BHAPC Spline Sensitivity Analysis (GSS)
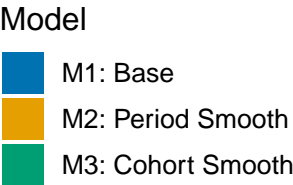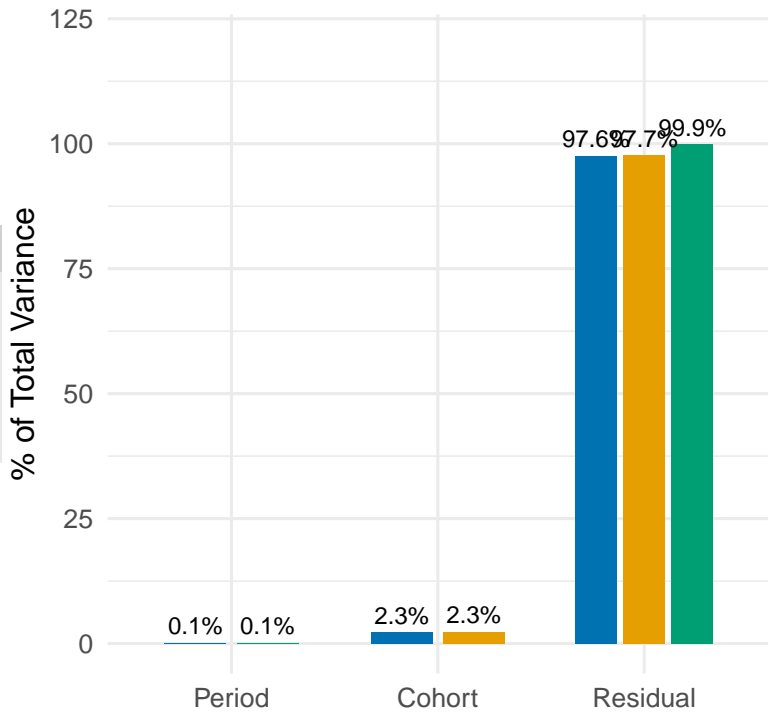
Comparing 4 model specifications: Random effects vs. splines for period and cohort
N = 57,627 observations

LOOIC Comparison

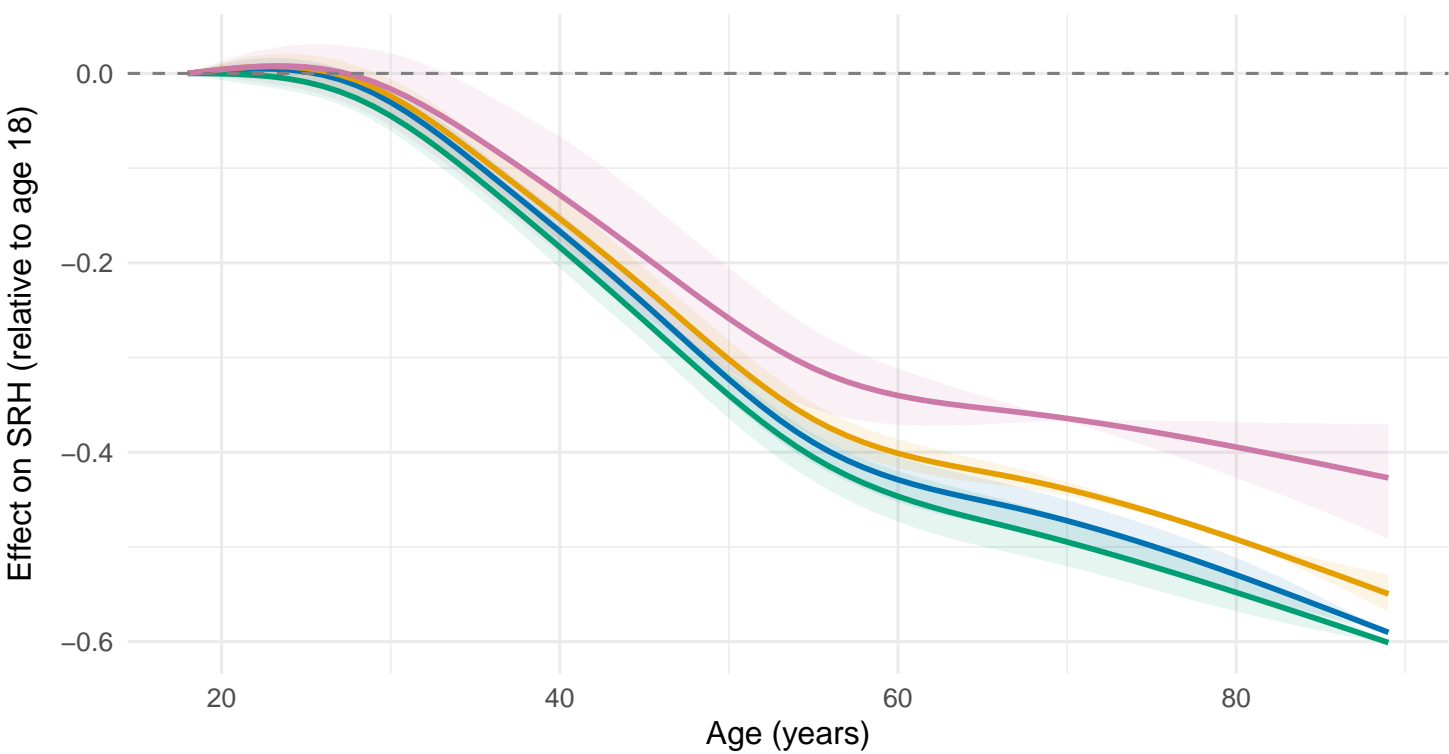| Model	elpd_loo	SE	. LOOIC	p_loo
M3: Cohort Smooth	−69419.0	158.1	−0.0	28.6
M4: Both Smooth	−69420.3	158.1	2.5	23.8
M1: Base	−69422.7	158.1	7.5	48.1
M2: Period Smooth	−69425.8	158.0	13.7	42.6

