

CONTENTS

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We have been encountering intolerable technical problems with the company that has until now been processing subscriptions the past ten years. We are in the process of moving the magazine subscription-handling to a different company, one that is staffed by human beings. We will keep you posted (by email) when the move is imminent. Thank you (we are sorry to have to say so many times, here in the vexed year 2025) for your patience!

Special Section: Ig Nobel

- 8 The 35th First Annual Ig Nobel Prize Ceremony*
- 14 The 2025 Ig Nobel Prize Winners*
- 21 The Acceptance Speeches*
- 29 The 2024 24/7 Lectures*
- 31 Libretto: "The Plight of the Gastroenterologist"

Improbable Research Reviews*

- 2 May We Recommend: Boring Bivalves*
- 4 Improbable Research Review: Ant vs. Human Puzzlers, Toe Confusion, Smell Maps*
- 6 Medical Research: Human Rotation, Stink Training*
- 13 Ig Nobel Illustrated: Swallowed Shrew, Solid/Liquid Cats*
- 37 Ig® and Beyond: Dung Beetles Straight Lines, Music from Rocks*
- 39 Ig Nobel Limericks: Ig Nobel Limericks: Audience Breath, Discarded Chewing Gum*

News & Notes

- 3 AIR Vents: Finance and Folklore and Pots
- 7 AIR books
- 20 Teachers' Guide
- 40 Spot-the-Typos Contest
- IBC Unclassified Ads
- BC Back Issues

Where There's More

There's always new improbable — it's not what you expect! — stuff on the **Improbable Research blog** at [IMPROBABLE.COM](https://improbable.com)



On the Front Cover

The Ig Nobel Biology Prize winners receive the prize from Nobel laureate Eric Maskin. Photo: Mike Benveniste.



Some Coming Events

(See [IMPROBABLE.COM](https://improbable.com) for details of these and other events.)

November 6, 2025

— Falling Walls,
Berlin, Germany

November 12, 2025

— Monell Center,
Philadelphia, USA

November 28, 2025

— "Science Friday"
Ig Nobel radio broadcast

December 9-10, 2025

— Paris, France

December 12, 2025

— Perugia, Italy

January 10, 2026

— Ig Nobel Face-to-Face,
Miraikan, Tokyo, Japan

January 2026

— Arisia, Boston,
Massachusetts, USA

February 13, 2026

— AAAS Annual Meeting,
Phoenix, AZ, USA

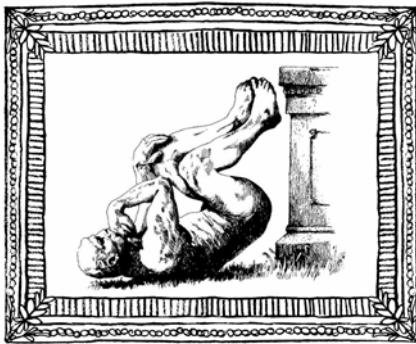
March/April 2026

— Ig Nobel EuroTour

Northern Hemisphere Autumn:

— The 36th First Annual
Ig Nobel Prize ceremony





IMPROBABLE RESEARCH REVIEW: ANT VS. HUMAN PUZZLERS, TOE CONFUSION, SMELL MAPS

Improbable theories, experiments, and conclusions

compiled by Evelyn Good, *Improbable Research staff*

Ants Versus Humans: Puzzling

"Comparing Cooperative Geometric Puzzle Solving in Ants Versus Humans," Tabea Dreyer, Amir Haluts, Amos Korman, and Ofer Feinerman, *Proceedings of the National Academy of Sciences*, vol. 122, no. 1, 2024, article e2414274121. The authors, at the Weizmann Institute, Israel, report:

Testing whether collective cognition exceeds that of the individual is often impractical.... One exception is the problem of navigating large loads through complex environments and toward a given target. People and ants stand out in their ability to efficiently perform this task not just individually but also as a group. This provides a rare opportunity to empirically compare problem-solving skills and cognitive traits across species and group sizes. Here, we challenge people and ants with the same 'piano-movers' load maneuvering puzzle and show that while ants perform more efficiently in larger groups, the opposite is true for humans. We find that although individual ants cannot grasp the global nature of the puzzle, their collective motion translates into emergent cognitive skills.

