The Organizational Neurodynamics of Teams

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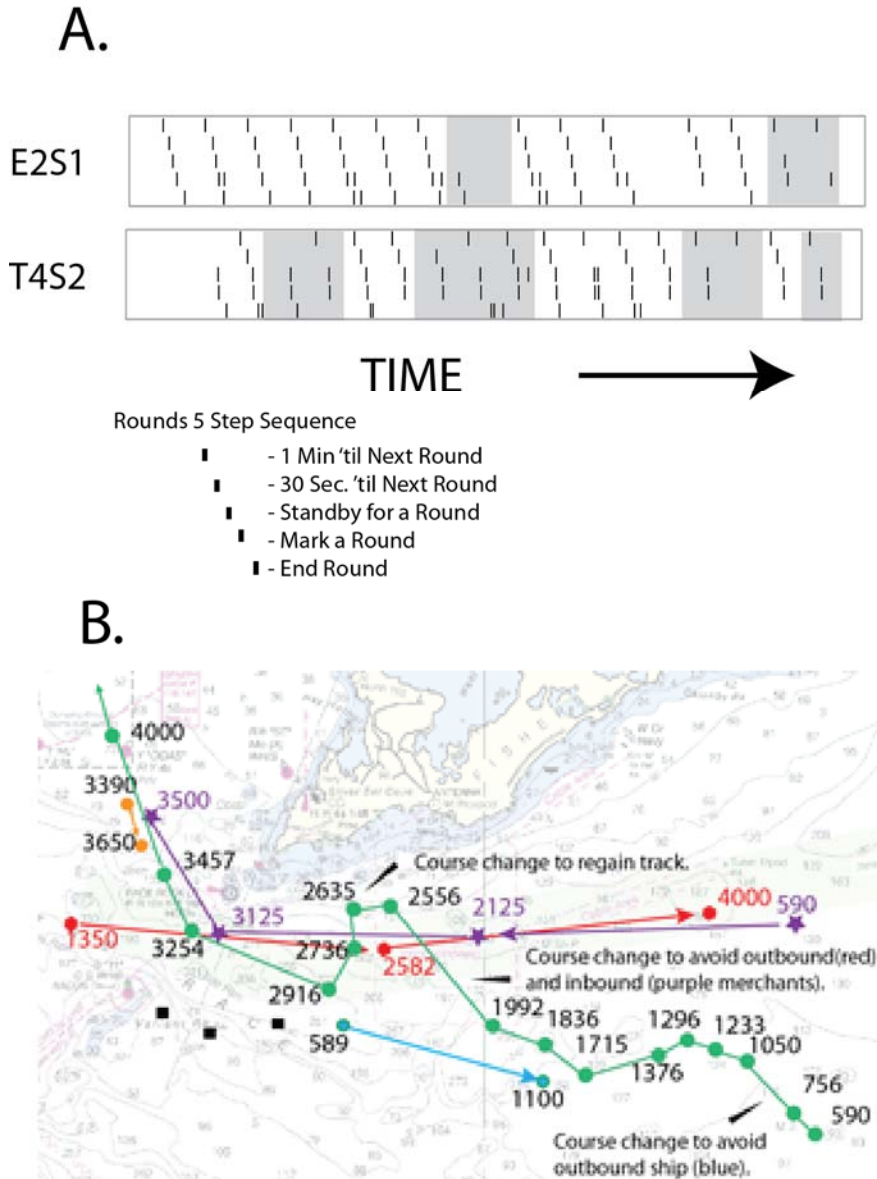
Color Figures

