Mothers' Mean Age at Birth Fell from 28.7 in 1950 to 27.4 in 1975, Yet the Mean Age for 1st, 2nd, and 3rd Children All Rose — the Fall Was the Composition Part (−2.432 Years) from Births of 4th or Later Children Falling by 0.2591 in Share, and 0.990 of the 4.9-Year Rise from 1975 to 2024 Is the Rise Within the Same Birth Order [M101]

Difference in mothers' mean age = part from the composition by birth order + part within the same order ── What separates them is which birth order is common, or whether mothers got older for the same order

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Abstract

Using the birth-order tables of the Ministry of Health, Labour and Welfare's Vital Statistics (Table 4.12: births by birth order; Table 4.19: mothers' mean age by birth order; 35 rounds from 1950 to 2024), this paper split the change in mothers' mean age at birth into the part from the composition by birth order and the part within the same order. No new mathematical theorem and no new law are claimed.

First, **mothers' mean age at birth (all births) fell from 28.7 years in 1950 to 27.4 in 1965 and 1975, then rose to 32.3 in 2024. Over 1950→1975, mean age for the 1st child rose from 24.4 to 25.7, for the 2nd from 26.7 to 28.0, and for the 3rd from 29.4 to 30.3 — all rose** (Section 4).

Second, this is the core of the paper. **Splitting the −1.3-year fall from 1950 to 1975, the composition part is −2.432 years (rounding range −3.004 to −1.860) and the within-order part +1.132 years**

(+0.506 to +1.758), in opposite directions. The share of births of 4th or later children fell from 0.2838 to 0.0246 (−0.2591), which offset the rise within each order and lowered the total (Section 5).

Third, **of the +4.9-year rise from 1975 to 2024, the composition part is +0.048 (−0.009 to +0.104) and the within-order part +4.852 (+4.716 to +4.988), so 0.990 is the rise within the same order. The 1st child rose by +5.30 years, the 2nd by +5.10, and the 3rd by +3.90** (Section 5).

Fourth, mean age for 4th or later children is not in the table and was back-calculated from the total. In 1950, when the share of 4th or later is large, it is determined at 34.38 years (rounding range 34.08–34.69), but in 1975, when the share is small, the range is wide at 30.95–38.97. Even so, the range of the composition part is narrow, as above (Section 3).

Fifth, according to the table notes, mean ages up to 1991 are the mean of completed years plus 0.5, and from 1992 they are computed from age in days, so the method changed (Section 3).

Sixth, what separates them is **which birth order is common, or whether mothers got older for the same order**. The movement of the overall mean age was almost entirely determined by the composition by birth order in 1950→1975, and by the rise within the same order in 1975→2024.

Scope note: **This paper claims no new mathematical theorem and no new law** — births and mothers' mean age by birth order are in public tables, and this paper only computed the composition, back-calculated mean age for 4th or later children, and split the difference in mean age into two parts. **This paper is a structural interpretation of the shape of numbers in public aggregate data; it is not medical advice, not a diagnosis, and not a treatment recommendation. The author is not a physician. Decisions about individual health should be discussed with a physician or a medical institution. This is a preprint that has not been peer reviewed. It does not judge age at childbirth or number of children as good or bad, does not discuss the reasons (marriage, work, housing, systems, etc.), and does not evaluate policy.** Mean age for 4th or later children is not in the table and was back-calculated from the total, so the range is wide in years when its share is small. The split is one choice, weighting by the average of the two years. The method of computing mean age differs up to 1991 and from 1992. Birth order is the order counted by the number of live births the same mother has had. **About the data**: the Vital Statistics (Ministry of Health, Labour and Welfare) were taken from e-Stat and used under the Government of Japan Standard Terms of Use (Version 2.0); the composition, back-calculated mean age for 4th or later children, split, and rounding ranges in this paper were processed from them. What this paper adds: **splitting the change in mothers' mean age into the composition by birth order and the within-order part, and showing, with the full rounding range of the table, that the fall of the total from 1950 to 1975 was the composition part while the mean age rose within each order**.

1. Notation and question

- **Birth order**: the order counted by the number of live births the same mother has had (1st, 2nd, 3rd, 4th or later child).
- **Composition**: the share of each order among births excluding order not stated.
- **Mothers' mean age**: mean age of the mother at birth (years). The total includes 4th or later children.

- **Split**: total mean = Σ (share of order × mean age of order). The difference between two years is split into the part from changes in shares (composition part) and the part from changes in each order's mean age (within-order part), weighting by the average of the two years. The two sum exactly to the difference.

Question: Did mothers' mean age at birth change because of which birth order is common, or because mothers got older for the same order?

