Stochasticity-induced stabilization weakens in diverse communities

What is the Manuscript Microscope Sentence Audit?

The Manuscript Microscope Sentence Audit is a research paper introspection system that parses the text of your manuscript into minimal sentence components for faster, more accurate, enhanced proofreading.

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Manuscript Source: https://www.biorxiv.org/content/10.1101/2021.03.21.436309v1
Manuscript Authors: Jayant Pande & Nadav M. Shnerb

Features of the Sentence Audit:

The Sentence Audit combines two complementary proofreading approaches:

1. Each sentence of your text is parsed and displayed in isolation for focused inspection.
2. Each individual sentence is further parsed into Minimal Sentence Components for a deeper review of the clarity, composition and consistency of the language you used.

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Comments and Caveats:

• The sentence parsing is achieved using a prototype natural language processing pipeline written in Python and may include occasional errors in sentence segmentation.

• Depending on the source of the input text, the Sentence Audit may contain occasional html artefacts that are parsed as sentences (E.g. "Download figure. Open in new tab").

• Always consult the original research paper as the true reference source for the text.

Contact Information:

To get a Manuscript Microscope Sentence Audit of any other research paper, simply forward any copy of the text to John.James@OxfordResearchServices.com.

All queries, feedback or suggestions are also very welcome.

Research Paper Sections:

The sections of the research paper input text parsed in this audit.

Section No.	Headings	Sentences
Section: 1	I. METHODS	1
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
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The Sentence Audit Of The Research Paper

Title — **Stochasticity-induced stabilization weakens in diverse communities**

S0 [001] Abstract

Abstract

S0 [002] Environmental stochasticity and the temporal variations of demographic rates associated with it are ubiquitous in nature.

Environmental stochasticity ...

... and the temporal variations ...

... of demographic rates associated ...

... with it are ubiquitous ...

... in nature.

S0 [003] The ability of these fluctuations to stabilize a coexistence state of competing populations (sometimes known as the storage effect) is a counterintuitive feature that has aroused much interest.

The ability ...

... of these fluctuations ...

... to stabilize a coexistence state ...

... of competing populations ...

... (sometimes known ...

... as the storage effect) ...

... is a counterintuitive feature ...

... that has aroused much interest.

S0 [004] Here we consider the performance of environmental stochasticity as a stabilizer in diverse communities.

Here we consider the performance ...

... of environmental stochasticity ...

... as a stabilizer ...

... in diverse communities.

S0 [005] We show that the effect of stochasticity is buffered because of the differential response of populations to environmental variations, and its stabilizing effect disappears as the number of populations increases.

We show ...

... that the effect ...

... of stochasticity is buffered ...

... because of the differential response ...

... of populations ...

... to environmental variations, ...

... and its stabilizing effect disappears ...

... as the number ...

... of populations increases.

S0 [006] Of particular importance is the ratio between the autocorrelation time of the environment and the generation time.

Of particular importance is the ratio ...

... between the autocorrelation time ...

... of the environment ...

... and the generation time.

S0 [007] Species richness grows with stochasticity only when this ratio is smaller than the inverse of the fundamental biodiversity parameter.

Species richness grows ...

... with stochasticity ...

... only ...

... when this ratio is smaller ...

... than the inverse ...

... of the fundamental biodiversity parameter.

S0 [008] In an opposite regime, when stochasticity impedes coexistence and lowers the species richness, its effect is determined by the ratio between the strength of environmental variations and the rate at which new types are added to the community via speciation, mutation or immigration.

In an opposite regime, ...

... when stochasticity impedes coexistence ...

... and lowers the species richness, ...

... its effect is determined ...

... by the ratio ...

... between the strength ...

... of environmental variations ...

... and the rate ...

... at which new types are added ...

... to the community ...

... via speciation, ...

... mutation ...

... or immigration.

S0 [009] Coexistence of competing species poses a long-standing puzzle to the theory of community dynamics.

Coexistence ...

... of competing species poses a long-standing puzzle ...

... to the theory ...

... of community dynamics.

S0 [010] The competitive exclusion principle states that the number of species is bounded by the number of limiting resources [1, 2], and May's complexity-diversity analysis suggests that as the number of species increases their coexistence states become highly fragile [3].

The competitive exclusion principle states ...

... that the number ...

... of species is bounded ...

... by the number ...

... of limiting resources ...

... [1, 2]...

... , ...

... and May's complexity-diversity analysis suggests ...

... that as the number ...

... of species increases their coexistence states become highly fragile ...

... [3].

S0 [011] Yet many natural communities, like fresh-water plankton [4], trees in tropical forests [5] and fish in coral reefs [6], seem to support high-diversity assemblages with very little evidence for substantial niche differentiation.

Yet many natural communities, ...

... like fresh-water plankton ...

... [4], ...

... trees ...

... in tropical forests ...

... [5] ...

... and fish ...

... in coral reefs ...

... [6], ...

... seem ...

... to support high-diversity assemblages ...

... with very little evidence ...

... for substantial niche differentiation.

S0 [012] To resolve this problem, a few mechanisms that may facilitate coexistence have been presented and analyzed in the literature [7].

To resolve this problem, ...

... a few mechanisms ...

... that ...

... may facilitate coexistence have been presented ...

... and analyzed ...

... in the literature ...

... [7].

S0 [013] One of the most important has to do with the ability of stochastic temporal fluctuations to stabilize an otherwise unstable, or weakly stable, coexistence state [8, 9].

One ...

... of the most important has ...

... to do ...

... with the ability ...

... of stochastic temporal fluctuations ...

... to stabilize an otherwise unstable, ...

... or weakly stable, ...

... coexistence state ...

... [8, 9]...

... .

S0 [014] This counterintuitive phenomenon was discovered about forty years ago [10–12] and has been discussed since then by many authors.

This counterintuitive phenomenon was discovered ...

... about forty years ago ...

... [10–12] ...

... and has been discussed ...

... since then ...

... by many authors.

S0 [015] A few recent methodological papers have offered simple numerical methods to quantify the strength and the relative importance of this mechanism using empirical datasets [13, 14].

A few recent methodological papers have offered simple numerical methods ...

... to quantify the strength ...

... and the relative importance ...

... of this mechanism ...

... using empirical datasets ...

... [13, 14]...

... .

S0 [016] In parallel, several prominent studies have analyzed the role of environmental stochasticity in promoting the diversity of tropical forests [15, 16], grasses [17], yeast species [18] and E. coli strains [19].

In parallel, ...

... several prominent studies have analyzed the role ...

... of environmental stochasticity ...

... in promoting the diversity ...

... of tropical forests ...

... [15, 16]...

... , ...

... grasses ...

... [17], ...

... yeast species ...

... [18] ...

... and E. coli strains ...

... [19].

S0 [017] The potential role of stochasticity-induced stabilization (SIS) in protecting genetic polymorphism has been considered as well [20–23].

The potential role ...

... of stochasticity-induced stabilization ...

... (SIS) ...

... in protecting genetic polymorphism has been considered ...

... as well ...

... [20–23].

S0 [018] Here we would like to discuss the relationship between the strength of SIS and the diversity of a given community.

Here we would ...

... like ...

... to discuss the relationship ...

... between the strength ...

... of SIS ...

End of Sample Audit