
# Assembly of Mind

Reflecting on the symmetries between our minds and hive minds, and their many similarities.

*"It is those hidden tricks of mental management that produce the systems that create those works of genius."*
— Marvin Minsky, *The Society of Mind*



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# Cries and Murmurations: Our Minds as Flocks of Starlings

Why are we so attracted to looking at ourselves? Is it because every brain likes to watch itself, or is it because we're more comfortable copying each other?

Our minds are attracted to what stimulates us, and those things are things that we've done before. What stimulates us is what has stimulated us. Vicarious pleasure is real. It's part of the reason we're so habit-prone.

Like birds to mirrors, we love to watch ourselves. We like to watch ourselves and think about doing things that remind us of the things we like to do. We ruminate. This is how mirror neurons work and why they have that name: we re-experience what we watch and think.

Such is how we understand everything from politics to professional sports to pornography. We repeat ourselves ninety-nine times, get bored, change something, and discover novelty. But you can't skip the ninety-nine times.

We don't even need to see something to feel it. It's enough to imagine it. But of course, you knew this. It's

the basis of empathy. It's been shown we don't need to practice doing things in order to get better at them, it's enough to imagine doing them and we'll get better at them. Yes, you can become better by playing the air guitar! (See "**If you can't imagine things, how can you learn?**")

At the simplest level we like order. We like to see, imagine, and create it. We're hardwired to arrange things. This reflects our particular strength as humans, which is to interfere with stuff. To do this we need to sense things in order to better place them in relationship with us. We move, taste, touch, smell, and examine things.

But before we can do anything with something we have to recognize it. We're obsessed with identifying things. So, in a way, our proclivity toward monkeying around with things leads naturally to our desire to identify, distinguish, and name things. Hence, to language. It does seem that those animals that are the most manipulative of objects are considered the most intelligent. They also test highest in distinction, word recognition, and counting.

# Starting at One, The Basic Unit

Identity means one and multiplicity means many, but what is the basic unit? Human babies cannot yet count when they're 6 months old, but they can discriminate between one set of objects and another that has twice as many. However, if the first set isn't exactly half the size of the second, they have trouble telling them apart. Formal counting doesn't emerge in humans until after the first year.

Bees will respond differently to groups of objects that differ in number as long as their numbers range between one and four. Beyond that, bees can't distinguish. On the other hand, a bee does not represent the whole of bee intelligence, which is represented by a beehive.

We can't easily test the "hive mind" of bees because it's hard to see it in action. We don't really know what they're thinking, or if they're thinking, but we can see they're doing something and coming to a conclusion. The key stage in the development of the hive's mind seems not to be in the finding of new ideas, but in the selection between them. See "**You Have a Hive Mind**".

> "Honeybees have become the first invertebrates to exhibit pessimism, a benchmark cognitive trait supposedly limited to 'higher' animals." —Brandon Kiem, **"Honeybees Might Have Emotions."**

Birds "count" up to 6 or 8 (see **"Birds' Judgments of Number and Quantity**"), though this isn't the same as what we call counting since it has more to do with comparison than abstraction. But we can see the collective behavior of birds, and when we do, it has a strange effect on us. The collective mind of starlings is dramatic. It occurs in their flocking behavior. It's called a murmuration.

