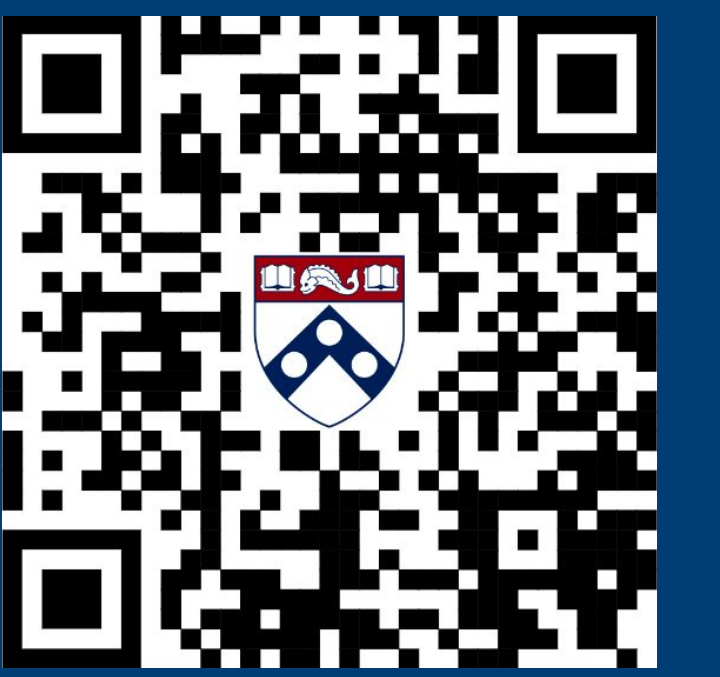# Tasks Beyond Taxonomies:
A Multidimensional Design Space for Team Tasks

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Abstract

When an experimenter studies teams working on a specific task, will their results generalize to other tasks? And if so, which "types" of tasks?

Problem
- It's hard to "quantify" how similar one team's task is to another's.
- Consequently, we cannot say when we expect similar (versus different) results for teams working on different tasks.
- **This poses a problem for generalizability:** is a study *supposed* to replicate, or are the tasks just too different?

Solution: The "Task Space"
- We introduce the "Task Space," a framework synthesizing the literature on team tasks into **24 dimensions**.
  - Example dimensions: "degree of creativity required," "amount of physical effort required," "extent of demonstrable correctness."
- We also label **102 tasks** across many social science disciplines.
- We contribute:
  1. A **new way to think about tasks**;
  2. A **tool for researchers to explore tasks** in a systematic, quantitative, and multidimensional way.
- Research applications include resolving theoretical puzzles, identifying boundary conditions for theories, and efficiently sampling tasks for experiments.
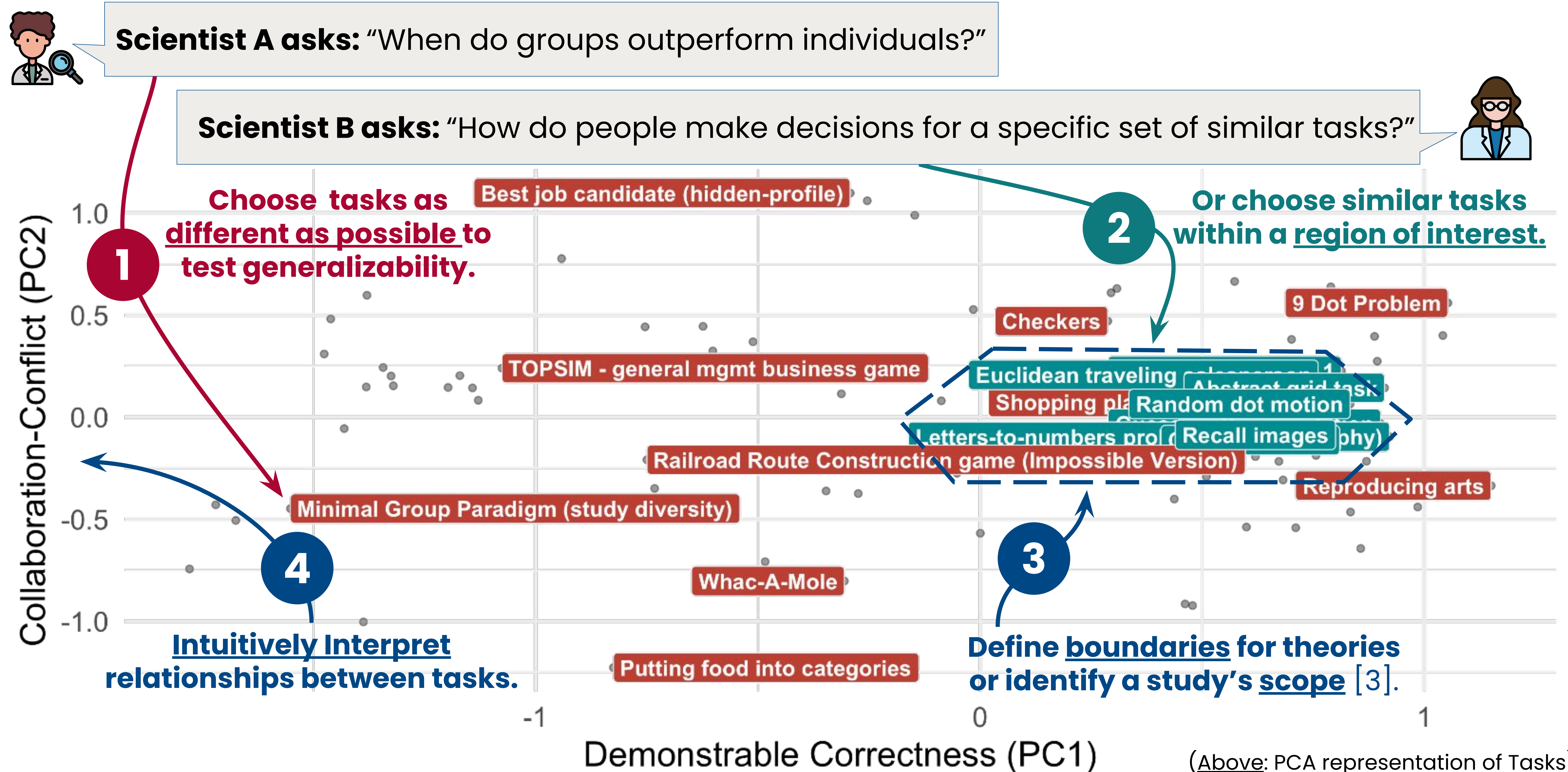
Methods

