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Subjective Game Structures: A Behavioral Game Theoretic Analysis of Hidden Perceptions and Strategic Properties Underlying the Israeli–Palestinian Conflict

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Abstract: Here, we apply a novel framework, termed Subjective Game Structures (SGSs), for uncovering and analyzing hidden motivations in ecological conflicts. SGSs enable the examination of implicit attitudes and motivations within individuals and groups. We elicited SGSs from Israeli and Palestinian participants between March 2019 and February 2020 (approximately three years before 7 October 2023), trying to answer the questions of whether Israelis and Palestinians perceived the conflict in a similar manner, whether they have identical assessments of the associated payoffs, and what can be done to reduce future hostilities and attain peaceful solutions. The results reveal meaningful differences between the parties. Israeli SGSs largely reflected expectations of mutually cooperative outcomes, while Palestinian SGSs exhibited ambivalence and a higher occurrence of confrontational expectations from *both* parties. Approximately 70% of Israeli SGSs and 40% of Palestinian SGSs were categorized as absolutely stable games, indicating that a meaningful portion of participants implicitly anticipated cooperative and mutually beneficial resolutions. Additionally, Palestinian participants' perceptions of strategic similarity with Israelis were considerably lower than the perceptions of Israeli participants, pointing to meaningful gaps in the alternatives each side was expecting the other side to choose. The discussion highlights the importance of enhancing subjective perceptions of similarity and shaping parties' perceived payoff structures as two key pathways to fostering peaceful interactions in diverse social and political conflicts.

Keywords: subjective game structures; taxonomy; subjective expected relative similarity; SERS; Israeli–Palestine conflict

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1. Introduction

International disputes are typically managed and conveyed by central authorities, which define disagreements, shape the public agenda, and drive the use of diplomatic or military actions. However, individuals living in conflict zones may hold perceptions that diverge from those promoted by central authorities. Even within the same group, individuals may experience subjective perceptions that differ from those of other group members or the views expressed by group representatives. Understanding these individually constructed perceptions—particularly those developing within prolonged, ongoing conflicts—can offer valuable insights into the underlying dynamics of the conflict, its potential trajectories, and may suggest innovative approaches for conflict resolution. Previous research has provided participants with a predefined set of possible outcomes, asking them to rate their preferences or utilities. For instance, Plous (1985) collected utility ratings for four

proposed outcomes related to the arms race between the US and the Soviet Union during the Cold War. Similarly, Ames et al. (2012) presented American participants with four options describing a US–China conflict, asking them to indicate their own preferences as well as those they believed reflected the average Chinese citizen's perspective. Halevy et al. (2012) asked participants to rank the outcomes of two-by-two matrices representing negotiation scenarios. While these methods effectively focus participants' attention on specific outcomes, they do not allow for the elicitation of fully subjective conflict perceptions, which could then be transformed into games and analyzed formally.

To this end, we implemented a novel procedure that elicits implicit strategic perspectives from laypeople, requiring no prior knowledge or expertise (Fischer et al., 2024), and translates them into formally defined two-by-two game structures. These resulting games, termed Subjective Game Structures (SGSs), can then be analyzed and classified using various decision-making principles and game-theoretic frameworks.

To investigate the Israeli–Palestinian conflict and reveal individual motivations, we sampled participants from Israel, Gaza, and the West Bank. Data collection occurred between 2018 and 2020 as part of an international study applying game theory while aiming to uncover the roots of conflict and war across different global disputes. The results reveal both commonalities and differences in the perspectives of the two populations, suggesting potential interventions that may encourage cooperative solutions. Furthermore, by comparing explicit statements with implicit game structures, we reveal gaps between these perspectives and emphasize the importance of eliciting Subjective Game Structures as a means to better understand and resolve real-life conflicts.

Before detailing the experimental procedure, we briefly discuss: (i) the use of game theory as a framework for understanding and analyzing social interactions, conflict, and war; (ii) the calculation of two types of expected values that guide decision-making under uncertainty; and (iii) the classification of games according to two taxonomies: a revised version of the taxonomy proposed by Rapoport and Guyer (1966), and a taxonomy based on the theory of Subjective Expected Relative Similarity (SERS; Fischer, 2009, 2012; Fischer et al., 2022; Fischer & Savranevski, 2023). Readers familiar with some of the topics may wish to skip these sections and proceed directly to the description of the tools and procedures used in this study. Also, readers less interested in applied game-theoretic concepts may prefer to go directly to the sections detailing individual statements and perceptions of similarity.

2. Game-Theoretic Modeling as an Instrument for Understanding and Analyzing Social Interactions

Game theory provides useful tools for describing and predicting social and economic interactions. Game matrices describe possible alternatives for two or more parties, and associate them with expected payoffs that may be gained by each of the sides. *For example*, the well-known Prisoner's Dilemma game (Flood, 1958; Rapoport & Chammah, 1965) has been applied to model arms races, the outbreak of war (Axelrod, 1984; Brams, 1993), and the motivation to pollute and ignore the impact of climate change (Hardin, 1968; Ostrom, 1998; Fischer et al., 2022). The basic two-by-two PD game provides each party with two alternatives, typically referred to as cooperation and defection. The possible results are described by four different payoffs, termed as follows: Temptation (T), Reward (R), Punishment (P) and Sucker (S), where T > R > P > S (Figure 1a). Examining the PD game reveals several important strategic properties such as the existence of a dominant strategy of defection, and a deficient Nash equilibrium at the intersection of both dominant strategies (see Supplemental Materials—Basic decision criteria).

(a)

	Cooperate	Defect
Cooperate	R, R	S, T
Defect	T, S	P, P

T > R > P > S

(b)

	Cooperate	Defect
Cooperate	8, 8	0, 10
Defect	10, 0	1, 1

(c)

	Cooperate	Defect
Cooperate	R, R	S, T
Defect	T, S	P, P

T > R > S > P

(d)

	Cooperate	Defect
Cooperate	8, 8	1, 10
Defect	10, 1	0, 0

Figure 1. Examples of two-by-two game matrices, showing two alternatives for the row and column players and their corresponding payoff values derived from simultaneous choice combinations. Left and right values in each cell indicate the playoffs for the row and column players, respectively. Panel (**a**) depicts a generic Prisoner's Dilemma game, defined by the inequalities: T > R > P > S (and in some experiments also 2R > S + T; Flood, 1958; Rapoport & Chammah, 1965). Panel (**b**) depicts a numeric example of the Prisoner's Dilemma game. Panel (**c**) depicts a generic Chicken game, defined by the inequalities: T > R > S > P (Rapoport & Chammah, 1966). Panel (**d**) depicts a numeric example of the Chicken game.

2.1. The Computation of Expected Values

Applying Expected Values (EVs; von Neumann & Morgenstern, 2007) to games, such as the PD game, combines the expected payoffs associated with the choice of each specific alternative with the *estimated probabilities* of the opponent choosing each alternative. In the case of two-by-two games, the choice of one of the opponent's alternatives is assigned a probability, p, while the other alternative is assigned the complementary probability of $1 - p$. Using the example of the PD game and assigning the probability p to the prospects of the opponent to cooperate allows for the computing the EV for each alternative. The EV associated with own cooperation is given by $Rp + S(1 - p)$, and the EV associated with own defection is given by $Tp + P(1 - p)$ (Figure 1a), letting decision makers choose the alternative with the higher EV.

However, it has been shown that when addressing human interactions with an opponent in two-by-two games, assigning a probability to the prospect of the opponent to choose a *similar* alternative to one's own chosen alternative, p_s (and the complementary probability of $1 - p_s$ to the prospects of the opponent to choose a *different* alternative), allows for computing EVs that better correspond to actual human choices. This form of EV computation, termed Subjective Expected Relative Similarity (SERS), has been shown to predict actual human behavior in PD, Chicken, and Battle of the Sexes games (Fischer, 2009, 2012; Fischer & Savranevski, 2023, Figure 1), and has been developed into a theoretical strategy that maximizes players' expected outcomes across all two-by-two games (Fischer et al., 2013, 2022; Fischer & Avrashi, 2024).

As in the classic EV calculations, SERS predicts that players choose the alternative with the higher EV. For the PD example (where similar choices refer to both mutual cooperation and mutual defection and are assigned the p_s probability, and different choices refer to both cases in which one of the players chooses to cooperate and the other chooses to defect, and are therefore assigned the probability of $1 - p_s$), a player may, either formally or intuitively, compare the EV of cooperation with the EV of defection and decide to cooperate whenever $Rp_s + S(1 - p_s) > Pp_s + T(1 - p_s)$. Further separating between *perceptions of the opponent*, p_s, and the game's *payoffs* allows for the rewriting of SERS's decision rule as follows: cooperate whenever $p_s > (T - S)/(T - S + R - P)$, otherwise defect. While the left side of the inequality describes the perception of strategic similarity with the opponent, the right side defines a fixed *threshold* value of the game. Denoting the payoff ratio by p_s* generates an abridged decision rule that states the following: cooperate whenever $p_s > p_s$*, and defect whenever $p_s < p_s$*. Importantly, the p_s* index is not only an abridged form of writing, but a critical estimate of the extent of cooperation motivated by each payoff matrix. When p_s* is sufficiently low, many opponents may be regarded as being sufficiently similar to motivate the choice of the cooperative alternative; in contrast, a game with a high p_s* suggests that most opponents are likely to be considered as insufficiently similar, and therefore motivates the choice of the confrontational alternative. In other words, games with low p_s* values may be regarded as more cooperative than games with high p_s* values.