# Starting With Many, The Whole

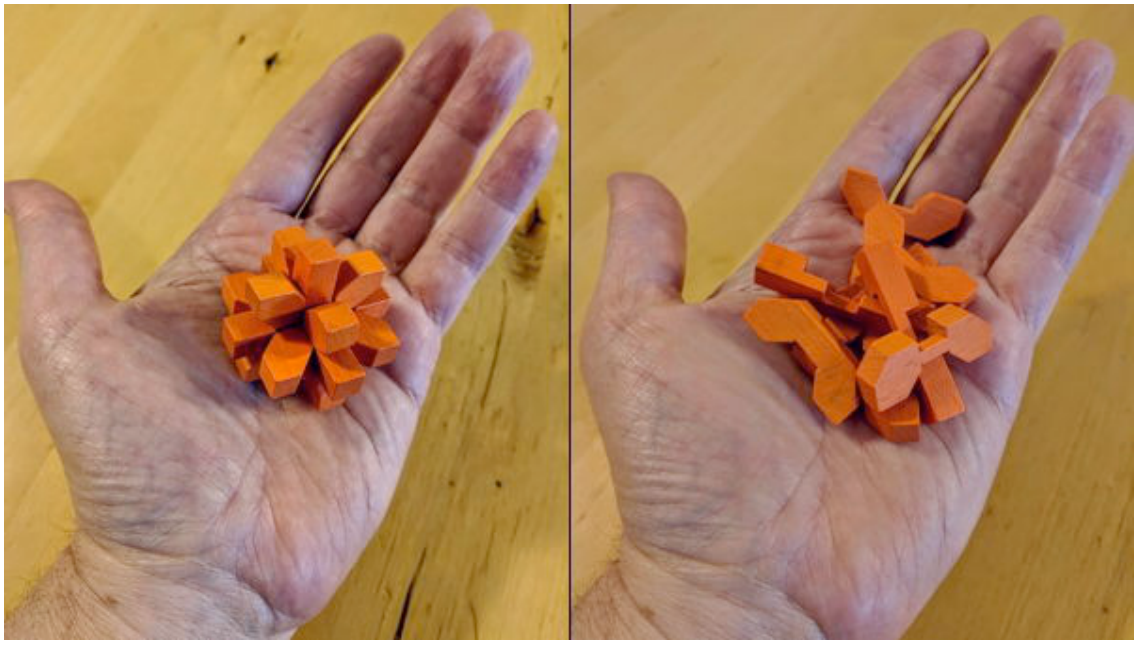
Most social birds flock, but starlings take it to the extreme. They don't just hang out as crows do, starlings behave as a single unit. I secretly believe it's because they're stupid as individuals and they need to form a smarter group mind. Maybe I'm not being fair to starlings, but I think human herding behavior is stupid, also.

I think the reason we're so naturally attracted to collective behavior, such as we see with a murmuration of starlings, is that it represents us. We also engage in collective behavior. We're doing it all the time, but we rarely see it because we are it. But when we see it happening in others, we recognize it.

Your mind is a collective but you don't see it as a collective. You can't see it as separate because you are it. You can't see the parts because the parts are doing the seeing. You can't hold yourself at arm's length. You can't take your mind apart and look at it. We are fascinated to look at ourselves because it helps us imagine what we are.

In those cases where your mind is taken apart to the extent that an outsider can recognize you as separate people, you're no longer there to see yourself. When you see yourself from the outside and can no longer identify yourself as a whole, we call it delusion. Some of those delusions are a more accurate representation of who you are than the "normal" delusion of unity.

One must retain some balanced, still-point; some core identity in order to see the separate working parts. All psychotherapy and soul retrieval is based on this: to rebuild the structure of your mind around your healthy core. Have you ever met your healthy core?



# From Many to One, Building a Mind

If you could see a thought move through your brain it might look like a flock of starlings, or the waggle dance and head butting of bees. It probably wouldn't really, but it would exhibit some collective behavior. In the case of our brains, we have some notion of signals traveling around so we can imagine something like an electrical murmuration. How do starlings do it?

Clearly, something is connecting them. One proposal is that each starling in a flock averages the behavior of the birds flying around it. Another is that the birds sense the dispersion of the flock in all directions by sensing changes in the light that reaches them: when it gets too dark they move apart, and when it gets too light they come together. These suggestions don't feel satisfying, but they're the state of the art. (See the misleadingly titled article, "**The mystery behind starling flocks explained**." It's not explained, it's described.) These mechanisms are not exclusive, and there are probably others operating as well.

There are three subtleties you must understand. The first is the process in which separate things become similar. The second is how similar things become separate. The third is the selection between choices. These things lie at the root of at the root of our identity, and also of our fascination. We see each of these things happening before our eyes in a murmuration of starlings.

