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Applying game theory and interpersonal circumplex models to evaluations of outcomes of dyadic disagreements

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ABSTRACT

Two studies integrated personality and game theory models to elucidate how people approach disagreements. Four potential outcomes of dyadic disagreements are Yielding (only self makes concessions), Dominating (only partner makes concessions), Compromising (both make concessions), and Clashing (neither makes concessions). Participants (N = 725) evaluated each outcome's expected payoff in hypothetical disagreements from the *Evaluations of Disagreement Outcomes Scales* and real disagreements from their everyday lives. They also completed interpersonal circumplex measures of values and problems. More communal and less agentic values or problems—that prioritize mutuality and harmony over gaining advantage—predicted evaluating compromising and yielding more positively and clashing more negatively. Evolutionary game theory simulations showed how these interpersonal and evaluative dispositions can dynamically shape the outcomes of disagreement interactions.

1. Introduction

In everyday life, it often occurs that two individuals face an interdependent decision but disagree about the best course of action. For example, roommates may disagree about who should pay to repair a broken sink, coworkers may disagree about who should work overtime to complete a project, or siblings may disagree about who should care for their aging parents. The way individuals resolve or fail to resolve such disagreements can positively or negatively affect their well-being and the quality of their relationship (Gottman, 1994). Even seemingly trivial disagreements—such as who should prepare dinner or who should do the dishes—may have corrosive effects that accumulate over time. Given the prevalence and significance of everyday disagreements, the current research sought to better understand the personality factors involved in how individuals seek to resolve them.

2. Game theory models of disagreements

Interpersonal disagreements are a type of interdependent situation in which each individual's outcomes partly depend on the other's actions. Game theory provides a framework for formally analyzing such situations (Rapoport et al., 1976). Applying game theory to dyadic disagreements, each person can choose one of two strategies—either offering a concession or inflexibly insisting on their preferred option. Their combined choices generate four possible outcomes: (1) Person A makes concessions, but Person B does not (Person A *Yields*); (2) Person B makes concessions, but Person A does not (Person A *Dominates*); (3) both Person A and Person B make concessions (they *Compromise*); (4) neither Person A nor Person B makes concessions (they *Clash*).

Dominating and *Yielding* refer to dyadic outcomes, not individual actions. If Person A and Person B both loudly demand that the other make concessions, then neither is dominating; instead, they are *Clashing*. Likewise, if Person A and Person B both politely offer concessions, then neither is yielding; instead, they are *Compromising*. *Dominating* and *Yielding* only occur when one person makes concessions and the other does not. Thus, *Dominating* and *Yielding* must cooccur: If *Dominating* is Person A's outcome, then *Yielding* is Person B's outcome. To distinguish these labels for dyadic outcomes from their colloquial use (e.g., as labels for *individuals'* behaviors or traits), throughout this paper they will appear in capitalized italics (i.e., *Dominating*, *Yielding*, *Compromising*, *Clashing*).

Table 1 presents these outcomes in matrix form. Each outcome has a value for each person, and each person may evaluate the outcomes differently (Halevy & Katz, 2013). For example, *Dominating* might have a value of +1 for Person A and a value of −2 for Person B. Populating the matrix with these values produces a payoff matrix that can be used to

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Table 1
Outcome Matrix for Disagreement Between Two Individuals.

		Person B Makes Concessions	No Concessions
Person A	Makes Concessions	*Compromise*	*Person A Yields*
	No Concessions	*Person A Dominates*	*Clash*

mathematically predict the behavioral strategies each person is likely to choose and how those strategies may change across repeated interactions. Since individuals' subjective payoff matrices (i.e., their relative preferences for each outcome) are important inputs to game-theoretic models of everyday disagreements, it is important to be able to assess and quantify those preferences.

Evolutionary game theory adds dynamic cumulative processes to traditional game theory (Dawkins, 1976; Maynard Smith & Price, 1973). To illustrate, imagine the following scenario: When two members of a species simultaneously discover a piece of food, each can either offer to share it (and not fight over it) or try to grab it all (and fight for it if necessary). The payoffs (fitness consequences) of each encounter are: (a) an individual who grabs when the other shares gets a +2 payoff (all the calories at no cost); (b) an individual who shares when the other also shares gets a +1 payoff (half the calories at no cost); (c) an individual who shares when the other grabs gets a zero payoff (no calories, but no cost either); (d) an individual who grabs when the other also grabs gets a –1 payoff (on average, the cost of fighting exceeds the caloric benefit). Assuming there are genes that govern an individual's propensity to grab versus share, evolutionary game theory predicts that across multiple generations individuals' behavioral tendencies will converge toward an equilibrium or "evolutionarily stable strategy". For the payoff values in this example, the equilibrium is a mixed strategy where during any particular encounter the probability of an individual sharing versus grabbing is 0.5. If either behavior becomes more prevalent in the population, then natural selection favors genes contributing to the less prevalent behavior (e.g., too frequent sharing allows individuals less inclined to share to get more calories at little cost, thereby increasing their fitness), eventually restoring the equilibrium. Thus, evolutionary game theory can be used to predict and explain the ratio of behavioral traits in animal populations.

The same approach can be used to understand the dynamics of behaviors within a specific interpersonal relationship or interaction (Westermann & Banisch, 2024). For example, imagine that Person A and Person B repeatedly encounter situations in which they can either share or grab. Person A's expected payoff for each behavior depends not on the probability that some random individual will share or grab, but rather on the probability that Person B will share or grab. And instead of behavioral probabilities evolving across generations via natural selection, the two individuals' behavioral probabilities evolve continually as they interact via reinforcement and punishment. This is how evolutionary game theory is applied in the current manuscript. Importantly, the mathematics remains the same. For example, if the payoffs for Person A and Person B are like those above (i.e., mutual sharing yields a payoff of +1, and so on), then across multiple interactions Person A and Person B will increasingly learn that they maximize their expected payoff by sharing approximately half the time (since sharing more frequently makes one too vulnerable to exploitation, while sharing less frequently makes one too prone to costly competitions).

