Decoding Negotiation Dynamics: The Impact of Opponent Identity and Privacy on Strategy, Deception, and Emotional Transparency in Human-Agent Interaction

Extended Abstract

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ABSTRACT

Negotiation is a fundamental aspect of human-human and human-agent interactions, shaping decision-making and conflict resolution. As AI systems become increasingly embedded in these contexts, understanding how opponent framing (human vs. AI) and privacy decisions (webcam sharing) influence negotiation strategies merits investigation. This study examines their effects on deception and emotional engagement using the IAGO platform [8], where participants negotiate with an opponent framed as either human or AI while deciding whether to share their webcam.

Results demonstrate that participants who withheld webcam data exhibited increased deceptive behavior, which positively influenced negotiation performance, though deception only partially mediated this effect. Although opponent identity did not significantly affect deception or success, participants exhibited higher emotional engagement when negotiating with a human opponent. These results underscore the necessity for privacy-aware, adaptive AI agents that foster engagement and ethical decision-making while aligning with human negotiation strategies.

KEYWORDS

Webcam Use and Privacy; Opponent Framing; Negotiation; Deception; IAGO Platform; Human-agent Interaction

1 INTRODUCTION AND BACKGROUND

Negotiation is a complex process integral to business, conflict resolution, and digital marketplaces [3]. With AI increasingly facilitating negotiations, elucidating its influence on strategic behaviors—especially deception and emotional engagement—is critical. Prior studies indicate that humans perceive AI negotiators as predictable and emotionally detached [4, 10], yet how these perceptions

influence negotiation strategies, including deception, warrants further investigation [7].

Privacy choices, such as webcam sharing, further complicate negotiation dynamics. Emotional transparency has been linked to reduced deception and increased cooperation [2], yet concerns about privacy may prompt individuals to withhold emotional data, potentially altering their strategic approach. While transparency affects human-human negotiations [12], its role in AI-mediated interactions remains ambiguous. As AI agents become integral to negotiations, it is imperative to examine how privacy decisions and opponent framing interact to shape negotiation behaviors [1].

To address these gaps, this investigation analyzes two key factors: *opponent framing* (human vs. AI) and *privacy choices* (webcam sharing vs. withholding). Using the IAGO negotiation platform [8], a widely used multi-issue bargaining system [11, 13], we track behavioral data to assess deception, performance metrics, and emotional engagement. Participants engaged in negotiations with an opponent framed as either human or AI, with an option to share or conceal webcam data. Regardless of their choice, no actual emotional expressions were transmitted, as opponent behavior was pre-scripted. Our research questions are:

- **RQ1:** Does opponent framing (human vs. AI) influence participants' willingness to share their webcam data?
- **RQ2:** How does webcam sharing impact deception and negotiation performance, irrespective of opponent identity?
- **RQ3:** How does opponent framing influence negotiation behavior, including deception, performance, and perceived emotional transparency?

By exploring these dynamics, this study contributes to the design of AI negotiation systems that balance transparency, strategic adaptability, and ethical engagement [9].

2 METHODOLOGY

This study was implemented through the IAGO platform, which allows for controlled manipulation of negotiation conditions, including opponent framing and privacy settings. Participants engaged in multi-issue bargaining, making strategic decisions on how to divide items with varying values (e.g., record crates, antique lamps, art deco paintings, and cuckoo clocks).

2.1 Experimental Design

A 2×2 factorial design manipulated opponent framing (human vs. AI) and webcam sharing (share vs. not share). Participants negotiated with an opponent framed as either human or AI, both represented by avatars. They also decided whether to share their real-time facial expressions. However, regardless of their choice, no emotional expressions were actually transmitted, as the opponent's behavior was pre-determined.

