SCAN: Cultural Analyses

Presenter:

Miriam Metzger
University of California, Santa Barbara
Department of Communication

What is the influence of culture on players' trust in the context of a deception game, as well as their accuracy in detecting deceivers?

Universal Cues Hypothesis

- Lie detection reflects universal adaptive principles and has similar evolutionary benefits for all humans
- All liars fear detection, have higher cognitive load, and self-inhibit behavioral "tells" so should act similar across cultures, and detectors should have evolved similarly to spot this deceptive behavior
- The UCH implies that cues to deception are experienced in the same way for everyone:
  - the cues emitted by senders should not vary across cultures, nor should the deception cues receivers recognize during deceptive encounters

Specific Discrimination Perspective

- Lying might be strongly conditioned by culture
- There are differences between cultures in
  - nonverbal behavior (Watson, 1970)
  - the value attached to honesty (Bond, 1988) parents' responses to their children's lies (Whiting & Whiting, 1975)
  - frequency of lying (Feldman, 1968)
  - interpersonal trust (Bond & Forgas, 1984)
- The SDP implies that deception and its detection are learned and are specific to communication patterns that vary across cultures

How does culture influence deception and deception detection?

Universal Cues Hypothesis

- Due to evolutionary benefits for all humans,
  - cues emitted by senders should not vary across cultures
  - cues to deception are experienced in the same way by everyone
- All liars
  - fear detection
  - experience higher cognitive load
  - inhibit behavioral “tells”
- Therefore, deceivers should act similarly across cultures
- Detection should have evolved similarly to spot deceptive behavior

Specific Discrimination Perspective

- Lying is strongly conditioned by culture
- Cultures differ in
  - nonverbal behavior (Watson, 1970)
  - the value attached to honesty (Bond, 1988)
  - parents' responses to their children's lies (Whiting & Whiting, 1975)
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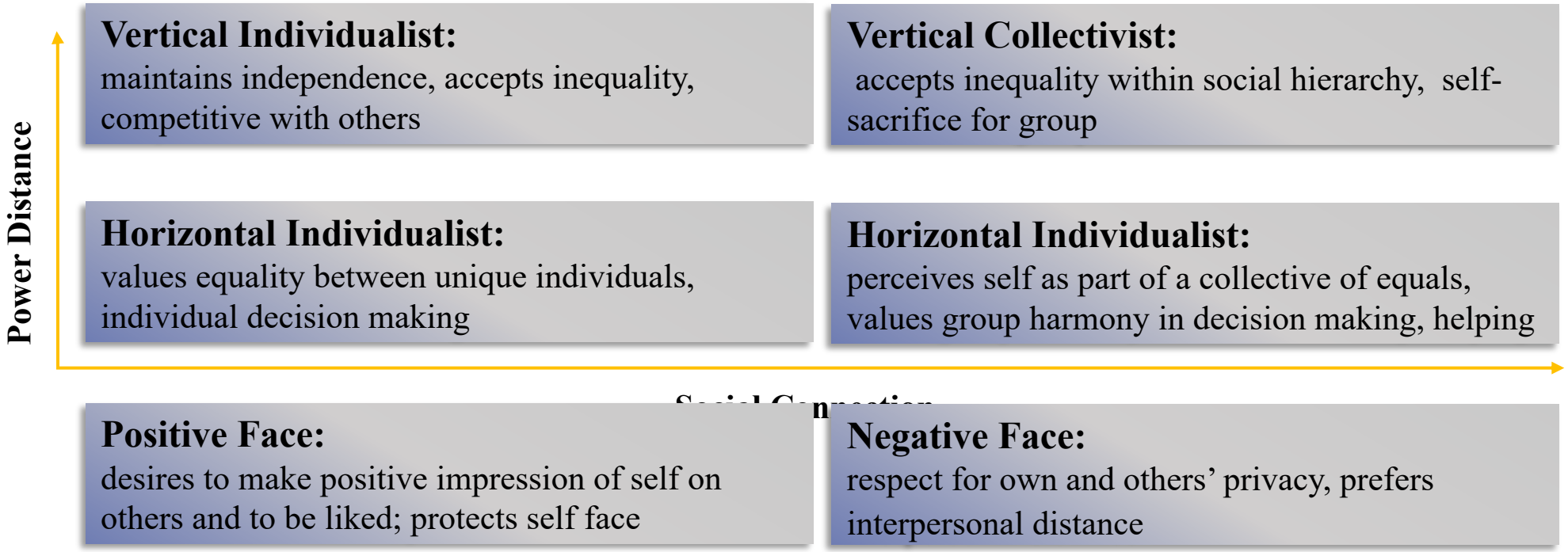
  - are learned and
  - specific to communication patterns that vary across cultures

Ways to Measure "Culture"

