# Polimatrix: Conversation Analysis as a Method for Evaluating Performance in Matrix Games

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**Abstract:** In this paper we analyse the spoken interactions that take place during matrix games. Matrix games are serious role-playing games, used as training exercises in the military and areas such as strategy studies. Each matrix game simulates a real-world crisis, providing players with specific roles to play and the opportunity to interact in a 'fail-safe' environment. While there have been many studies on oral interactions in professional contexts (Kolb 2004, Glenn 2019), there has been less analysis of actual dialogues during table-top gameplay, especially face-to-face negotiation games. In order to address this issue, we designed a game based on the *Russia-Ukraine* war and recorded sessions of these games in order to compile an annotated corpus. We report findings from the Polimatrix corpus here, looking especially at statistically salient keywords (terminology), n-grams (phraseology) and speech functions (discourse strategies). Generally, we find a correlation between certain linguistic features and contextual variables. For example, the negotiation strategies of (self-declared) 'novice' players is typically direct, informal, and preoccupied with the 'here-and-now' of gameplay. In contrast, the discourse of 'expert' players is typically more respectful of other players' status, stylistically more elaborate and centres on 'higher' strategic themes. Given such differences of linguistic performance, it is worth examining whether language itself should be a factor in the evaluation of matrix game sessions. Previous studies have shown a causal relationship between linguistic proficiency and negotiation outcomes (Taylor et al 2005, Hayakawa et al. 2019). This suggests that the quality of spoken interaction is a key factor in the evaluation of participants and their performances during negotiations. The question then is how to integrate the analysis of language into the design and practice of matrix games. We argue here that facilitators and their students may find it useful to conduct explicit analysis of linguistic performance in the form of (1) introductory conversation analysis and (2) the 'post-match' analysis of extracts from previous gameplay.

**Keywords:** Conversation analysis, Discourse strategies, Gameplay evaluation, Matrix games, Negotiation games

## 1. Introduction

Matrix games are serious role-playing games that are used in professional contexts for training purposes. In the professional world, the participants who take part in them are experts and trainees in fields such as the military and government services. The topic of a typical matrix game generally involves a crisis in the real world (earthquake, military invasion, humanitarian crisis). The reasons for gaming this kind of situation are to study hypothetical courses of action in a risk-free environment, as well as to explore the varying reactions of participants.

In this contribution, we argue that matrix games provide an ideal platform for the analysis of how language is used in gameplay, especially negotiation games. There have been several studies on the language of negotiations, especially in contexts such as commercial deal-making and legal proceedings (Kennedy et al 1981, Drew & Heritage 1993, Planken 2005). However, there has been less work done on the spoken interactions that take place in negotiation games, especially in games where structured dialogue is a key feature of the game system. In order to address this gap, we set up the Polimatrix project[1], with the aim of developing a protocol for analysing the dialogues which take place during a series of matrix games.

In addition to linguistic analysis, we also wanted to explore how matrix games are evaluated, either by the facilitators or the players looking at their own performance. The evaluation of matrix games has traditionally focused on debriefings (Morrison & Meliza 1999). We argue here that it would be useful to supplement such 'after action reports' (AAR) and self-assessment with actual linguistic analysis.

[1]Polimatrix stands for 'the Power Of Language In MATRIX games'. The authors would like to acknowledge the GIS 'Groupe d'intérêt scientifique Sciences du jeu' (*Ludocorpus*, Paris) for financing this project. For details see https://csc.u-paris.emundus.io/index.php?option=com_emundus&view=job&id=236&Itemid=1468

## 2. Game Design: Designing a Matrix Game for Language Research

A typical matrix game asks players to assume the roles of major protagonists during a crisis. Matrix games use two core mechanics (1) structured debate (requiring the use of an adjudicator) and (2) 'matrix' tables (listing available options plus costs). Just like traditional wargames, matrix games are organised in turns in order to simulate the changing circumstances of a particular crisis.

The aim of the Polimatrix project is to analyse the language of strategic negotiations. To this end we approached Natalia Zwarts at the Hague University of Applied Sciences (THUAS) in order to design, run and record a series of matrix games for use with masters-level students enrolled on the 'Safety and Security Studies Management Programme' at THUAS. The details of the game are set out in Table 1.

