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

Competitive interactions between pairs of species are the foundation of our most general theories of community coexistence and stability. A key assumption about how pairs of species interact is that this interaction remains the same regardless of whether additional species are present—i.e. there are no higher order interactions. However, recent theoretical work demonstrates important consequences of breaking this assumption and a recent empirical study provides some evidence of higher order interactions in nature (Grilli et al. 2018, Levine et al. 2018, Stoufer and Mayfield 2017). Despite the flurry of interest in this topic, there remain significant confusion defining higher order interactions, and a large gap between our understanding of the theoretical consequences of higher order interactions on the one hand, and our relatively limited understanding of how they could be detected and measured in empirical systems.

Our manuscript provides new insights into the definition of higher order interactions and demonstrates issues in measuring higher order interactions when the mechanistic basis of competition is unknown. Critically it shows the difficulty inherent in finding higher order interactions in discrete time competition. A problem that other theoretical work on higher order interactions has avoided.

We simulate a simple

We believe our manuscript will interest a large audience of theoretical and empirical ecologists interested in pushing the envelope of standard theories about competition. It will serve as a valuable reference for interpreting the current and future evidence for higher order interactions.

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

Jonathan Levine

Nathan Kraft