Fig. 2. Components of SPAN tasks. A: The sequence of Rounds is shown for two SPAN teams. The top team showed a regular progression of the five-step sequence, being irregular at only two points (gray). The second team showed a more disrupted Rounds process. B: The numbers on the tracks indicate the position of the submarine and other traffic during the simulation; the submarine's track is shown by the black circles beginning at 590 seconds.
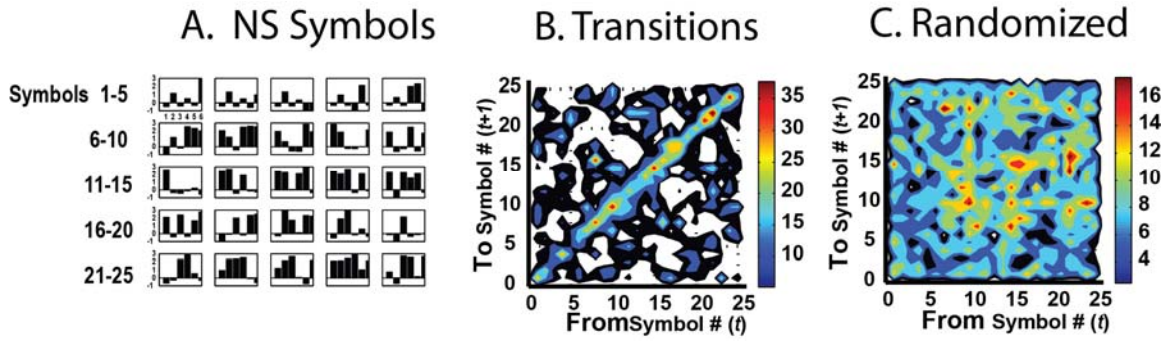
Fig. 4. Developing the dynamics of neurophysiologic synchrony attractors by the set of state variables and their transitions from *t* to *t*+1. A: The activity level of the twenty-five NS state variables can be tracked over time using a (B) neurophysiologic synchronies state transition matrix. C: The transition matrix resulting from the randomization of the NS data stream in B.
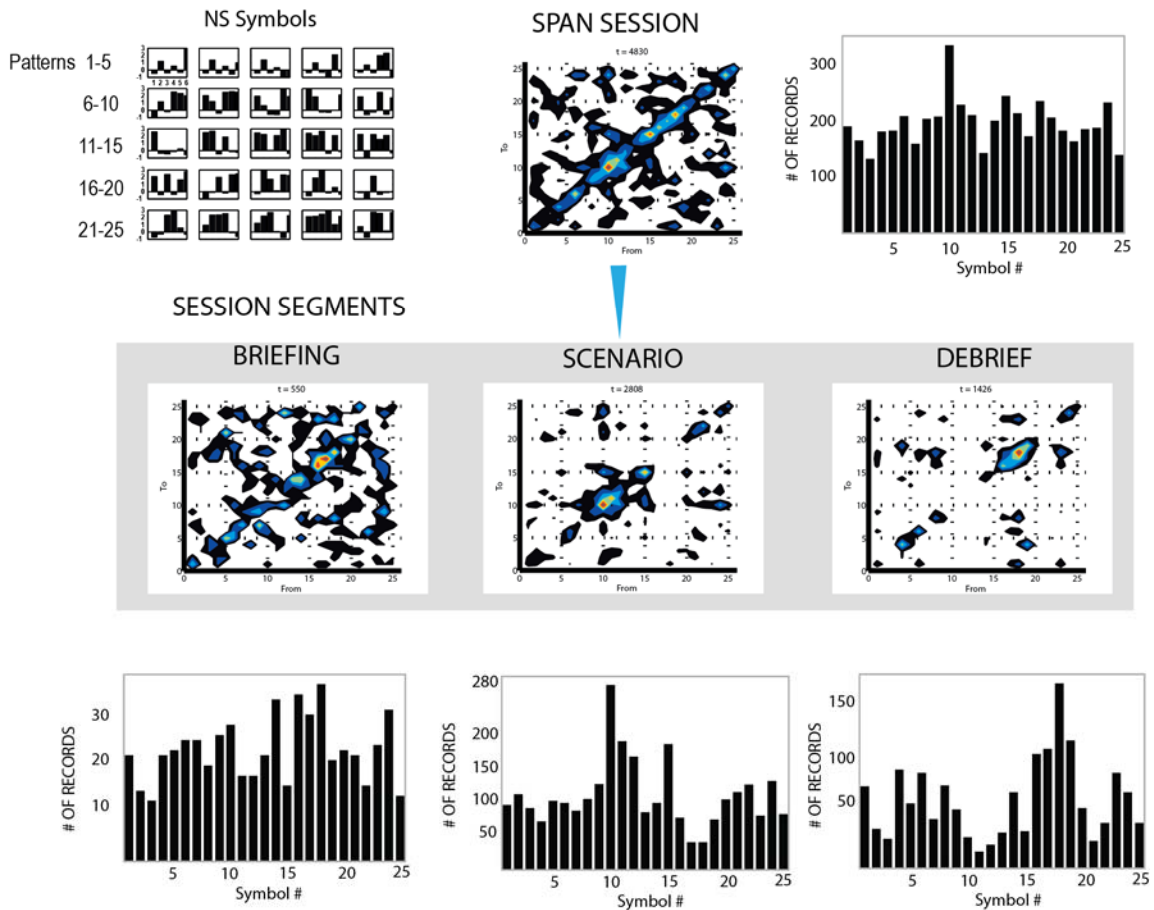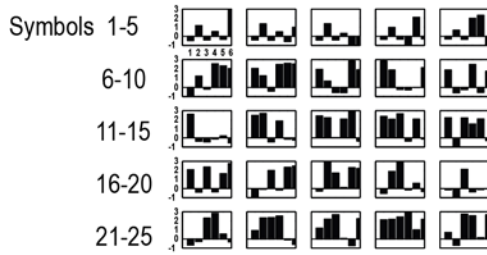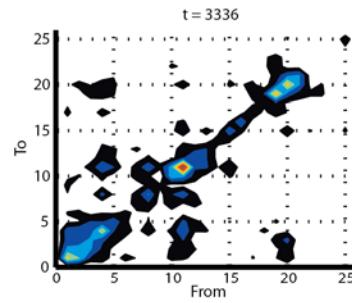