The above scenarios are examples of "symmetric games" in which the payoff structure is the same for both interactants. But in the natural world games are often asymmetric, meaning the payoff structure differs for each individual (Maynard Smith & Parker, 1976; McAvoy & Hauert, 2015). For example, when two animals discover a piece of food, the relative expected value of sharing versus grabbing may differ depending on how hungry—or how skilled a fighter—each animal is. In disagreements between humans, while outcome payoffs will partly reflect particulars of the disagreement and relationship, asymmetries in preferences may also reflect stable individual differences. For example, some individuals may generally find *Yielding* less appealing than others do, regardless of the situation. A reliable measure of these evaluative dispositions could help predict individuals' typical payoff matrices and thus their typical strategies for handling disagreements. Since no such measure exists, the first aim of this research was to develop one.

3. Interpersonal personality dispositions and evaluations of disagreement outcomes

Many studies have found that personality traits predict *behavior* in interdependent situations, such as economic games (see Pletzer et al., 2018; Tehrani & Yamini, 2020; Thielmann, Spadaro, & Balliet, 2020; Zhao & Smillie, 2015). Cooperative behavior was positively associated with traits like HEXACO honesty-humility, FFM-agreeableness, and empathy, and negatively associated with aggression, envy, and the dark triad (Machiavellianism, narcissism, and psychopathy). But little is known about whether personality dispositions predict *preferences* for different potential outcomes of disagreements. Perhaps only Halevy and colleagues (2014) have examined this question directly, finding that in conflict situations HEXACO Honesty-Humility and Big-Five Agreeableness predicted preferring mutual cooperation over unilateral gain. Thus, the second aim of this paper was to extend this line of research by examining whether interpersonal dispositions encompassed by the interpersonal circumplex predict evaluations of disagreement outcomes.

The interpersonal circumplex—depicted in Fig. 1—is a circular framework underlaid by a vertical dimension of *agency* and a horizontal dimension of *communion* (Leary, 1957; Wiggins, 1979). The agency axis ranges from confident, assertive, forceful stances (at the upper +A or "PA" pole) to meek, passive, conflict-avoidant stances (at the lower –A or "HI" pole). The communion axis ranges from warm, trusting, nurturing stances (at the right +C or "LM" pole) to cool, wary, distancing stances (at the left –C or "DE" pole).

In a circumplex model the diagonals also reflect meaningful dimensions of variation. The diagonal spanning the "BC" to "JK" octants range from agentic-and-uncommunal (+A–C) aggressive, callous, manipulative stances in the upper-left to unagentic-and-communal

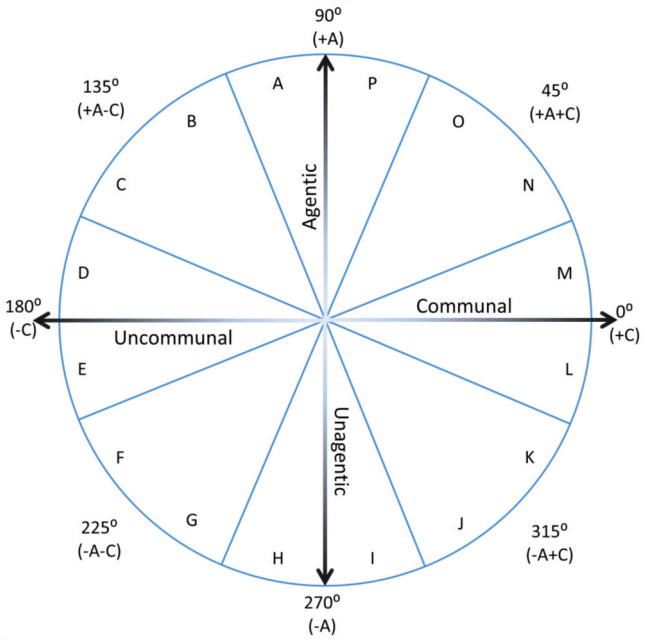

Fig. 1. Interpersonal circumplex. +C = Communal; +A+C = Agentic & Communal; +A = Agentic; +A–C = Agentic & Uncommunal; –C = Uncommunal; –A–C = Unagentic & Uncommunal; –A = Unagentic; –A+C = Unagentic & Communal.

(–A+C) gentle, compliant, altruistic stances in the lower-right. The diagonal spanning the "FG" to "NO" octants range from unagentic-and-uncommunal (–A–C) reserved, apprehensive, introverted stances in the lower-left to agentic-and-communal (+A+C) enthusiastic, expressive, extroverted stances in the upper-right.

The circumplex is a structural model (Gurtman, 2016) that has been used to assess and organize various interpersonal dispositions, including behavioral dispositions (Meisel et al., 2024; Wiggins, 1979), motivational and emotional dispositions (Hopwood et al., 2011; Horner et al., 2025; Locke, 2000), and problematic dispositions (Boudreaux et al., 2018; Horowitz et al, 2003). The current paper specifically focuses on motivational dispositions (i.e., interpersonal values) and problematic dispositions (i.e., interpersonal problems). The interpersonal circumplex is a promising framework for understanding dispositional influences on evaluations of disagreement outcomes for three reasons. First, the above-mentioned personality dispositions that predicted responses to interdependent situations (i.e., honesty-humility, agreeableness, empathy, aggression, envy, and the dark triad) also correlate with interpersonal circumplex inventories (e.g., Barford et al., 2015; Dowgwillo & Pincus, 2017, Du et al., 2021). Second, the circumplex framework can reveal how different personality dispositions share similar locations within the space of agency x communion and can help specify which dimension within that space best predicts outcome preferences. Third, linking evaluations of disagreements to the interpersonal circumplex situates them within a broader nomological network of other variables linked to that circumplex.

