

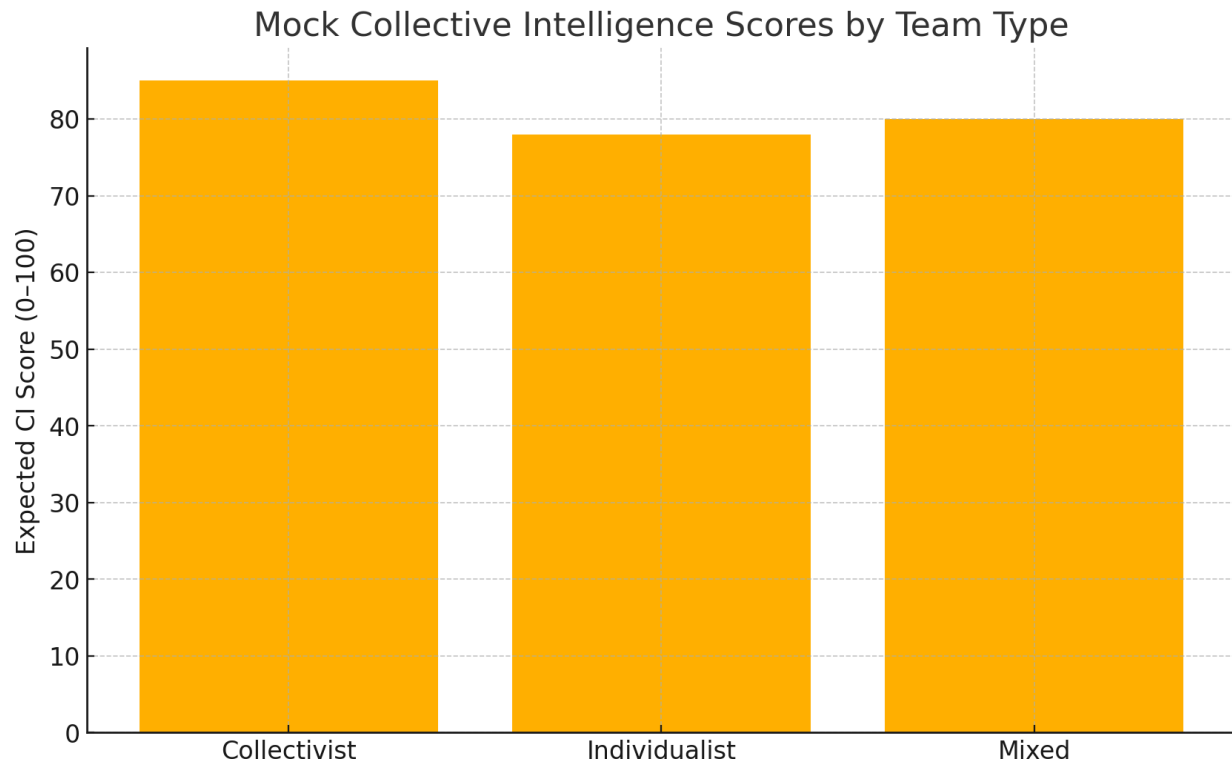
## 1. Research Context and Goal

- a. In cross-cultural teams, how do underlying cultural values, such as collectivism and individualism, shape the way people share information, assume leadership, and make decisions together?
- b. This project seeks to empirically test whether and how cultural orientation influences *collective intelligence (CI)*. Drawing from Triandis & Gelfand (1998), participants will be assigned into culturally homogeneous and heterogeneous teams to solve a complex task: the Traveling Salesman Problem (TSP). CI will be evaluated using performance metrics (task success), linguistic patterns (from Natural Language Processing), and communication structures (via Social Network Analysis).

