

Figure 1.

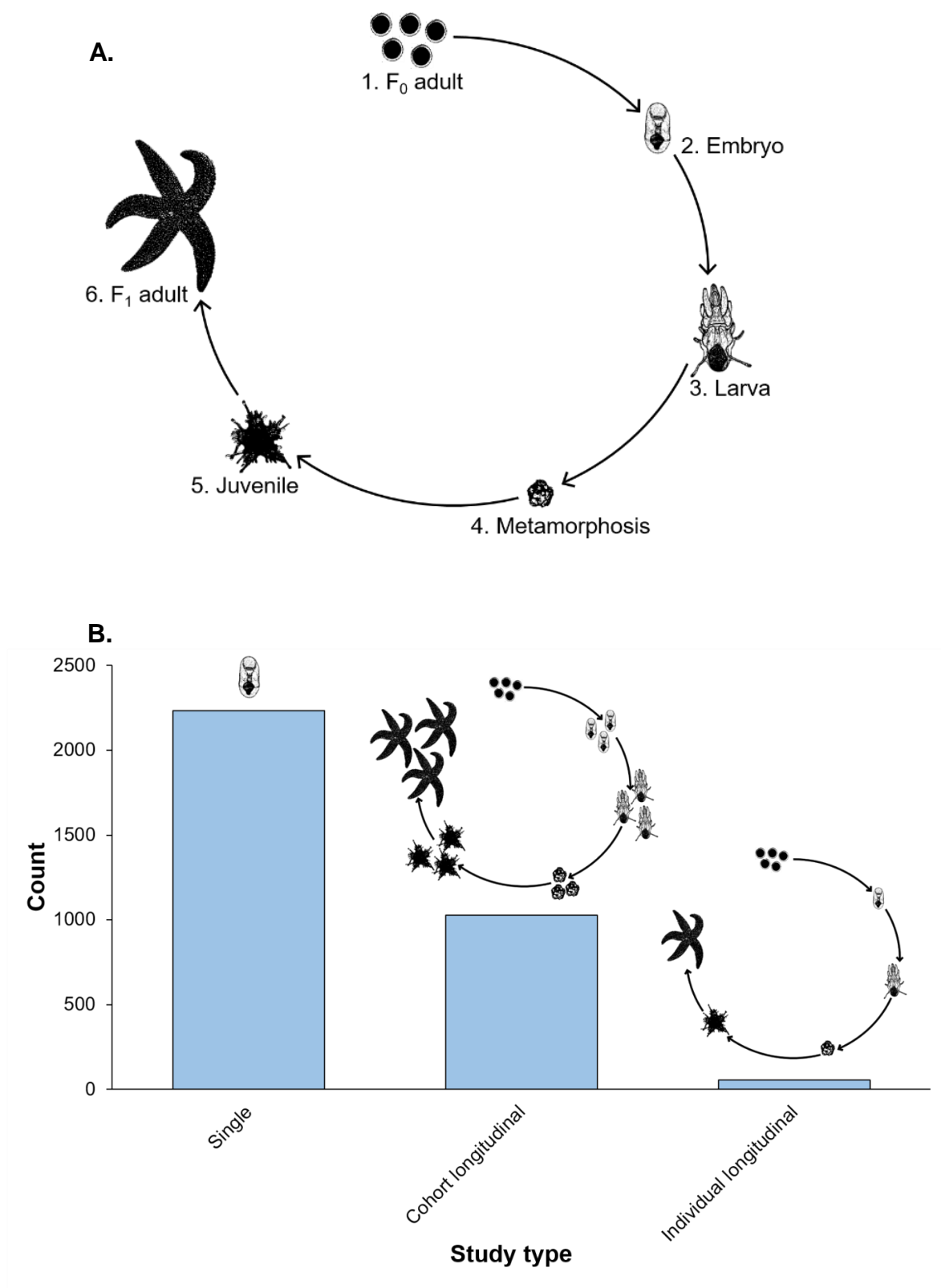


Figure 2.