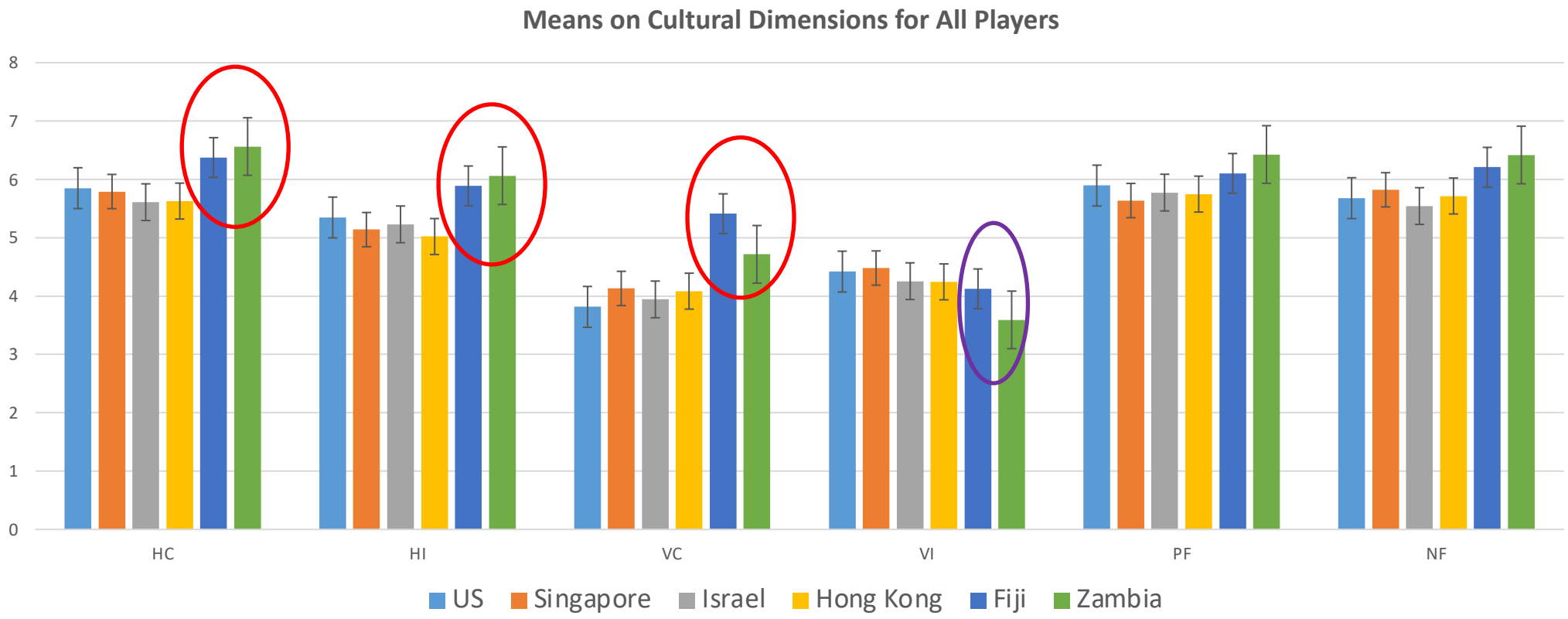
- Country of player's origin or residence (e.g., US, SG, IS, FJ, GR, CH)
- Ethnicity/nationality of player (e.g., Chinese in SG, Bemba in ZM)
- Country/location where game was played (e.g., US, IS, SG, FJ, HK, ZM)
- Self-described cultural orientations (e.g., individualism, collectivism)

