

# Kumon: Let's read for fun!

Lien Vu, Henry May, Ph.D., Richard Houang, Ph.D., Stephanie Del Tufo, Ph.D.



## Introduction

Research shows that children and adolescents who read for pleasure have greater academic success across subjects (e.g., Mol & Jolles, 2014; Whitten, et. al., 2019). Despite the benefits of reading (Mak & Fancourt, 2020; Petscher, 2010; Sun et. al., 2024), the frequency of reading for pleasure among children and adolescents has declined in recent years (Vogrnič Čepič et al., 2024). This issue highlights the importance of increasing access to engaging, age-appropriate reading materials and supporting students' early literacy skills (e.g., decoding) to help ensure that reading remains both accessible and enjoyable as children grow.

One context for promoting both decoding skills and reading enjoyment is found in Kumon. Founding in Japan over 65 years ago, Kumon is an after-school mathematics and reading program (Ukai, 1994). Kumon emphasizes individualized, mastery-based instruction. In the context of struggling readers, Kumon builds foundational skills while exposing children to books that are appropriately challenging. Investigating reading enjoyment among children participating in Kumon, provides insight into how learning programs contribute to fostering a sustained interest in reading.

## Research Questions

Within children participating in Kumon:

- RQ1.** What factors are positively (or negatively) associated with reading for enjoyment?
- RQ2.** What are the child characteristics associated with reading for enjoyment?

## Subjects & Methods

We analyzed a sample of 4,679 students across 167 Kumon centers across the United States collected in 2006. Children completed a survey and a standardized test.

A Bayesian multilevel structural equation modeling (SEM) approach explored the connection between reading for enjoyment child characteristics (e.g., sex, age) and other factors (e.g., mathematics achievement, social economic indicators).

Statistics were conducted in R (version 4.5.1) using the `bsem()` function in the blavaan package (Merkle, 2021). The model accounted for clustering at the center level. The estimation used standard reference priors, and the Bayesian inference was conducted via Markov Chain Monte Carlo (MCMC) with 3 chains, 1,000 burn-in iterations, and 5,000 posterior samples. This approach allows for the estimation of complex relationships among variables while accounting for hierarchical data structure and uncertainty in parameter estimates.

## Results

Table 1: Basic Statistics						
	Variable Description	Mean	Median	SD	Min	Max
<b>Continuous</b>						
Average Mathematics Score		13.5	12.9	5.4	0.719	31.1
Points*		68.1	71.5	21.3	0	106
<b>Categorical</b>						
Enrolled in both mathematics and reading		0.345	0	0.475	0	1
Sex (female = 1; male = 0)		0.428	0	0.495	0	1
At least one parent has a bachelors degree		0.762	1	0.426	0	1
Grade		5.58	5	2.05	3	12
How often English is spoken at home **		1.24	1	0.453	1	3
How much education student intends pursue ***		5.81	6	1.16	1	7
Number of books at home, 1 = 0 (lowest) to 5 = 200+ (highest)		3.75	4	1.11	1	5
<b>What students think about math in school (1 = strongly agree to 4 = strongly disagree)</b>						
Math is important to everyone's life.		3.5	4	0.67	1	4
Math is an easy subject.		2.83	3	0.816	1	4
I enjoy learning math.		3.22	3	0.75	1	4
<b>Time spent before/after school doing these activities (1 = no time, 2 = &lt;1 hour, 3 = 1-2 hours, 4 = 2-4 hours, 5 = 4+ hours)</b>						
Reading a book for enjoyment (DV)		2.36	2	0.881	1	5
<b>Workplace related</b>						
Doing jobs at home.		1.86	2	0.721	1	5
Working at a paid job.		1.16	1	0.604	1	5
<b>Academic</b>						
Working on Kumon math.		2.15	2	0.466	1	5
Studying school math or do mathematics homework from school.		2.38	2	0.696	1	5
Studying science or doing science homework after school.		2.07	2	0.703	1	5
<b>Personal Choice/Pleasure</b>						
Playing computer games or video games.		1.83	2	0.913	1	5
Playing sports.		2.42	2	1.05	1	5
Playing or talking with friends outside school.		2.05	2	0.91	1	5
Studying or doing homework in school subjects other than math or science.		2.48	2	0.756	1	5
Surfing, IMing, or chatting on the internet.		1.64	1	0.943	1	5
Watching television, videos, or DVDs.		2.34	2	0.97	1	5

Figure 1. Trace plots for two exemplar parameters from the Bayesian multilevel SEM.

