

LIMITS: THE ROLE OF COLLECTIVE EFFECTS IN INDIVIDUAL & TEAM PERFORMANCE

A Santa Fe Institute workshop funded by the Miller Omega Program
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Organized by Jessica Flack & John Krakauer

SYNOPSIS

Research on human performance tends to emphasize the individual. But even for activities outside of team sports and specialized military units, human performance occurs in the context of groups. For example, although the marathon is an individual event, runners tend to cluster and synchronize their pace. Furthermore, all competitions occur within a social environment and many times that social environment has a distinct culture thought to influence aspects of performance from the successful implementation of strategy to willingness to adopt novel methods—variation in willingness to adopt a quantitative approach to sports analytics is an example—to team chemistry. Teams and individual players are often described as having streaks of poor or outstanding performance. To what extent are the physiological changes underlying these above and below baseline performances mediated by collective dynamics on the field itself, synergisms among players,

team mood or team culture? Can optimal configurations of players be reliably identified? How does the importance of configuration change as a function of how synergistic or collective (versus additive) performance is—for example, does configuration matter more in basketball than in baseball and how do we quantify this? How decomposable is performance into individual contributions?

In this workshop, we will bring together a diverse group of researchers—spanning physics to machine learning to information theory to neuroscience to anthropology—to identify key questions around how collective dynamics influence individual and team performance.

The questions identified as critical by this working group will form the basis for a larger workshop planned for the summer of 2019 that will bring together scientists and practitioners.

Funds to support this working group have been generously provided by Bill Miller through the MillerOmega Program.

MEETING SESSIONS

Chemistry & Synergy

Physical & Mental Limits

Streaks & Flow

Synchronicity & Coordination

PARTICIPANTS

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Image: Weaver Hawkins, *Dance of the Football Field* (1947)



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