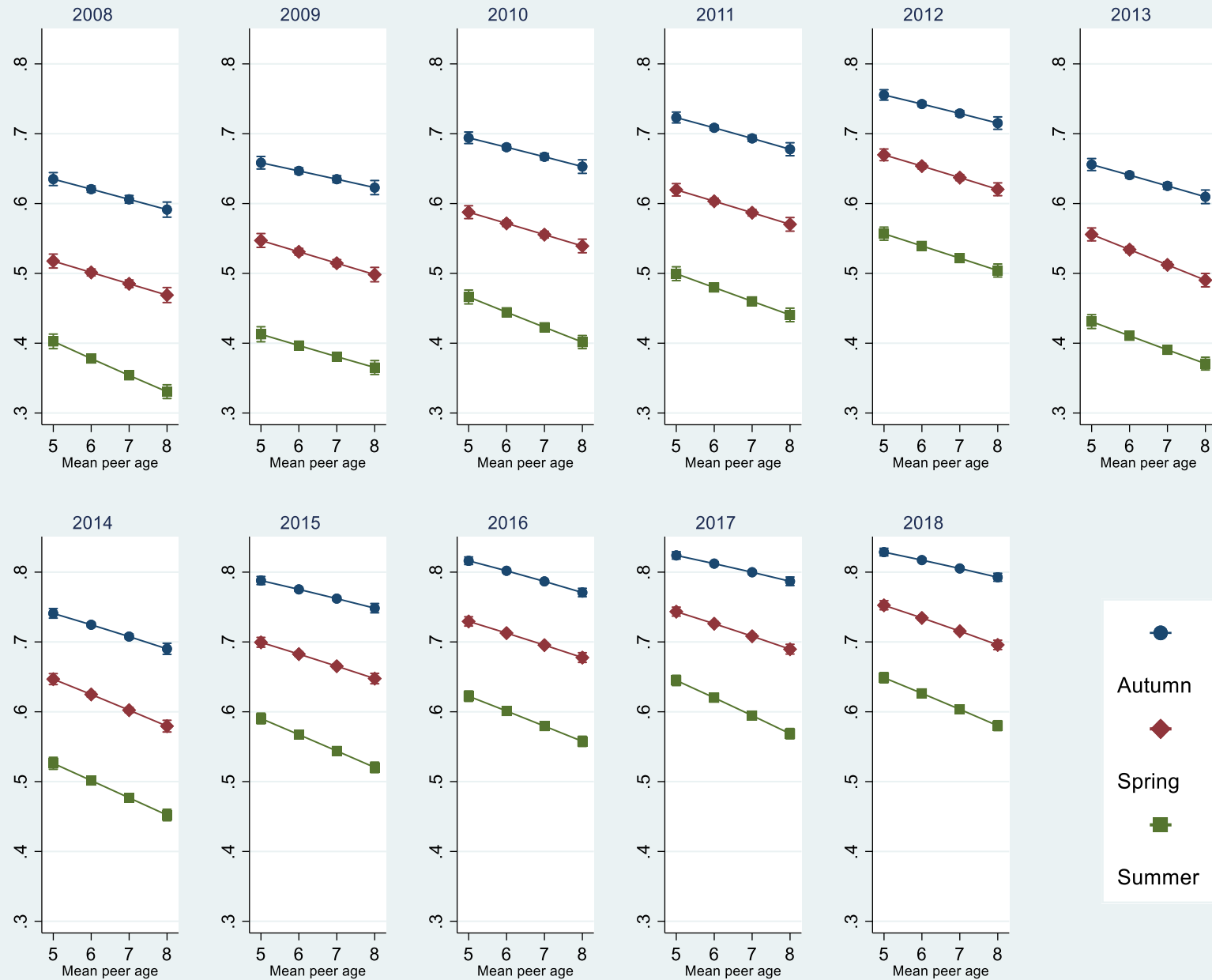

Note: The distribution is split by standard deviation within each year (< -1[younger peers]; -1-0 [somewhat younger peers]; 0-1 [somewhat older peers]; >1 [older peers])

2008: N=492,232; 2009: N=519,469; 2010: N=545,195; 2011: N=560,776; 2012: N=582,141; 2013: N=603,581; 2014: N=602,999; 2015: N=615,096; 2016: N=615,497; 2017: N=589,310; 2018: N=523,846

Findings 3:

More older peers associated with lower chances of 'GLD' attribution for children who are **themselves both older and younger**.