**Table 1: Design features of the Polimatrix game**

| **Game elements** | **Description** |
|---|---|
| Scenario | Polimatrix: a strategic negotiation game focusing on the early stages of the Russia-Ukraine conflict (2022-). |
| Audience | Novice cohort: 5 groups of students enrolled on the Safety and Security Studies Management Programme at THUAS. Expert cohort: 4 groups of volunteers, including game designers and strategy consultants. (See Table 2 for details). |
| Mode of play | Novice cohort: 5 sessions were run face-to-face (recording details in section 3)<br>Expert cohort: 4 sessions were run online (recording details in section 3) |
| Participants | In theory, 1 game master (GM), 2 players (Rus., Ukr.) and 3 adjudicators. In practice, the GM plays the role of one or more adjudicators. |
| Setup and materials | Analogue board (for F2F: face-to-face play) or digital board (for online play), role descriptions (Rus., Ukr.), matrix table for special actions, round cards (distributed by the GM). |
| Mechanics | The GM manages the sequence of play and provides an update to the Russia and Ukraine players on in-game events. The sequence of play involves three phases:<br>1) Negotiations. Every round, players are asked if they want to negotiate (on topics listed on the game board).<br>2) Actions. Every round, players perform actions (purchasing / moving assets, with associated costs). Expensive actions require a debate with the adjudicators.<br>3) End of Round. The GM calculates total spending for Russia / Ukraine and consequent Public Support. Each new round, the players receive a secret Round Card (discussed below). The game continues for three rounds, ending with scoring. |
| Timing | Rules explanation (15 min.), gameplay (three rounds x 20 min.), debriefing (30 min.). |

As can be seen in the Table 1, a key feature of the *Russia-Ukraine* game is the Negotiations Phase. This involves discussions between the two protagonists. Figure 1 shows the main game board, with the topics for negotiation on the left-hand side, a map for actions in the centre, and game rules on the right. The numbers in squares indicate the points which can be gained by both sides in case of successful agreement / occupation.


**Figure 1: Main board of the Russia-Ukraine matrix game**

Player interaction can also take place during the Actions Phase. During this round, each player may choose one option from an action table (corresponding to the traditional 'matrix' portion of the game). Low-risk choices (e.g. 'field attack', 'propaganda') can succeed without discussion. However, for high-risk choices ('international loan', 'drones'), the player must obtain a majority of votes from the adjudicators. This part of the game corresponds to a structured debate, with both players providing arguments and counter-arguments.

The internal economy of the game also incites players to enter into negotiations. This is reflected in the unequal values of geographical locations (e.g. control of Crimea is worth 10 to Russia but 5 to Ukraine) and the varying values of negotiation topics (see Figure 1).

Hidden information is also an important feature. Once per turn the players receive a secret round card giving them a temporary ability (moving assets for free, doubling the value of negotiations, and so on). Since neither player has complete information about the exact values of all of the assets in the game, there is an incentive to obtain and exchange information from the other player.

As we have seen, the *Russia-Ukraine* matrix game encourages player interaction through obvious mechanics such as the 'negotiations phase', but also by less obvious means (matrix debates, asymmetry, hidden information). Since the underlying assumption of this game is that negotiation is a key strategic process in the 'war of information', it is particularly interesting to examine how this information is communicated during actual gameplay.

## 3. Project Design: Compiling a Corpus of Matrix Game Sessions

The primary aim of the Polimatrix project is to provide a linguistic description of matrix game sessions in terms of register features. By register features, we mean the inventory of lexical and grammatical features associated with a particular 'register' or type of discourse. There are many such variables, but here we focus on three:

- Discourse functions (sequences of speech with functions such as: gameplay questions / answers, negotiation probes / responses, metagame comments on strategy, roleplay, critiques of the game)
- Lexical items (statistically salient keywords, technical terminology)
- Phraseological patterns (regular expressions)

The primary hypothesis of the Polimatrix project is that it is possible to observe significant correlations between language features such as these and features of context. Here are some contextual variables which we are interested in:

- Experience in gaming or matrix games (novice vs. expert)
- Language proficiency (L1 or 'native English' vs. L2 'user of English as an additional language')
- Mode of play (face-to-face vs. online)

Several research questions can be framed in terms of these variables. For example, is there a difference between the terminology used by novice (inexperienced) players as opposed to experienced players?

