

Supporting Information

Berghänel et al. 10.1073/pnas.1707152114

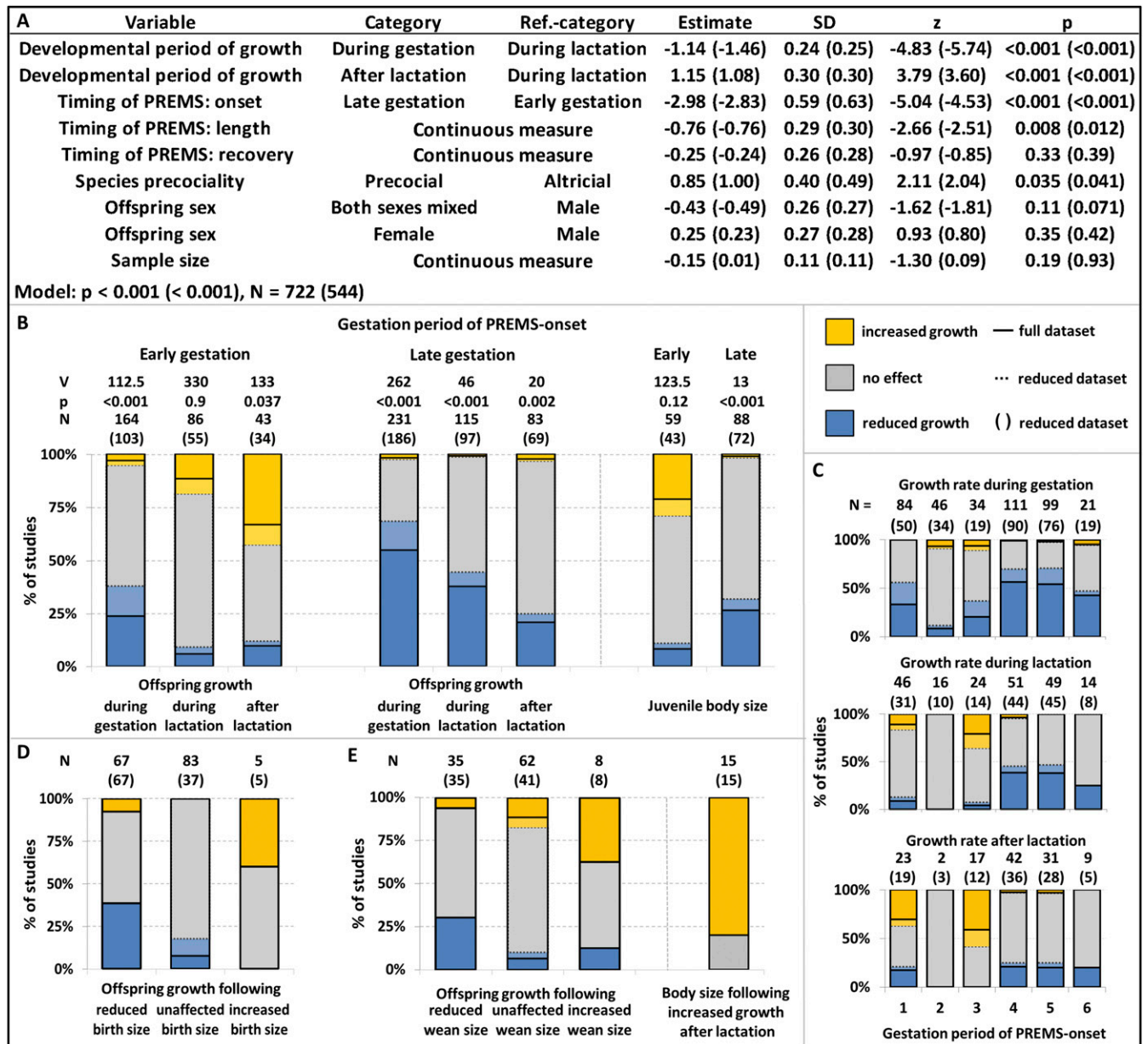


Fig. S1. The effects of our main model remain if only those studies were taken into account where PREMS effects on offspring growth were not an essential part of the tested hypotheses. Early/late gestation means first/second half of gestation. Percentage of studies reporting a higher (orange), equal (gray), or lower (blue) growth rate in offspring from PREMS mothers compared with control mothers (relative growth rate). (A–C) For each developmental period, relative growth rates following PREMS during the first half of gestation were higher than those following PREMS during the second half of gestation. Within this pattern, the relative growth rate increased with increasing levels of offspring independence (developmental period). (A) In a cumulative Logit link mixed model (CLMM) (random factors: species, within study repeated measures), relative growth rates were independently predicted by developmental period of growth measurement and gestation period of PREMS onset, also after controlling for length of and recovery time after stress exposure (both in percent of gestation period). (B) PREMS effects on offspring growth following PREMS during the first half of gestation largely conformed to predictions if both developmental constraints and a counteracting growth plasticity coincide (Fig. 1D). PREMS effects following PREMS during the second half of gestation largely conformed to predictions of mere developmental constraints in the absence of a counteracting growth plasticity (Fig. 1C). (C) Presenting PREMS effects on offspring growth depending on finer-scaled periods of PREMS onset (half gestational trimester) illustrates the difference between early and late gestation PREMS onset. (D and E) PREMS effects on offspring growth were not due to catch-up growth in reaction to a preceding growth reduction because accelerated offspring growth was preceded by increased rather than decreased body size at both birth and weaning, and accelerated postindependence growth led to increased rather than unaffected juvenile body sizes.