Fig. 5. Sub-task distributions of NS symbols and transitions. The top level shows the transition matrix and expression of the twenty-five NS symbols for the SPAN performance by a SOAC team. The matrices and histograms below show similar data for the three major segments of the task.

A. NS Symbols

B. Scenario Transitions

C. Attractor Dynamics

+ 56 Seconds   + 96 Seconds

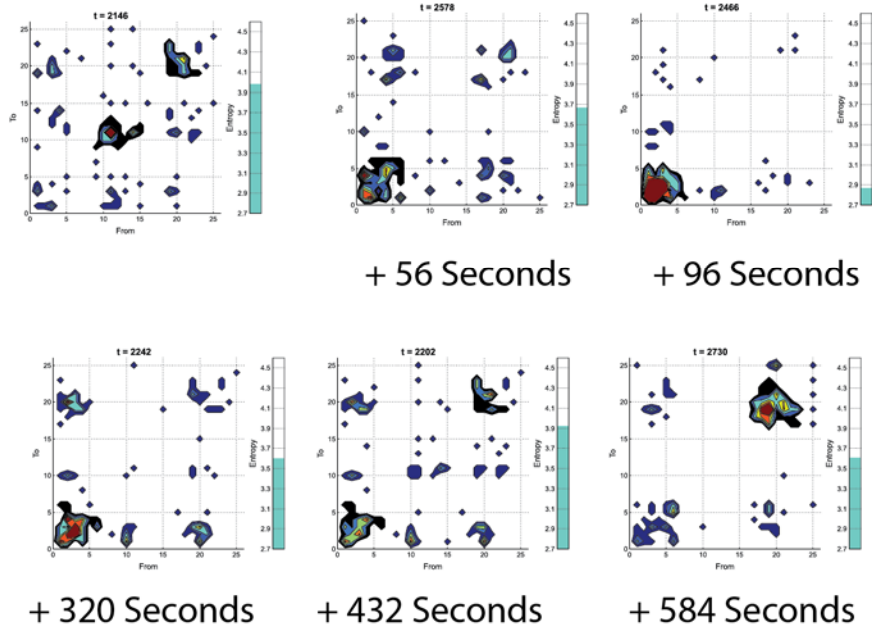+ 320 Seconds   + 432 Seconds   + 584 Seconds