It has been shown that while strategic similarity is a concealed trait, its extent may be approximated by various observed similarity cues (Chierchia & Coricelli, 2015; Fischer, 2009, 2012; Toma et al., 2012). In the present study, we ask Israeli and Palestinian participants to assess two similarity estimates: similarity assigned to the other party as a collective *group*, and similarity assigned to an *individual* associated with the other party. While group similarity is expected to reflect common stereotypes and perceptions of the out-group (Banaji, 2002), interpersonal similarity is expected to reflect more idiosyncratic, and therefore more heterogeneous, perceptions. Research has shown that participants make more *confrontational* choices while playing inter-group games than while playing interpersonal games, even when the payoffs in both games are identical (Bornstein & Ben-Yossef, 1994).

2.2. Game Classifications

While the Prisoner's Dilemma game used here as an example is a well-known model illustrating strategic properties, it represents just one of many possible games, each with unique strategic characteristics. To identify meaningful strategic similarities and differences between games, one must examine and compare these properties. Accordingly, this study relies on two game classifications: a revised taxonomy of two-by-two games based on Rapoport and Guyer (1966), and a SERS-based taxonomy (Fischer et al., 2024).

Rapoport and Guyer's (1966) taxonomy classifies all *strictly ordinal* two-by-two games (games in which the payoffs of each player are represented by ordinal ranks—1, 2, 3, 4, each appearing once for each player) into ten categories, characterized by an expected end-state referred to as the *natural outcome* (which reflects a theoretical expectation of the players to choose an alternative that optimizes their payoffs, see Supplementary Materials—Rapoport and Guyer's Taxonomy of Two-by-Two Games). Here, we use a revised and abridged taxonomy, which groups all games into five classes (Fischer et al., 2024). This revised taxonomy allows classifying not only strictly ordinal games, but all two-by-two games. The revised taxonomy comprises the following five game categories: (1) *Absolutely Stable* games, in which both players can jointly obtain their maximal payoffs. Such games are regarded as no-conflict games. In other words, both parties easily and naturally converge on a mutually beneficial solution. (2) *Stable/Strongly Stable* games, in which one or both players are not

satisfied with the natural outcome (because they do not obtain their maximal payoff), yet they are not able to influence the outcome of the game by changing, or threatening to change, their choice. In other words, even though there is no mutually beneficial solution where both players obtain their maximal payoff, none of the players is motivated to depart from their initial choice. (3) *Non-Stable* games, in which one or both players are not satisfied with the natural outcome, yet the player/s are able to influence the game's outcome by changing or threatening to change their choice. Interactions modeled by these games may be regarded as intractable conflicts, since every action taken by one of the players can be answered with a counteraction of the other player ad infinitum. (4) *Prisoners' Dilemma (PD)-like* games[1], in which neither player is satisfied with the natural outcome, yet they are not motivated to change their choice. Unlike Stable/Strongly Stable games, the natural outcome of PD-like games is a Nash equilibrium but not a Pareto equilibrium[2]. In other words, two rational players are expected to obtain a smaller payoff than the payoff jointly available for both of them in another cell of the matrix. (5) *No Natural Outcome* games—in this category, one or both players have no preferred choice. Therefore, there is no predicted choice for at least one of the players, and consequently no expected outcome. Figure 2 shows matrix examples for all five classes (see also Supplementary Materials—Rapoport and Guyer's Taxonomy of Two-by-Two Games).

Absolutely Stable		*Stable/Strongly Stable*		*Non-Stable*		*PD-like*		*No Natural Outcome*	
50, 50	0, 30	30, 30	50, 20	30, 30	20, 50	20, 20	50, 0	50, 20	20, 50
30, 0	20, 20	20, 50	0 , 0	50, 20	0, 0	0, 50	30, 30	20, 50	50, 20
50, 50	0, 20	20, 30	50, 20	0, 0	50, 30	20, 20	30, 0	50, 0	20, 20
20, 0	30, 30	0, 20	30, 0	30, 50	0, 0	0, 50	30, 30	50, 30	20, 50

Figure 2. Example matrices for the five categories of the revised and abridged Rapoport and Guyer taxonomy (Fischer et al., 2024). In all matrices, other than the No Natural Outcome games, the natural outcome is the top left cell. The top Absolutely Stable game is typically referred to as the Stag Hunt game (Skyrms, 2001). The top Non-Stable game is a Chicken game (Rapoport & Chammah, 1966). The bottom Non-Stable game is typically referred to as Battle of the Sexes (Rapoport, 1967). The top PD-like game is a classic PD (Flood, 1958; Rapoport & Chammah, 1965). The top No Natural Outcome game is a Matching Pennies game (Budescu & Rapoport, 1994).

While the revised Rapoport and Guyer taxonomy helps gain theoretical insights, the success of SERS in predicting behavioral choices (Fischer, 2009, 2012; Fischer et al., 2022; Fischer & Savranevski, 2023) suggests also using it as a basis for a taxonomy of games. As mentioned above, SERS shifts the focus from the payoff structure per se to the interaction between the game's payoff structure and the players' perceptions of their opponent; specifically, the prospects of both players making similar choices. Therefore, the SERS-based taxonomy distinguishes between two basic types of payoff sets. Games in which the SERS-based expected choices *vary* under different perceptions of strategic similarity with the opponent are referred to as *similarity-sensitive games*. Games in which the SERS-based expected choices *do not vary* under different perceptions of strategic similarity with the opponent are referred to as *non-similarity-sensitive games*. Clearly, some games can be similarity-sensitive for one of the players and non-similarity-sensitive for the other.

Therefore, the SERS-based taxonomy differentiates between *two-player similarity-sensitive games*, *one-player similarity-sensitive games*, and *two-player non-similarity-sensitive games*.

The importance of this classification for analysis of games derives from its capacity to determine which games are susceptible to social and behavioral interventions, allowing for the influencing of the parties' choices. That is, influencing perceptions of strategic similarity between the interacting parties (in the present study—Israelis and Palestinians) has the potential to alter the expected outcome of similarity-sensitive games without changing the game's actual payoffs. See Supplementary Materials—SERS-Based Taxonomy of Games for a detailed description of the SERS-based classification. Figure 3 shows examples of games associated with each of the four classes of the SERS-based classification.

(a)

	A	B
A	20, 20	10, 10
B	15, 15	5, 5

(b)

	A	B
A	15, 20	20, 15
B	10, 10	5, 5

(c)

	A	B
A	15, 15	5, 20
B	20, 5	10, 10

(d)

	A	B
A	15, 15	20, 10
B	10, 20	5, 5

Figure 3. Examples of the four classes of the SERS-based classification. (**a**) depicts a *row player-only similarity-sensitive* game. When assuming both players are completely similar, and thus both are expected to choose the same alternatives (either AA or BB), the row player prefers 20 over 5, hence choosing the top row. However, when assuming both players are completely dissimilar, and thus both are expected to choose opposite alternatives (either AB or BA), the row player prefers 15 over 10, and hence chooses the bottom row. Consequently, similarity perceptions change the preferred alternative of the row player. In contrast, the column player prefers the left column under *both* assumptions of complete similarity and complete dissimilarity (since 20 is preferred over 5 for complete similarity, and 15 is preferred over 10 for complete dissimilarity). Hence, similarity perceptions do not change the preferred alternative of the column player. (**b**) depicts a *column player-only similarity-sensitive* game, as the row player prefers the upper row under both the assumptions of complete similarity and complete dissimilarity, while the column player prefers the left column under the assumption of complete similarity, and the right column under the assumption of complete dissimilarity. (**c**) (also termed the Prisoner's Dilemma game) depicts a *two-player similarity-sensitive* game. Both players prefer alternative A under the assumption of complete similarity and alternative B under the assumption of complete dissimilarity. (**d**) depicts a *two-player non-similarity-sensitive*. Both players have the same preferences under the assumption of complete similarity and the assumption of complete dissimilarity. Note that complete similarity and dissimilarity are two extreme cases helping to easily determine the class of the game. Actual similarity perceptions may obtain any value between, and including, these two extremes.

3. Methods

Participants: One hundred and forty-one Israeli Jewish individuals (50% women, M_{age} = 24.6, SD = 4.86), recruited at an Israeli university, participated in the study in award of academic credit points or the equivalent of USD 20. Eighty-six Palestinian individuals (47% women, M_{age} = 36.7, SD = 11.97) from the Gaza Strip and the West Bank who visited Israel for personal reasons participated in the study in award of the equivalent of USD 20. Data were collected between March 2019 and February 2020.