Our analyses considered all of these

Cultural Orientations



Cultural Differences on Key Variables



Cultural Dimension Scores by Country

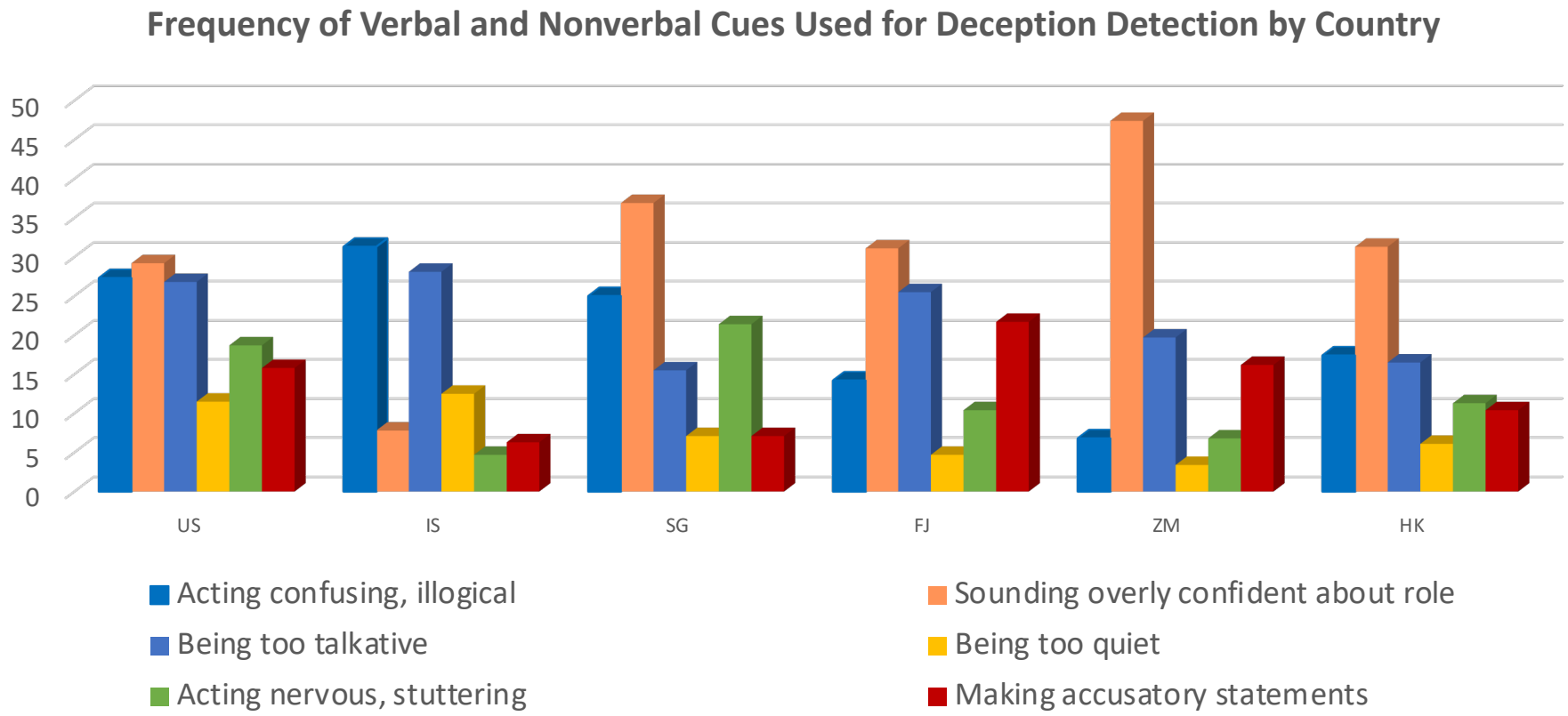
Cultural Differences on Key Variables

	US	SG	HK	FJ	IS	ZM
Prior game experience	67%	81%	51%	14%	44%	5%
Average # rounds played	6.6	6.5	4.8	5.6	3.6	3.6
Proportion games villagers win	.50	.83	.80	.42	.21	.20
Villagers' spy detection accuracy	.42	.55	.30	.41	.23	.24
Villagers' average trust (all players)	3.01	3.06	3.01	3.17	2.96	2.79
Villagers' average trust (spies only)	2.43	1.92	2.64	2.59	2.46	2.62
Average # lies told by spies (n = 40 games only)	1.78	.65	1.22	1.63	.75	1.83

Cultural Differences in Deception Detection Cues

Do the cues used to detect deception vary across cultures?

- Same cues used in the 6 countries
- but the cues are used with different frequencies in different cultures

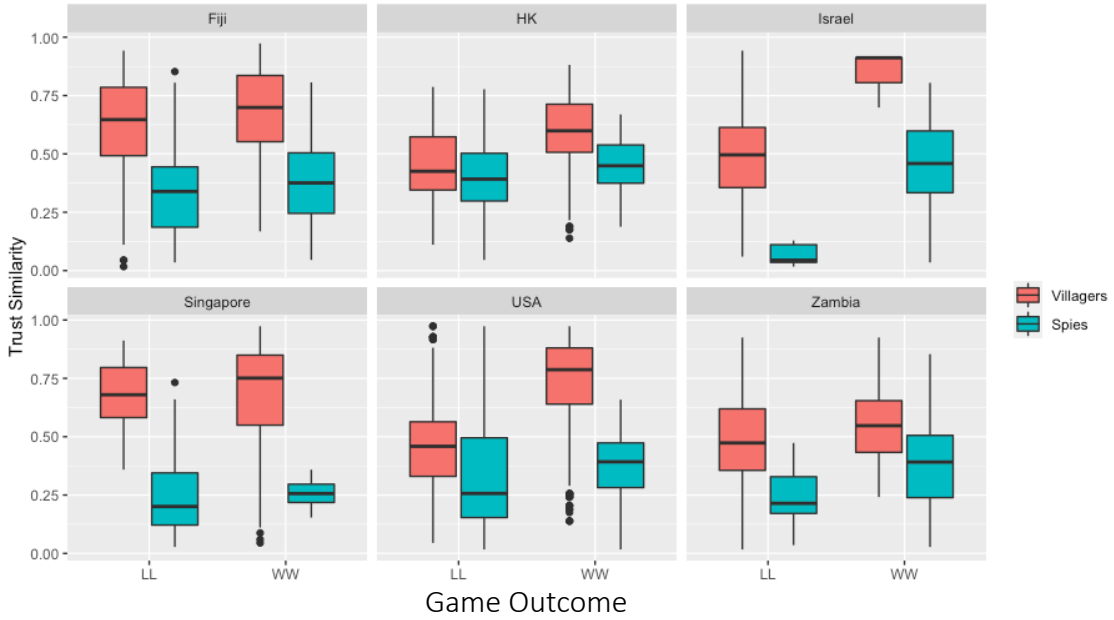


Cultural Analyses of Self-report Data

Role of culture in self-reported trust and win/lose outcomes:

- We examined the relationship among culture and win/lose outcomes for spies and villagers by constructing pairwise similarity scores for all players based on their self-report data
- We analyzed to what extent location or cultural dimensions help predict a spy or villager pair's win/lose outcome
- We tested a three-way interaction of trust similarity, location, and win/lose state on accuracy similarity

(a)



