This paper models the determinants of children’s age-3 cognitive skill as a function of innate endowment, pre-natal influences, and the quality of the post-natal care environment. We use data from the Infant Health and Development Program (IHDP), which randomly assigned new mothers and their low-birth weight babies to a control group or an intervention involving access to home visits during the child’s first year of life and very high-quality, center-based care while the child was 1 and 2 years old. We develop a model of maternal choice of child human-capital investment, consumption, labor, and leisure, and use the randomly assigned intervention to estimate maternal responses with respect to parenting, time use, and other margins. We estimate the degree of productive complementarity between (1) pre-natal and early post-natal investments (inter-temporal complementarity) and (2) maternal and non-maternal post-natal care (intra-temporal complementarity), and find inter-temporal complementarity between pre-natal and early post-natal investments but intra-temporal substitutability of maternal and non-maternal care.