To date, the only study to explicitly map evaluations of disagreement outcomes onto the circumplex is Locke's (2014, Study 6) which mapped evaluations of inter*group* disagreement outcomes onto a circumplex of inter*group* goals. The results showed that stronger communal and weaker agentic goals predicted evaluating *Compromising* as the best outcome and *Clashing* as the worst.

Based on their outcome preferences, individuals can be categorized as construing disagreements in terms of four game-theoretic "templates" (Halevy & Katz, 2013). Individuals who consider *Dominating* the best outcome and *Clashing* the worst are construing disagreements as a game of "*Chicken*". Individuals who consider *Compromising* the best outcome and *Yielding* the worst are construing disagreements as an "Assurance" game. Individuals who consider *Compromising* the best outcome and *Clashing* the worst are construing disagreements as a "No-Conflict" or "Harmony" game.[1] Individuals who consider *Dominating* the best outcome and *Yielding* the worst are construing disagreements as a "Prisoner's Dilemma". Thus, Locke (2014) found that stronger communal and weaker agentic goals predicted construing disagreements as *Harmony Games* and not as *Prisoner's Dilemmas*.

Locke's (2014) study was limited by relying on a single intergroup disagreement and forced-choice outcome measures. In contrast, the present studies examine multiple interpersonal disagreements and measure outcome evaluations on four independent ordinal scales. Using separate continuous scales enables more powerful and precise tests of how evaluations of each outcome relate to interpersonal dispositions, and—by quantitatively specifying individuals' payoff matrices—enables more precise hypotheses regarding when individuals are apt to offer concessions.

[1] Halevy and Katz (2013) refer to this game type as "*Maximizing Difference*". *Maximizing Difference* traditionally labels games where the objective payoffs favor cooperation and the only reason someone would not cooperate is that they want to maximize the difference between their gains and others' gains (McClintock & McNeel, 1966). The term *maximizing difference* describes not the original payoff matrix, but rather the matrix after it has been transformed (e.g., by hostility, resentment, or spite) into a competitive structure in the minds of uncooperative individuals. Thus, *Maximizing Difference* is a misleading name for the subjective payoff matrix of individuals who invariably favor offering concessions because they genuinely experience *Compromising* as the best outcome and *Clashing* as the worst. Accordingly, the current paper refers to this type of payoff matrix as a *Harmony Game*, a term regularly used in the context of evolutionary game theory (Martinez-Vaquero et al., 2012; LaPorte et al., 2025).

4. Summary of current studies

Game theory provides a formal account of how evaluations of disagreement outcomes can shape the trajectory of disagreement interactions (Rapoport et al., 1976). The interpersonal circumplex provides a framework for predicting individual differences in evaluations of disagreement outcomes. For example, greater openness to *Compromising* or *Yielding* may reflect broader unagentic-and-communal dispositions to preserve pleasant, harmonious, supportive relationships, while greater openness to *Dominating* and even *Clashing* may reflect broader agentic-and-uncommunal dispositions to protect one's sense of control and autonomy.

Combining insights and tools from game theory and interpersonal theory, two studies examined associations between dispositional values and problems reflecting each interpersonal circumplex octant and the perceived desirability of potential disagreement outcomes. Individuals who place high value on communion and low value on agency (i.e., who prioritize being connected, liked, and not upsetting or disappointing others) were hypothesized to evaluate offering concessions more favorably—and thus be more likely to construe disagreements as a *Harmony Game*—than individuals who place high value on agency and low value on communion (i.e., who prioritize being firm, strong, and not letting others control or exploit them).

To assess preferences for *Dominating*, *Yielding*, *Compromising*, and *Clashing* the studies relied primarily on a novel measure, the *Evaluations of Disagreement Outcomes Scales* (*EDOS*). The EDOS asks respondents to evaluate the desirability of each outcome in the context of hypothetical disagreements between themselves and another person. To increase confidence in the validity of the EDOS and generalizability of the findings, Study 2 also asked participants to evaluate outcomes of actual disagreements they were currently facing.

Finally, participants' outcome preferences either as reported on the EDOS (in Study 1) or estimated from their interpersonal circumplex scores (in Study 2) were used as inputs to evolutionary game theory simulations of disagreement interactions. The simulations illustrate how dispositional outcome preferences can generate testable predictions about the likely dynamics of disagreement interactions.

5. Open Science and Ethics

Both studies were preregistered. The preregistered materials, procedures, sample sizes, hypotheses, and hypothesis tests along with the data and R analysis code are publicly available at https://doi.org/10.17605/OSF.IO/DY385 (for Study 1) and https://doi.org/10.17605/OSF.IO/6SNA2 (for Study 2). This research was certified as exempt from review by the University of Idaho Institutional Review Board. All participants provided informed consent.

6. Study 1

Study 1 had three aims which collectively sought to establish the reliability, relevance, and personality correlates of individual differences in evaluations of outcomes of everyday disagreements.