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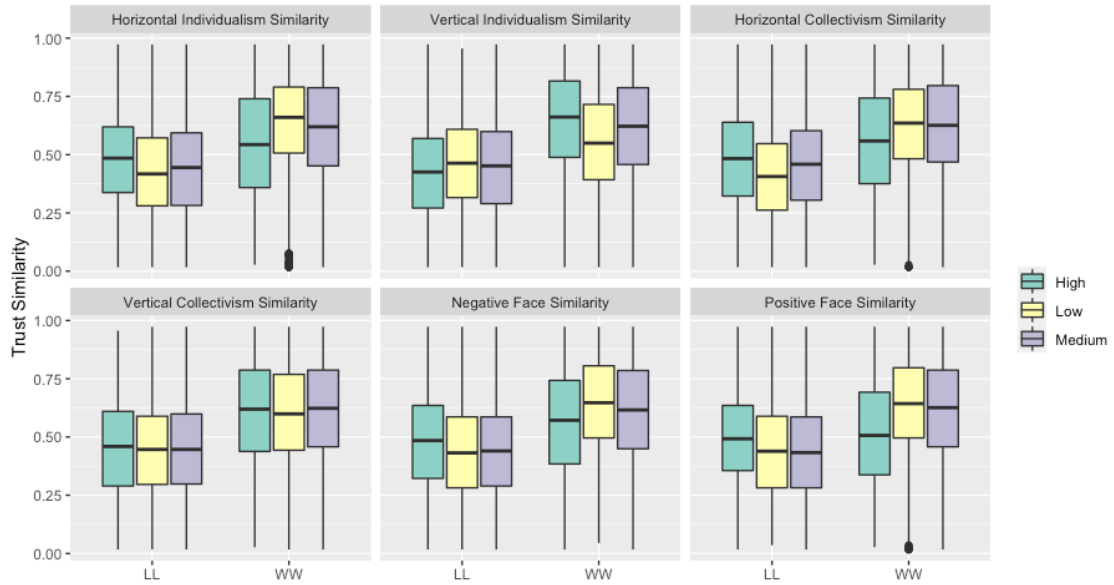
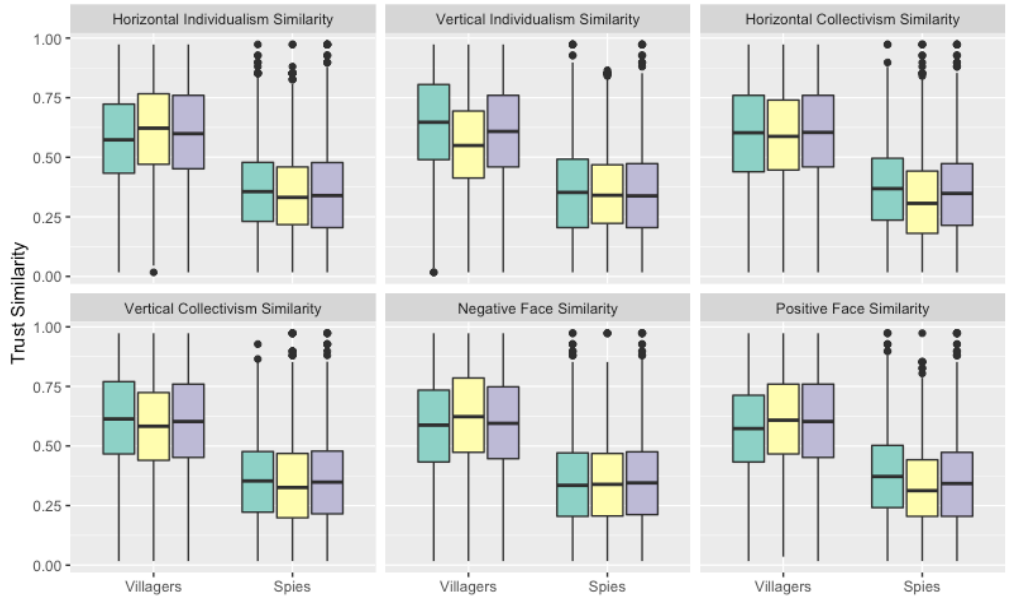


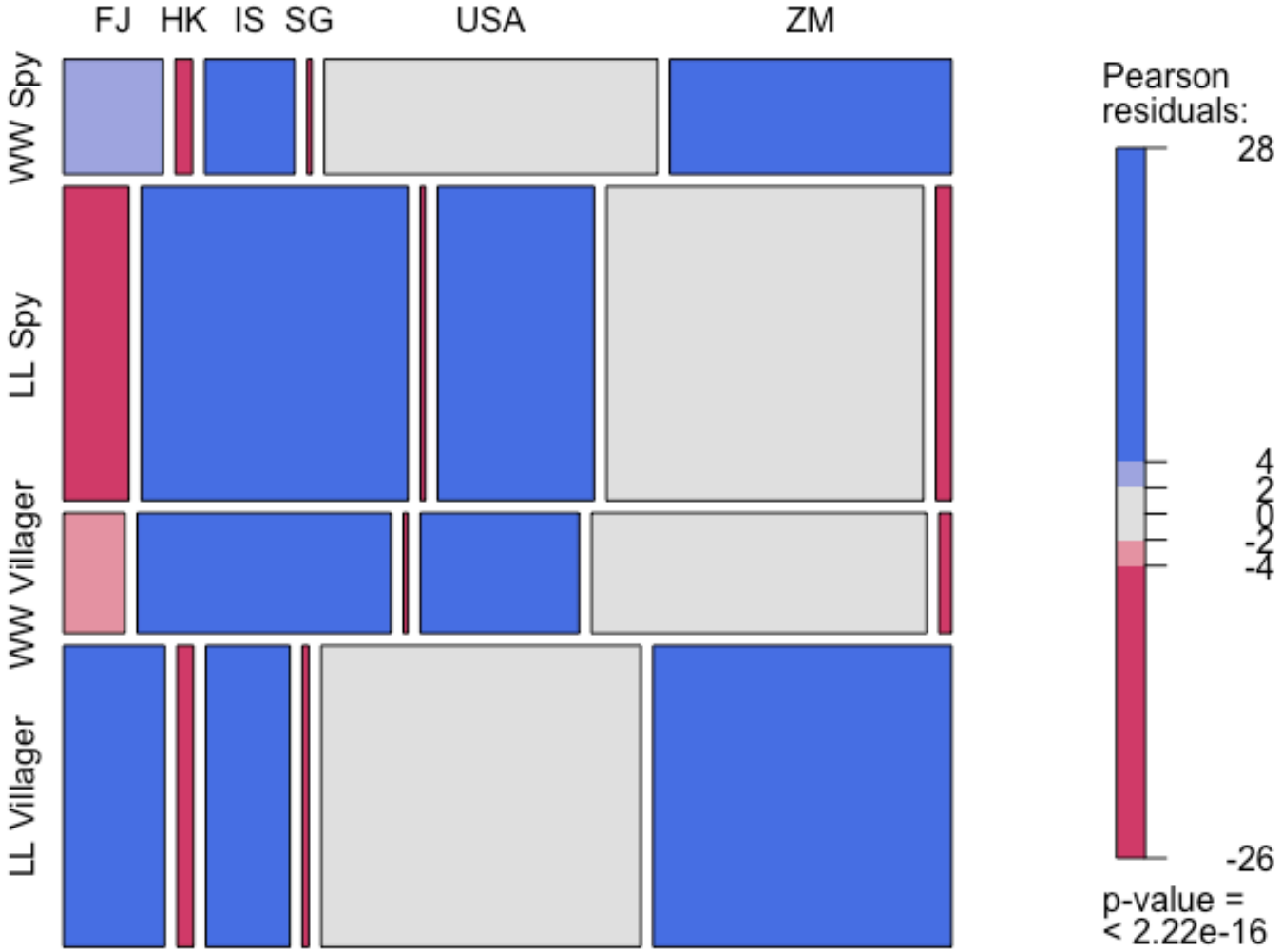
Across the 6 locations and 6 cultural dimension groups (low, medium, high):

