



Supplementary Figure S1. *Allosaurus* (A, B, C) and *Nothronychus* (D, E, F) shoulder abduction/adduction (A, D), protraction/retraction (B, E), long axis rotation (C, F) plots. Muscles: BH, biceps brachii; TD, triceps brachii. Negative angles and moment arms represent adduction (AAAD), retraction (PR), and internal rotation (LAR) while positive angles and moment arms represent abduction (A, D) and (B, E) and protraction (C, F). Crossing 0 reflects a change in function (Hutchinson et al., 2015).