The first aim was to test the reliability of the measure of evaluations of disagreement outcomes—the *EDOS*. The *EDOS* asks respondents to evaluate the desirability of each possible outcome of hypothetical disagreements between themselves and another person. Hypothesis 1 posited that across the scenarios there would be reliable individual differences in evaluations of the desirability of *Dominating* (H1a), *Yielding* (H1b), *Compromising* (H1c), and *Clashing* (H1d).

The second aim was to model how individuals' evaluations of disagreement outcomes might shape interpersonal dynamics over time. To do so, several example participants' EDOS scores were used to

populate payoff matrices, and their disagreement interactions were simulated by applying evolutionary game theory to those matrices.

The third aim was to test whether interpersonal motives reflecting different regions of the interpersonal circumplex predict evaluations of desirability of different disagreement outcomes. To this end, participants' EDOS scores were correlated with their scores on the *Circumplex Scales of Interpersonal Values* (CSIV; Locke, 2000), a measure of interpersonal goals associated with each circumplex octant. Hypothesis 2 posited that evaluations of *Dominating* (H2a), *Yielding* (H2b), *Compromising* (H2c), and *Clashing* (H2d) would show prototypical circumplex profiles (Wright et al., 2009), characterized by positive associations with one region of the circumplex and negative associations with the opposite region.

7. Method

7.1. Participants and sample size

A power analysis indicated a sample size of 463 was adequate to observe small associations $\geq$ 0.15 with 90 % power at $\alpha = 0.05$ (2-tailed); however, assuming 5 % of respondents would fail the inclusion criteria, the preregistration proposed recruiting 487 participants. On 16-May 2024, 489 English-speaking participants residing in the United States were recruited via CloudResearch's Connect platform (Hartman et al., 2023). Eleven participants failed the inclusion criteria by either giving the same response to over 90 % of the CSIV items or incorrectly answering at least one of two attention-check items. Thus, the final sample size was 478 (225 women, 251 men, 2 non-binary; *M* age = 38.8 years, *SD* = 11.7, *range* = 19–75). Their self-reported race/ethnic groupings (provided by CloudResearch) were: 66 % White/Caucasian, 16 % Black, 9 % Asian, 5 % Hispanic/Latino, 4 % Other.

7.2. Measures

7.2.1. Interpersonal motives

Interpersonal motives or goals associated with each interpersonal circumplex octant were assessed using the 32-item (4-items per octant) version of the *CSIV* (Locke, 2000). This version has been used successfully in multiple studies (e.g., Fournier et al., 2022; Horner et al., 2025; Nielsen & Wright, 2025). Respondents rated the importance of acting, appearing, or being treated in particular ways in interpersonal situations on scales ranging from *not important to me* (0) to *extremely important to me* (4). Example items include how important is it that "I appear confident" (+A), "I do what they want me to do" (−A), "I feel connected to them" (+C), and "they keep their distance from me" (−C). The order of item presentation was randomized across participants.

Supplemental Table S1 reports the reliability and descriptive statistics for each CSIV scale. Reliability was very good for all scales (ω = 0.75–.85) except for the +A scale ($\omega = 0.67$). Mean scores were highest on scales reflecting communal motives (+C, +A+C, and –A+C) and lowest on scales reflecting uncommunal and agentic-and-uncommunal motives (–C and +A–C), indicating that participants typically reported being more concerned with getting along with others than with protecting or prioritizing their own interests. The general pattern of people rating communal goals as moderately to very important but rating uncommunal and agentic-and-uncommunal goals as only mildly important has reliably been observed in prior studies (e.g., Horner et al. 2025).

Conformity of the CSIV octant scales to a two-dimensional circular model was tested in two ways. First, a principal components analysis (PCA) on the CSIV octants' intercorrelations showed that the first two components accounted for 67.5 % of the variance, consistent with a two-dimensional structure. (As is common when using circumplex inventories to test overall patterns across octants, in this and subsequent analyses octant scores were ipsatized by centering them around a respondent's mean response elevation across all items). Second, the CSIV's intercorrelations were subjected to a test of hypothesized order relations (Tracey, 2000). A circular model predicts that correlations between octants should decrease as the angular distance between octants increase. The CSIV's intercorrelations met 275 of the 288 predicted order relations, yielding a correspondence coefficient (proportion predictions met minus proportion predictions violated) of 0.91, reflecting excellent fit to a circular model.

7.2.2. Evaluation of disagreement outcomes scales (EDOS)

Participants imagined themselves in eight hypothetical scenarios involving a disagreement with a friend, partner, roommate, or co-worker along with four possible outcomes: *Dominating* (the other person makes concessions), *Yielding* (the participant makes concessions), *Compromising* (both make concessions), and *Clashing* (neither makes concessions and the disagreement remains unresolved). Participants rated the desirability of each outcome on the following 7-point (–3 to +3) scale: very negative, somewhat negative, slightly negative, neither, slightly positive, somewhat positive, very positive. Thus, participants made 32 desirability ratings (8 scenarios x 4 outcomes).

An example scenario was: "You and your partner disagree about how to coordinate your sleep schedules so you do not disrupt each other's sleep. You want your partner to shift their sleep/wake times forward one hour. Your partner wants you to shift your sleep/wake times back one hour." The four possible outcomes were:

- How negative or positive of an outcome would it be if this disagreement gets resolved by your partner shifting their sleep/wake times forward one hour?
- How negative or positive of an outcome would it be if this disagreement gets resolved by you shifting your sleep/wake times back one hour?
- How negative or positive of an outcome would it be if this disagreement gets resolved by you both shifting your sleep/wake times by half an hour?
- How negative or positive of an outcome would it be if neither of you make concessions and you continue to disrupt each other's sleep?