(Pred. probs from log regs with all controls; national main samples each year; child's own birth season interacted with mean peer age)

2008: N=492,232; 2009: N=519,469; 2010: N=545,195; 2011: N=560,776; 2012: N=582,141; 2013: N=603,581; 2014: N=602,999; 2015: N=615,096; 2016: N=615,497; 2017: N=589,310; 2018: N=523,846

Checks and additional analyses

- Small schools (N=12-30)
- Schools with less skewed peer age distributions (remove those with 50%+ summer- or autumn-borns) (NB not many)
- Mean year-group age constitution (including child themselves, rather than peers only)
- Linear probability models with Local Authority fixed effects
- Pool cohorts across all years; schools with consistent ID; linear probability model, school fixed effects

- Robust across all analyses and across years

Summary and implications(1)

- Birth month is starkly predictive of 'GLD' attribution: to a significant extent the 'Good Level of Development' systematically measures age, not individual development.

- An older year-group predicts lowered chances of 'GLD' attribution, for children born across all seasons.

- Possibility 1: an older year-group will boost chances of 'GLD' attribution ✗

- Possibility 2: more older peers will depress children's likelihood of being awarded a 'GLD' ✓

- Findings are consistent with research on how teacher's assessments within the school system work: relative judgement and 'moderation' filter and distort; teachers assess relatively and 'on a curve'; 'moderation' compounds this.

Summary and implications(2)

The latest EYFSP revision continues to ignore both the dominance of age in determining 'GLD' attribution and the effects of context and relative judgement. Aims and intended uses of the EYFSP thus continue to be problematic, even on its own terms:

- 'provide a reliable, valid and accurate assessment of individual children at the end of the EYFS'

- 'inform parents about their child's development'

- provide 'an accurate national data set relating to levels of child development'

- 'inform the dialogue between reception and year 1 teachers'

- be used for policy-making 'both nationally and locally'