3.1. Tools

Symbolic Quantification Tools (SQT): visual aids that allow the participants to express quantities, using intuitive pictorial representations that do not necessitate formal numerical skills (Fischer et al., 2024). The two SQTs consist of a series of illustrations, 24 showing various depictions of a tree, ranging from a worst condition (a tree with no leaves at all), to a best condition (a tree with a rich foliage); and 41 showing depictions of a jar filled with various portions of a gold-colored substance. The tree and jar SQTs were selected from among six SQTs that had been validated in a preceding study, which associated each image with a specific numerical value. They were selected for inclusion in the present study due to their relatively high convergent validity and the consistently perceived intervals between successive illustrations. See Figure 4 for examples of the SQT illustrations.

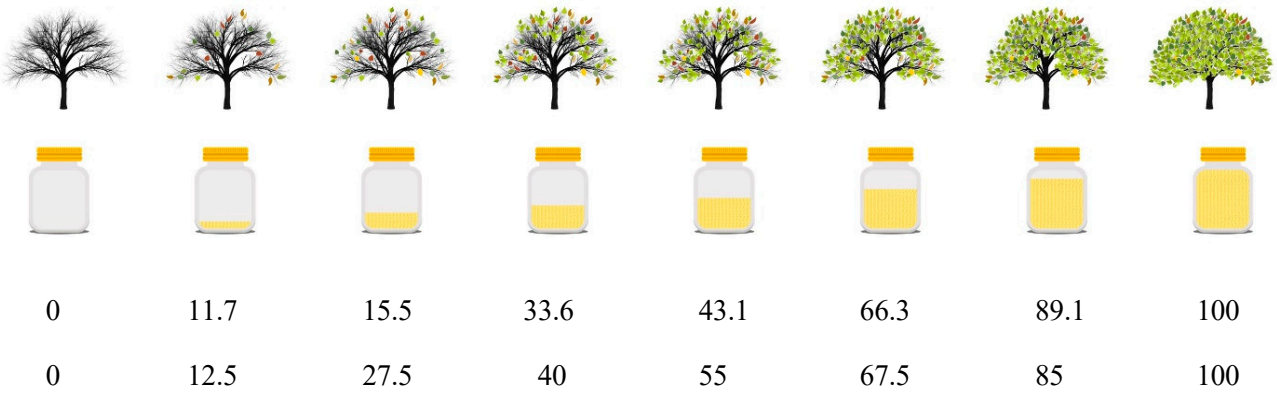

Figure 4. A representative subset of the tree and jar illustrations used as SQTs and their associated values. The top values correspond to the tree SQT images and the bottom values to the jar SQT images.

3.2. Procedure

Participants were welcomed by a research assistant who spoke their native language (Hebrew or Arabic) and asked if they could spare approximately one hour of their time. All participants were shown and read a description of their rights as participants, assured of full anonymity during and after the study, and of their right to discontinue their participation without any consequences. They were then seated in front of a computer with dedicated software that presented the questions and SQTs, and collected participants' responses.

The experiment started by mentioning the ongoing Israeli–Palestinian conflict and asking the participants to suggest two different/opposing and realistic courses of action, first for their own side (either Israeli or Palestinian), and then for the other side (either Palestinian or Israeli). To assure that the meaning of opposing alternatives was linguistically and conceptually comprehended by Arabic speaking participants, the Arabic version also included a short example describing two cellphone companies considering how to take over a larger market share, by examining opposing alternatives (i.e., selling at a fair price or selling at a lower price than the competitor; praising their own product or defaming the competitor). Notice that the instructions did not explicitly mention the terms 'cooperation' and 'confrontation', thus avoiding induction of a specific framing that might not coincide with participants' genuine attitudes and reasoning.

After the participants defined their own alternatives, the software presented the four combinations generated by each participant's provided alternatives, and asked participants to list three possible *outcomes*, *experiences*, *or emotions* that are likely to be experienced by the participant as a member of *his or her group* (separately for each intersection of alternatives). The same set of four questions was repeated while asking the participant to describe the outcomes, experiences, and emotions the *other party* is likely to experience. Next, each of the two SQTs was presented and explained, explicitly providing examples

of the best and worst outcomes and their respective images (Figure 4). After the SQT introduction, each participant was asked to separately consider the four Israeli–Palestinian alternative intersections (as proposed by the participant), each presented alongside the three consequences (also provided by the participant), and to choose the SQT image that best represents the desirability of the situation, once for the tree SQT and once for the jar SQT. The process was then repeated, asking the participant to assess the desirability of the four alternative intersections and their respective three consequences while considering the *other party* (either the Israeli or the Palestinian party). The next couple of questions addressed participants' forecasts, asking them to identify which of the two alternatives they suggested earlier for their own party is more likely to be enacted, and which of the two alternatives they suggested for the other party is more likely to be enacted by the other party. Next, two questions addressed participants' subjective perceptions of similarity with the other party. First, participants were asked to think of a *person* who best represents the other side and indicate, using a slider, how similar this person is to themselves (i.e., interpersonal similarity). Second, participants indicated how similar the other *group* is to their own group (i.e., group similarity), again using a slider. Finally, basic demographic information was collected. Palestinian participants were debriefed and received their participation fee. Israeli participants were invited to a second session, taking place about a week later, which allowed further testing the reliability of the SQT elicitation method[3] (Fischer et al., 2024). The data were collected between 2018 and 2020. See Figure 5 for an illustration of the procedure.

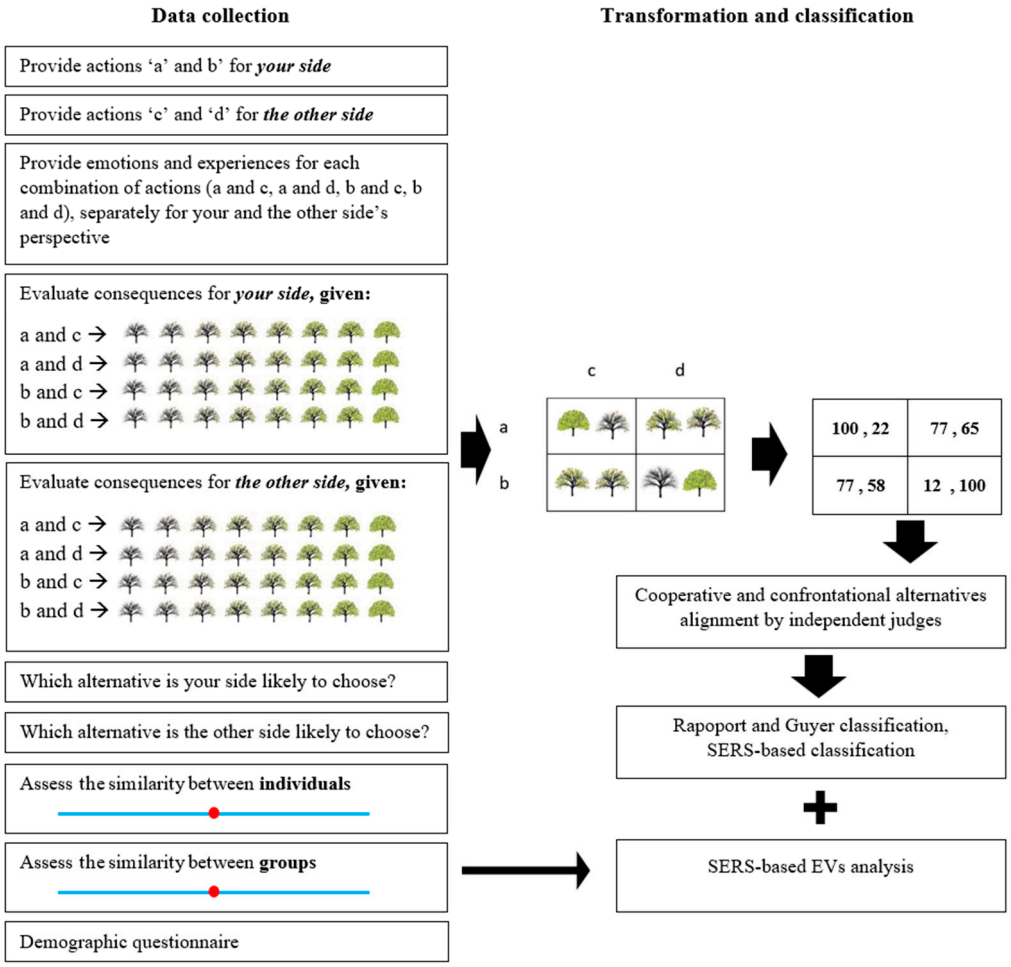

Figure 5. Illustration of the procedure allowing the eliciting of Subjective Game Structures (SGSs) while using the tree SQT.