The *Dominating* and *Yielding* items simply stated that one person made a concession that resolved the disagreement (and did not explicitly state that the other person did not make concessions); however, participants presumably inferred that the other person did not make concessions since the concession that resolved the disagreement was exactly and entirely what that other person wanted.

To control for any confounding of outcome valence with which "side" of the disagreement a participant was on, half of the participants were randomly assigned to each side of the disagreement. For example, in the above example some participants read "You want your partner to shift their sleep/wake times forward one hour…", whereas other participants read "You want your partner to shift their sleep/wake times back one hour…". In three of the eight scenarios both parties wanted identical concessions (e.g., both parties wanted the other to put more effort into staying in touch), in which case changing which "side" was assigned did not change the wording.

7.3. Procedure

Participants completed an online questionnaire consisting of the CSIV followed by the EDOS. The order of the EDOS scenarios was randomized for each participant, as was the order of the four outcome ratings within each scenario. Age and gender were recorded at the end of the survey but were not part of the preregistered hypotheses or analysis plan.

8. Results

Because the survey required participants to answer every item before

Table 2
Reliability and Descriptive Statistics for the Evaluations of Disagreement Outcomes Scales (EDOS) and Evaluations of Outcomes of Real Disagreements

	Hypothetical Disagreements (*EDOS*)						Real Disagreement	
	Study 1			Study 2			Study 2	
Outcome	ω	*M*	*SD*	ω	*M*	*SD*	*M*	*SD*
Compromising	0.85	1.65	*0.89*	0.81	1.92	*0.79*	1.25	*1.60*
Dominating	0.89	0.92	*0.98*	0.85	0.68	*0.91*	0.64	*1.72*
Yielding	0.85	0.29	*0.93*	0.84	0.13	*0.84*	−0.85	*1.61*
Clashing	0.94	−2.00	*1.09*	0.86	−2.45	*0.63*	−2.09	*1.26*

Note. Ns = 478 in Study 1 and 247 in Study 2. Ratings were made on –3 (very negative) to +3 (very positive) scales. Evaluations of the outcomes of hypothetical disagreements reflect the average of eight items. ω = McDonald's total omega.

moving to the next section, there was no missing data. Data outliers were not removed.

8.1. Properties of the EDOS

Hypothesis 1 was that there would be reliable individual differences in ratings of the negativity-positivity of each outcome. As Table 2 (column 1) shows, scale reliability ranged from 0.85 to 0.94, consistently exceeding the preregistered (McDonald's ω > 0.6) criterion. Since Hypothesis 1 was supported, each participant's evaluations of each outcome were averaged across the eight scenarios. Table 2 shows that the average participant rated *Compromising* as a somewhat positive outcome, *Dominating* as slightly positive, *Yielding* as neither positive or negative, and *Clashing* as somewhat negative. In short, participants typically liked mutual concession and disliked mutual intransigence, with asymmetrical outcomes (*Dominating* or *Yielding*) falling in between. Intercorrelations among the scales are reported in Supplemental Table S2.

Using Game Theory to Simulate Outcomes of Disagreement Interactions.

Projecting EDOS scores through the lens of evolutionary game theory (Westermann & Banisch, 2024) can reveal how interactants' disagreement interactions might unfold dynamically over time. To illustrate, consider how we might predict the behavior of Person A who is having a disagreement with Person B. If B offers a concession, then A's expected value for offering versus not offering a concession is the difference between A's evaluations of *Compromising* versus *Dominating*. If B does not offer a concession, then A's expected value for offering versus not offering a concession is the difference between A's evaluations of *Yielding* versus *Clashing*. Thus, A's expected value for offering a concession is a weighted combination of (a) the difference between A's evaluations of *Compromising* versus *Dominating*, multiplied by the probability that B offers a concession, and (b) the difference between A's evaluations of *Yielding* versus *Clashing*, multiplied by the probability that B does not offer a concession. Expressed mathematically:

$$\begin{aligned} EV_A\text{Concession} = {} & (V_A\text{ Compromise} - V_A\text{ Dominate}) \times P_B\text{ Concession} \\ & + (V_A\text{Yield} - V_A\text{Clash}) \times (1 - \text{Yield} \\ & - P_B\text{Concession}) , \end{aligned} \tag{1}$$

where EV_AConcession is Person A's expected value for making a concession; V_ACompromise, V_ADominate, V_AYield, and V_AClash are Person A's evaluations of each outcome (i.e., Person A's EDOS scores); and P_BConcession is Person B's current probability of making a concession.

Evolutionary game theory assumes that to the degree that EV_AConcession is positive (negative), making concessions will be reinforced (punished), and Person A will become more (less) likely to offer concessions to Person B. How strongly EV_AConcession changes A's inclination to make concessions depends on A's prior inclination towards or against making concessions. The impact of EV_AConcession is maximal when Person A is maximally uncertain about whether concessions will be reinforced or punished (i.e., when A's P_AConcession = 0.5) and will progressively diminish as Person A's P_AConcession approaches either zero or one. Expressed mathematically (and mirroring replicator dynamics from evolutionary game theory):

$$\begin{aligned} dP_A\text{Concession}/dt = {} & P_A\text{ Concession}\,(1 - P_A\text{ Concession}) \\ & \times EV_A\text{ Concession} , \end{aligned} \tag{2}$$

where dP_AConcession/dt is the instantaneous rate of change in P_AConcession.

Analogous equations describe Person B's experiences and actions. Consequently, each person's propensities to offer or withhold concessions evolves in response to the other's propensities, creating a coupled dynamic system in which both interactants continually update their inclinations to make concessions based on their accumulated experience with each other. We can model or simulate these dynamics of disagreement interactions using simple algebra and ordinary differential equations, as formalized in the equations above and illustrated in the simulations below.