To address such questions, we compiled a corpus of texts based on nine sessions of the *Russia-Ukraine* matrix game, each organised, played and recorded during the second semester of 2024 by our colleagues at THAUS. Five of the sessions were played face-to-face (F2F), four online. During gameplay, an audiovisual recording of each session was made using the Teams[2] software. The audio was then transcribed using Whisper[3], creating a raw text corpus. These texts were then corrected and processed for use on the INCEpTION[4] platform, which allows us to annotate the corpus for speech functions (annotations have so far only been applied manually). The main features of the Polimatrix corpus are set out in Table 2.

**Table 2: Polimatrix corpus of matrix game oral interactions**

| Text | Date / Duration | Mode of play | Participants [5] | Tokens | Novice / Expert (majority) | L1 / L2 (majority) |
|---|---|---|---|---|---|---|
| **A** | 2024-04-20 / 1:10 | F2F | Rus, Ukr +1 | 8623 | Novice | L2 |
| **B** | 2024-06-21 / 1:05 | F2F | Rus, Ukr +1 | 7682 | Novice | L2 |
| **C** | 2024-11-25 / 1:04 | Online | Rus, Ukr +0 | 8276 | Expert | L1 |
| **D** | 2024-06-21 / 1:40 | F2F | Rus, Ukr +1 | 14781 | Novice | L2 |
| **E** | 2024-10-16 / 1:53 | Online | Rus, Ukr +1 | 13330 | Expert | L1 |
| **F** | 2024-10-23 / 1:45 | F2F | Rus, Ukr +2 | 12052 | Novice | L2 |
| **G** | 2024-10-24 / 2:30 | Online | Rus, Ukr +1 | 17240 | Expert | L1 |
| **H** | 2024-11-08 / 1:42 | F2F | Rus, Ukr +1 | 13683 | Novice | L2 |
| **I** | 2024-11-13 / 1:04 | Online | Rus, Ukr +0 | 7944 | Expert | L2 |
| **TOTAL** | | | | 103611 | | |

As Table 2 shows, each of the game sessions was given a binary label indicating one of several contextual variables (novice / expert, online / live). Information about expertise and language proficiency was obtained using a questionnaire distributed ahead of the game session. For the purposes of this paper, we determined the main characteristics of each session according to 'majority'. Thus, as far as expertise is concerned, for over half the sessions (A, B, D, F and H) a majority of the players declared themselves 'novice' players, while for the other sessions (C, E, G and I), most players declared themselves to be (relative) 'experts'.

It turns out that all of the F2F sessions were played at THUAS with (a majority of) novice players, while all of the online sessions were played online, almost exclusively involving expert players. Since there is no difference therefore between these two variables, in the remaining sections of this paper, it is sufficient to divide the data into two corpora: novice / F2F (Subcorpus 1) and expert / online (Subcorpus 2).

## 4. Identifying Regular Patterns of Discourse in Matrix Game Dialogues

In this section, we set out some initial observations based on a preliminary analysis of the Polimatrix corpus.

[2] https://teams.microsoft.com/v2/download

[3] https://openai.com/index/whisper/

[4] https://inception-project.github.io. INCEpTION was installed on a server at University Paris Cité: https://inception.u-paris.fr. https://inception-project.github.io/

[5] 0-2 =number of Adjudicators. If 0, then the GM played the role of Adjudicator.

### 4.1 Keywords in the Polimatrix Corpus

The first kind of data that can be derived from the Polimatrix corpus involves 'keywords', lexical items that occur significantly more frequently in one corpus as opposed to the other. The AntConc software (Anthony 2024) was used to create two frequency lists for Subcorpus 1 and Subcorpus 2. Tables 3 and 4 show how a sample of items from each list can be grouped together into meaningful categories (i.e. words grouped by theme, or by functional category).

**Table 3: Sample Keywords in Subcorpus 1**

| Lexical category / semantic field | Example Keywords |
|---|---|
| Markers of familiar speech | anyways, [inaudible], [laughter], gonna, oh, shit, yeah, you |
| Operational lexis relating to game dynamics | adjudicator/s, agree, beneficial, choose, deals, judge/s, moving, negotiating, points, winning |
| Technical lexis relating to Russia-Ukraine conflict (general terms for participants, themes) | attacks, civilians, cyber, disinformation, information, peacekeeping, people, soldiers |