## 2. Mocked-up Results: Visualizing Hypothesized Outcomes

- a. Although data collection is forthcoming, I have created simulated visualizations to anticipate potential findings based on the literature and pilot observations. These figures are designed not just as placeholders, but to model the kind of evidence I expect to gather.
- b. The mock-up results presented in this assignment were generated using Python's Matplotlib and NetworkX libraries, based on conceptual assumptions derived from the literature and my experimental design. No empirical data were collected; instead, the values and trends were simulated to reflect plausible outcomes for a controlled experiment on cultural orientation and team performance.

c. Figure 1: Expected CI Score by Team Type

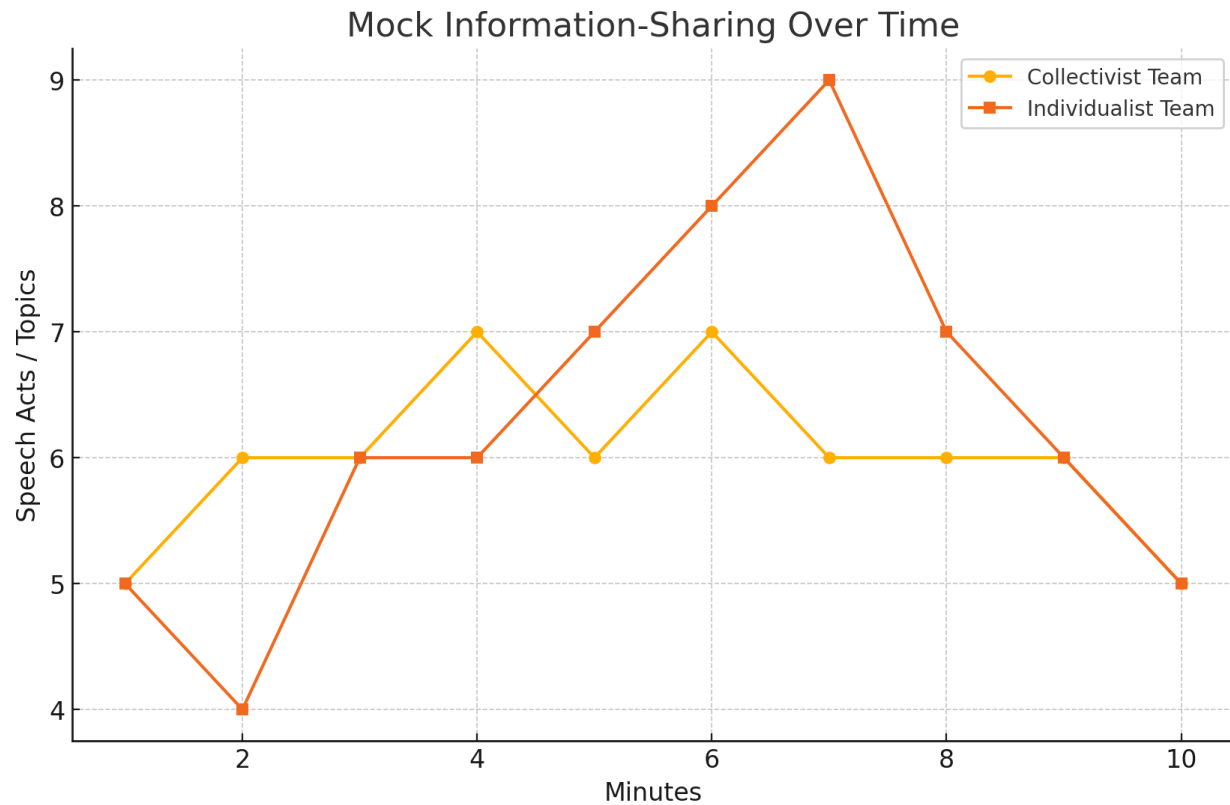


Interpretation:

Building on Engel et al. (2015), who found that social sensitivity and equal participation predict higher CI, I hypothesize that collectivist teams will score highest due to cohesive, hierarchical coordination. Individualist teams, while possibly more innovative (Saad et al., 2015), may underperform in coordination. Mixed teams are expected to show variable outcomes depending on their internal composition and balance of norms.