Table 3 (top section) shows typical participants' payoff matrix (using the mean EDOS scores from Table 2). Entering typical Person A's payoffs into Equation 1: EV_AConcession = (1.65 – 0.92) * p_BConcession + (0.29 + 2.00) * (1 − p_BConcession). Solving this equation shows that EV_AConcession is positive for every value of P_BConcession. The implication is that typical individuals favor making concessions regardless of others' actions, and typical dyads construe everyday disagreements as *Harmony Games* and resolve them by *Compromising*.

But not everyone approaches disagreements as a *Harmony Game*. To illustrate possible patterns when one or both interactants do not construe disagreements as a *Harmony Game*, simulations involving Study 1 participants #173, #356, and #476 are presented below. Participant #173 was a woman whose EDOS scores closely mirrored the sample averages; thus, #173 construed disagreements as a *Harmony Game* where making concessions is always preferred. Participant #476 was a man who also preferred *Compromising* over *Dominating*, but unlike most people considered *Yielding* the worst outcome, even worse than *Clashing*; thus, participant #476 construed disagreements as an *Assurance Game* where making concessions is only desirable if reciprocated. Participant #356 was a woman who preferred *Dominating* to *Compromising* and *Yielding* over *Clashing*; thus, #356 construed disagreements as a *Chicken Game* where making concessions is only desirable when the other person does *not* make concessions. For simplicity the simulations begin with each participant's odds of making a concession being 50:50.[2]

8.2. Simulation 1: Participants #173 x #476 (Harmony x Assurance)

How might an interaction proceed between participant #173 who construes disagreements as a *Harmony Game* and participant #476 who construes disagreements as an *Assurance Game*? Table 3's second matrix

[2] Curious readers can adjust those initial probabilities and several other parameters in the simulation code at the bottom of Study 1's R code posted at https://doi.org/10.17605/OSF.IO/DY385.

Table 3
Payoff matrices for an average pair of participants and the pairs of participants used in simulations in Study 1

Average Participants' Payoffs		**Average Participant "B"**	
		Makes Concessions	No Concessions
Average Participant "A"	Makes Concessions	*Compromise*: 1.65,1.65	*"A" Yields*: 0.29,0.92
	No Concessions	*"A" Dominates*: 0.92,0.29	*Clash*: −2.0,−2.0
Simulation #1		**Participant #476**	
		Makes Concessions	No Concessions
Participant #173	Makes Concessions	*Compromise*: 1.625,0.25	*#173 Yields*: 0.5,−0.375
	No Concessions	*#173 Dominates*: 0.75,−0.25	*Clash*: −2.0,0.75
Simulation #2		**Participant #173**	
		Makes Concessions	No Concessions
Participant #356	Makes Concessions	*Compromise*: 1.25,1.625	*#356 Yields*: −1.125,0.75
	No Concessions	*#356 Dominates*: 2.75,0.5	*Clash*: −3.0,−2.0
Simulation #3		**Participant #476**	
		Makes Concessions	No Concessions
Participant #356	Makes Concessions	*Compromise*: 1.25,0.25	*#356 Yields*: −1.125,−0.375
	No Concessions	*#356 Dominates*: 2.75,−0.25	*Clash*: −3.0,0.75

shows the dyad's EDOS scores. Entering them into Equation 1 reveals that participant #173′s EV_{173}Concession is positive regardless of what participant #476 does, but #476′s EV_{476}Concession is only positive when #173′s P_{173}concession exceeds 0.62. By solving Equation 1 simultaneously for both participants, we can model their likelihood of making concessions—and experiencing each potential disagreement outcome—over time. Fig. 2 shows the results. Because #173 is *unconditionally* reinforced for making concessions, her P_{173}Concession quickly increases to 1.0 (see panel a) and thus her probabilities of *Clashing* or *Dominating* #476 quickly decrease to zero (see panel b). And once #173′s P_{173}Concession exceeds 0.62, #476′s EV_{476}concession becomes positive. Consequently, #476 increasingly offers concessions and their disagreements are increasingly resolved by *Compromising*.

More generally, this trajectory is expected whenever one person approaches disagreements warily as an *Assurance Game* and the other approaches it openly as a *Harmony Game*. As the wary individual becomes increasingly sure that the other person will offer concessions they will become increasingly open to making concessions as well.

8.3. Simulation 2: Participants #356 x #173 (Chicken x Harmony)

How might the interaction proceed if participant #173 instead interacts with participant #356 who construes disagreements as a *Chicken Game*? Table 3 displays their payoff matrix. Equation 1 shows that once #173′s P_{173}concession exceeds 0.55, participant #356′s EV_{356}Concession becomes *negative*. Fig. 3 shows the resulting dynamics. Since #173′s P_{173}Concession quickly rises to 100 %, participant #356′s P_{356}Concession quickly drops to 0 %, and the dyad gets mired in #356 always *Dominating*. More generally, this trajectory is predicted whenever one person approaches disagreements as a *Chicken Game* while the other approaches it as a *Harmony Game*: As the person playing *Chicken* become increasingly sure that their partner will offer concessions—and thus that refusing to make concessions will be rewarded by *Dominating* rather than punished by *Clashing*—they will become increasingly intransigent.

8.4. Simulation 3: Participants #356 x #456 (Chicken x Assurance)

Finally, how might disagreement interactions proceed between participant #356 (who construes disagreements as a *Chicken Game*) and participant #476 (who construes disagreements as an *Assurance Game*)? Table 3 shows their payoff matrix. Crucially, the other's offering concessions makes #476 more inclined to offer concessions but makes #356 less inclined offer concessions. Fig. 4 shows the resulting dynamics.