Things that are separate move toward similarity by being coupled to each other. If enough things are coupled with each other, then they start to coordinate as a group. This can create resonance, which depends on frequency and is the root of structure. Resonance is different from response because resonance persists. What is critical is that these things couple in similar ways. If they don't, and there is a "lose connection," then clumps and dislocated regions form.

It's not enough that each bird copies its neighbor, in fact, they don't copy their neighbors exactly. They extrapolate an average of many neighbors' positions, velocities as well as changes in these, and follow what is essentially an abstraction (see "**Study finds European starlings flocking patterns similar to metals being magnetized**"). The resonance is the constant back and forth of the signals and responses.

The whole does not behave as a single mind but as a collection of similar thinking minds. Something larger begins to emerge when this happens. This is not all that different from what a person does when dancing: the whole start to express something that the parts could not do separately.

When the flock is attacked by a peregrine falcon, smaller collections of individuals orchestrate evasive maneuvers, after which they group returns to a whole. There is both wholeness and separateness at the same time.

# From One to Many, How Things Fall Apart

Noise will cause things that resonate to separate. When we talk about things collaborating we often overlook the noise. Understanding noise changed our world, perhaps more than anything since the development of language.

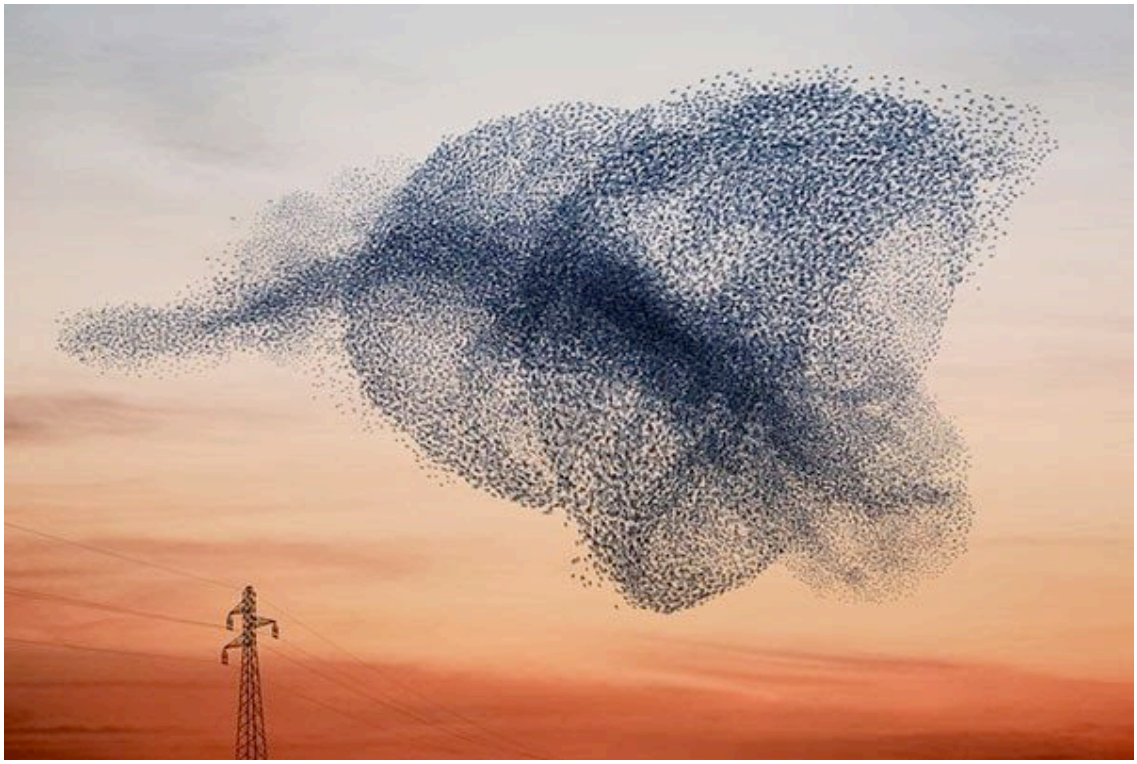
Noise is the antithesis of language, as was first explained by the father of Andy Shannon. Andy was my college housemate, and I'm grateful to Andy for showing me some of the deeper psychology of his family's mind. His father was a hobbyist and a toy maker, and the civilization-changing work he did in communications theory he pursued in his spare time.