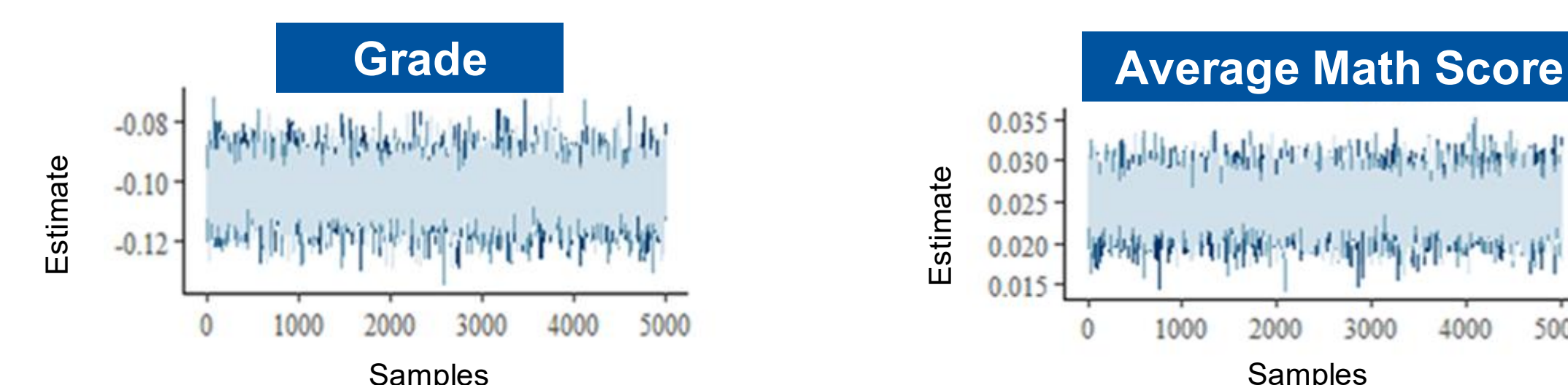


Figure 1. Trace plots showed that the estimates from each sampling chain were stable and overlapped well. This indicates that the model likely found reliable results. **Panel A** shows a well-mixed trace plot with stable, overlapping changes, indicating good convergence for grade. **Panel B** shows a similar pattern for average math score, further supporting the stability and reliability of the model estimates.

Figure 2. Posterior density plots for two parameters from the Bayesian multilevel SEM.