Initially, when they both have a 50:50 likelihood of making a concession, #356′s EV_{356}Concession is positive and #476′s EV_{476}Concession is negative. Consequently, #356′s P_{356}Concession increases and #476′s P_{476}Concession decreases. But once #356′s P_{356}Concession exceeds 62 % and #476 can feel less anxious about *Yielding*, #476′s EV_{476}Concession becomes positive and he begins making more concessions (resulting in more *Compromising* and less *Clashing*). But once #476′s P_{476}concession exceeds 55 %, #356′s EV_{356}Concession becomes negative and her propensity to offer concessions declines (causing the trend towards more *Compromising* and less *Clashing* to decelerate and then reverse). But once #356′s P_{356}concession drops below 61 %, #476′s EV_{476}Concession becomes negative, and he starts making fewer concessions, which in turn increases #356′s EV_{356}Concession. The bottom line is that by around time point 11 they are *both* back where they began—with a 50:50 likelihood of making a concession—and the exact same dynamics begin again! More generally, any dyad where one person approaches disagreements as an *Assurance Game* and the other approaches it as a *Chicken Game* is prone to getting trapped in endlessly repeating cycles (with the specifics of the cycles varying depending on the interactants' specific preferences and initial openness to offering concessions).

The preceding simulations necessarily omit the complexities of real-world interactions. Nonetheless, they illustrate how preferences for different outcomes may shape how dyads negotiate disagreements, thereby underscoring the importance of being able to reliably measure and predict those preferences.

8.5. Associations between EDOS and CSIV

If predicting individuals' evaluations of disagreement outcomes is useful, then it will be useful to know how their evaluations relate to other personality dispositions. Hypothesis 2 was that each EDOS scale would show a prototypical wavelike profile of correlations with the CSIV, with positive correlations in one region of the values circumplex and negative correlations in the opposing region. Hypothesis 2 was tested by using the correlations between each outcome and each CSIV octant to compute circumplex summary parameters (Gurtman & Pincus, 2003).

To illustrate, consider the correlations between the CSIV and evaluations of *Compromising* in Table 4 (first row, left side). *Compromising* correlated negatively with uncommunal (–C) and agentic-and-uncommunal (+A–C) values and positively with communal (+C) and unagentic-and-communal (−A+C) values. Fig. 5 displays these correlations on the interpersonal circumplex. Within each octant, more positive correlations appear closer to the circumference of the circle and more negative correlations appear closer to the center. Thus, the correlations are closer to the circumference in the +C and −A+C regions and closer to the center in the antipodal –C and +A–C regions. As we circumnavigate the circle, the correlations roughly follow a sinusoidal pattern—progressively increasing as they approach the −A+C octant and progressively decreasing as they near the antipodal +A–C octant. To the degree that a profile of correlations fits this pattern, they can be summarized by a single vector (Gurtman & Pincus, 2003). We can quantify how well the correlations conform to a wave function via a goodness-of-fit index, R^2, that ranges from 0 to 1, with adequate fit defined as R^2s >

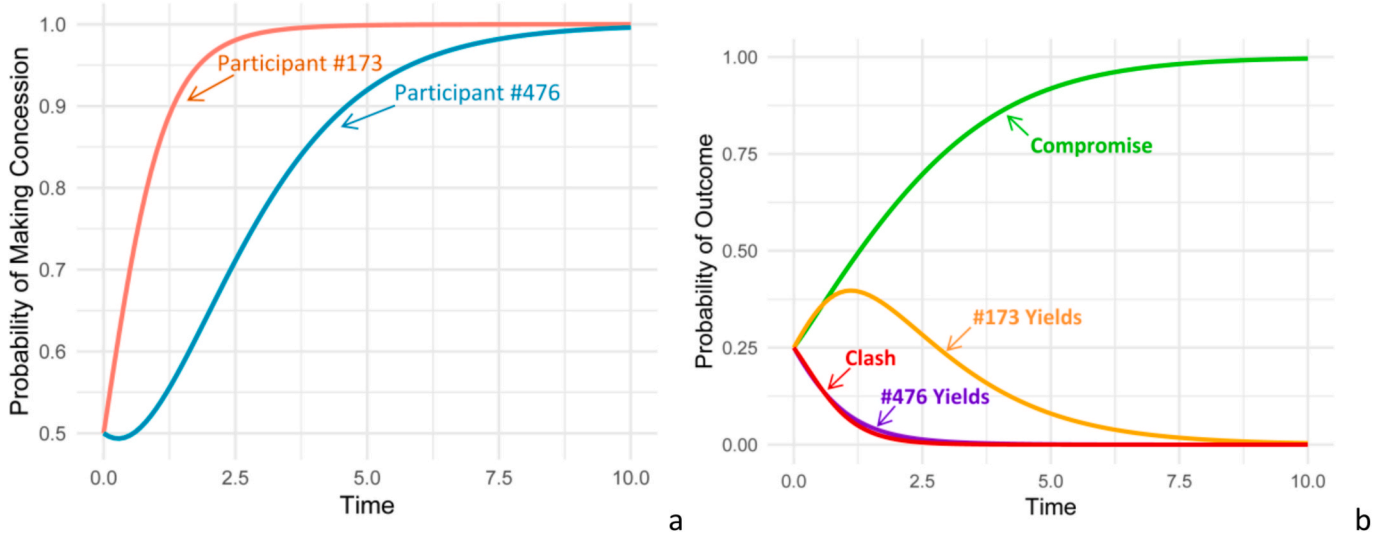

Fig. 2. Simulation of probability of making concessions (panel a) and outcomes of disagreements (panel b) for interactions between Study 1 participants #173 and #476. Participant #173 preferred to *Compromise* than to *Dominate* and preferred to *Yield* than to *Clash* (i.e., construed disagreements as a *Harmony Game*). Participant #476 preferred to *Compromise* than to *Dominate* and preferred to *Clash* than to *Yield* (i.e., construed disagreements as an *Assurance Game*).