- Winners have higher trust similarity than losers
- Villagers have higher trust similarity than spies

(c)



Win/Lose Status & Location (Country)



Spies: If the spy pair is from ***Israel*** or ***Zambia***, they are more likely to **win**. But if in ***Hong Kong*** or ***Singapore***, they are more likely to **lose**.
Villagers: **opposite** to above for villager pairs.

If ***the US***, spy or villager pairs have almost equal chance to win or lose the game.

If only based on location and win/lose status,

- Given the game location, we have ***36.63%*** (***36.75%***) chance to predict the win/lose status of a pair of **spy** (**villager**) correct.
- However, given the win/lose status of a **spy** (**villager**) pair, we have only ***15.98%*** (***15.89%***) chance to predict the location correctly

Win/Lose Status & Cultural Dimensions

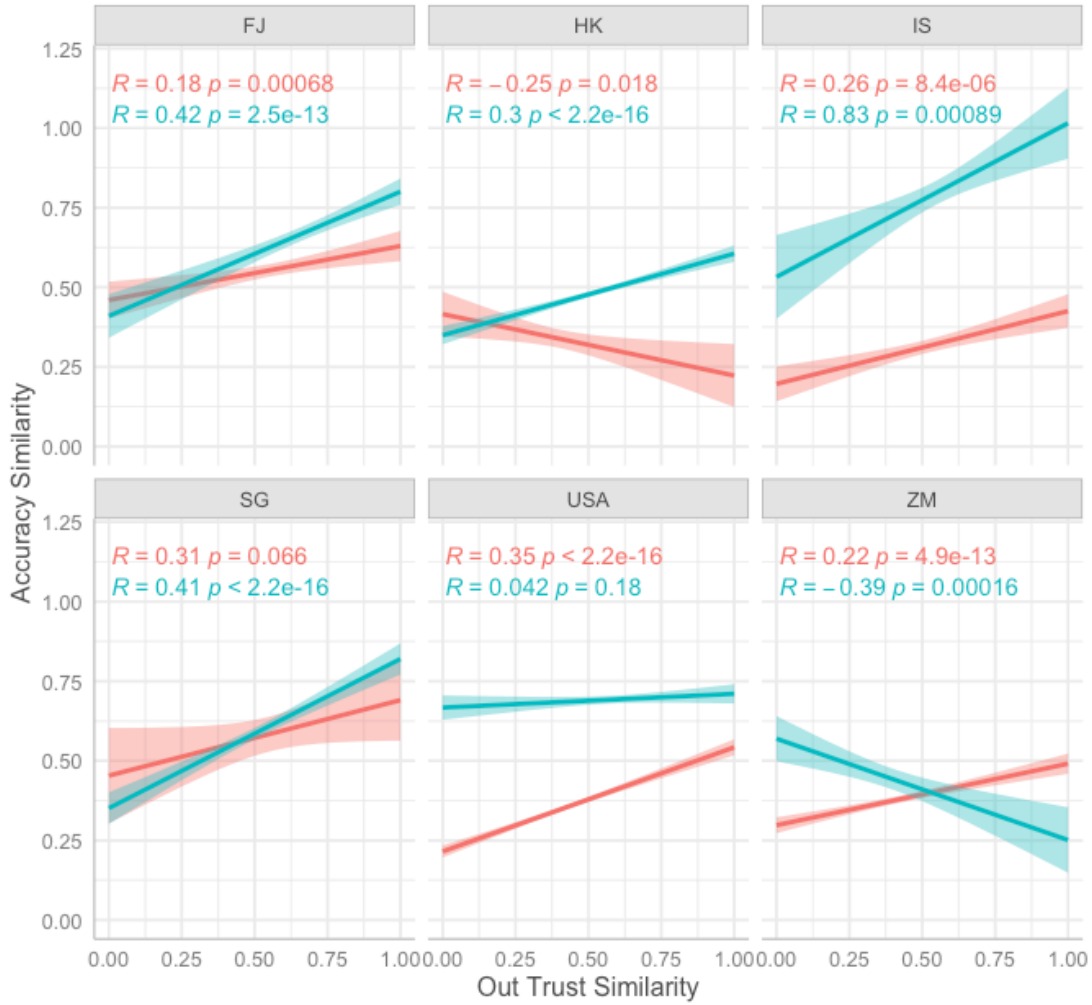
If we use cultural dimension similarity to predict win/lose state of a player pair, the chance of success would be:

	Spy Pairs	Villager Pairs
Horizontal Individualism	5.9%	6.56%
Vertical Individualism	0.96%	3.86%
Horizontal Collectivism	10.55%	4.43%
Vertical Collectivism	2.58%	0.33%
Negative Face	3%	3.67%
Positive Face	6.61%	4.83%

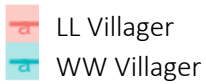
The associations between cultural dimensions and the location are very low.