A. Variance Decomposition by Model
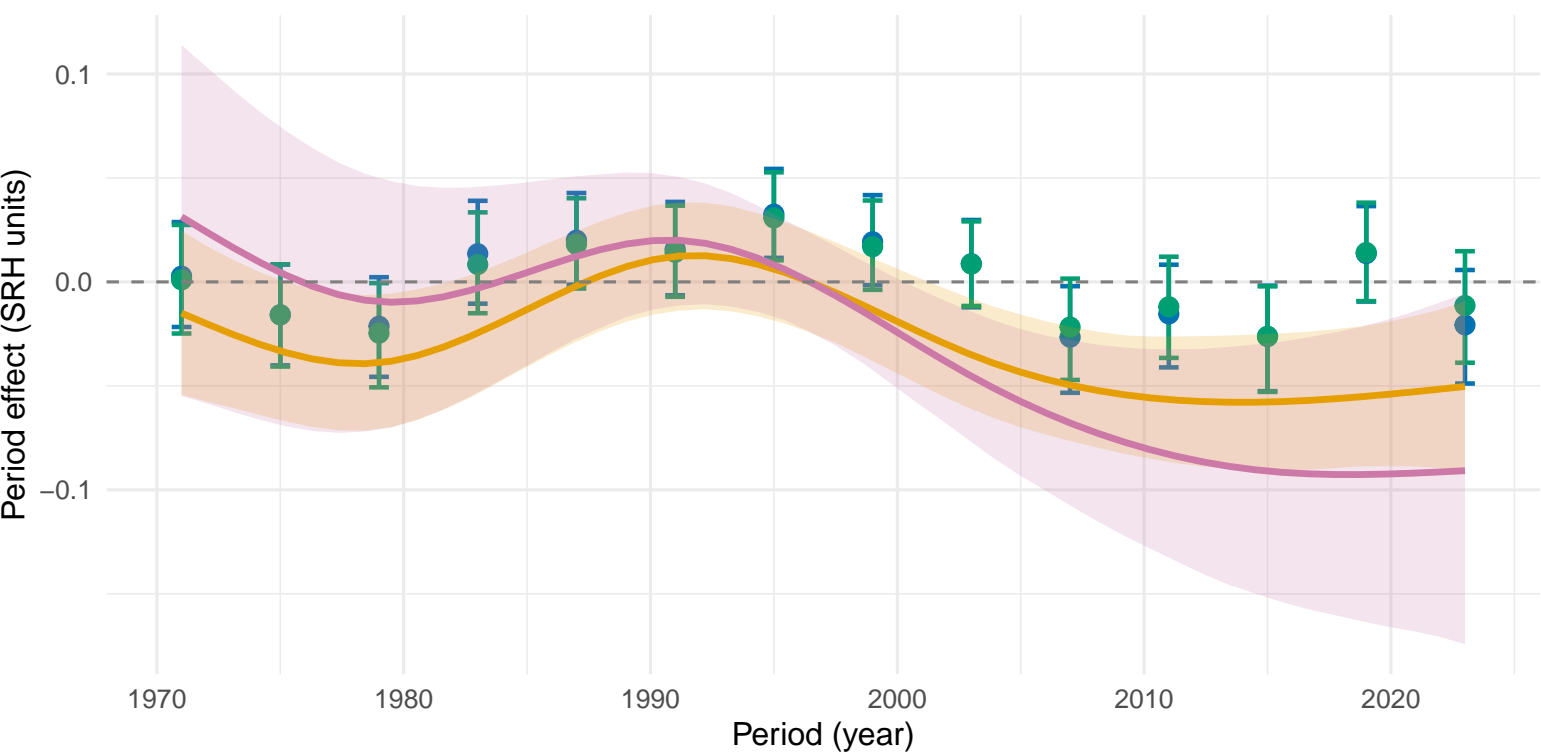M4 excluded (no random effects)

B. Age Effects (All 4 Models)
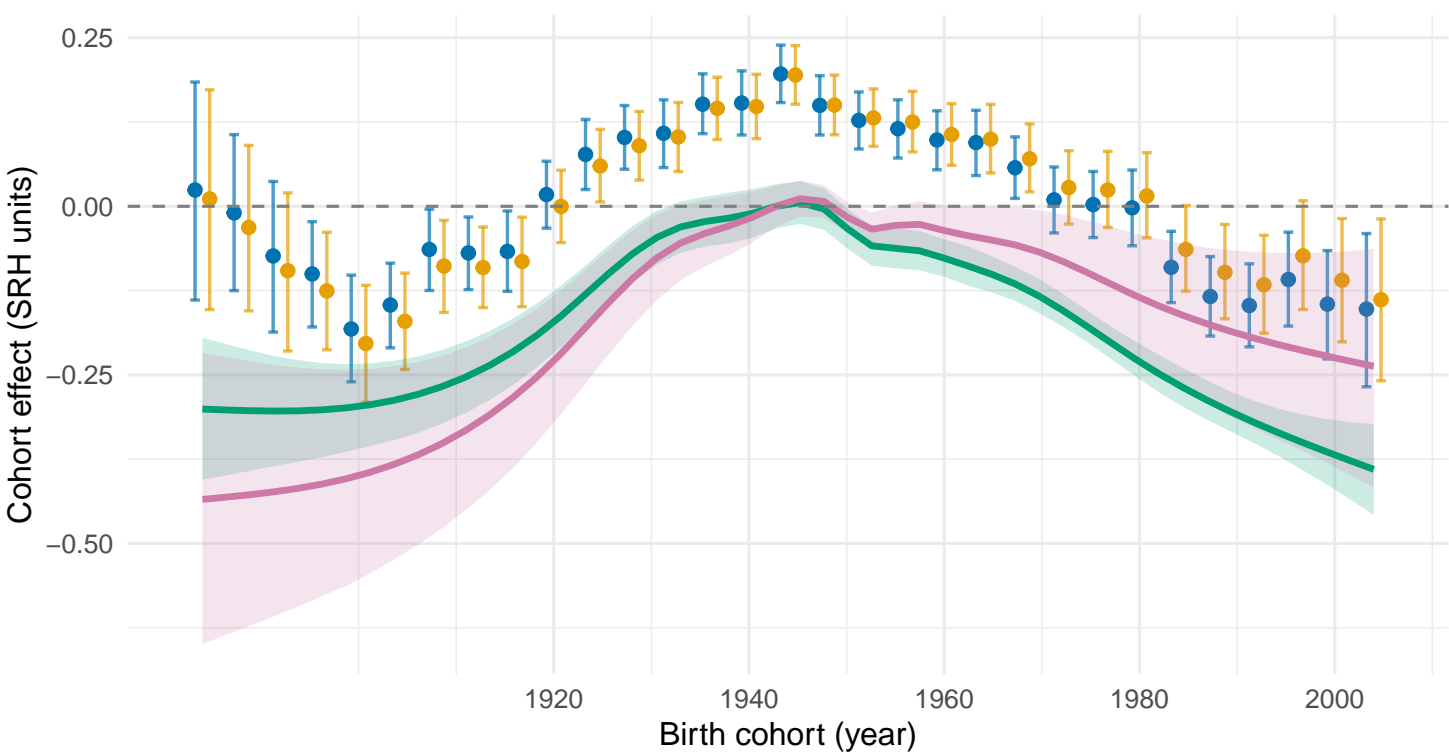Sanity check: should be similar across models

C. Period Effects Comparison
Random effects (points) vs splines (lines)

D. Cohort Effects Comparison
Random effects (points) vs splines (lines)

Models: M1=ns(age,6)+(1|period)+(1|cohort), M2=ns(age,6)+ns(period,5)+(1|cohort), M3=ns(age,6)+(1|period)+ns(cohort,10), M4=ns(age,6)+ns(period,5)+ns(cohort,10)
Error bars/ribbons show 90% CIs. Lower LOOIC = better fit.