Fig. 6. NS_E transition matrix sampled at different points over a 584 second period of a SPAN Debriefing. Second-by-second dynamics of this and other SPAN performances can be found at www.teamneurodynamics.com.
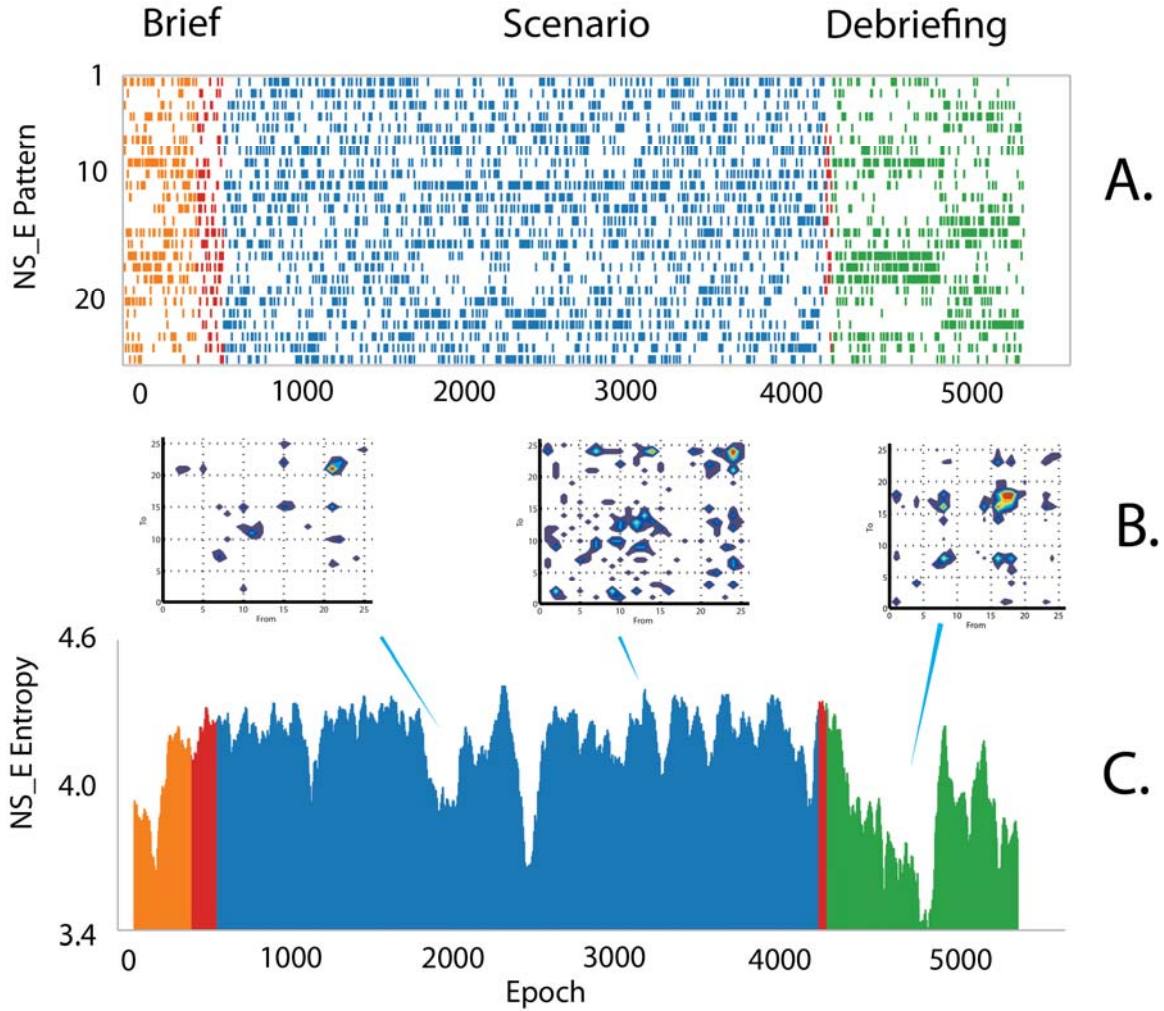
Fig. 7. Multiple representations of NS_E neurodynamics. A: The second-by-second expression of individual NS_E symbols. B: The transition matrices for NS_E show the NS_E symbols being expressed at the regions indicated in the entropy profile (C). During periods of low entropy (~epochs 1900 & 2400) few of the 625 potential (i.e. *from* 25 symbols *to* 25 symbols) NS symbol transitions were used by the team during a 100 second window.
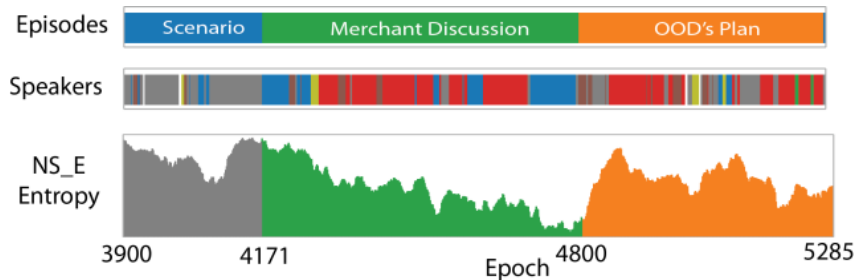

