Please consider our submission of a regular Article to *American Naturalist* titled, “Defining and detecting competitive higher order interactions”.

Ecologists are increasingly interested in the potential for higher order interactions to shape competitive coexistence in communities with more than two species (Grilli et al. 2018, Levine et al. 2018, Stoufer and Mayfield 2017). Despite the flurry of interest in this topic, recent papers also show inconsistency in defining higher order interactions and offer few explanations for how higher order interactions could emerge in the first place.

In our manuscript we address both of these issues. First, we develop a general definition of higher order interactions that distinguishes them from non-linear single species competitive effects. Our definition leads to a practical set of procedures for detecting higher order interactions in empirical data.

Next, we build a simple mechanistic model of competition among three annual plant species. We use this model to simulate competitive outcomes in two and three species communities. We then attempt to detect higher order interactions in the data generated by the simulations. This worked example shows how we can detect higher order interactions using our definition. And importantly, by starting from a mechanistic model, our example also sheds light on the traits and environmental conditions that are likely to generate strong higher order interactions.

We believe our manuscript will interest a large audience of theoretical and empirical ecologists working to push the envelope of standard theories about competition. As more ecologist attempt to detect higher order interactions in nature and build them into theoretical models of community interactions it will undoubtedly be widely cited in the years to come.

We have no competing interests to declare, and none of the data or results reported in the manuscript have been published or submitted elsewhere.

Sincerely,

Andrew Kleinhesselink

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Jonathan Levine