4. Results

Before analyzing the SGSs, the data were presented to ten additionally recruited participants, serving as independent judges. Five judges examined the Israeli data, and the other five examined the Palestinian data. Since the participants were only instructed to provide opposing alternatives, and were not restricted to cooperative or confrontational alternatives, many responses may have addressed various other characteristics, such as: severe vs. mild (e.g., military attack vs. civil protest), humane vs. inhumane (e.g., approaching the international court vs. engaging in terror acts), or domestic vs. foreign policy (e.g., education vs. negotiation). Such categories are not at the core of the present study, which focuses on cooperation and confrontation. Therefore, the judges' task was to examine the provided alternatives and filter out responses that cannot be labeled as cooperative and confrontational alternative pairs. They were also asked to identify the more cooperative and the more confrontational alternative provided by each participant. Only SGSs that were judged as expressing cooperative and confrontational alternative pairs by at least three out of the five independent judges were included in the subsequent analyses. These matrices were identically aligned, allowing for the comparison of values and properties across the SGS set, while the non-alignable matrices were excluded from further analyses, though interpersonal and inter-group similarity assessments provided by the same participants were still included in the similarity analyses. To illustrate the judges' dilemmas, consider the terms 'one state solution' and 'two states solution', which the judges could not clearly identify as representing cooperative or confrontational alternatives without further context. Other non-alignable alternatives comprised two cooperative or two confrontational actions, as well as irrelevant or incomprehensible alternatives (see Table 1). Following the judgments, 134 Israeli SGSs (two matrices per participant, each elicited with a different SQT) and 150 Palestinian SGSs (two per participant, each elicited with a different SQT) were subjected to further analyses.

Table 1. Examples of alignable and non-alignable alternatives.

Alignable alternatives—Israeli participants			
Israel alternative A	**Israel alternative B**	**Palestine alternative A**	**Palestine alternative B**
Peace treaty	Instituting martial law on the West Bank and the Gaza Strip	Peace treaty	Carrying out terrorist acts
Encourage and support the establishment of a Palestinian state	Annex the territories of the Palestinian authority	Be tolerant and try to promote peace	Carry out terror attacks and fight for their [the Palestinians] freedom
Alignable alternatives—Palestinian participants			
Israel alternative A	**Israel alternative B**	**Palestine alternative A**	**Palestine alternative B**
Focus on their own affairs within the Israeli borders	Expansion of the State of Israel	Accept the Israeli side	Fight the Israelis
Striving towards peace and coexistence	Refuse returning the land to the Palestinians	Improving relations and negotiations with Israel	Continue fighting and try to take back [land] by force

Table 1. *Cont.*

Non-alignable alternatives—Israeli participants			
Israel alternative A	**Israel alternative B**	**Palestine alternative A**	**Palestine alternative B**
Reach a two-state agreement, and declare a Palestinian state partially within Israeli territories.	The leaders of Israel can negotiate with the leaders of Palestine on territories/funds/ceasefires, etc., which do not involve declaring a Palestinian state but rather improving their current living conditions	Demand from Israel better funds and conditions in order to have a good and full life without declaring an independent state	Join one of the various Arab countries and form a partnership with them, both in terms of residence and declaration of independence and in terms of finances
Not provide Palestinians with needed health services.	Keep Palestinians out of the region by using military forces and setting clear borders.	Exhaust the Israelis until they [the Palestinians] achieve what they want.	Act in any violent way possible to achieve their goals.
Non-alignable alternatives—Palestinian participants			
Israel alternative A	**Israel alternative B**	**Palestine alternative A**	**Palestine alternative B**
Resolving the conflict in two states but without weapons and a conditional Palestinian state.	Annex the Palestinian territories and force the Palestinians to accept reality or leave.	Encourage international pressure and demand the formation of a committee to investigate the actions of Israel.	Sticking to their [the Palestinians] ground and facing the other party [Israel] or death.
Leaving Palestine and returning the occupied lands.	Expulsion of all Palestinians from the country, with complete control and restrictions.	Boycott Israeli products.	Demonstration, protest and creating problems at the border.

Hereafter, we describe the results, beginning with the explicitly provided self-reported predictions, and moving to the more elaborate characteristics of the elicited SGSs. The following analyses show the following: (i) self-reported predictions, (ii) average SGSs of both samples, (iii) average SGSs grouped by the cooperative and confrontational character of the self-reported predictions, (iv) distribution of game types according to the revised Rapoport and Guyer's taxonomy, (v) distribution of game types according to the SERS-based taxonomy, (vi) perceived inter-group and interpersonal opponents' similarity distributions, (vii) predicted choices according to SERS, and (viii) averaged SGSs grouped by perceived similarity quartiles.

i. Self-reported predictions

Figure 6 shows the proportion of cooperative and confrontational alternatives reported by participants of each sample as their forecast for each party's expected choice. These self-reported forecasts reveal a meaningful gap. Comparing the frequencies of cooperation and confrontation for the *Israeli* side, as perceived by the Israeli and the Palestinian participants, shows many more cooperative predictions made by Israeli participants [N_{coop} = 108 (80.6%); N_{conf} = 26 (19.4%)], compared to the cooperative predictions made by the Palestinian participants [N_{coop} = 72 (48%); N_{conf} = 78 (52%)], revealing a significant difference between the samples (χ^2 = 32.4, $p < 0.001$). A rather similar pattern is apparent in the comparison of cooperation and confrontation for the *Palestinian* side, also showing many more cooperative predictions made by Israeli participants [N_{coop} = 100 (74.6%); N_{conf} = 34 (25.4%)], compared to the cooperative predictions made by the Palestinian participants [N_{coop} = 82 (54.7%); N_{conf} = 68 (45.3%)], revealing a significant difference between the

samples (χ^2 = 12.3, $p < 0.001$). Interestingly, no difference was found when comparing both Israeli and Palestinian participants' reports of their own side's expected cooperative and confrontational choices and their reports of opponents' expected cooperative and confrontational choices (Israeli sample: χ^2 = 1.37, p = 0.24; Palestinian sample χ^2 = 1.33, p = 0.25).

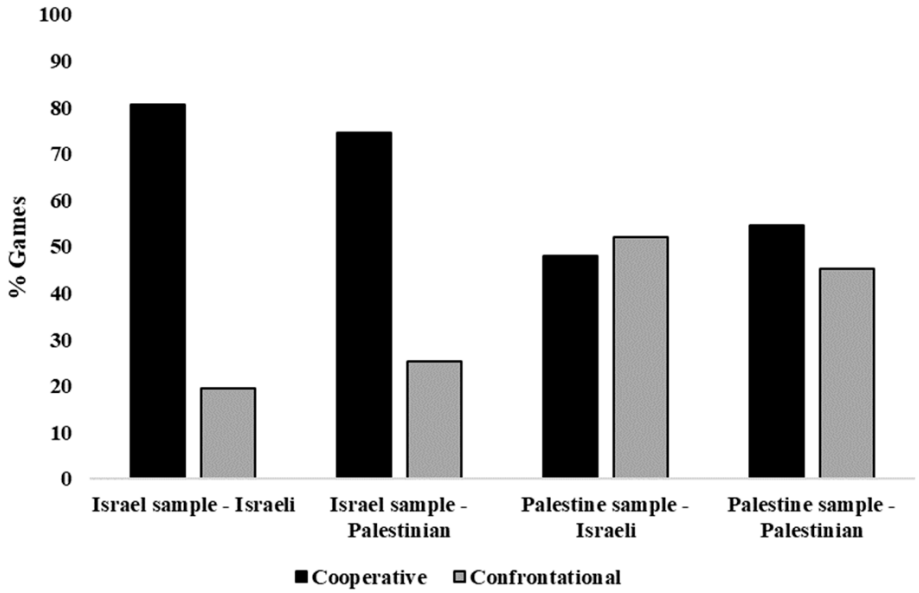

Figure 6. Self-reported forecasts for cooperative and confrontational alternatives that are likely to be enacted by both parties as proposed by Israeli and Palestinian participants.

ii. Average SGSs of both samples

To further examine the elicited games, we average the corresponding payoffs across all sampled SGSs, separately for each group. As shown in Figure 7, both Israeli and Palestinian averaged matrices are absolutely stable games, according to Rapoport and Guyer's (1966) taxonomy. In other words, the maximal payoff of each of the two parties is obtained when both choose their cooperative alternative. According to Rapoport and Guyer, these matrices represent fully cooperative interactions. Nevertheless, examining the averaged SGSs according to the SERS-based taxonomy reveals meaningful and critical differences. Although both averaged matrices are two-player similarity-sensitive games, the *Israeli average matrix* has very low similarity thresholds of p_s^* = 0.20 for the Israeli side and p_s^* = 0.34 for the Palestinian side, whereas the similarity threshold for the *Palestinian average matrix* is meaningfully higher, with p_s^* = 0.45, for the Israeli side, and an identical p_s^* = 0.34 for the Palestinian side. As defined by SERS, the cooperative alternative is expected to be chosen whenever $p_s > p_s^*$ (i.e., perceived strategic similarity exceeds the similarity threshold of the game); therefore, we compare the average *inter-group similarity* provided by each sampled group with its averaged matrix's *similarity threshold*. The average reported inter-group similarities for the Israeli and Palestinian parties are $\overline{p_s}$ = 0.40 and $\overline{p_s}$ = 0.31, respectively. Therefore, despite both SGSs being rather identical, one may expect a cooperative choice to be made by the Israeli side (since 0.40 > 0.20) yet a rather inconclusive tendency for the Palestinian side (since 0.31 ≈ 0.34).