Fig. 8. NS entropy organizes around conversational episodes or topics. The Episodes bar shows the major discussion episodes of the Debriefing. The Speakers bar is color coded to periods when there were different speakers. The NS_E entropy variability shows the entropy profile.
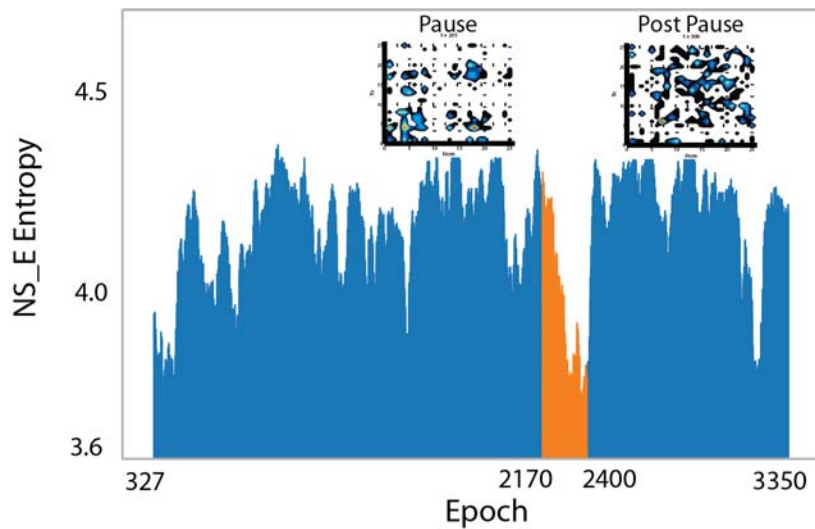
Fig. 9. Perturbation of the SPAN task induces team reorganization. During the period highlighted, the simulation was in pause and the attractors were more organized than after the pause.
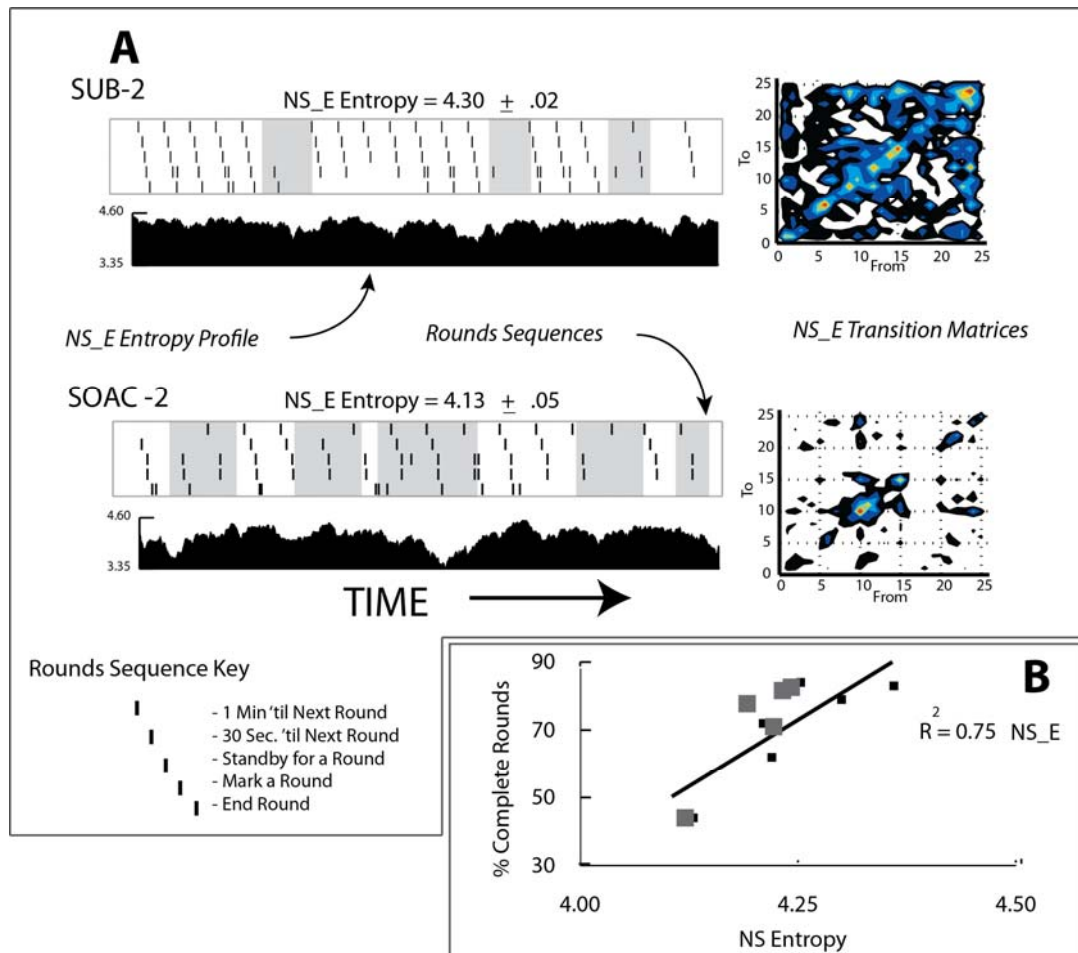