How we synthesized the task literature into a single framework.

Applications: Using the Task Space in Experimental Research

By systematically exploring the design space of experiments [1], researchers can test the generalizability of their findings.

Scientist A asks: "When do groups outperform individuals?"

Scientist B asks: "How do people make decisions for a specific set of similar tasks?"

① **Choose tasks as different as possible to test generalizability.**

② Or choose similar tasks within a region of interest.

③ Define boundaries for theories or identify a study's scope [3].

④ Intuitively Interpret relationships between tasks.

(Above: PCA representation of Tasks)

PCA scatter plot — x-axis: Demonstrable Correctness (PC1); y-axis: Collaboration-Conflict (PC2). Labeled tasks: Best job candidate (hidden-profile), Checkers, 9 Dot Problem, TOPSIM - general mgmt business game, Euclidean traveling, Abstract grid task, Shopping pl..., Random dot motion, Letters-to-numbers pro..., Recall images (...phy), Railroad Route Construction game (Impossible Version), Minimal Group Paradigm (study diversity), Reproducing arts, Whac-A-Mole, Putting food into categories.

Methods flow:

Review Taxonomies and Typologies of Tasks → **Filter to 24 Task Dimensions** → **Train 120+ Raters** / **Collect 102 Tasks** → **Rate Tasks** →

70+ dimensions for describing tasks | Using criteria from [2] | 20+ ratings per task

	Dimension 1	Dimension 2	Dimension 3	Dimension 4
Task 1				
Task 2			for example, "Maximizing" (from Steiner)	
Task 3				
Task 4	for example, "Writing Story"			0
Task 5				Writing a story is not "Maximizing"
Task 6				
Task 7				

References: [1] Almaatouq, Abdullah, Thomas L Griffiths, Jordan W Suchow, Mark E Whiting, James Evans, and Duncan J Watts. 2022. "Beyond Playing 20 Questions with Nature: Integrative Experiment Design in the Social and Behavioral Sciences." Brain and Behavioral Sciences, 1–55; [2]Larson, James R. 2010. In Search of Synergy in Small Group Performance. New York: Psychology Press; [3] Simons, Daniel J., Yuichi Shoda, and D. Stephen Lindsay. 2017. "Constraints on Generality (COG): A Proposed Addition to All Empirical Papers." Perspectives on Psychological Science 12 (6): 1123–28. https://doi.org/10.1177/1745691617708630.

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