Israeli participants average matrix
(67 participants, 134 matrices)

	Pal. C	Pal. D
Isr. C	81.4, 71.9	24.5, 45.1
Isr. D	39.9, 21.2	19.5, 25.4

Israel p_s* = 0.20
Palestine p_s* = 0.34
Reported mean group similarity: $\overline{p_s}$ = 0.40

Palestinian participants average matrix
(75 participants, 150 matrices)

	Pal. C	Pal. D
Isr. C	65.4, 81.1	32.9, 50.8
Isr. D	55.0, 13.6	38.1, 9.4

Israel p_s* = 0.45
Palestine p_s* = 0.34
Reported mean group similarity: $\overline{p_s}$ = 0.31

Figure 7. Averaged matrices elicited from Israeli and Palestinian participants. The rows represent the choices and the respective payoffs (left payoff in each cell) of the Israeli side (Isr) and the columns represent the choices and the respective payoffs (right payoff in each cell) for the Palestinian side (Pal). The *top* row and the *left* column represent cooperative alternatives (C), while the *bottom* row and *right* column represent defective (confrontational) alternatives (D). Each matrix allows computing two distinct similarity thresholds, derived from one's own and opponent's payoffs. The *Israeli* matrix gives rise to an Israeli similarity threshold of p_s* = 0.20, and a Palestinian similarity threshold of p_s* = 0.34. Comparing both p_s* thresholds with the average inter-group similarity reported by Israeli participants, $\overline{p_s}$ = 0.40, suggests that the Israeli party is expected to choose a cooperative alternative (0.40 >> 0.20), but also that the Palestinian party (as reported by the Israeli participants) is rather likely to prefer the cooperative alternative (0.40 > 0.34). Computing both similarity thresholds from the averaged Palestinian matrix, reveals a similarity threshold of p_s* = 0.45 and 0.34 for the Israeli and Palestinian parties, respectively; both exceeding the average inter-group similarity of $\overline{p_s}$ = 0.31 reported by Palestinian participants, therefore suggesting a clear Palestinian expectation for Israeli defection, yet a rather indecisive choice (with some preference for the defective alternative) for the Palestinians.

iii. Average SGSs grouped by self-reported predictions

Since averaged SGSs do not reflect within-group differences, we split the SGSs in accord with participants' self-reported predictions, separately for each party. In other words, we separately examine the matrices of participants who *reported* the following four predictions: mutual cooperation (CC), mutual defection (DD), Israeli cooperation and Palestinian defection (CD), and Israeli defection and Palestinian cooperation (DC). We then examine the game types as derived from the revised Rapoport and Guyer's and the SERS-based taxonomies, and also compute SERS's similarity thresholds, p_s*, for both parties in each matrix.

Figure 8a–d, show the four averaged SGSs elicited from the *Israeli* sample. The matrices represent participants SGSs according to their self-reported expected outcomes: CC, CD, DC and DD. According to the revised Rapoport and Guyer's taxonomy, three of the matrices are absolutely stable games, and one (the DC averaged matrix) is a non-stable game. Therefore, the revised Rapoport and Guyer's taxonomy suggests that three of the four games are expected to result in a mutually cooperative outcome, while the fourth is likely to give rise to an intractable conflict.

a. Israeli CC mean matrix
(43 participants, 86 matrices)

	Pal. C	Pal. D
Isr. C	89.8, 77.9	23.7, 40.3
Isr. D	35.3, 15.7	13.2, 22.1

Israel p_s* = 0.13
Palestine p_s* = 0.31

b. Israeli CD mean matrix
(11 participants, 22 matrices)

	Pal. C	Pal. D
Isr. C	81.0, 52.9	28.2, 50.2
Isr. D	40.5, 26.0	29.0, 25.0

Israel p_s* = 0.19
Palestine p_s* = 0.46

c. Israeli DC mean matrix
(7 participants, 14 matrices)

	Pal. C	Pal. D
Isr. C	58.3, 68.6	30.1, 51.1
Isr. D	61.1, 36.5	44.5, 29.7

Israel p_s* = 0.69
Palestine p_s* = 0.27

d. Israeli DD mean matrix
(6 participants, 12 matrices)

	Pal. C	Pal. D
Isr. C	48.8, 67.0	16.5, 63.2
Isr. D	47.0, 33.5	18.4, 44.6

Israel p_s* = 0.50
Palestine p_s* = 0.57

e. Palestinian CC mean matrix
(25 participants, 50 matrices)

	Pal. C	Pal. D
Isr. C	85.7, 85.4	28.1, 33.7
Isr. D	40.2, 10.8	18.9, 3.6

Israel p_s* = 0.15
Palestine p_s* = 0.22

f. Palestinian CD mean matrix
(11 participants, 22 matrices)

	Pal. C	Pal. D
Isr. C	75.7, 78.8	56.1, 55.7
Isr. D	56.5, 17.8	51.5, 14.3

Israel p_s* = 0.02
Palestine p_s* = 0.37

g. Palestinian DC mean matrix
(16 participants, 32 matrices)

	Pal. C	Pal. D
Isr. C	46.3, 90.2	22.3, 55.9
Isr. D	73.9, 17.6	41.7, 5.5

Israel p_s* = 0.92
Palestine p_s* = 0.31

h. Palestinian DD mean matrix
(23 participants, 46 matrices)

	Pal. C	Pal. D
Isr. C	51.7, 71.2	34.3, 63.5
Isr. D	57.2, 11.9	49.9, 15.9

Israel p_s* = 0.93
Palestine p_s* = 0.48

Figure 8. Average SGSs grouped by participants' (Israeli and Palestinians) self-reports. CC indicates mutual cooperation, CD indicates Israeli cooperation and Palestinian defection, DC indicates Israeli defection and Palestinian cooperation, and DD indicates mutual defection.

Applying SERS to the four averaged Israeli SGSs shows that all four matrices are *two-player similarity-sensitive* games, and are therefore dependent on both parties' strategic similarity perceptions of each other. Moreover, the low similarity thresholds (p_s* = 0.13 and

0.19) calculated for the Israeli party for those participants who predict Israeli cooperation (**C**C and **C**D), suggest that cooperation may be chosen even when Palestinians are not perceived as very similar; while the relatively high similarity thresholds (p_s* = 0.69 and 0.50) calculated for those who predict Israeli defection (**D**C and **D**D) suggest that cooperation may only be attained when Palestinians are perceived as highly similar. Likewise, examining the similarity threshold of the opponent (the Palestinian side) shows that Israeli participants who predict the choice of a cooperative alternative by the Palestinian side (C**C** and D**C**) experience matrices with low to medium similarity thresholds, p_s* = 0.31, 0.27, while Israelis who predict a Palestinian choice of the defective alternative (C**D** and D**D**) experience matrices with higher similarity thresholds, p_s* = 0.46 and 0.57.

Examining the averaged SGSs elicited from the *Palestinian* participants (Figure 8e–h) reveals two absolutely stable games and two non-stable games. Therefore, the revised Rapoport and Guyer's taxonomy suggests that two of the four games (CC and CD, where the first and second letters refer to the Israeli and Palestinian parties, respectively) are expected to result in mutually cooperative outcomes, while the other two games (DC and DD) are likely to give rise to intractable conflicts. Applying SERS to the four Palestinian averaged SGSs shows that, like the Israeli averaged matrices, all four matrices are two-player similarity-sensitive games, and are therefore dependent on both parties' strategic similarity perceptions of each other. Moreover, those who predict Israeli cooperation (**C**C and **C**D) are characterized by extremely low similarity thresholds for the Israeli side, 0.15 and 0.02. In contrast, those predicting Israeli defection (**D**C and **D**D) are characterized by remarkably high similarity thresholds for the Israeli side, 0.92 and 0.93. These results reflect the existence of a meaningful gap in the strategic perceptions of Palestinians. Those who expect Israelis to cooperate and those who expect Israelis to defect have very different perceptions of the strategic nature of the interaction. Examining the similarity threshold of the Palestinian side shows that those who predict the choice of a cooperative alternative for the Palestinian side (C**C** and D**C**) experience low to medium similarity thresholds, p_s* = 0.22, 0.31; while those who predict Palestinian choice of the defective alternative (C**D** and D**D**) experience higher similarity thresholds, p_s* = 0.37 and 0.48.

iv. Distribution of game types according to the revised Rapoport and Guyer taxonomy

Applying the revised Rapoport and Guyer taxonomy to compare the types of games generated by individual Israeli and Palestinian participants (Figure 9) reveals significant differences in the distribution of game types (χ^2 = 36.51, Fisher exact test $p < 0.001$). While the Israeli SGSs comprise 72% absolutely stable games and only 22% non-stable games, Palestinian SGSs comprise 41% absolutely stable games and a rather equal proportion, 35%, of non-stable games. Out of the Israeli absolutely stable games, 95% reflect a mutually cooperative solution that endows both parties with their maximal expected payoff. This property also holds for 93% of the Palestinian absolutely stable games. Therefore, almost all elicited absolutely stable games express the expectation for a mutually cooperative solution. However, the gap in the proportions of absolutely stable games between the parties (72% vs. 41%) reveals meaningful differences in the perception of the Israeli-Palestinian conflict. Noticeably, none of the parties tend to perceive the interaction as a PD-like game.