Comparing cooperative geometric puzzle solving in ants versus humans

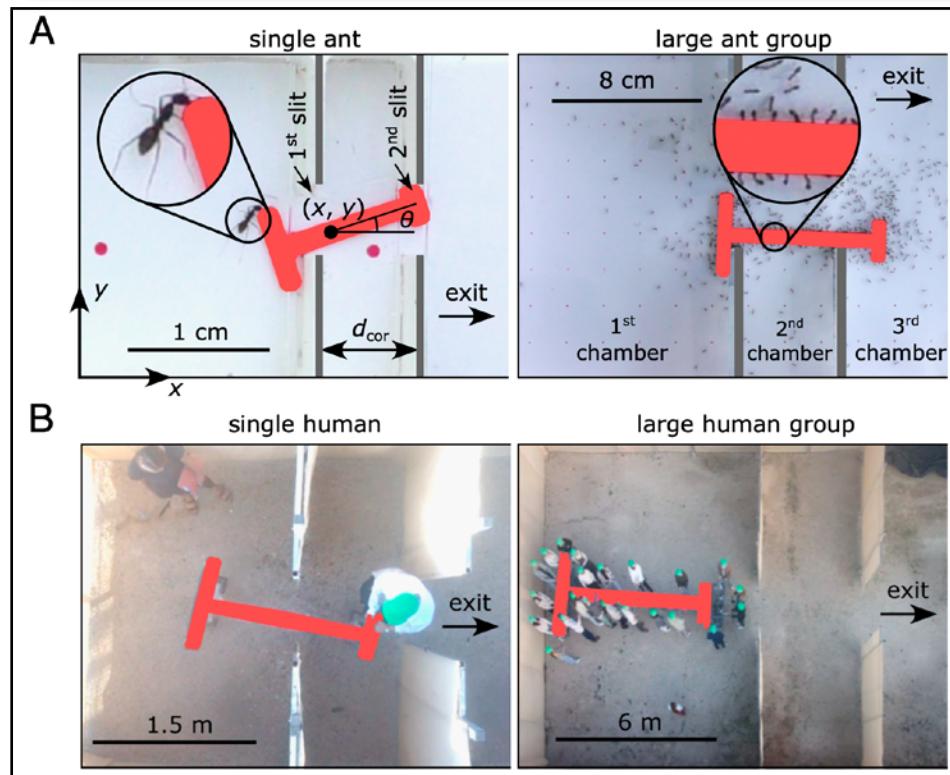
Tabea Dreyer^a, Amir Haluts^b, Amos Korman^a, Nir Gov^b, Ehud Fonio^a, and Ofer Feinerman^{a,*}

Edited by Marcus Feldman, Stanford University, Stanford, CA; received July 17, 2024; accepted November 11, 2024

Biological ensembles use collective intelligence to tackle challenges together, but suboptimal coordination can undermine the effectiveness of group cognition. Testing whether collective cognition exceeds that of the individual is often impractical since different organizational scales tend to face disjoint problems. One exception is the problem of navigating large loads through complex environments and toward a given target. People and ants stand out in their ability to efficiently perform this task not just individually but also as a group. This provides a rare opportunity to empirically compare problem-solving skills and cognitive traits across species and group sizes. Here, we challenge people and ants with the same "piano-movers" load maneuvering puzzle and show that while ants perform more efficiently in larger groups, the opposite is true for humans. We find that although individual ants cannot grasp the global nature of the puzzle, their collective motion translates into emergent cognitive skills. They encode short-term memory in their internally ordered state and this allows for

Significance

Collective cognition is often mentioned as one of the advantages of group living. But which factors actually facilitate group smarts? To answer this, we compared how individuals and groups of either ants or people tackle an identical geometrical puzzle. We find that when ants



Detail from the study "Comparing Cooperative Geometric Puzzle Solving in Ants Versus Humans."

IMPROBABLE RESEARCH REVIEW: ANT VS. HUMAN PUZZLERS, TOE CONFUSION, SMELL MAPS [CONT'D]

Induced Toe Confusion in Healthy Humans

"Tactile Toe Agnosia and Percept of a 'Missing Toe' in Healthy Humans," Nela Cicmil, Achim P. Meyer, and John F. Stein, *Perception*, vol. 45, no. 3, 2016, pp. 265-280. The authors, at the University of Oxford, UK, and Humboldt University, Germany, report:

We demonstrate a directional disturbance in tactile identification of the toes in healthy humans. Nineteen young adult participants underwent tactile stimulation of the digits with the eyes closed and verbally reported the identity of the stimulated digit. In the majority of individuals, responses to the second and third toes were significantly biased toward the laterally neighboring digit. The directional bias was greater for the nondominant foot and was affected by the identity of the immediately preceding stimulated toe. Unexpectedly, 9/19 participants reported the subjective experience of a "missing toe" or "missing space" during the protocol.

Tactile Toe Agnosia and Percept of a "Missing Toe" in Healthy Humans

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Abstract

A disturbance of body representation is central to many neurologic but the mechanisms by which body representations are constructed are not well understood. We demonstrate that healthy humans experience a disturbance in the spatial representation of the toes, which is reflected in the percept of a "missing toe" or "missing space" during a protocol of tactile stimulation of the toes. The disturbance is directional, with a bias toward the laterally neighboring digit. The bias is greater for the nondominant foot and is affected by the identity of the immediately preceding stimulated toe. The results are discussed in the context of the equal spatial representations hypothesis, which suggests that internal representations of the toes allocate equal proportions of foot space to each toe, partly explaining the systematic bias in tactile identification of Toes 2 and 3.