**Table 4: Sample Keywords in Subcorpus 2**

| Lexical category / semantic field | Example Keywords |
|---|---|
| Markers of deliberate speech | Alexander, Francesco, hm, Natalia, um, think |
| Operational lexis relating to wider conflict | european, international, korean, national, russian, ukrainian |
| Technical lexis relating to wider conflict (specific terms for participants, processes) | artillery, assets, asymmetric, conflict, firepower, front, hexagons, matrix, military, offensive, operation, opponents, partners, player, strategy, units, wargaming |

Tables 3 and 4 show that the themes addressed by participants in both sets of data are comparable but subtly different. In Subcorpus 1, participants are concerned with exchanging information about the game at hand (game functions, such as *adjudicator*, or gameplay *winning*). When participants refer to technical concepts, these are generic in nature (*civilians, people*) or refer to well-known topics in the Russia-Ukraine conflict (*cyber, disinformation*). In Subcorpus 2, the participants refer to technical terms that are less bound to the game, referring instead to the wider strategic context (*european, international, korean*) or abstract concepts in strategic studies (*front, offensive, operation,* etc.).

Although it is natural to focus on vocabulary, it is also important to consider other statistically significant features, notably grammatical items and 'discourse markers'. These can reveal significant differences in terms of style. For example, in Subcorpus 1 the presence of expletives such as *shit!* and non-standard forms such as *anyways*, *gonna…* are indicative of highly informal discourse. Similarly, labels such as *[laughter]* and *[inaudible]*, suggest solidarity and intimacy among participants, as well as fluid turn-taking. Turning to Subcorpus 2, it is significant that player interaction is often accompanied by first names, an indication that the speakers are more attentive to the identities and status of other participants. Similarly, hesitancy markers (*hm, um*) and the verb *think* also suggest more deliberate forms of interaction.

As we note below, such there is clearly a correlation here between language use and the degree of experienced involved, as well as mode of play.

### 4.2 N-Grams in the Polimatrix Corpus

An efficient way of looking for regular patterns of speech is look for repeated sequences of lexical items, known as 'clusters' or 'n-grams'. Tables 5 and 6 present a sample of n-grams which occur frequently[6] in Subcorpus 1 and Subcorpus 2 (here n-grams have a minimum length of 3 words and maximum of 10). N-grams are often incomplete, so in the examples below we have included the surrounding material that typically accompanies these items in the corpus (parentheses).

[6]The key figure here is rank: the position of a repeated sequence relative to the many n-grams that appear only once. To give an idea of scale, the total number of n-gram types for Subcorpus1 is 334 699 and total tokens 340 731. For Subcorpus2 the total n-gram types is 278 614 and total n-gram tokens: 280 380.

**Table 5: Sample n-grams in Subcorpus 1**

| Rank | Frequency | Range (items involved) | N-gram (+ typical context) |
|---|---|---|---|
| **2** | 35 | 4 | i don't know (+how she calculates it, +which country I am, +what is my cost?) |
| **92** | 11 | 5 | i don t want to (+give away my moves, +make concrete plans, +negotiate about that) |
| **132** | 6 | 5 | do you want to negotiate? |
| **478** | 3 | 5 | i can agree to that (+if you move, +potentially, +[end of statement]) |
| **555** | 3 | 4 | how about we agree (+to allow shipping, +that?, +to exchange prisoners), |

**Table 6: Sample n-grams in Subcorpus 2**

| Rank | Frequency | Range (items involved) | N-gram (+ typical context) |
|---|---|---|---|
| **4** | 11 | 6 | i don't know if I (+trust the Russians on this, + meant to divulge it, + would have done that) |
| **18** | 6 | 5 | i don't know what (+happened during other sessions, + that will mean for my side, + the total is) |
| **19** | 6 | 5 | i don't think it (+ has any bearing on the military reality, + has any impact, +works) |
| **46** | 4 | 5 | and i think that's (+ a smart move, +probably a good thing, +my major reservation) |
| **183** | 3 | 4 | what do you think (+ about International loan for Russia?, +about the prospects of International loans ? +in terms of doubling fire power?) |

These results show that the same phraseology can occur in both Subcorpus 1 and 2, but it is used in different ways. Thus, in Subcorpus 1, when players say they 'don't know', they are typically referring to their own lack of comprehension (*I don't know + how she calculates it, + what is my cost,* etc.). In Subcorpus 2, on the other hand, this phrase is often used as a rhetorical device, introducing gameplay suggestions (*I don't know + if I would have done that*), or commenting on strategy (+ *what that will mean*).