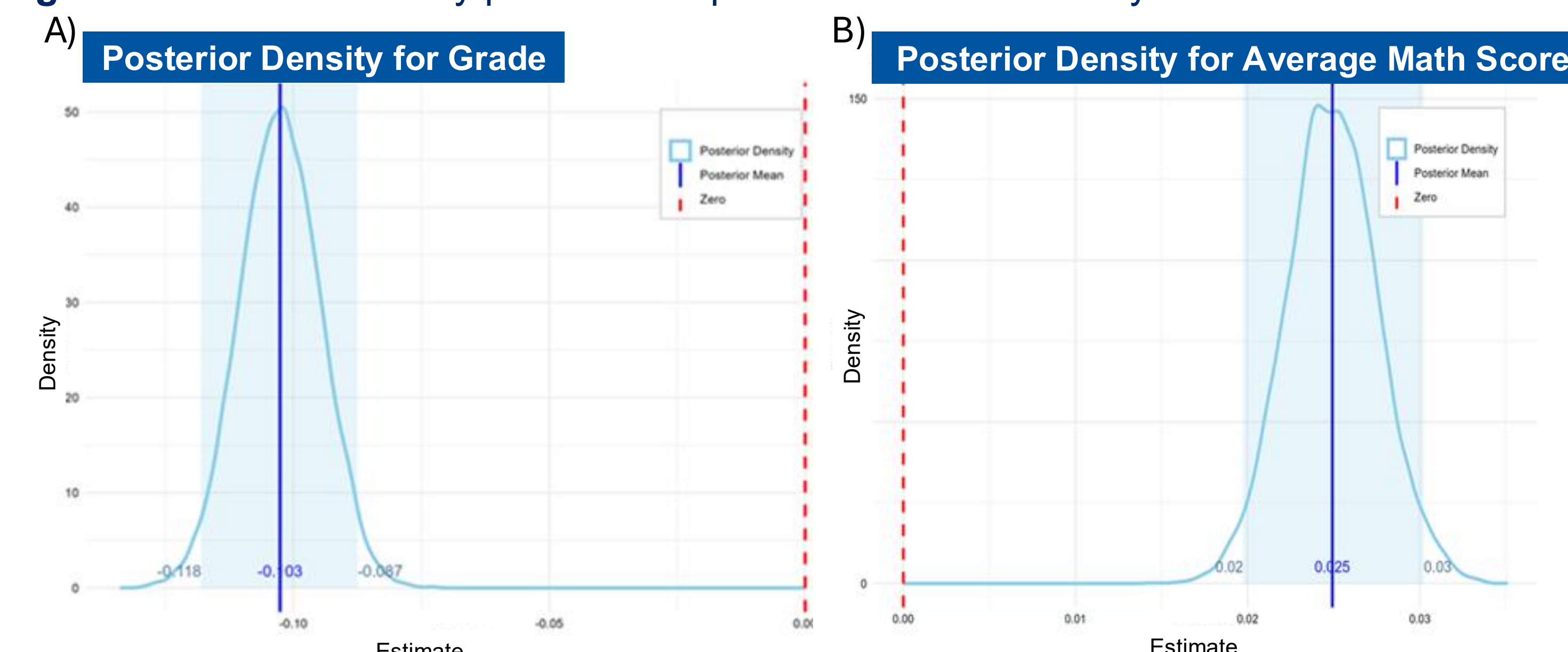


Figure 2. Posterior density plots show the distribution of likely values for each parameter after combining prior information with the observed data. The shape of each curve reflects how confident the model is about the parameter's value. Narrower peaks indicate greater certainty. **Panel A** shows that students in higher grade levels report lower enjoyment of reading for pleasure. **Panel B** shows that students with higher mathematics achievement tend to report greater enjoyment of reading for pleasure.

## Discussion

To determine what **factors** (RQ1) and **child characteristics** (RQ2) are associated with reading for enjoyment, we examined a range of behavioral, academic, and demographic variables.

In terms of **factors associated with reading for enjoyment** (RQ1) results indicated that academic engagement, positive attitudes toward learning, increased time spent on academic activities, and those with more books at home were more likely to report reading for enjoyment. Interestingly, we also found that students with higher mathematics achievement were also more likely to report reading for enjoyment. In contrast, children who had higher levels of passive entertainment, such as television viewing were less likely to report reading for enjoyment.

These findings suggest that reading for enjoyment is closely tied to broader patterns of academic engagement and learning attitudes. Students who are more actively involved in academic activities, whether through structured programs like Kumon, homework, or positive dispositions toward learning, may develop greater motivation that extends to reading. The association with higher math achievement may reflect a more general orientation toward school success or a shared set of cognitive or motivational skills. Meanwhile, the negative link between passive entertainment and reading enjoyment highlights the potential competition between screen-based and print-based leisure activities (Loh & Sun, 2022).

For **child characteristics associated with reading for enjoyment** (RQ2), we found that girls and younger children were more likely to report reading for enjoyment. These effects are consistent with prior research, suggesting that younger children and girls may be more socially or developmentally inclined toward reading as an enjoyable activity (Vogrnič Čepič et al., 2024).

Taken together, our findings highlight the importance of fostering active learning environments and early literacy engagement to support sustained reading motivation.

## Future Directions

While the current data provide valuable insights, they are limited to students in the United States. To gain a more international perspective on structured enrichment programs like Kumon, future analyses will incorporate data from other North American countries.

Additionally, our current sample includes only students who participated in structured enrichment (e.g., Kumon). To better understand how widespread these patterns are, we plan to compare responses from students who are not engaged in structured enrichment activities. This will allow us to assess whether similar associations with reading enjoyment emerge across different groups.

**REFERENCES:** Loh & Sun, Journal of Adolescent & Adult Literacy(2022); Mak & Fancourt (2020) *Social Science & Medicine*; Mol & Jolles (2014) *Frontiers in Psychology*; Merkle et al., *Journal of Statistical Software* (2021); Petscher (2010) *Journal of Research in Reading*; Sun, et al. (2024) *Psychological Medicine*; Ukai, N. *Journal of Japanese Studies* (1994); Vogrnič Čepič et al. (2024) *New Zealand Journal of Educational Studies*; Whitten et al. (2019) *Journal of Multidisciplinary Graduate Research*.  
**ACKNOWLEDGMENTS:** We thank the Developmental and Aging Neuroscience Education (DANE) laboratory for their support.  
**FUNDING:** NIH/NICHD R03HD104051, NIH/NIGMS COBRE P20GM103653 Pilot Funds, University of Delaware Research Foundation (UDRF) Strategic Initiative Grant, Spencer Foundation #202200122, College of Education and Human Development (CEHD) Faculty Start-Up Funds.

For more information, contact: lienvu@udel.edu