Thanks for listening. All comments / feedback very welcome
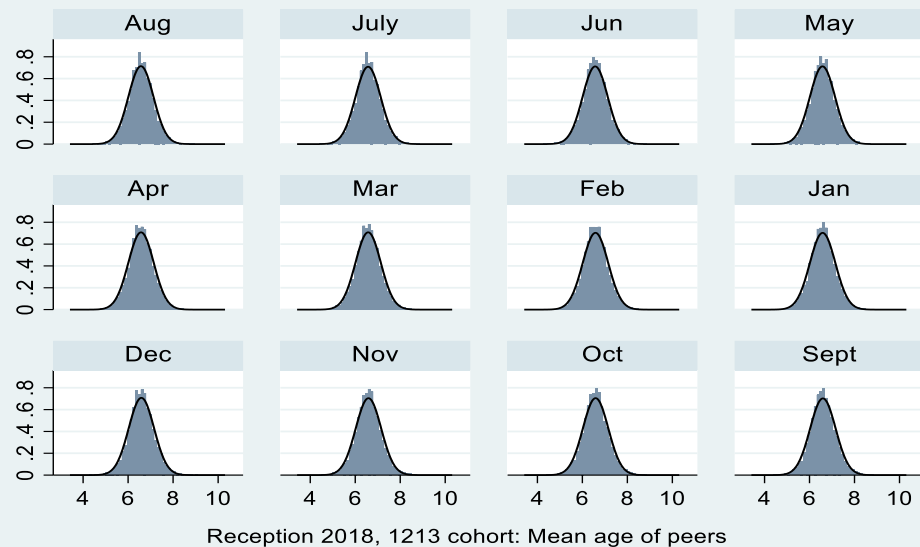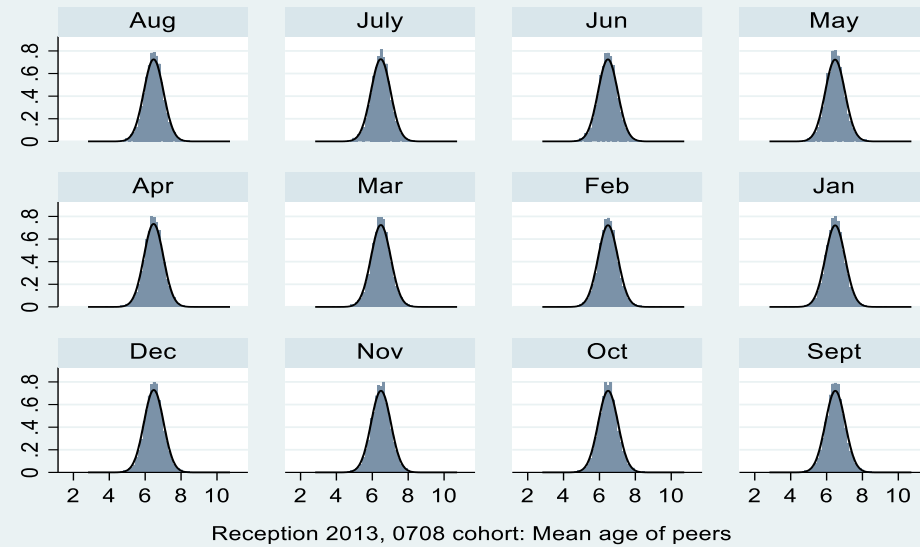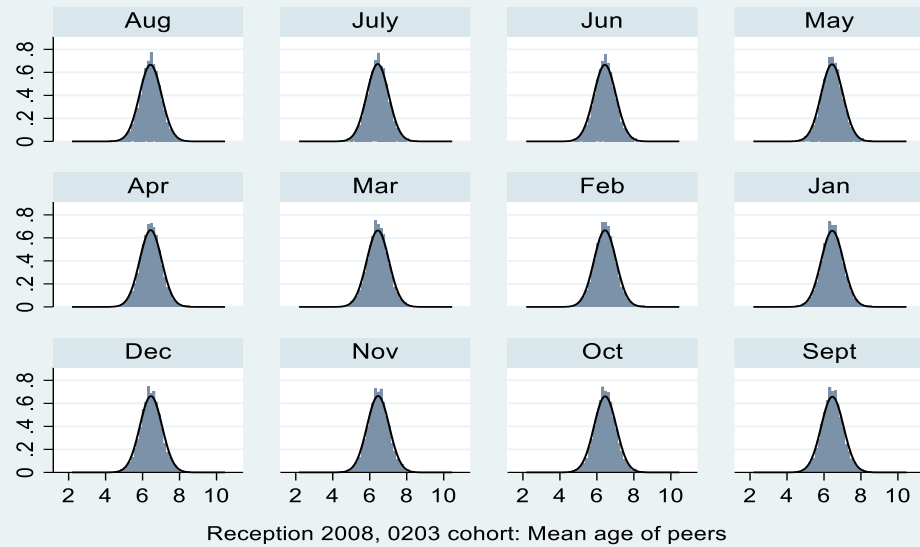
Thanks and acknowledgements:

References

1. Department for Education (2017). Early years foundation stage profile 2018 handbook. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669079/Early_years_foundation_stage_profile_2018_handbook.pdf

2. Department for Education (2020). Early Years Foundation Stage Reforms. Government consultation response. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/896872/EYFS_reforms_consultation_-_government_response.pdf

3. Office for Statistics Regulation (online). National Statistics. https://osr.statisticsauthority.gov.uk/national-statistics/

4. Department for Education (2010a). Achievement of Children in the Early Years Foundation Stage Profile. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/181551/DFE-RR034.pdf

5. Department for Education (2010b). Month of Birth and Education. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/182664/DFE-RR017.pdf

6. Department for Education (2020), ibid.

7. Crawford, C., Dearden, L., & Greaves, E. (2013). The drivers of month of birth differences in children's cognitive and non-cognitive skills: a regression discontinuity analysis. IFS: London.