Looking for differences, we can see that Subcorpus 1 involves statements about what the participants 'want' or 'agree', either boldly stating their strategy (*I don't want to*), probing other participants about the possibility of a negotiation (*do you want to negotiate? how about we agree?*), or openly accepting the terms of an agreement (*I can agree to that*). By contrast, in Subcorpus 2, we find more indirect formulations. In particular, three patterns are built around what the participants 'think', including evaluations of strategy (*I think that's + a smart move*), counter-arguments (*I don't think it + works*), or probing other participants about their position (*what do you think + about international loan?*).

Even if we consider this very small sample, there appear be significant differences in the rhetorical strategies adopted in the novice / F2F sessions (direct interactions, engagement with the game at hand) as opposed to the expert / online sessions (indirect interactions, reflexions about the strategic situation outside the game).

### 4.3 Annotating the Polimatrix Corpus for Speech Functions

In this section, we move from a quantitative analysis of the Polimatrix corpus to the description of qualitative features, especially 'speech functions'. The purpose here is to show that by looking at the rhetorical structure of conversations, we can perhaps explain why certain negotiating strategies fail, while others apparently succeed.

The analytical tools we adopt here originate in conversation analysis (Glenn 2019). The core concept is the Adjacency Pair (AP), a matching pair of conversational turns around which most dialogue is scaffolded. In a previous study we identified the discourse functions that typically occur in strategic negotiation games (Farges & Gledhill 2024). On the basis of this study, we posit four main subtypes of AP:

- Game Organisation / Performance
- Game Probe / Response
- Negotiation Open / Close
- Negotiation Probe / Response

In addition, participants sometimes extemporise or 'side-step' the typical AP sequence. This involves comments on strategy, judgements about the game or engaging in 'roleplay'. For these we propose three APs:

- Meta-critique
- Meta-strategising
- Meta-roleplay

Exchange 1 (below) shows a typical negotiation cycle (in this case taken from Subcorpus 1). This is started off by the game master (GM) as an invitation to negotiate (Nego Open), followed by an uncommitted response from Player A (Nego Resp). Player A then makes a proposal (Nego Probe). The conversation then goes through several cycles of Probe / Response before a final agreement (Nego Close) which occurs later in the exchange.

*Exchange 1*

*GM: Then you can choose if you negotiate. [Nego Open]*

*PA: I am not sure. [Nego Resp]*

*PA: I would like an agreement to exchange prisoners of war [Nego Probe]*

*PB: I am willing to exchange POWs. [Nego Resp]*

*PB: on the exchange that you will leave no forces in the Crimea. [Nego Probe]*

*PB: And you will withdraw your forces. [Nego Probe]*

*PA: I am not going to agree to that [Nego Resp] […]*

Exchange 2 (below) shows another way that a negotiation can proceed (again, from Subcorpus 1). Here Player A uses elements of the game state (Meta Strat) as a bargaining point. As well as making promises about future gameplay, Player A mentions that '*I cannot move these two [pieces]*' in order to reassure Player B. In pragmatic terms, this is an attempt to help Player B 'save face'. The agreement is then 'officially' acknowledged by the GM (NEGO CLOSE), but this function is also signalled by the players shaking hands.

*Exchange 2*

*PA: I would like the NPP [National Power Plant] then as well. [Nego Probe]*

*PA: (as well as) not deploying any more forces and just leaving it as it is there. [Nego Probe]*

*PB: I can consent to that. […] [Nego Resp]*

*PA: That also means that I cannot move these two. [Meta Strat]*

*PB: Yeah. I can do that [Nego Resp]*

*PA: Yes [Dialogue Control]*

*PB: OK (Players shake hands) [Nego Close]*

*GM: So we have then a negotiation for Nord Stream [Nego Close]*

Specialists in the field of conversation analysis (Glenn 2019) have often observed a divide between the transcriptions of spoken exchanges and the perceptions of participants (especially when asked to recall the phrasing used). Given the gulf between participant recollections and actual performance, there seems to be a strong argument in favour of not only keeping a record of these exchanges, but also in engaging in some form of analysis, even if it this involves short extracts, as we have seen here.

