$$f = \frac{A-B}{A+B},$$

$$f = \frac{A}{(A+B)} - \frac{B}{A+B}$$

$$\delta f = \sqrt{\left(\frac{\partial f}{\partial A}\delta A\right)^2 + \left(\frac{\partial f}{\partial B}\delta B\right)^2}$$

[1]

$$\frac{\partial f}{\partial A} = \frac{1(A+B)-A}{(A+B)^2} - \frac{-B}{(A+B)^2} = \frac{2B}{(A+B)^2}$$

$$\frac{\partial f}{\partial B} = \frac{-A}{(A+B)^2} - \frac{1(A+B)B}{(A+B)^2} = \frac{-2A}{(A+B)^2}$$

$$\delta f = \sqrt{\left(\frac{2B}{(A+B)^2}\delta A\right)^2 + \left(-\frac{2A}{(A+B)^2}\delta B\right)^2}$$

$$\delta f = \frac{2}{(A+B)^2}\sqrt{B^2\delta A^2 + A^2\delta B^2}$$

[2] **Equation S1.** Finding the formula for error propagation through the normalization formula used to
[3] calculate pairwise comparisons depicted in Figure 2 and Figure S2. The formula compares taxonomic
[4] classes relative enrichment between two experimental conditions as well as scaling. The classes are
[5] expressed as A and B and the standard error corresponds to δA and δB respectively. The resulting
[6] normalized standard deviation is represented as δf.