

**Mother-infant lateral biases in humans and wild animals: conservatism of the phenomenon and its benefits for fitness.**

Yegor Malashichev

Department of Vertebrate Zoology, Faculty of Biology, Universitetskaya nab., Saint Petersburg State University, Saint Petersburg, Russian Federation

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The maternal preference to hold infants on the left rather than right side of the body is well known for humans and apes [1,2], and is thought to be associated with mother–infant bonding [3]. A number of hypotheses related cradling bias to a right-hemispheric specialization for processing of social information [4,5]. A paucity of naturalistic observations and studies on non-primate species means that the adaptive significance and evolutionary origin of lateralized mother-infant positioning remains unknown. Observations on wild beluga whales demonstrated for the first time the side bias in mother-infant position and suggested that left eye – right hemisphere dominance for social processing is the underlying mechanism for the bias [6]. This bias appeared to be consistent in different populations, environments, external conditions or way of data collection [7,8]. We further explored the pattern of lateralization in mother-infant interactions in ten other species of marine and terrestrial mammals [9], which was found to be consistent with those found earlier in humans [10]. Observations on individually identified mother-infant pairs showed that infants prefer to keep their mothers on the left compared with the right side in a variety of behaviors in the wild, whereas mothers display the preference to keep their infants on the left side only in potentially threatening situations [9, 11]. When keeping mothers on the left, i.e. predominantly in their left visual field, infants better maintained proximity and directed more attachment behavior to mothers. In providing the first evidence of a clear advantage of lateralized positioning for the infant our results suggest significant impact of lateralization on individual fitness. Therefore, infants (including human children) with abnormal pattern of left-right hemispheric asymmetry and specialization would have fewer chances for survival (e.g., children with autism spectrum disorder). At the other hand, I propose that Tinbergen’s holding therapy of autistic children [12] may now have a new support and might be reconsidered in that not the holding per se is important for potential behavioral correction, but if applied early enough the left eyes and the right hemispheres contact between the mother and the infant, providing an opportunity for the infants’ right hemisphere activation.

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