## 5. Language and the Evaluation of Matrix Games

In this section, we turn our attention to the evaluation of matrix games. There is now a considerable body of evidence that suggests that language proficiency and language use can have an impact on negotiation outcomes (Sokolova and Szpakowicz 2007, Hayakawa et al. 2019, Wang and Yip 2022). For example, Taylor and Thomas (2005) found that successful negotiation outcomes are associated with several 'high-level' discourse features, including greater coordination of turn taking, reciprocation of positive affect and a focus on alternatives rather than on competition. These discourse strategies correspond to the kinds of lexicogrammatical features that we have observed in the Polimatrix corpus (especially Subcorpus 2). Although our work is still only at a preliminary

stage, it would appear that factors such as relative experience coupled with channel (mode of play) have an impact on the actual language and negotiating styles that players adopt.

Given the relationship between linguistic performance on the one hand and gameplay on the other, we suggest that it would be instructive for the participants in matrix games to analyse their own performance (or that of others) in linguistic terms. Traditionally, matrix games have been evaluated by debriefing (Morrison & Meliza 1999, Nicholson 2012, Crookall 2015). This practice stems from the fact that matrix games were originally designed as a qualitative training tool in wargaming. Rather than seeking a 'winning' strategy (as in chess or other strategy games), the evaluation of military matrix games is based on the participants' ability to identify risks, test assumptions, and make informed decisions. Wojtowicz (2020) describes an additional benefit of debriefing sessions: they can create a risk-free environment for potential knowledge gaps to be discussed and openly clarified.

But despite the attention that has been paid to debriefing, as far as we are aware, few if any organisers of matrix games make use of the spoken interactions which take place during gameplay when assessing actual performance. Yet, if we accept that high-level discourse strategies (as we mentioned above) have an effect on the outcomes of gameplay, it should follow that linguistic performance should also be taken into account when evaluating how well a matrix game has been played.

How do we propose to do this? We set out below a very simple three-step recommendation.

Step 1) *Corpus selection*. Participants obtain a transcription of their own matrix game session. Many streaming services and meeting platforms provide options for automatic subtitling / transcription (although often limited to English). If unable to obtain a transcription for professional or logistical reasons, it should also be possible to obtain one from an archive (the Polimatrix corpus exists precisely for this purpose).

Step 2) *Extract selection*. Participants select a short extract for analysis. In the first instance, it is instructive to look for passages where there is a 'significant moment' or a visible 'ludic act' (a complete negotiation cycle, agreement or disagreement between the players, shaking hands, etc.)

Step 3). *Conversation analysis*. For non-specialists, this may present a novel challenge. Therefore we recommend that analysis be 'scripted'. That is to say, broken down into bite-sized activities which can be followed systematically (and performed incrementally). Table 7 shows a possible check-list for this exercise.

**Table 7: Debriefing questions and related requirements**

| Category | Question |
|---|---|
| Experience | Identify a significant moment in your matrix game, maybe one which corresponds to successful / unsuccessful negotiation (no more than 10-20 phrases / utterances). |
| Observations | Label each phrase / utterance according to speech function [see Section 4.3 for examples]. |
| | For each player involved in this exchange, how would you describe their negotiating style / negotiating strategy (businesslike, conciliatory, demanding, jocular, threatening, etc.)? |
| Conclusions | Listening to your own participation, what did you learn about your own negotiating style? |
| | Listening to the different participants, do you think their mastery of language (accuracy, fluency, rhetorical skills) contributed to the success (or failure) of communications in this game? |
| Reflectivity | Generally, how well do you think the negotiations went in this game session? What was the effect of this on the final result? |

At the current time, we have not had an opportunity to test this proposal with actual participants. However, it is planned to apply this approach using an adapted variant of a commercial strategy game in two different separate institutions in two countries (also with different channels / modes of play: thus separating variables such as expert / novice, online / face-to-face).

## 6. Conclusion

In this paper, we have set out various reasons why the analysis of spoken interactions may be relevant to the players and organisers of matrix games. The detailed analysis of lexicogrammatical features reveals broad differences in discourse strategy, which themselves correlate with variables such as the relative experience of players (but also the channel of communication). The value of linguistic analysis lies firstly in the interpretation of data: it is useful to be able to predict which phrases and terms are used in 'successful' as well as 'unsuccessful'

negotiations. But linguistic analysis may also have pedagogical value: in effect, we suggest here that participants in matrix games may benefit from being able to identify, compare and label the different conversational turns and speech acts used during negotiations which they have effectively witnessed or played a part in creating.

**Ethics declaration:** Ethical clearance was not required for this research.

**AI declaration:** AI tools were not used in the creation of this paper.

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