

Variability that causes collective behavior

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Commentary on

Knebel, D, Ayali, A, Guershon, M, Ariel, G, 2019, "Intra- versus intergroup variance in collective behaviour". *Sci Adv.*, vol. 5 (1), eaav0695.

1. Unescapable variability

This Internet social media is now a highly successful platform for people to share their interests, thoughts and ideas. For certain contents, we observe large number of "likes" and "comments", whereas for many others there are only a few responses. For the former, what triggers the collective social response; the content or people with similar personal characteristics?

Scientists have studied collective or synchronizing behavior for a long time and have shown that large-scale networks, such as internet, social or biological networks, belong to a universal scale-free format, comprising of nodes and hubs, where the hubs make the significant influence (1). However, this static inference does not explain the dynamism of collective or group behavior, or the effect of heterogeneities found within the group or network members. Cooperativity, to an extent, requires the synchronization of all members in the system over time.

To understand the mechanism of locust swarm behavior, Knebel and colleagues (2) carefully constructed a laboratory experiment, together with a mathematical model, and tracked the kinematics of real (all traveling

in the same direction) and shuffled (random movements) groups of locusts. In contrast to our intuition, their results showed that the shuffled group possess more homogenizing effect than the real group. In other words, higher individual variance within a group can eventually lead to more effective collective behavior. This may somewhat will be hard to digest, but it is reminiscent to a chaos process where order can arise out of randomness through self-organization (3).

Therefore, when we next time see a large collective response in social media, we can believe that the group of people reading the media possess large intragroup personality variance, rather than the synchronizing effect of the media content. Sounds odd but may most likely be true.

References

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