- i. This figure simulates scores (out of 100) across three team types:
  1. Collectivist: 85
  2. Individualist: 78
  3. Mixed: 80
- ii. These values reflect findings from Basabe & Ros (2005), who showed that collectivist environments support more stable leadership and coordinated decision-making, as well as Baldwin et al. (2023), who observed more fluid and unpredictable communication patterns in individualist teams.

d. Figure 2: Information-Sharing Over Time (Simulated)

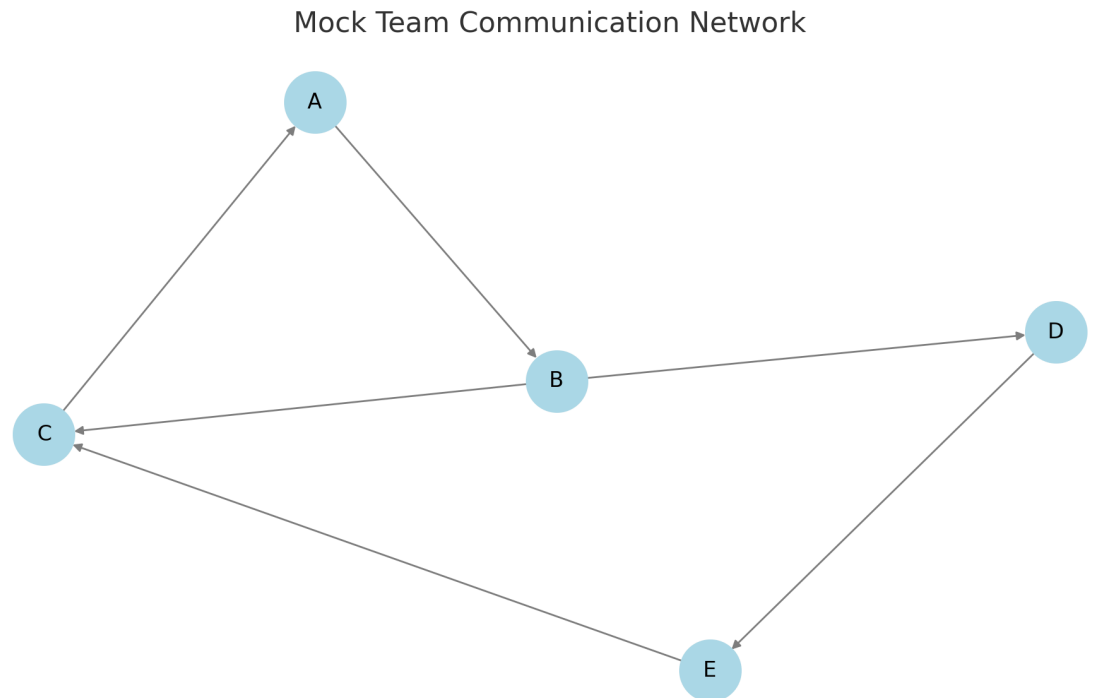


Interpretation:

This figure shows the density of speech acts or topics over a 10-minute time span. Collectivist teams (blue line) maintain relatively stable communication, whereas individualist teams (orange line) exhibit more fluctuation.

- i. Baldwin et al. (2023) emphasized that collectivist groups use high-context communication, relying on shared assumptions and minimal verbalization, while individualist groups favor explicit, verbal negotiation. This pattern matches our mockup: collectivist teams remain stable and steady in topic discussion; individualist teams demonstrate spikes in activity due to open debate and divergent problem-solving strategies.

e. Figure 3: Team Communication Network (Simulated)



Interpretation:

This mock Social Network Analysis (SNA) graph models interaction within a mixed-cultural team. Nodes represent team members; edges represent directional speech. Centralized hubs often represent cultural norms of hierarchy (collectivism), while more distributed graphs reflect individualist egalitarian values.

- i. For example, Torelli et al. (2020) describe how *vertical individualism* fosters authority based on merit, while *horizontal collectivism* supports peer-based legitimacy. This visualization assumes a mixed dynamic: one node (B) emerges as a central speaker, while others (C, D, E) interact more sporadically.

3. Rationale for Visual and Analytical Design

- a. The mockups reflect deliberate design choices grounded in the literature:
  - i. Figure 1 reflects expected main effects, based on CI performance metrics: accuracy, time, and dialogue quality. This idea builds on the Bernstein et al. (2018) CI scoring framework.
  - ii. Figure 2 is aligned with Engel et al. (2015), who emphasized turn-taking and communication smoothness in predicting CI. The simulated data assumes that collectivist teams are more stable, while individualist teams show more discourse volatility.

- iii. Figure 3 supports the social structure hypothesis. Oyserman (2006) and Khatri (2009) argued that hierarchy in collectivist cultures creates centralized communication paths, which may either enhance coordination or suppress dissent. This graph visually simulates such configurations.

## Reference

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