8. Crawford, C., Dearden, L., & Greaves, E. (2014). The drivers of month-of-birth differences in children's cognitive and non-cognitive skills. Journal of the Royal Statistical Society A, 177(4), 829-860

9. Sharp, C., George, N., Sargent, C., O'Donnell, S., & Heron, M. (2009). International thematic probe: The influence of relative age on learner attainment and development. NFER.

10, 11. Cascio, E., & Schanzenbach, D. W. (2007). First in the class? Age and the education production function. NBER Working Paper 13663.

References

12. Ansari, A., Purtell, K. & Gershoff, E. (2016). Classroom age composition and the school readiness of 3- and 4-year olds in the Head Start Programme. Psychological Science, 27(1), 53-63.

13. Moller, A. C., Forbes-Jones, E., & Hightower, D. (2008). Classroom age composition and developmental change in 70 urban preschool classrooms. Journal of Educational Psychology, 100(4), 741-753

14. Guo, Y., Tompkins, V., Justice, L. & Petscher, Y. (2014). Classroom age composition and vocabulary development among at-risk pre-schoolers. Early Education and Development, 25, 1016-1034

15. Borbelly, D., Gehrsitz, M., McIntyre, S., Rossi., G. & Roy, G. (2021). Composite classes, class size and human capital accumulation. London: Nuffield Foundation.

16. Barbetta, G. P., Sorrenti, G. & Turati, G. (2019). Multigrading and Child Achievement. University of Zurich. https://www.jacobscenter.uzh.ch/dam/jcr:e1af546c-6e38-4d80-9652-dfcd1dbfddab/econwp275_Revised_Aug19_Final.pdf

17. Elder, T. & Lubotsky, D. H. (2009). Kindergarten entrance age and children's achievement. The Journal of Human Resources, 4(3), 641-683.

18. Meissel, K., Meyer, F., Yao, E. S., Rubie-Davies, C. M. (2017). Subjectivity of teacher judgements: Exploring student characteristics that influence teacher judgements of student ability.

19. Calsamiglia, C. & Loviglio, A. (2019). Grading on a curve: When having good peers is not good. Economics of Education Review, 73, 101916

20. Crawford, C., Dearden, L., & Greaves, E. (2013b). Identifying the drivers of month of birth differences in educational attainment. IFS: London.

21. Bradbury, A. (2011). Rethinking assessment and inequality: the production of disparities in early years education. Journal of Education Policy, 26(5), 655-696

22. Campbell, T. et al (forthcoming, 2021). No such thing as a free lunch? The (in)consistency of Free School Meals as a proxy for low income in recent years. CASE Paper 2xx.

Extra slides

Reception 2008, 0203 cohort: Mean age of peers

Reception 2013, 0708 cohort: Mean age of peers

Reception 2018, 1213 cohort: Mean age of peers

Distribution of mean peer ages experienced by children born in each month: main samples, 2008, 2013, 2018.