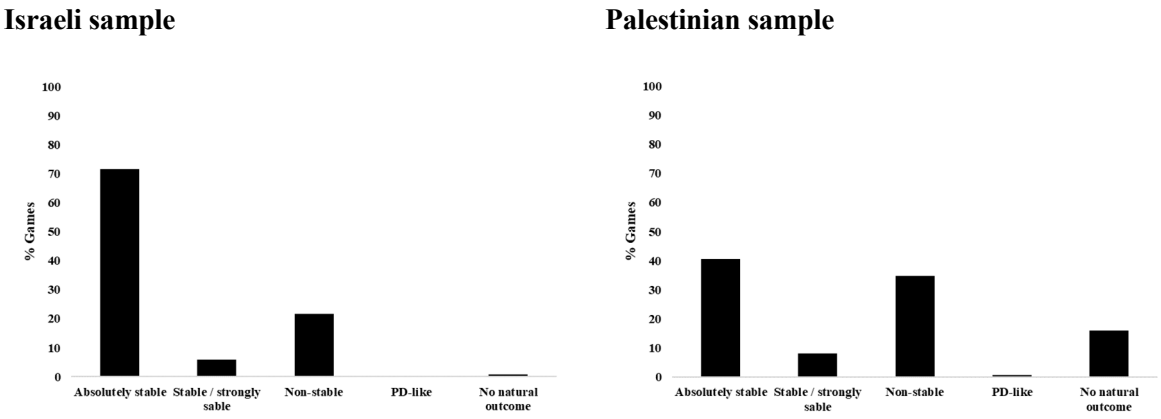

Figure 9. Distributions of Israeli and Palestinian SGSs according to the revised Rapoport and Guyer taxonomy of games.

v. Distribution of game types according to the SERS-based taxonomy

Further examining the SERS-based taxonomy of all games, Figure 10 shows that about a third of all games in both samples are *two-player similarity-sensitive* games. However, Israeli participants perceived almost three times as many Israeli one-sided similarity-sensitive games (26%) compared to Palestinian participants' perceived Israeli one-sided similarity-sensitive games (9%). Also, Israeli participants perceived fewer Palestinian one-sided similarity-sensitive games (27%) compared to Palestinian participants' perceived Palestinian one-sided similarity-sensitive games (43%). Overall, the distributions of SERS-based game types reveal a significant difference between the perceptions of both parties ($\chi^2 = 19.47$, $p < 0.001$).

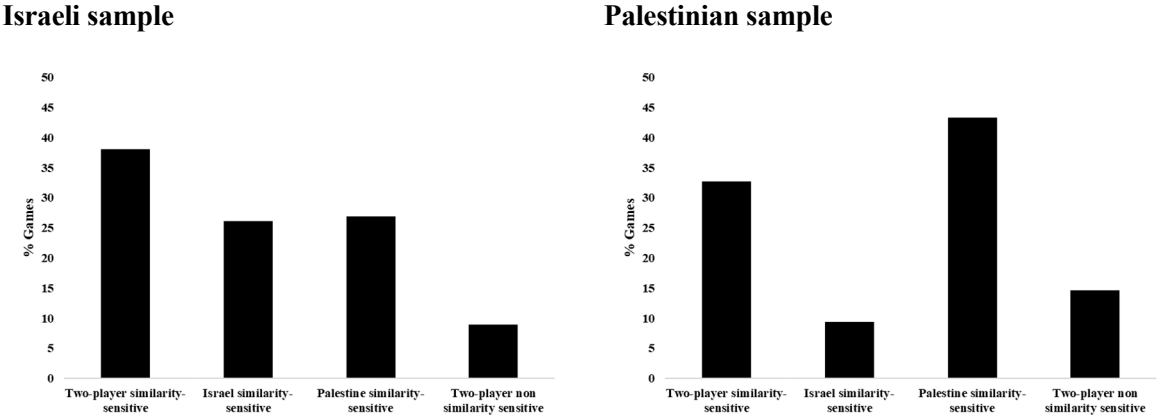

Figure 10. Distributions of Israeli and Palestinian SGSs according to the SERS-based taxonomy of games.

Merging two-player similarity-sensitive games with own-side similarity-sensitive games, separately for each party, shows that 64% of the Israeli SGSs are similarity-sensitive for the Israeli side, and that 76% of the Palestinian SGSs are similarity-sensitive for the Palestinian side. These relatively high percentages point to the importance of similarity perceptions, suggesting that influencing the parties' similarity perceptions of each other may play a key role in resolving the conflict.

vi. Perceived inter-group and interpersonal similarity distributions

As mentioned above, participants provided two types of similarity perceptions, one that addresses the similarity between the two groups, and one that addresses the similarity between the participant and a person the participant considers to be representative of

the other group. Figure 11 shows that both inter-group and interpersonal similarities reported by the Israeli participants give rise to a rather homogeneous distribution, where all similarity levels (apart from extremely high values) are equally represented. In contrast, the distributions of Palestinian inter-group and interpersonal similarities are characterized by a large proportion, about 40%, of extremely low similarity perceptions (ranging from 0 to 10, out of 100); while the other 60% of reported similarity perceptions exhibit a rather homogeneous distribution across all other similarity levels.

For both groups, inter-group and interpersonal similarity assessments reveal identical distributions (Figure 11). The average Israeli participants' inter-group and interpersonal similarity estimates are 40.0 (SD = 25.04) and 39.4 (SD = 26.08), respectively; and the correlation between both measures is r = 0.55 ($t_{(140)}$ =7.77, $p < 0.001$). The Palestinian participants' inter-group and interpersonal similarity estimates are 31.3 (SD = 30.60) and 36.7 (SD = 35.36), respectively; and the correlation between both measures is r = 0.40 ($t_{(85)}$ = 3.95, $p < 0.001$). Comparing the average reported similarity estimates of Israeli and Palestinian participants shows a significant difference for the inter-group similarity ($t_{(153)}$ = 2.22, p = 0.028; Cohen's d = 0.32), and no significant difference for the interpersonal similarity measure ($t_{(141)}$ = 0.60, n.s.; Cohen's d = 0.09). Focusing on the inter-group conflict, we continue the analyses by using the inter-group similarity measure in SERS-based EV calculations.

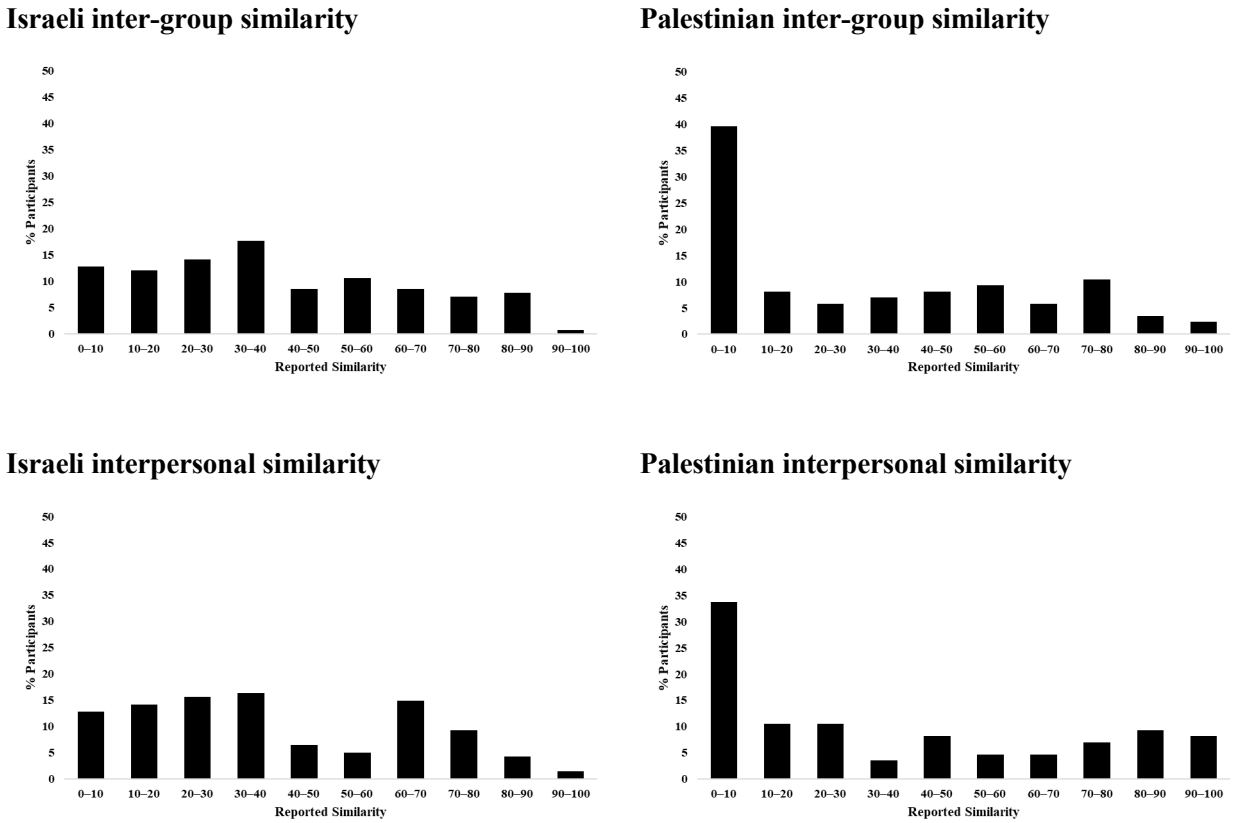

Figure 11. Reported similarity distributions for all participants. $N_{Israeli}$ = 141; $N_{Palestinian}$ = 86.