In the case of flocking, when the errors, uncertainties, miscalculation, and miscommunications between birds become magnified due to the compounding of small errors, the cohesion of their behavior is lost. The extent of their collective behavior is limited by the range over which instructions can be sent. This is the signal to noise ratio: too much noise, no more signal. This is also why our brains cannot work solely through the action of neurons communicating through synapses: too much noise to support something as large as mind.

This underlies one of the more subtle aspects of these murmurations: the coordination of the flock doesn't get weaker as the flock gets bigger. Instead, even the largest flocks continue to move in unison. A few birds or a few dozen moving together is interesting, but a few thousand becomes mesmerizing. From a physics point of view, the article "**Scale-free correlations in starling flocks**" is the most insightful.

Each starling copies seven of its nearest neighbors, which happens to be close to the maximum number that birds can follow. But they are not counting. What they're doing is happening in fractions of thousandths of a second in their brains if, indeed, it is happening in their brains. It could be happening in their bodies, or it could be some collective field to which they are attuned. Telepathy, which has been demonstrated in humans, is a plausible mechanism.

The same could be said of us with regard to our thoughts. I know at least four leading neurophysiologists (**Plotkin**, **Lettvin**, **Tasaki**, and **Pribram**) who don't think the coordination of our brains is happening through the standard network model of chemical action between our synapses.



# Emotion as Telepathy

Telepathy gets a bad rap. It's considered akin to magic, which is rather dumb as it doesn't require anything supernatural. Some observations of telepathy strain plausibility (see "**Thinking about telepathy**") but, given the piezoelectric properties of ectoplasm and the ubiquity of electric fields in the brain, telepathy seems unavoidable. The question is, where is it happening?

My answer is that telepathy within the brain is just collective behavior, and the most collective stimulus we experience is emotion. It would follow that emotional information between humans would be more amenable to telepathy, which may be the case (see "**Telepathic Transfer of Emotional Information in Humans**").

It should be noted that signals are amplified through collective behavior, which means messages can be broadcast more loudly. In the same manner, a receiver becomes more sensitive through its resonant behavior. This is what a microphone does, it's what our ears do, and it's probably what our brains do, too.

We can make ourselves more resonant. This is what we do when we "sensitize" ourselves. The process is two-fold. First, we focus our attention in order to eliminate the noise. Then we imagine we are getting a signal and, in this way, we tune-in. Once we've found the signal we can lock onto it, but at that point, the hard part has been accomplished: we've located the source.

# The Search for Intra-Terrestrial Intelligence

The SETI project, the Search for Extraterrestrial Intelligence, listens for messages in radio signals from deep space. I would suggest there are just as mysterious signals in the space between us. I don't know what they are, how they're broadcast or received, but I think they affect us. And even though we're ignorant of the source and mechanism, I'd like to explore the idea that we can manipulate them.

We're aware of our boundaries and we have many of them. Boundaries are important for the maintenance of mental and physical structures, in personality and physiology. Containers develop when their contents need protection. Something different forms at the edges. In biology, the boundary becomes a membrane. In psychology, the boundary becomes an attitude.

If you consider how we relate to each other, then you see we create boundaries for ourselves. We define and identify people and forces according to how they do or will affect us. We behave differently in the presence of those we trust from those we do business with.

We have levels of relationship and people are constantly moving within these levels, and less commonly moving between them. The quality of our lives can be judged by how we've populated these levels, and who we've put in them.

I want to understand how the levels we create around us reflect the levels we maintain inside us. I suggest that by tuning into these outside levels we can amplify and better discriminate our own personal resonance with these levels. The differences we perceive around us may not exist to quite the degree we presume but might, instead, reflect the congregations and separations of our own mental constructs. Our own mental flocks, as it were.