Accuracy & Trust & Location: 3-way Interaction

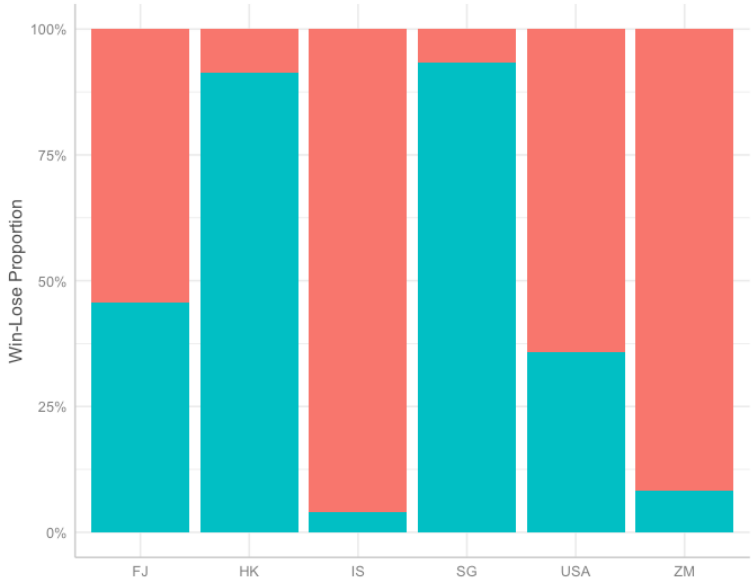
*Accuracy_similarity ~ trust_similarity*location*(win/lose) + game_type*



Total Adjusted R^2 = 40.08%

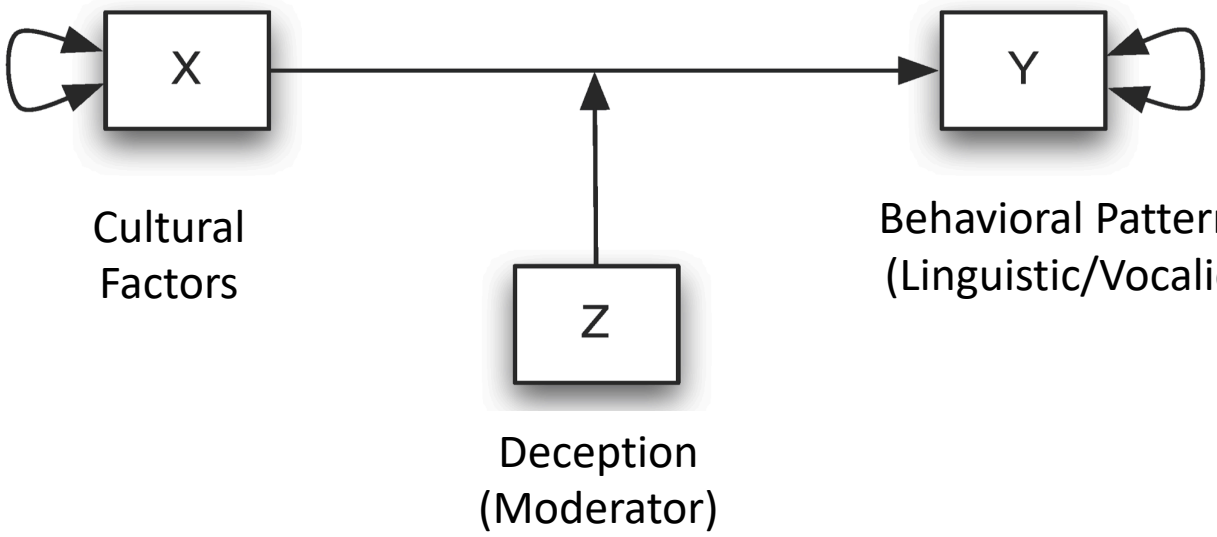


In most places, villagers who rate other players higher in trust, will have higher accuracy. However, that is not the case in the US and Zambia.



Cultural Analyses of Behavioral Data

We examined the differences in culture (nationality/ethnicity/site location/cultural dimensions) to understand its effects on linguistic and vocalic behaviors during deceptive communication



Behavioral Features (dependent variables)

Linguistic Features

1. Sentence complexity
2. Word complexity
3. Affect
4. Uncertainty
5. Nouns
6. Disfluency
7. Specificity
8. Quantity

Vocalic Features

1. Spectral change variance
2. Spectral change mean
3. Loudness
4. Jitter
5. Pitch
6. harmonic-to-noise ratio (HNR)
7. Shimmer

Culture and Deception Variables Used in Analyses

Culture (independent variables)