Fig. 10. Entropy fluctuations and sequencing of the Rounds. The sequences of Rounds for a representative experienced (SUB) and SOAC team are plotted above the NS_E entropy profiles. To the right are the overall transition matrices for the Scenario segment. Figure 10B plots the output of a performance metric, the taking of Rounds, against the overall NS_E entropy levels for the Scenario segments of three SUB and three SOAC SPAN teams.
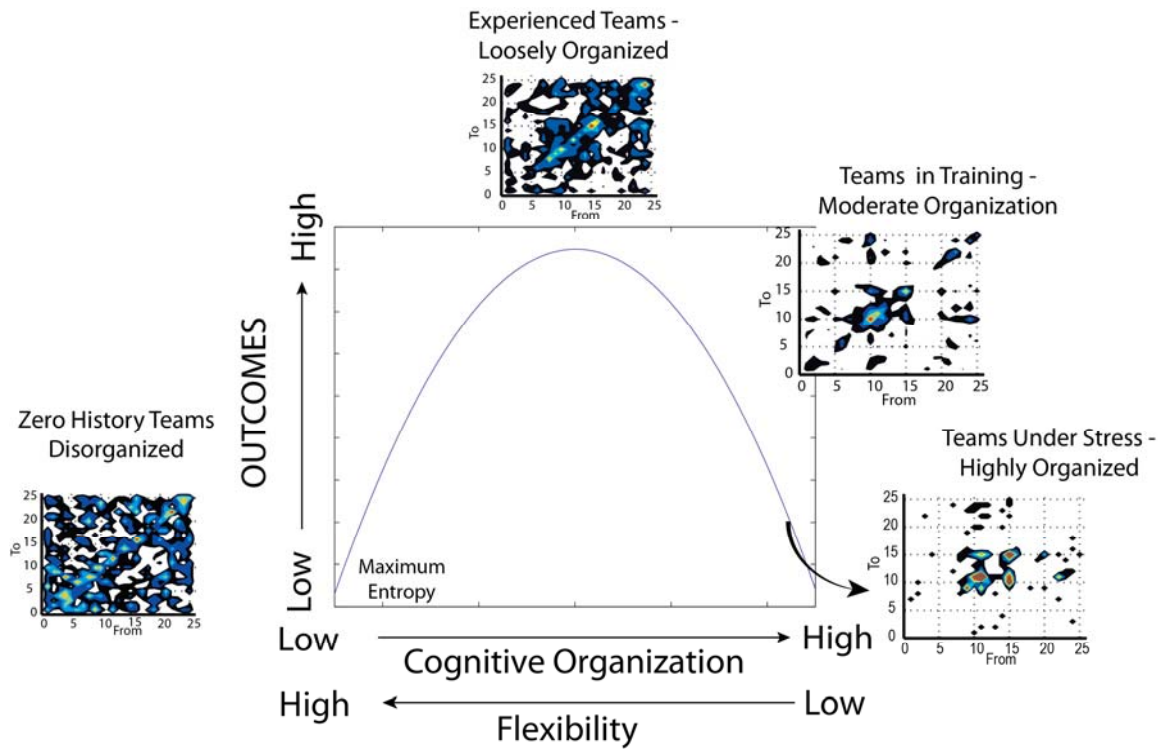
Fig. 11. A model of expertise and the cognitive organization of SPAN teams.