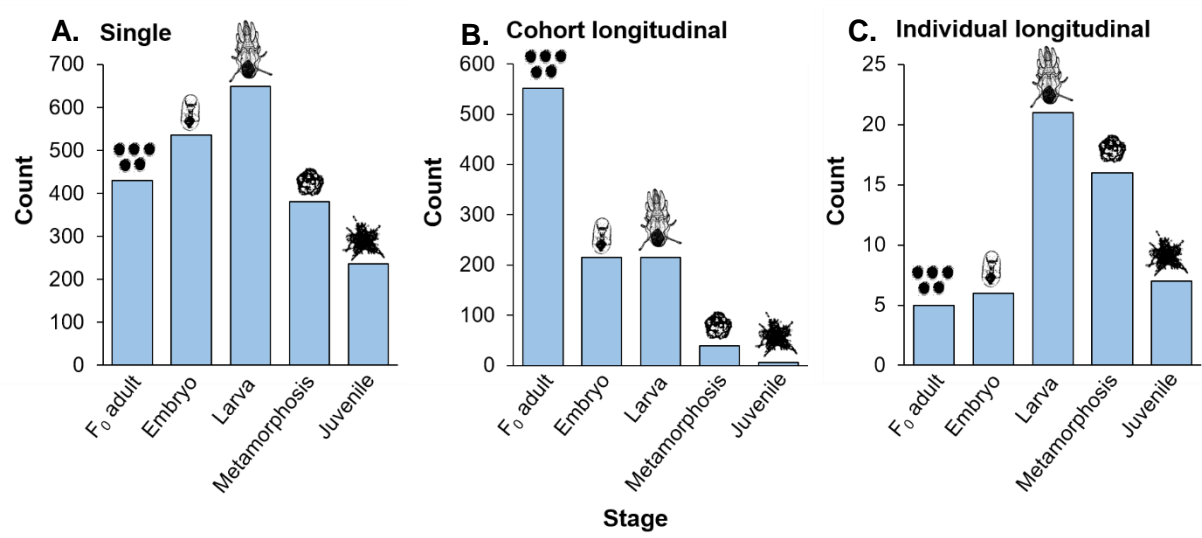
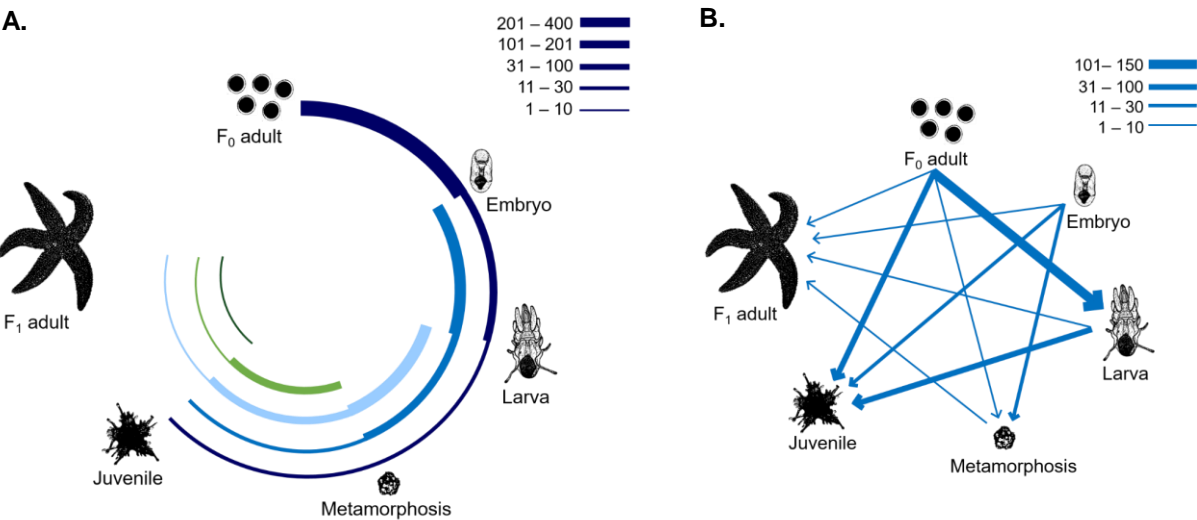


Figure 3.

Cohort longitudinal



Individual longitudinal

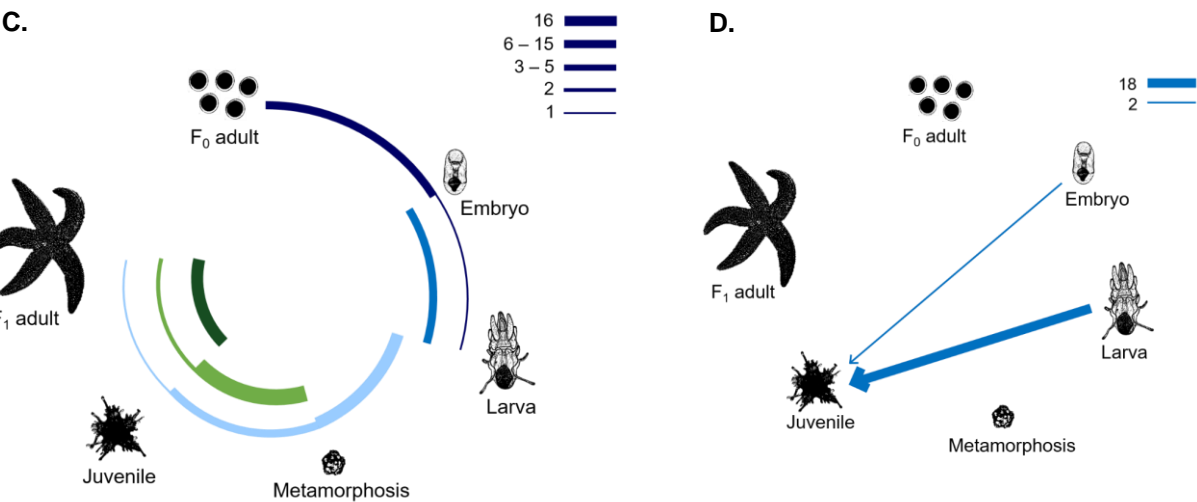


Figure 4.