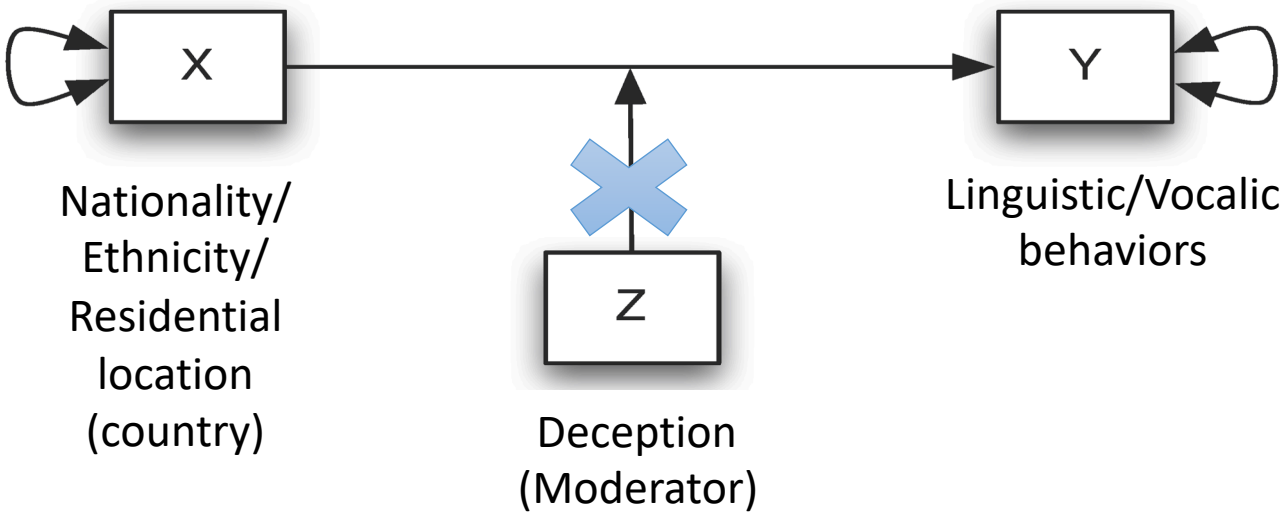
- Nationality: Players' self-reported answer on: "What is your country of origin?"
- Ethnicity: Players' self-reported answer on: "What is your ethnic background?"
- Game/Residential location: The data collection site that players participated in our study; the country in which players lived at the time of data collection
- 6 Cultural dimensions: Horizontal collectivism, Horizontal Individualism, Vertical collectivism, Vertical individualism, Positive face, Negative face

Deception (moderator variable)

- The role that is randomly assigned to the player: Villager or Spy

Results for Behavioral Features

- Player's nationality, ethnicity, and location/residential background (country) influences their linguistic and vocalic behaviors.
- However, there is NO strong evidence to support that deception alters the strength of the relationship between cultural factors and behavioral patterns

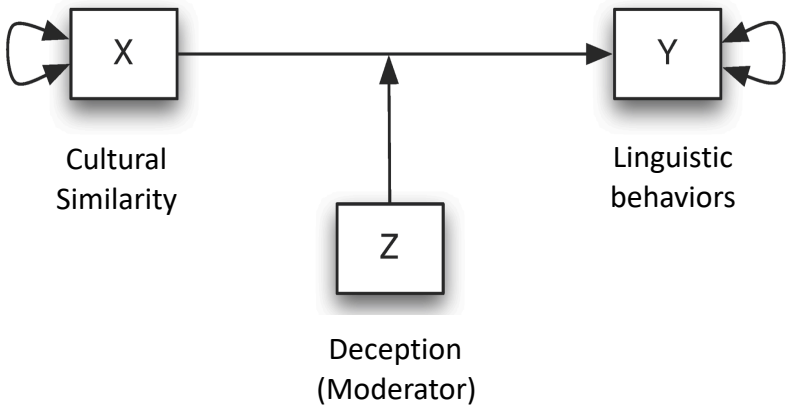


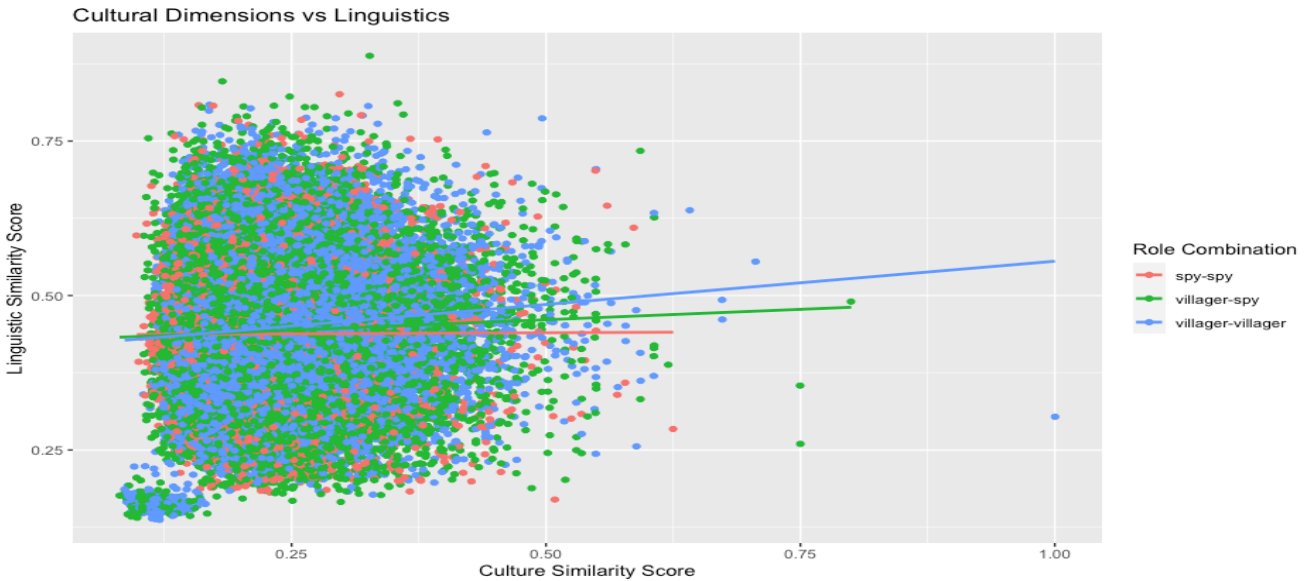
Cultural Dimension Similarity vs. Behavioral Similarity