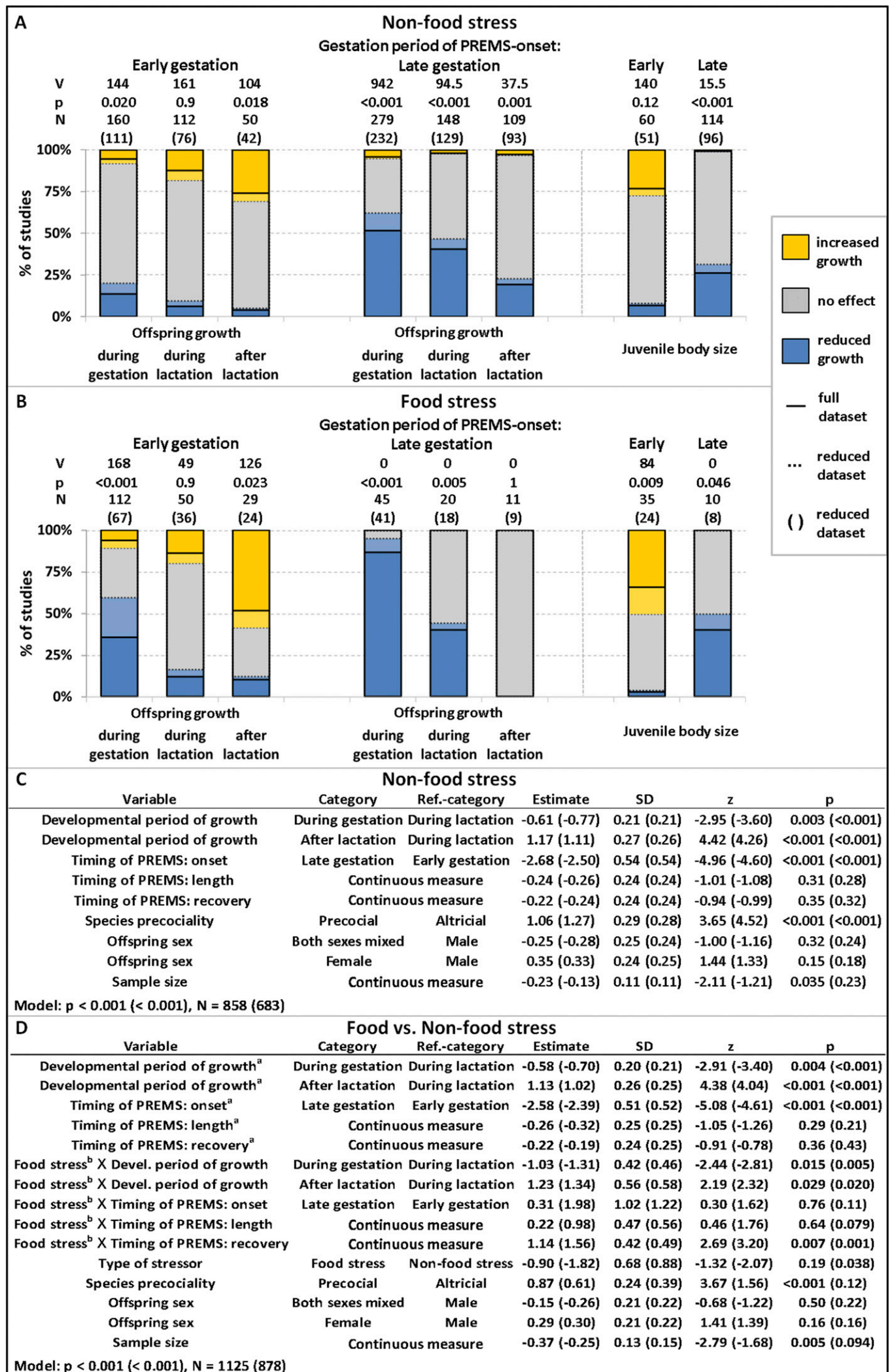


Fig. S2. Moderating effects of the type of PREMS (food vs. nonfood) on PREMS effects on offspring growth rates across mammals. Early/late gestation means first/second half of gestation. Percentage of studies reporting a higher (orange), equal (gray), or lower (blue) growth rate in offspring from PREMS mothers compared with control mothers (relative growth rate). Length/recovery means period between onset and end of PREMS/between end of PREMS and parturition (both in percent of gestation period). (A and B) Effects of early vs. late gestation maternal stress on offspring growth rates during gestation, during lactation, and after lactation are plotted separately for (A) nonfood PREMS and (B) food restriction PREMS. (C and D) Cumulative Logit link mixed model (CLMM) (random factors: species, within study repeated measures). (C) An analysis limited to nonfood stress revealed that both the effects of reduced maternal investment (developmental period) and the counteracting growth plasticity (effect of the timing of PREMS onset) can be caused by nonfood PREMS. (D) Food stress further amplifies the effect of maternal investment (developmental period), whereas the strengthening of the counteracting growth plasticity was not significant in our analysis (interaction effects). ^aConditional effect for nonfood PREMS only; ^breference category for interaction term: nonfood stress.

