Title:	Emergent patterns in interacting neuronal sub-populations
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Abstract:	We investigate an ensemble of coupled model neurons, consisting of groups of varying sizes and intrinsic dynamics, ranging from periodic to chaotic, where the inter-group coupling interaction is effectively like a dynamic signal from a different sub-population. We observe that the minority group can significantly influence the majority group. For instance, when a small chaotic group is coupled to a large periodic group, the chaotic group de-synchronizes. However, counter-intuitively, when a small periodic group couples strongly to a large chaotic group, it leads to complete synchronization in the majority chaotic population, which also spikes at the frequency of the small periodic group. It then appears that the small group of periodic neurons can act like a pacemaker for the whole network. Further, we report the existence of varied clustering patterns, ranging from sets of synchronized clusters to anti-phase clusters, governed by the interplay of the relative sizes and dynamics of the sub-populations. So these results have relevance in understanding how a group can influence the synchrony of another group of dynamically different elements, reminiscent of event-related synchronization/de-synchronization in complex networks.
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