2.2 Procedure

The study followed a structured sequence, incorporating key system modifications to maintain framing consistency:

1. **Consent and Pre-Study Survey:** Participants provided informed consent and completed a demographic survey (e.g., gender, age, race).
2. **Tutorial and Quiz:** A brief tutorial explained negotiation rules, the role of OpenFace 2.0 [15] for facial expression analysis, and webcam usage. A quiz ensured comprehension before proceeding.
3. **Opponent Framing and Connection:** A simulated loading screen introduced the opponent (human or AI), reinforcing the assigned framing condition.
4. **Webcam Verification and Sharing Decision:** Participants completed a webcam check to reinforce the perception of real-time tracking, then chose whether to share their emotional expressions. They were told their avatar would reflect this choice, but no real data was transmitted.
5. **Negotiation Task:** Participants engaged in multi-issue bargaining within IAGO, attempting to maximize their individual outcomes. They believed their avatar displayed real-time emotional expressions, depending on their sharing decision.
6. **Post-Negotiation Survey:** Participants answered questions assessing their perceptions of emotional transparency and engagement.
7. **Manipulation and Attention Checks:** Participants completed verification questions to confirm their understanding of opponent framing and webcam sharing. Those who failed were excluded from further analysis.
8. **Debrief:** Participants were informed of the true nature of the study, including the framing manipulation.

A total of 100 U.S.-based adult participants were recruited via Prolific. After consent and screening, 91 participants proceeded, with nine failing manipulation checks, leaving 82 valid responses (retention rate: 90.1%). The study was conducted under an approved Institutional Review Board (IRB) protocol.

3 RESULTS AND DISCUSSION

Data analysis was performed using SPSS and Microsoft Excel, integrating survey responses and logs from the IAGO platform.

RQ1: Opponent Framing and Webcam Sharing Decision
A chi-square test revealed no significant association between opponent framing and webcam sharing ($\chi^2(1) = 0.029, p = .864$), indicating that opponent identity did not affect participants' willingness to share their webcam. This result contrasts with prior research indicating that perceived social presence often affects self-disclosure [6], implying that in negotiation settings, strategic considerations may override perceived social dynamics.

RQ2: Webcam Sharing Decision, Deception, and Negotiation Strategy
Participants who withheld their webcam data were significantly more likely to engage in deception ($\chi^2(1) = 5.116, p = .024$), with 39.3% of non-sharing participants lying compared to 16.7% of those who shared. An independent samples t-test showed that non-sharing participants attained higher negotiation scores ($M = 25.50, SD = 5.232$) than those who shared ($M = 20.91, SD = 5.694$), $t(80) = -3.558, p < .001$.

Mediation analysis confirmed that deception served as a partial mediator for the relationship between webcam sharing and performance, accounting for 22.1% of the variance in negotiation outcomes. Logistic regression indicated that participants who shared their webcam were 69% less likely to lie ($B = -1.174, p = .027$, odds ratio = 0.309). Multiple linear regression further showed that both webcam sharing and deception significantly predicted negotiation scores, with deception positively contributing to higher performance ($B = 4.114, p = .005$). These results align with research suggesting that reduced social accountability increases deceptive behaviors [14], particularly when negotiators have control over their self-presentation [2].

Overall, visual anonymity facilitated conditions conducive to deception, which in turn enhanced performance. However, since deception only partially mediated this effect, additional strategic factors—such as greater cognitive flexibility or enhanced control over impression management—may also contribute to the observed advantage [5].

RQ3: Opponent Framing and Negotiation Behavior
Opponent framing did not significantly impact deception ($\chi^2(1) = 0.280, p = .597$) or performance ($t(80) = -1.532, p = .129$). However, it influenced emotional engagement, with participants negotiating with human opponents reporting significantly higher engagement ($M = 3.38, SD = 0.982$) than those negotiating with AI opponents ($M = 2.96, SD = 0.928$), $t(80) = 2.000, p = .049$. This finding aligns with previous research indicating humans evoke greater emotional investment than AI agents in interactive settings [10]. This finding aligns with previous research indicating humans evoke greater emotional investment than AI agents in interactive settings [10].

4 CONCLUSION AND FUTURE WORK

Our findings reveal that participants withholding webcam data used more deception and achieved better negotiation outcomes, though deception only partially explains this advantage. While opponent framing didn't affect deception or performance, human opponents generated stronger emotional engagement. Future research should examine actual webcam data to analyze non-verbal cues' impact on negotiation strategies, potentially integrating real-time emotion recognition into AI negotiation platforms for enhanced adaptability and personalization. Further exploration of anthropomorphism in AI could illuminate how perceived opponent characteristics influence strategic behavior in multi-agent systems, ultimately contributing to more human-centered negotiation technologies.

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