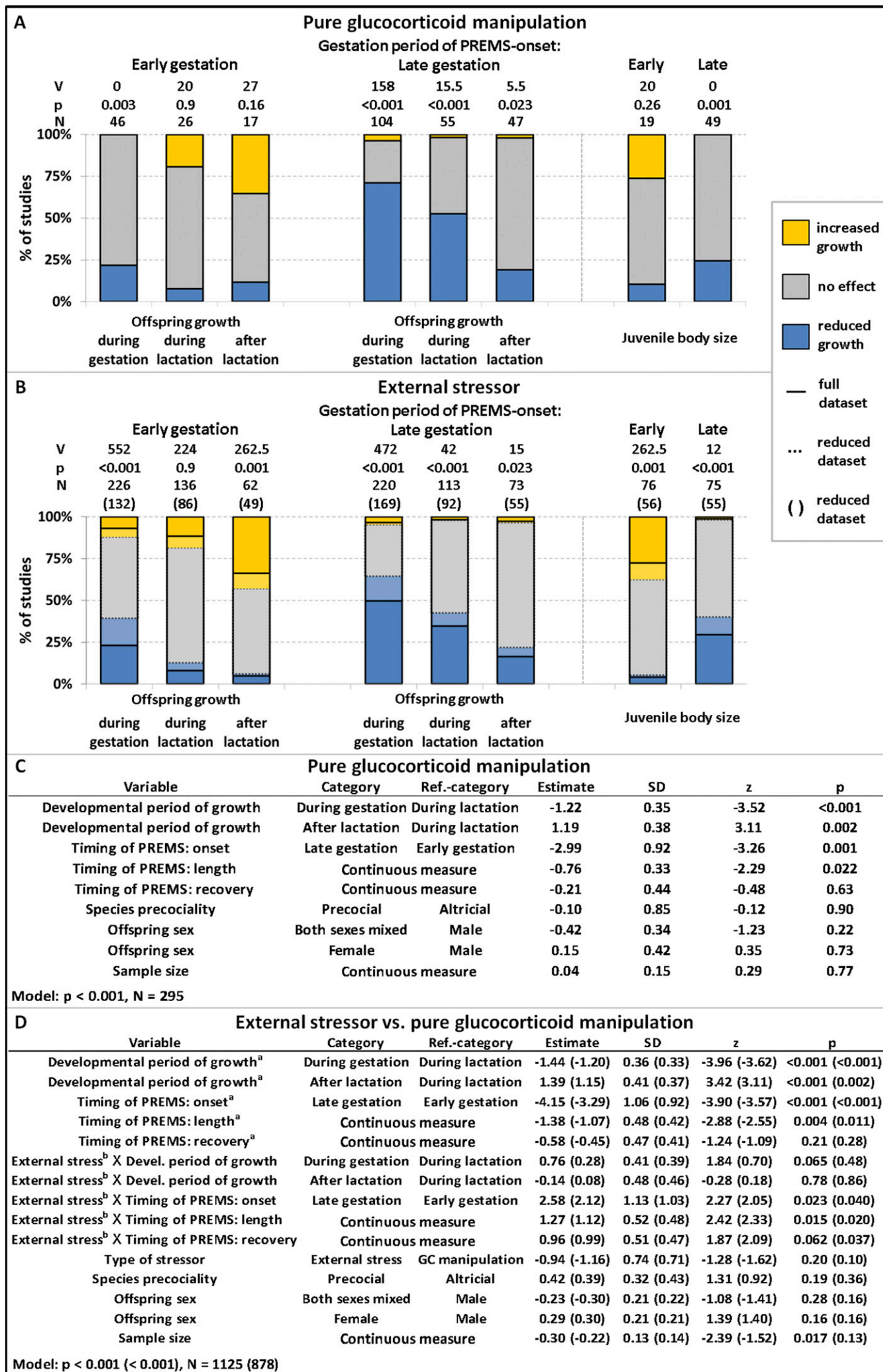


Fig. S3. Comparing effects of PREMS elicited by manipulation of maternal glucocorticoids only with effects elicited by external stressors. The potential role of prenatal maternal GC levels in shaping maternal investment and offspring growth plasticity is evident from the fact that in the absence of any stressor, GC manipulation alone can elicit the entire range of PREMS effects on offspring growth. Early/late gestation means first/second half of gestation. Percentage of studies reporting a higher (orange), equal (gray), or lower (blue) growth rate in offspring from PREMS mothers compared with control mothers (relative growth rate). Length/recovery means period between onset and end of PREMS/between end of PREMS and parturition (both in percent of gestation period). (A and B) Effects of early vs. late gestation maternal stress on offspring growth rates during gestation, during lactation, and after lactation are plotted separately for pure glucocorticoid manipulation (A) and external stressors (B). (C and D) A cumulative Logit link mixed model (CLMM) (random factors: species, within study repeated measures). (C) An analysis limited to pure glucocorticoid manipulation revealed that both the effects of reduced maternal investment (developmental period) and the counteracting growth plasticity (effect of the timing of PREMS onset) can also be caused by pure manipulation of maternal glucocorticoid levels. (D) With external stressors, the timing effects of PREMS on growth patterns were less pronounced (interaction effect of the timing of PREMS onset). ^aConditional effect for pure glucocorticoid (GC) manipulation without external stressor; ^breference category for interaction term: pure glucocorticoid manipulation without external stressor.

Other Supporting Information Files

[Dataset S1 \(XLSX\)](#)

[Dataset S2 \(PDF\)](#)