To take that one step further, if we get a grip on our mental constructions, and if we can change them at least in our imagination, then might we really be changing them, at least inside us? How else can we make

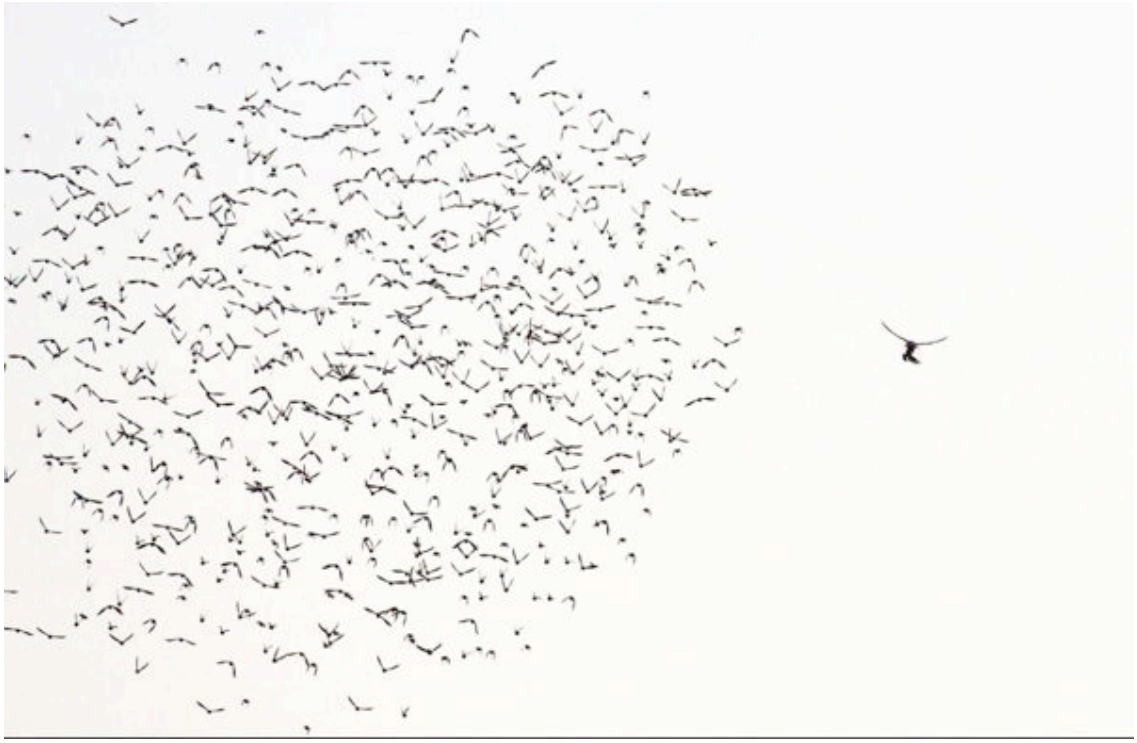
changes? How else can we learn, if not by first imagining?

# Just Do It

Let's take it one step further, again. If we can change how we think about ourselves by imagining ourselves differently, then might we also change our external reality? And here we are, back at flocking. If we can change the reactions of the individuals within the flock, then this change can propagate out to other individuals. This does not require each individual to change their behavior, only their reaction to our behavior. In fact, they won't even notice the change, they'll simply react to it in their normal fashion.

That's how the flock works: every one individual has the power to affect the whole flock. It's the action of the individuals that imbues the whole with a sensitivity to detail. Without that sensitivity, the whole is a juggernaut that can run roughshod, much as society has affected the biome. My work, then, is to sensitize the individual.

Toward that end, I've recorded a guided visualization called "Friends, Foreigners, and Foes." In this piece, I ask you to recreate in your mind the social layers that exist and which you maintain. Then, I ask you to change them. I don't care if it's telepathy, mood, or body language. It doesn't matter because these are all controlled by your mind. And whatever you are or do starts with what you imagine. It starts with an idea.



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Lincoln Stoller

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