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Appendix from I. Capellini et al., "Placentation and Maternal Investment in Mammals"

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Additional Information on the Data and Data Sources

This appendix includes additional information on the data and the list of additional references for the data that are not already cited in the main text (data available as separate Excel data file).

Additional Information on the Data

Neonatal Brain and Body Mass

We define neonatal brain and body mass as the mass at birth (g). Most of our data come from primary sources, and we match neonatal brain and body mass estimates taken from the same specimens whenever possible. Where neonatal body mass was not reported in the primary source for neonatal brain mass, we used neonatal body mass data from the PanTHERIA database (Jones et al. 2009) or other sources if the species was not included in PanTHERIA. The data set of Sacher and Staffeldt (1974), commonly used in comparative analyses of neonatal brain size, includes both data collected directly by these authors and data from primary sources and personal communications. We checked all the primary sources in Sacher and Staffeldt (1974) and excluded data that were not strictly neonatal (e.g., individuals a few days old). Citations in our data set to Sacher and Staffeldt (1974) therefore refer only to brain and body mass data measured directly by these authors; personal communications to these authors are given in full to differentiate them from published data. We also distinguish citations for which we could not access the primary source and check the original data but that were cited in secondary sources. We averaged data if available from more than one primary source. J. De Silva kindly provided his unpublished data on brain mass at birth for three primate species.

Placental Invasiveness and Interdigitation

Following Grosser's (1927) classification (reviewed in Mossman 1987) of the chorionallontoic placenta of eutherian mammals, we define placental invasiveness on the basis of the number of maternal tissues separating maternal blood from fetal tissues. We consider only the morphology of the full-term placenta, that is, at birth, because some traits are not fully developed and/or present during early stages of placental development (Mossman 1987). Placental invasiveness is a three-state variable and is defined as noninvasive epitheliochorial (maternal uterine epithelia and endothelium separate maternal blood from fetal tissues), intermediately invasive endotheliochorial (fetal tissues are in contact with the endothelial walls of maternal blood vessels), or highly invasive hemochorial (fetal tissues are bathed in maternal blood). Following Mossman (1987) and Mess and Carter (2006), we classify placental interdigitation as a three-state variable and distinguish between villous (fetal tissues branch into villi forming a moplike structure), trabecular (villi are branched and only partially fused), and labyrinthine (villi are highly branched and fused in a weblike structure). We thus classify as villous the placentas of *Sus scrofa* and *Trusiops truncatus* and as labyrinthine the placentas of Canidae and Felidae. Information on invasiveness and interdigitation is taken from Mossman's (1987) key reference book on placentation in mammals. We have cross-checked information in the extensive database of this book when data on placentation were given for a family with no specific mention of the species by checking the cited primary references. We have also cross-checked this information with additional primary sources, including Professor Benirschke's Web site on comparative placentation (http://placentation.ucsd.edu/) and new information published since 1987, as well as for consistency with other secondary sources (e.g., Mess and Carter 2006).

Maternal Body Mass, Gestation Length, and Litter Size

Maternal body mass (g), gestation length (days), and litter size are taken from the PanTHERIA database (available at http://www.utheria.co.uk/home.aspx). This database, presented by Jones et al. (2009), has more than 100,000 entries summarizing data from primary and secondary sources on mammalian life-history traits, including all data of Hayssen et al.'s (1993) reference book on life histories summarizing data from more than 12,000 primary sources. We checked the primary literature and corrected data on gestation length for species known to have delayed implantation or other forms of delayed development/diapause (e.g., some carnivores and bats) because gestation length in PanTHERIA includes time in delayed implantation/diapause. Information on the length of delayed implantation was taken from Hayssen et al. (1993). Finally, we extracted information on maternal mass, gestation length, and litter size from primary sources for the few species missing from PanTHERIA.

Developmental State

We collected data on the state of development at birth from several sources, and following convention (e.g., Case 1978; Martin and MacLarnon 1985; Pagel and Harvey 1988), we classified species as precocial if neonates have open eyes at birth or altricial if they have closed eyes at birth. Information on age at eyes opening was taken from Hayssen et al. (1993).

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