- Our next analyses use the 6 cultural dimensions and linguistic/vocalic features as vectors
- We calculate the cultural similarity score and linguistic similarity score pairwise
- And then introduce the role-interaction (deception) effect
  - For each pair of two players, there exists three possible combinations:
    - villager-villager
    - spy-spy
    - villager-spy

Cultural Dimension Similarity and Linguistic Similarity

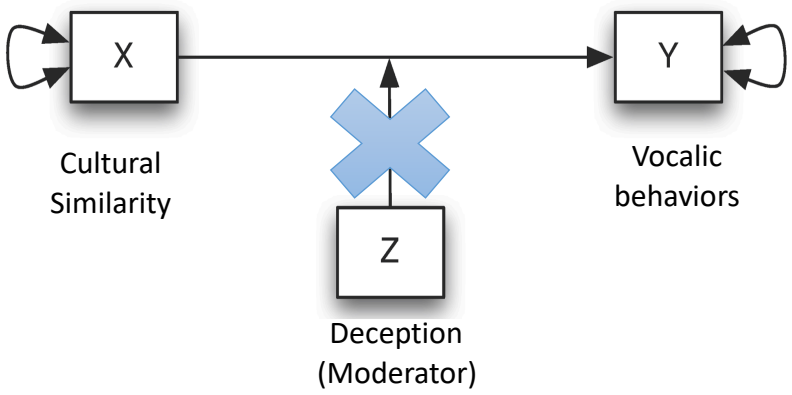
- Examined the cultural similarity score and linguistic similarity score pairwise for all available players
  - Cultural similarity leads to linguistic similarity
  - Role-combination influences the relationship between cultural similarities and linguistic similarities
    - The involvement of spies weakens the positive correlation between cultural similarity and linguistic similarity

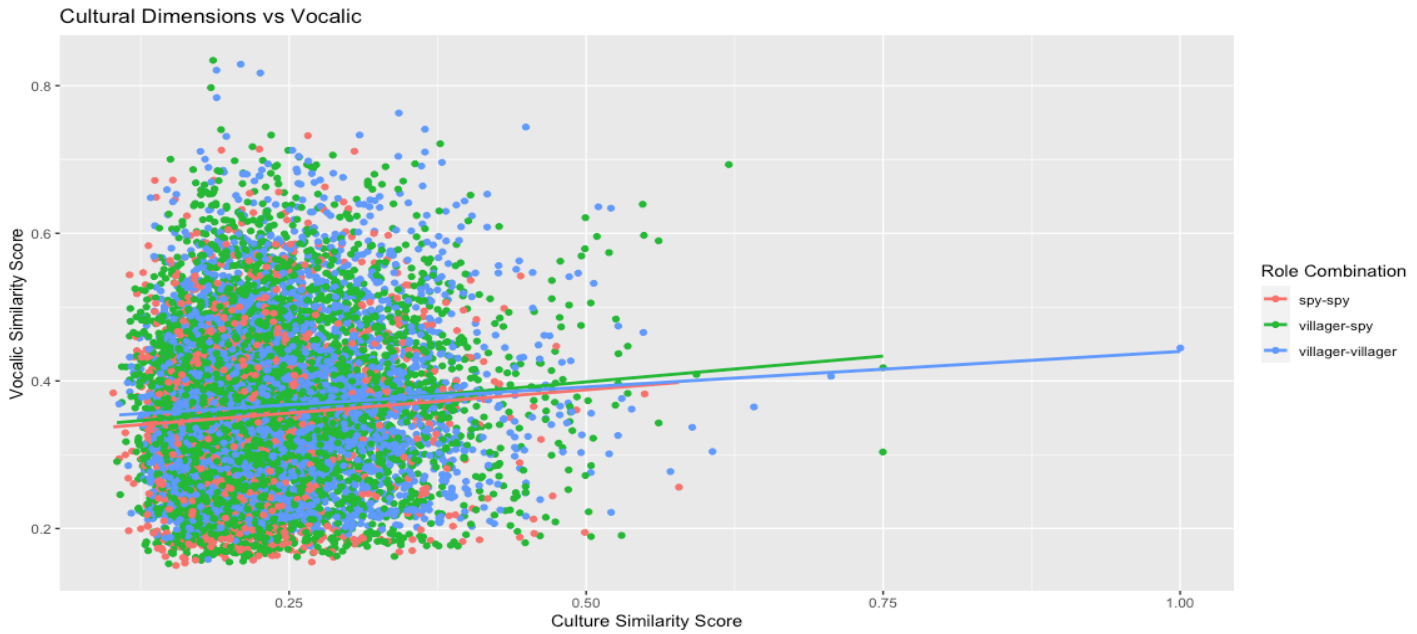




Cultural Dimension Similarity and Vocalic Similarity

- Examined the cultural similarity score and vocalic similarity score pairwise for all available players
  - Cultural similarity leads to vocalic similarity
  - Role-combination does NOT influence the relationship between cultural similarity and vocalic similarity





Summing Up