Nela Cicmil, lead author of the study
"Tactile Toe Agnosia and Percept of a 'Missing Toe' in Healthy Humans."
Drawing by Nan Swift.

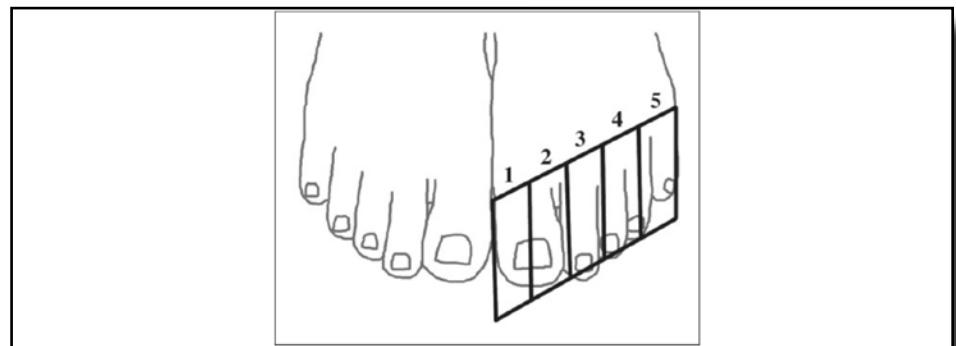


Figure 5. Schematic diagram of the toes overlaid with a grid showing how the top of the foot may be split into spatially equal quintiles, numbered 1 through 5. Stimulation of Toe 2 would be perceived to be within the third quintile, and stimulation of Toe 3 within the fourth quintile. The equal spatial representations hypothesis suggests that internal representations of the toes allocate equal proportions of foot space to each toe, partly explaining the systematic bias in tactile identification of Toes 2 and 3.

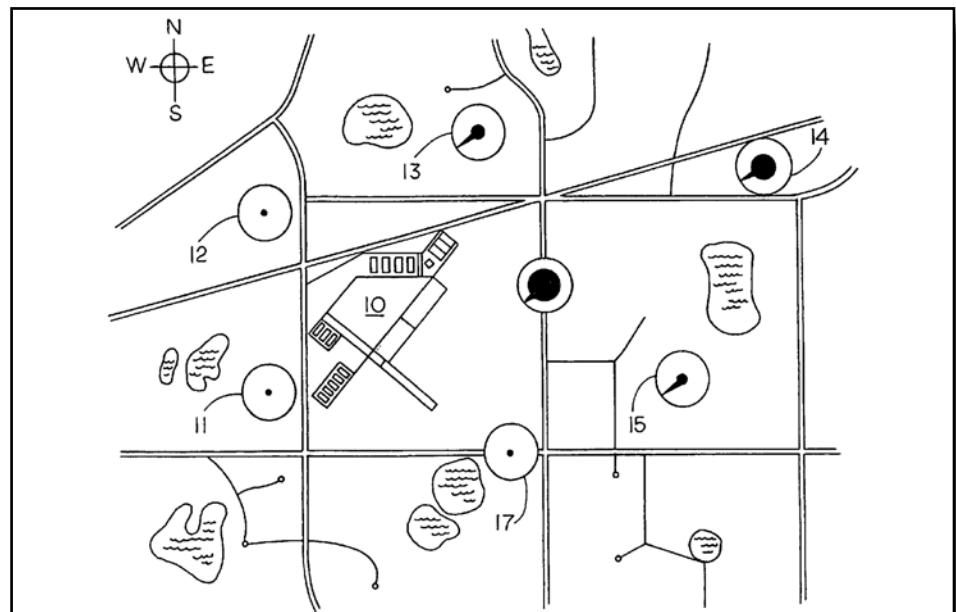
Putting Odors on the Map

"Odor Inspection System," U.S. patent #8321156B2, Charles M. McGinley, November 27, 2012. (Thanks to Michele Liguori for bringing this to our attention.) The inventor explains:

[O]dor inspection data of a site, as compiled by the observer or tester, is entered into an electronic database and selected odor inspection data from the database is electronically combined with a visual map of an area in the vicinity of the site for visually displaying odor inspection information of the site.

As a further feature of the invention, some of the data in the database is transformed into symbols for placing on the visual map to assist in providing the observer with a better overall view of the pattern and strength of the odorous air.

Detail from the study "Tactile Toe Agnosia and Percept of a 'Missing Toe' in Healthy Humans."



Detail from U.S. patent #8321156B2