

Appendix A from T. Bell et al., “A Linear Model Method for Biodiversity–Ecosystem Functioning Experiments” (Am. Nat., vol. 174, no. 6, p. 836)

Summary of Terms

Table A1
Summary of terms

Variable	Description	Explanation
δ	Set of richness levels	Set of levels of species richness used in the experiment
d	No. richness levels	No. elements in δ (i.e., no. levels of species richness used in the experiment)
M	Species composition	No. species compositions in the experiment; this source of variance is important because it is the denominator for the F -test of the species-identity effects
n	Replicates	No. times each of the M species compositions is replicated
P	Partitions	No. times the species pool is divided without replacement at each richness level
Q	Partitioned species pools	No. unique sets of experimental units, each of which is composed of $P \times R$ compositions; these are the “partitioned species pools.” This source of variance is important because it is the denominator for the F -test of nonlinear richness
R	Richness	Species richness of a particular composition; we distinguish between linear richness (richness treated as a continuous variable) and nonlinear richness (richness treated as a categorical variable). If the experimental design and analysis method that we describe are employed, we interpret the effect of nonlinear richness as the effect of interactions among species
S	Total richness	No. species in the pool of available species
y	Ecosystem functioning	Response variable, some measure of ecosystem functioning
$\tilde{f}(S)$	Experiment size	Total no. experimental units
β	Coefficient	Linear model coefficient associated with •
SS	Sums of squares	Sums of squares associated with •
SS _{i}	Species identity	Sums of squares associated with the presence/absence of each species summed across all species
x	Predictor variable	Predictor variable associated with •
e	Error	Normally distributed random error

Note: A schematic of the experiment design is provided in figure 1.

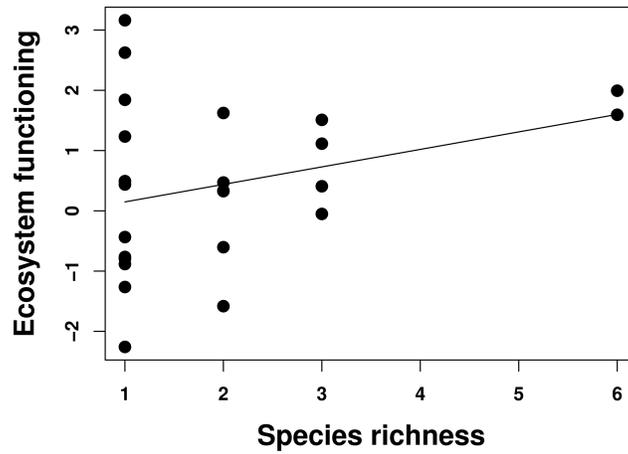


Figure A1: Relationship between species richness and ecosystem functioning for data generated according to equation (4) and where the experiment is designed according to figure 1. These data are analyzed in figure 2. See appendix B for instructions on how to reproduce this figure.

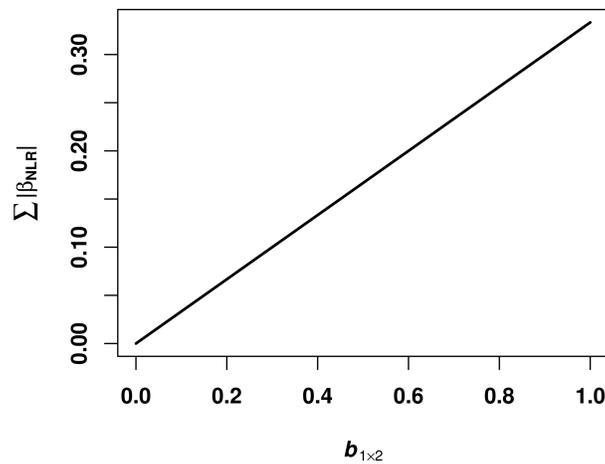


Figure A2: Relationship between the strength of the interaction between species 1 and species 2 ($b_{1 \times 2}$) and the coefficient for the nonlinear richness linear model coefficient. There is a linear increase in nonlinear richness as interactions become increasingly important. The ecological interaction is described in scenario 3 of the main text. The figure can be reproduced using the methods described in appendix B.