vii. Predicted choices according to SERS

Examining the SGSs and the inter-group similarity level reported by each participant allows for the computing of two SERS-based EVs (i.e., a cooperative and a confrontational EV) and choosing the alternative with the higher EV, first for the participant's own party, and then for the opponent. Note that the perceived strategic similarity is regarded here as a symmetric property. Therefore, the reported p_s of each participant is used to calculate one's own SERS-based expected value as well as the opponent's SERS-based expected value.

Figure 12 shows that the proportion of Israeli SERS-based cooperative choices for their own (Israeli) side is much higher (66%) than the Palestinian SERS-based cooperative choices for their own (Palestinian) side (49%; $\chi^2 = 8.00$, $p < 0.01$). Moreover, the proportion of Israeli SERS-based cooperative choices for their own (Israeli) side is much higher (66%) than the Palestinian SERS-based cooperative choices for the other (Israeli) side (42%), resulting in a significantly different distribution of cooperative and confrontational expected choices ($\chi^2 = 9.86$, $p < 0.01$). In other words, according to SERS, Israelis are predicted to choose more cooperative choices than the Palestinians expect them to choose. In contrast, the proportion of Palestinian SERS-based cooperative choices for their own (Palestinian) side is lower (49%) than the proportion of Israeli SERS-based cooperative choices for the other (Palestinian) side (58%). However, the distributions of cooperative and confrontational expected choices for the Palestinian side are not significantly different when comparing the Israeli and Palestinian samples ($\chi^2 = 2.87$, $p = 0.09$).

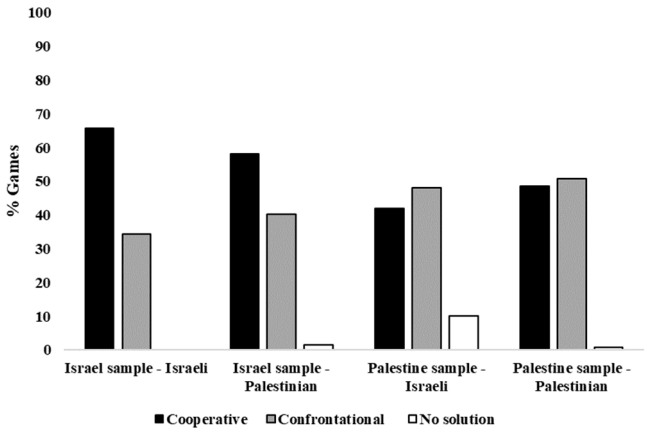

Figure 12. Cooperative and confrontational predicted choices, derived from SERS-based EVs.

viii. Averaged SGSs grouped by perceived similarity quartiles

According to SERS, (i) people with *high similarity perceptions* of the opponent are more likely to cooperate than people with low similarity perceptions, and (ii) people whose SGSs have *low similarity thresholds* are more likely to cooperate than people whose SGSs have high similarity thresholds. This raises the question of whether there exists a behavioral link between both perceptions, where the same participants that report *high similarity* levels with the opponent also provide SGSs with *low similarity thresholds*, and vice versa. To answer this question, we split the participants' samples into quartiles, according to the reported similarity perceptions. We then calculate the average SGSs separately for each similarity quartile, and describe each averaged SGS in terms of the two taxonomies and in terms of the game's (own and opponent) similarity thresholds. Note that quartiles are calculated across all participants, yet average SGSs comprise only alignable SGSs. Also note that 31% of the Palestinian sample reported a similarity level of 0; therefore, the lower similarity quartile comprises more SGSs compared to the other quartiles.

Figure 13 shows that all averaged matrices of both the Israeli and Palestinian samples, apart from the Palestinian lowest similarity quartile (Q1), are absolutely stable games according to the revised Rapoport and Guyer's taxonomy. For these games, the maximal payoffs are earned when both parties choose to cooperate. Only the Palestinian Q1 averaged SGS is a non-stable game, which is likely to motivate an intractable conflict. Moreover, all averaged SGSs of both parties for all quartiles are two-player similarity-sensitive games, meaning that both parties' strategic similarity perceptions are critical for determining the parties' expected choices.

a. Israeli Q1 mean matrix
(11 participants, 22 matrices)

	Pal. C	Pal. D
Isr. C	78.0, 73.3	15.2, 52.4
Isr. D	53.8, 16.9	26.2, 39.0

Reported similarity range: 0–0.20
Israel p_s* = 0.43
Palestine p_s* = 0.51

b. Israeli Q2 mean matrix
(22 participants, 44 matrices)

	Pal. C	Pal. D
Isr. C	87.5, 76.1	25.2, 42.1
Isr. D	43.6, 21.4	21.8, 21.9

Reported similarity range: 0.21–0.36
Israel p_s* = 0.22
Palestine p_s* = 0.28

c. Israeli Q3 mean matrix
(14 participants, 28 matrices)

	Pal. C	Pal. D
Isr. C	68.6, 61.9	23, 39.3
Isr. D	33.5, 23.3	14, 20.6

Reported similarity range: 0.37–0.59
Israel p_s* = 0.16
Palestine p_s* = 0.28

d. Israeli Q4 mean matrix
(20 participants, 40 matrices)

	Pal. C	Pal. D
Isr. C	85.6, 73.4	29.7, 48.5
Isr. D	32.6, 21.8	17.2, 25.0

Reported similarity range: 0.60–0.94
Israel p_s* = 0.04
Palestine p_s* = 0.36

e. Palestinian Q1 mean matrix
(24 participants, 48 matrices)

	Pal. C	Pal. D
Isr. C	60.7, 88.3	32.9, 62.4
Isr. D	68.6, 9.1	47.8, 5.2

Reported similarity range: 0.00–0.00
Israel p_s* = 0.73
Palestine p_s* = 0.39

f. Palestinian Q2 mean matrix
(15 participants, 30 matrices)

	Pal. C	Pal. D
Isr. C	72.3, 74.7	38, 33.6
Isr. D	48.2, 19.4	31.2, 15.0

Reported similarity range: 0.01–0.22
Israel p_s* = 0.20
Palestine p_s* = 0.19

g. Palestinian Q3 mean matrix
(20 participants, 40 matrices)

	Pal. C	Pal. D
Isr. C	59.4, 81.6	36.3, 60.8
Isr. D	49.0, 18.4	39.6, 11.8

Reported similarity range: 0.23–0.54
Israel p_s* = 0.39
Palestine p_s* = 0.38

h. Palestinian Q4 mean matrix
(16 participants, 32 matrices)

	Pal. C	Pal. D
Isr. C	73.5, 75.6	23.9, 37.0
Isr. D	48.5, 9.1	27.9, 7.3

Reported similarity range: 0.55–1.00
Israel p_s* = 0.35
Palestine p_s* = 0.29

Figure 13. Average SGSs grouped by reported inter-group similarity quartiles for Israeli and Palestinians participants.

As shown in Figure 13, the similarity thresholds of the Israeli side strictly decrease across the four quartiles. The similarity threshold of those who perceive low similarity with the Palestinians (Q1) is $p_s^* = 0.43$. Moving through the matrices of Q2 to Q4 reveals a gradual drop to $p_s^* = 0.04$. Comparing these similarity thresholds with the corresponding similarity perceptions in each quartile suggests that $p_s > p_s^*$ for all averaged SGSs apart from Q1 (where $0.2 < 0.43$). Therefore, most Israeli participants are expected to choose the cooperative alternative. Examining the Palestinian participants' sample, reveals an opposite pattern, where all averaged SGSs except Q4 are characterized by $p_s < p_s^*$, suggesting the choice of defection for most Palestinian participants.