Observation 1.1: M097 split the fall in mean birth weight into the part from the mix of weeks of gestation and the part within the same week. This paper applies the same kind of split to mothers' age and birth order.

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2. Preview and design

Written honestly: the design was decided after looking at the tables.

	Content
Tables	Vital Statistics 2024, Volume 1, Table 4.12 (births and percentages by birth order and year) and Table 4.19 (mothers' mean age by birth order and year)
Noticed in the preview	The total mean age fell from 1950 to 1975, while mean ages for the 1st to 3rd child all rose
Noticed in the preview (2)	Table 4.19 has no mean age for 4th or later children. Since the total includes them, it can be back-calculated from the total, but the table is rounded to 0.1 year, so the rounding range is computed
Noticed in the preview (3)	Only Table 4.19 has 1996–1999. The 35 rounds present in both tables are used
Comparison	Yearly total and by-order mean age, yearly composition, and the split for 1950→1975, 1975→2024, 1950→2024, and 1995→2024

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3. Data and checks

Calculation 3.1 The 2 retrieved files were fixed by SHA-256, and the following were checked.

- All 35 years in Table 4.12 are in Table 4.19. Only Table 4.19 also has 1996–1999 (I first assumed the two tables had the same years and the check failed).
- Table 4.12: 1st to 5th-or-later child plus not stated sum to the total. Percentages computed from counts (excluding order not stated) match the table's percentages within 0.05.
- Table notes: mothers' mean age up to 1991 is the arithmetic mean of completed years plus a correction of 0.5 years; from 1992 it is computed from the arithmetic mean of age in days. The total is the mean age including 4th or later children.
- Back-calculated mean age for 4th or later children and its rounding range: 1950 34.38 years (34.08–34.69), 1975 34.96 (30.95–38.97), 2024 34.26 (31.94–36.58).

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4. Yearly shape

Calculation 4.1 Mothers' mean age (years) and composition by birth order

Year	All	1st child	2nd child	3rd child	Share of 1st	Share of 4th or later
1950	28.7	24.4	26.7	29.4	0.2715	0.2838
1965	27.4	25.7	28.3	30.3	0.4751	0.0374
1975	27.4	25.7	28.0	30.3	0.4535	0.0246
1995	29.1	27.5	29.8	32.0	0.4781	0.0291
2024	32.3	31.0	33.1	34.2	0.4700	0.0423

Observation 4.2: **The total mean age is lowest at 27.4 years in 1965 and 1975. From 1950 to 1975 the total fell from 28.7 to 27.4, while mean ages for the 1st, 2nd, and 3rd child all rose.** Over the same years, the share of 1st children rose from 0.2715 to 0.4535 and the share of 4th or later fell from 0.2838 to 0.0246.

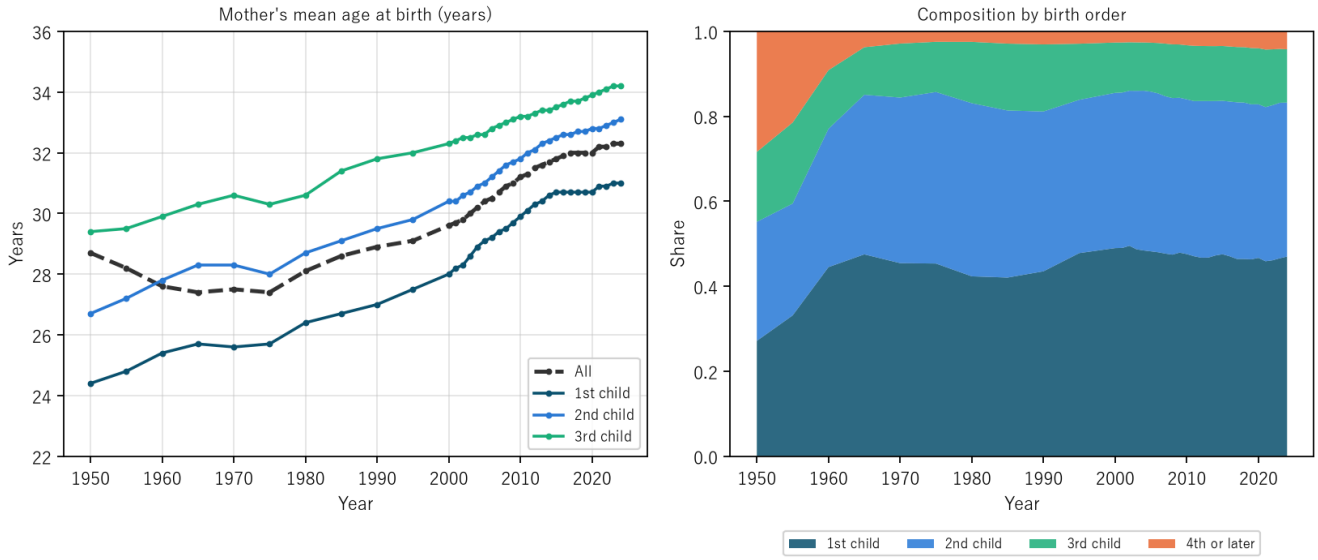


Figure 1: Left, mothers' mean age at birth (total dashed, 1st–3rd child solid). Right, composition by birth order.

