

Project Goal

This study asks how cultural orientations—specifically collectivism and individualism—influence team-based performance in collaborative problem-solving contexts. The core research question is: To what extent do cultural value systems shape collective intelligence (CI) outcomes, particularly in terms of decision-making efficiency, information-sharing patterns, and team leadership dynamics? In addition, the project explores how mixed-cultural teams function and whether the proportion of collectivist versus individualist members modulates the overall effectiveness of the group.

Research Design

The project adopts a lab-based experimental design to assess the relationship between cultural background and team performance. Teams composed of participants from collectivist (e.g., China) and individualist (e.g., United States) backgrounds will be formed under three conditions: fully collectivist teams, fully individualist teams, and mixed-cultural teams. Each team will be assigned a complex optimization task—the Travelling Salesman Problem (TSP)—that requires coordinated decision-making and collaboration under time constraints. Participants will complete the validated Individualism–Collectivism Scale (Triandis & Gelfand, 1998) prior to assignment, allowing for culturally aligned team composition. The lab setting will allow for structured facilitation and observation of group behavior in real time, while also enabling full control over task instructions and environmental variables.

Experiment Procedure

The experiment will be conducted in-person at a university lab space, with teams working face-to-face around physical or digital representations of the TSP. Each team will be given 30–40 minutes to solve the problem, with facilitators present to time sessions and monitor conditions. All sessions will be recorded (audio and video), and participants will be debriefed following the task. In mixed-cultural teams, bilingual facilitators and language matching will be used to ensure smooth communication. Communication behaviors, decision processes, and leadership roles will be observed and recorded for further coding and analysis.

Analytical Strategy

The analysis will combine quantitative and qualitative techniques. Task performance will be measured using a composite CI score, incorporating solution accuracy, time-to-completion, and communication efficiency. Quantitative techniques such as ANOVA will be used to test for differences across team types, while regression models will be applied to explore which behavioral factors (e.g., centralization of leadership, rate of information exchange) most strongly predict CI scores. In parallel, qualitative data including dialogue transcripts and video recordings will be analyzed using natural language processing (NLP) and social network analysis (SNA) to capture how information is exchanged and decisions are made across different cultural settings.

Feasibility

The lab-based approach is highly feasible given the university's infrastructure, which provides access to small-group testing rooms and institutional support for human-subject research. Participant recruitment can be managed through local university channels, including cultural

student associations and mailing lists. The sample size is projected to be between 120 and 150 participants, which is manageable within the academic timeline. The estimated budget of \$1,500–\$2,000 will cover participant incentives, software licenses, and transcription services. All procedures will undergo IRB review, and the study presents minimal ethical risks. Data privacy and informed consent protocols will be strictly followed.

Fit Between RQ and Design

The research design is well-suited to the questions posed. The TSP provides a standardized, cognitively demanding task that is capable of revealing group-level variation in decision-making and coordination. By using lab-based methods, the study gains deeper insight into real-time team dynamics, something that digital or survey-based methods may not capture effectively. The use of culturally homogeneous and heterogeneous groups enables examination of both cultural influence and cultural interaction effects on collective intelligence.

Potential Faculty Advisors

1. Dr. Henry Dambanemuya, the instructor for MACS 30455 Collective Intelligence, is deeply familiar with collective intelligence and applied experimentation and has already provided valuable guidance on the project's development.
2. Dr. James Evans, director of the Knowledge Lab, brings expertise in team collaboration, networks, and computational modeling, which would support both the experimental and analytical aspects of the study.
3. Dr. Marlon Twyman, Assistant Professor of Communication at USC Annenberg, is a quantitative social scientist whose expertise lies at the intersection of social network analysis, organizational behavior, and computational social science. His research focuses on how teams and collaborative networks form and function in digital environments, a direct parallel to this study's interest in team dynamics, information flow, and collective intelligence in culturally diverse groups.