Note: September=12, November=11,…July=2, August=1

Within each cohort, a largely symmetrical distribution of mean peer age across children born within each month, with clustering around the middle of the school year.
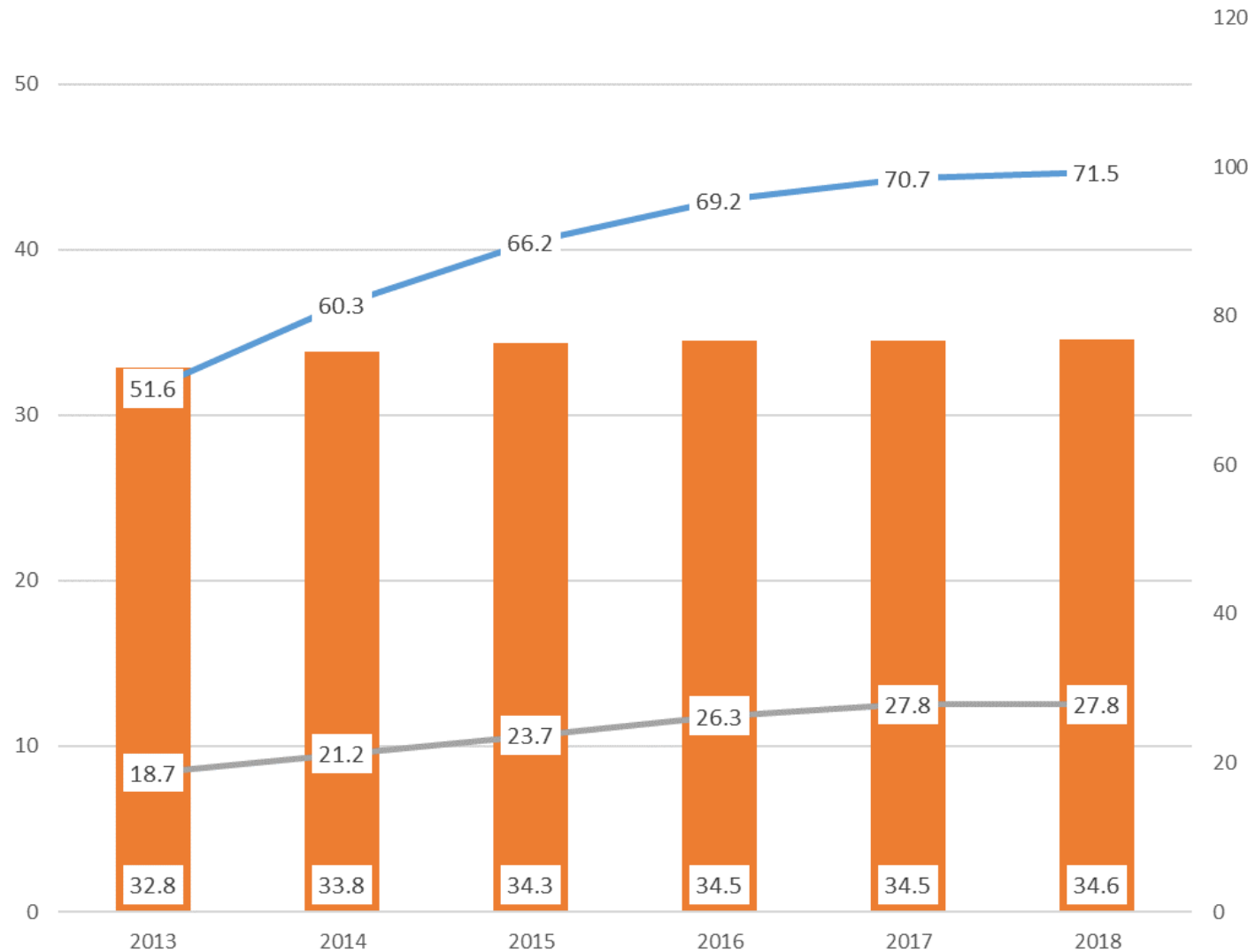
Variation seems 'naturally' to arise mainly by chance.