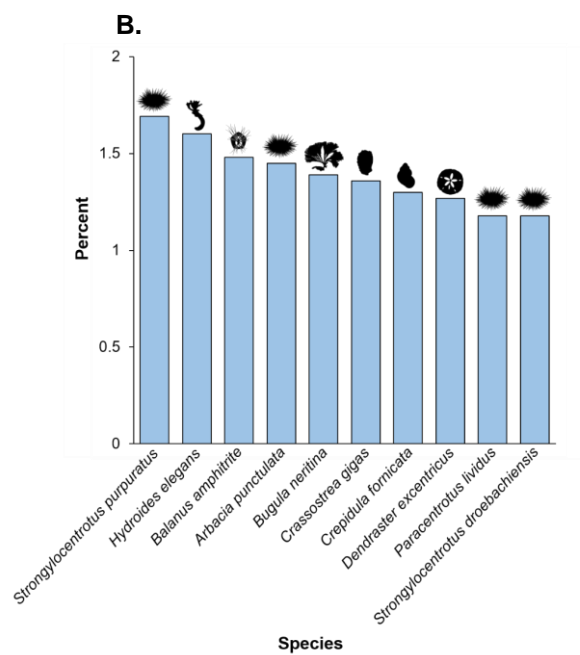
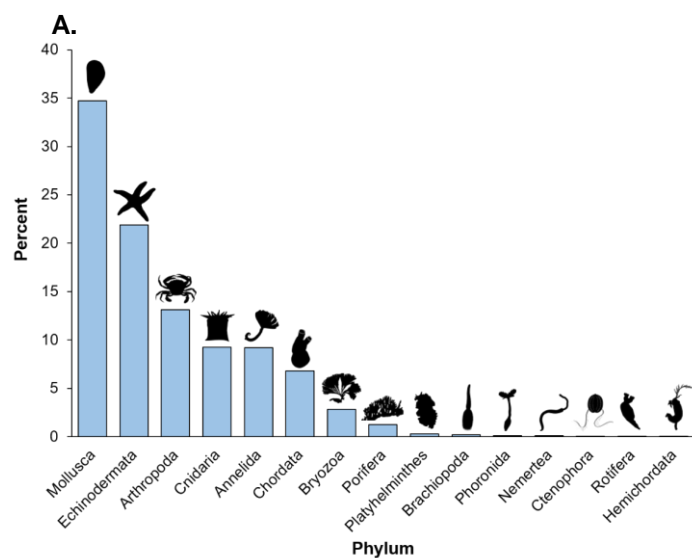


Figure 5.

Figure 1. Correlation between larval and adult traits as an example of Simpson's Paradox. (A) Points represent means of three cohorts. (B) A small point is an individual, and large points are the means of each cohort, depicted in panel A. Simpson's Paradox proposes that the relationship between two traits across cohorts (A), may not reflect the relationship observed across individuals (B). To make inferences about phenotypic links among life-history stages, studies using individuals are most appropriate.

Figure 2. (A) Stages included in literature map of marine invertebrate life histories. For each experiment, the life-history stages included in the study were recorded: (1) F_0 adult; (2) embryo; (3) larva; (4) metamorphosis; (5) juvenile; and (6) F_1 adult. (B) Frequency of each experimental design type identified in the literature map. Study type is depicted in life cycle above each column—single stage experiments measure one stage in the life history; cohort longitudinal experiments follow a single cohort through multiple stages; and individual longitudinal experiments follow individuals through the life history.

Figure 3. Frequency of experiments that begin with each life history stage, across the three experimental design approaches: (A) single stage; (B) cohort longitudinal (i.e. multiple stages, one cohort); (C) individual longitudinal (i.e. multiple stages, individuals).

Figure 4. Summary of life-history stages measured in cohort longitudinal (top panel) and individual longitudinal (bottom panel) experiments. Thickness of bars represent the number of experiments that measured each stage combination (see legends). (A, C) Concentric circles show experiments that start at each stage—bars are thick at the start of each circle, and become narrow

as fewer experiments measure subsequent stages. (B, D) Lines show when experiments skip stages (e.g. D; thick line measures larvae and juvenile, but not metamorphosis).

Figure 5. The taxa in the literature map of marine life histories ($n = 3,315$ experiments). (A) Percent of species in the fifteen phyla—Mollusca, Echinodermata and Arthropoda accounted for 70% of species. (B) The ten most common species in the map for which five of the are echinoderms: four sea urchins (*Arbacia punctulata*, *Paracentrotus lividus*, *Strongylocentrotus droebachiensis*, *S. purpuratus*) and one sand dollar (*Dendraster excentricus*).