5. Discussion

The present study examined the Israeli–Palestinian conflict (as perceived about three years prior to the outbreak of the 2023 Gaza war). Instead of relying on scholarly or political views, we applied a novel paradigm that allowed for eliciting implicit conflict perceptions, expressed as Subjective Game Structures (SGSs) from Israeli and Palestinian laymen, requiring no formal quantitative background for the participants. We then applied several analytical tools, allowing for underlying subjective perceptions of the conflict to be considered. Moreover, we tried to answer the questions of whether Israelis and Palestinians perceive the conflict in a similar manner; whether they have identical assessments of the associated payoffs; and most critically—what can be done to reduce future hostilities and attain peaceful solutions?

The results show that Israeli and Palestinian participants differed in their perceptions of the conflict. Israeli perceptions reflected rather cooperative views and the expectation for mutually cooperative resolutions, whereas Palestinian perceptions reflected ambivalent attitudes, with a higher proportion of confrontational expectations from both Israelis and Palestinians. Initial examination of participants' self-reports showed that most Israeli participants reported cooperative predictions for both sides (80% for Israelis and 75% for Palestinians), while Palestinian cooperative and confrontational expectations were more evenly divided (48% cooperation for Israelis and 55% for Palestinians).

Further analyzing participants' elicited SGSs showed that the averaged Israeli and Palestinian SGSs are both classified as absolutely stable games, which in theory should motivate fully cooperative interactions. Nevertheless, examining the same payoffs from the perspective of SERS (Fischer, 2009, 2012; Fischer et al., 2022; Fischer & Savranevski, 2023) reveals meaningful and critical differences between the parties' average matrices. Although both average matrices are two-player similarity-sensitive games, the *Israeli* matrix has very low similarity thresholds of $p_s^* = 0.20$ for the Israeli side and $p_s^* = 0.34$ for the Palestinian side, whereas the similarity thresholds of the *Palestinian* matrix are $p_s^* = 0.45$ for the Israeli side, and $p_s^* = 0.34$ for the Palestinian side. Interpreting these values requires comparing them with the parties' similarity perceptions of each other. The *average* reported inter-group similarities for the Israeli and Palestinian parties are $\overline{p_s} = 0.40$ and $\overline{p_s} = 0.31$, respectively. Therefore, despite both matrices being rather identical, one may expect a cooperative choice made by the Israeli side (since $0.40 > 0.20$) yet a rather inconclusive tendency for the Palestinian side (since $0.31 \approx 0.34$).

Examining the SGSs of individuals with different self-reported conflict expectations shows that individuals from *both samples* who expect Israeli cooperation also provide matrices with very low similarity thresholds for the Israeli party; while those who expected Israeli confrontation provided matrices with high similarity thresholds for the Israeli party. A similar pattern, though somewhat less extreme, is also observed when considering the self-reported conflict expectations and the similarity thresholds of Palestinian participants. In other words, individuals who reported expecting cooperation have a more cooperative

perception of the conflict structure itself (i.e., requiring only a low level of perceived similarity with the opponent in order to cooperate according to SERS). In parallel, those who report confrontational expectations have more confrontational perceptions of the conflict structure (i.e., requiring a high level of perceived similarity with the opponent in order to cooperate). This pattern is clearly demonstrated by Palestinian participants who predicted Israeli confrontation and provided SGSs with extremely high similarity thresholds for the Israeli party ($p_s^* = 0.93$), indicating their expectation that the Israeli side is likely to choose confrontation for almost *all* perceived levels of similarity with the Palestinians (i.e., for all levels where $p_s < 0.93$), practically indicating an overwhelming expectation of Israeli confrontation.

Examining the SGSs' game types according to the revised Rapoport and Guyer taxonomy (Fischer et al., 2024; Rapoport & Guyer, 1966) shows that 70% of Israeli participants' SGSs are absolutely stable games, while only 40% of Palestinian participants' SGSs are absolutely stable games. Since absolutely stable games are likely to indicate an expectation of mutual cooperation, this classification of games also points to a critical strategic gap, where many more Israeli participants (than Palestinian participants) expected a cooperative interaction between the parties. Notice that almost none of the participants tended to perceive the Israeli–Palestinian conflict as a PD-like game, as already suggested for ecologically valid conflicts (Johnson et al., 2002; Northcott & Alexandrova, 2015), and specifically for the Israeli–Palestinian conflict (Rowley & Webb, 2007).

Classifying SGSs according to the SERS-based taxonomy shows that 64% of the Israeli SGSs are similarity-sensitive for the Israeli side, and 76% of the Palestinian SGSs are similarity-sensitive for the Palestinian side. These relatively high proportions highlight the important role of similarity perceptions in determining the conflict's trajectory. Examining the elicited similarity perceptions reported by the Israeli participants reveals a rather homogeneous distribution, where all similarity levels (apart from extremely high values) are equally represented. In contrast, the distribution of Palestinian similarity perceptions is characterized by a large proportion, about 40%, of extremely low similarity perceptions, ranging from 0 to 10. This indicates that many Palestinian participants are likely to prefer the choice of a confrontational alternative. Calculating Israeli and Palestinian SERS-based EVs and assuming individuals choose the alternative with the higher EV reveals a higher proportion of cooperative choices (66%) for the Israeli side than for the Palestinian side (49%). In other words, according to SERS, Israelis were somewhat more likely than the Palestinians to choose a cooperative alternative.

Further splitting participants' samples into quartiles, according to the reported intergroup similarity perceptions, and calculating the average SGS similarity thresholds for each quartile, shows that the *lower* the similarity *perception* with the other party, the *higher* the similarity *threshold* of the game, both increasing the motivation to choose *confrontational* alternatives. As shown, Israeli participants in three reported similarity quartiles (all but the lowest similarity quartile) were motivated to choose a cooperative alternative, whereas Palestinian participants in three similarity quartiles (all but the highest similarity quartile) were motivated to choose a confrontational alternative.

Overall, the findings indicate differences in subjective perceptions of Israeli and Palestinian participants. Israeli attitudes tended to lean towards cooperation, while Palestinian attitudes exhibit more ambivalence and a greater inclination towards confrontational expectations from both parties. Since Israeli and Palestinian participants were sampled well before the 7 October 2023 atrocities and the following war, the reported subjective attitudes help elucidate the preconceptions that might have contributed to the outbreak of hostilities and to the Israeli misperception of Palestinian attitudes. Clearly the outbreak of war is likely to have modified the perceptions of both parties; therefore, the elicited SGSs may

no longer provide adequate representations of the current parties' strategic perceptions. Nonetheless, the results emphasize the critical role of similarity perceptions, which seem to have played an important role in determining the parties' attitudes and expectations, so that even participants with rather cooperative perceptions of the conflict (those who provided SGSs with relatively low similarity thresholds) were still expected to prefer confrontational alternatives, due to their low similarity perceptions. This suggests that peace-building efforts should focus on enhancing perceptions of inter-group similarity. While challenging, this may be more achievable than altering actual or individually perceived payoff structures. Although neither shifting similarity perceptions nor modifying actual or perceived payoffs is easy, both strategies offer pathways to foster cooperation and peaceful interactions in the Israeli–Palestinian conflict as well as in other social and political conflicts.

Finally, two cautious remarks are warranted. (i) The study relied on a convenience sample. Consequently, the two groups differ in terms of participants' average age. This difference suggests that some of the observed differences may be attributed to the higher average age of the Palestinian sample. While Peterson et al. (2020) find that political attitudes are remarkably stable over the long term, they also note that, when changes do occur, they are more likely to reflect shifts from liberal to conservative attitudes. This implies that younger participants are likely to display more liberal attitudes, which could be associated with a higher proportion of absolutely stable games, lower similarity thresholds, and higher values of elicited similarity perceptions. (ii) Clearly, using two-by-two games to model ecologically valid conflicts may oversimplify the strategic dynamics involved. However, this modeling approach focuses participants on critical choices, highlights the differences between the parties, and provides a basic, straightforward representation of the conflict and its possible resolutions.

To conclude, we wish to emphasize the benefits of shifting from externally imposed game matrices to subjectively perceived interaction structures, as represented by SGSs. This approach allows for the analysis of the interactions people perceive and respond to, rather than the games they are expected to be playing.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/g16010003/s1, Figure S1. Examples of the three classes of the SERS-based taxonomy of games, References Loomes and Sugden (1982), Nash (1950) and Rapoport and Guyer (1966) are cited in the Supplementary Materials.

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Notes

1 Note that while the classic PD game requires a strict order of the payoffs, T > R > P > S (Flood, 1958), in the category of PD-like games we allow T = R for one of the players.

2 A cell which no player is motivated to leave unilaterally while assuming the other player does not change his choice (i.e., a Nash equilibrium), yet there exists another cell in which both players obtain higher payoffs (and therefore the examined cell is not a Pareto equilibrium).

[3] Between session reliability for participants who were judged to be alignable across sessions was 7.08 (out of 10), SD = 1.87. See Fischer et al. (2024) for the computation of Matrices Strategic Resemblance Index (MSRI) applied here for assessing between session reliability.

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