2008: N=492,232; 2013: N=603,581; 2018: N=523,846
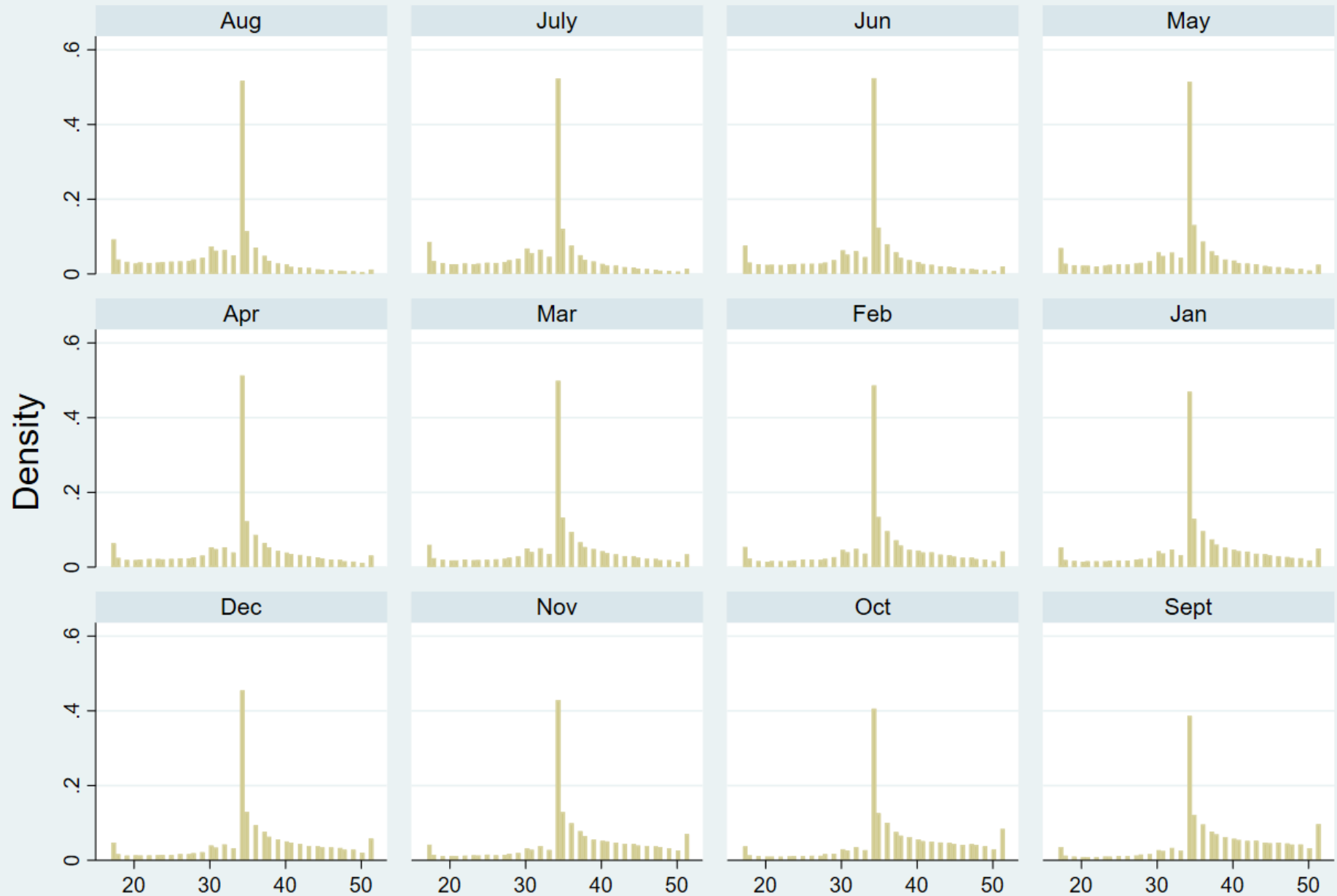
EYFSP total point score distribution - 2018

The binary threshold shapes the scores of which it is composed

Percent children attributed 'GLD', percent children awarded exact threshold score for EL/GLD, mean FSP total score

	% achieving good level of development	% achieving at least expected in all 17 early learning goals	Average total point score (out of 51)
2013	51.7	48.9	32.8
2014	60.4	58.0	33.8
2015	66.3	64.1	34.3
2016	69.3	67.3	34.5
2017	70.7	69.0	34.5
2018	71.5	70.2	34.6
2019	71.8	70.7	34.6

Department for Education national statistics for EYFSP scores (Department for Education, 2019, p5)

'It's all about who's going to achieve the GLD…the ones who may make it…' (Roberts Holmes and Bradbury 2016, p126).