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5. The core — composition part and within-order part

Calculation 5.1 Splitting the difference in the total mean age (years; rounding range in parentheses)

Period	Difference	Composition part	Within-order part
1950→1975	−1.3	−2.432 (−3.004 to −1.860)	+1.132 (+0.506 to +1.758)
1975→2024	+4.9	+0.048 (−0.009 to +0.104)	+4.852 (+4.716 to +4.988)
1950→2024	+3.6	−1.579 (−1.907 to −1.251)	+5.179 (+4.793 to +5.564)
1995→2024	+3.2	+0.039 (+0.001 to +0.078)	+3.161 (+3.038 to +3.283)

Observation 5.2: **In 1950→1975, the composition part was negative and the within-order part positive across the full rounding range. The change in composition — 4th or later down −0.2591, 3rd down −0.0464, 1st up +0.1820, 2nd up +0.1236 — offset the rise in age within each order (1st +1.30, 2nd +1.30, 3rd +0.90 years). In 1975→2024, the absolute composition part stays under 1 year across the rounding range, and 0.990 of the rise is the within-order part (1st +5.30, 2nd +5.10,**

3rd +3.90 years). Over 1950→2024, the composition part of −1.579 and the within part of +5.179 combine into +3.6 years.

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6. Limitations

1. **It does not judge age at childbirth or number of children as good or bad, and does not discuss the reasons.** Policy is not evaluated.
2. Mean age for 4th or later children is back-calculated from the total, and the range is wide in years when its share is small (such as 1975). The composition and within parts were given ranges over the 2^4 × 2^4 extremes of the table's rounding.
3. The method of computing mean age differs up to 1991 and from 1992 (the 0.5-year correction and age in days).
4. The split is one choice, weighting by the average of the two years. The distribution of mothers' age (how many at each age) is not examined.

Conclusion

Mothers' mean age at birth fell from 28.7 years in 1950 to 27.4 in 1975, yet mean ages for the 1st, 2nd, and 3rd child all rose. The fall was the composition part from the sharp fall in the share of births of 4th or later children, and 0.990 of the 4.9-year rise from 1975 to 2024 was the rise within the same order.

What separates them is one thing — which birth order is common, or whether mothers got older for the same order.

When you hear that "age at childbirth has risen (fallen)," **check together whether it is the mean over all births or the mean with birth order held fixed.**

Data and reproduction

Data	Vital Statistics 2024, Volume 1, Tables 4.12 and 4.19 (Ministry of Health, Labour and Welfare, e-Stat) (retrieved 26 September 2026)
Terms of use	e-Stat follows the Government of Japan Standard Terms of Use (Version 2.0). The composition, back-calculated mean age for 4th or later children, split, and rounding ranges in this paper were processed from it and are not numbers produced by the government
Coverage	Japan, births, 35 rounds from 1950 to 2024
Verification	`検算/M101.py` (`--zu` also draws the figure). Every number in the text is taken from `検算/M101_output.txt`
Raw data	`data/` holds the retrieved files and `SOURCES.md` (URLs, retrieval date, SHA-256, terms of use, definitions and how the calculations were set up)
Figures	`図/M101_zu1` (png, svg, English version)

References

- Ministry of Health, Labour and Welfare. Vital Statistics 2024, final figures, Volume 1, births, Tables 4.12 and 4.19 (in Japanese). e-Stat (accessed 26 September 2026). https://www.e-stat.go.jp/
- Yamagishi, Y. (2026). Mean Birth Weight Fell by 73.03 g, from 3070.24 g in 1995 to 2997.22 g in 2024, and 0.510 of the Fall Was Singletons' Gestation Shifting to Earlier Weeks, 0.394 Was Lighter Weight Within the Same Week, and 0.083 Was the Share of Multiple Births Rising from 0.0172 to 0.0249 — the Fall Within the Same Week Shrinks as the Week Advances, from 91.0 g at 34 Weeks to 4.1 g at 41 Weeks [M097]. Zenodo (unpublished).