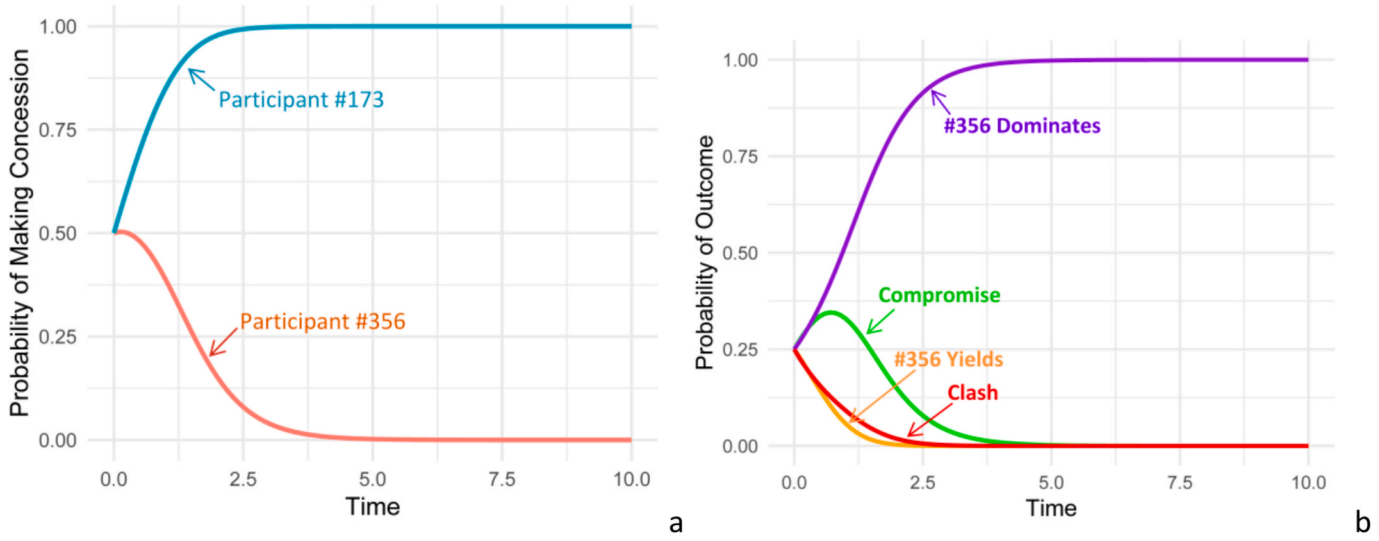

Fig. 3. Simulation of probability of making concessions (panel a) and outcomes of disagreements (panel b) for interactions between Study 1 participants #356 and #173. Participant #173 preferred to *Compromise* than to *Dominate* and preferred to *Yield* than to *Clash* (i.e., construed disagreements as a *Harmony Game*). Participant #356 preferred to *Dominate* than to *Compromise* and preferred to *Yield* than to *Clash* (i.e., construed disagreements as a *Chicken Game*).

0.7 (Zimmermann & Wright, 2017). Formulas for computing R^2 and the other summary vector parameters reported in Table 4 are detailed in the footnote below.[3] As Table 4 shows, correlations between ratings of *Compromising* and the CSIV octant scales fit a wave function very well ($R^2 = 0.92$), meaning they can be effectively described by one vector. Table 4 (top right) reports the vector's length and angle, and the arrow in Fig. 5 shows the vector projected onto the circumplex. The vector's *angle* (or *angular displacement*) shows the general *direction* of the association, with more positive evaluations of *Compromising* being pulled towards −A+C values and away from +A–C values. The vector's *length* (or *amplitude*) indicates how *intensely and unequivocally* evaluations of *Compromising* correlate with relatively high scores in one circumplex region and relatively low scores in the opposite region.

The preregistered minimum criteria for correlations to fit an interpretable circumplex profile was a vector length > 0.15 and $R^2 > 0.70$. Evaluations of *Dominating* did not meet these criteria, indicating no perspicuous pattern of associations with interpersonal values; thus, H2a was not supported. But evaluations of the other outcomes met the criteria, thereby supporting H2b, H2c, and H2d. *Compromising* and *Clashing* produced the clearest results. Communal (+C, –A+C, +A+C) values were positively associated with evaluations of *Compromising* and negatively associated with evaluations of *Clashing*. Inversely, uncommunal and agentic-and-uncommunal (–C, +A–C) values were positively associated with evaluations of *Clashing* and negatively associated with evaluations of *Compromising*. The results for *Yielding* roughly mirrored

[3] Communal Summary Vector = (0.25(LM − DE + 0.707(JK + NO − BC − FG))), and Agentic Summary Vector = (0.25(PA − HI + 0.707(BC + NO − JK − FG))), where PA is the variable's correlation with the PA octant, BC the correlation with the BC octant, etc. Vector Length = $SQRT(X^2 + Y^2)$, where X is the communal summary vector and Y and the agentic summary vector. $R^2 = (4/7 \text{ x } (VL/SD)^2)$, where *VL* is the vector length and *SD* is the standard deviation of the eight correlations (e.g., for *Compromising*, the *SD* of the first eight numbers in the first row of Table 1.6).

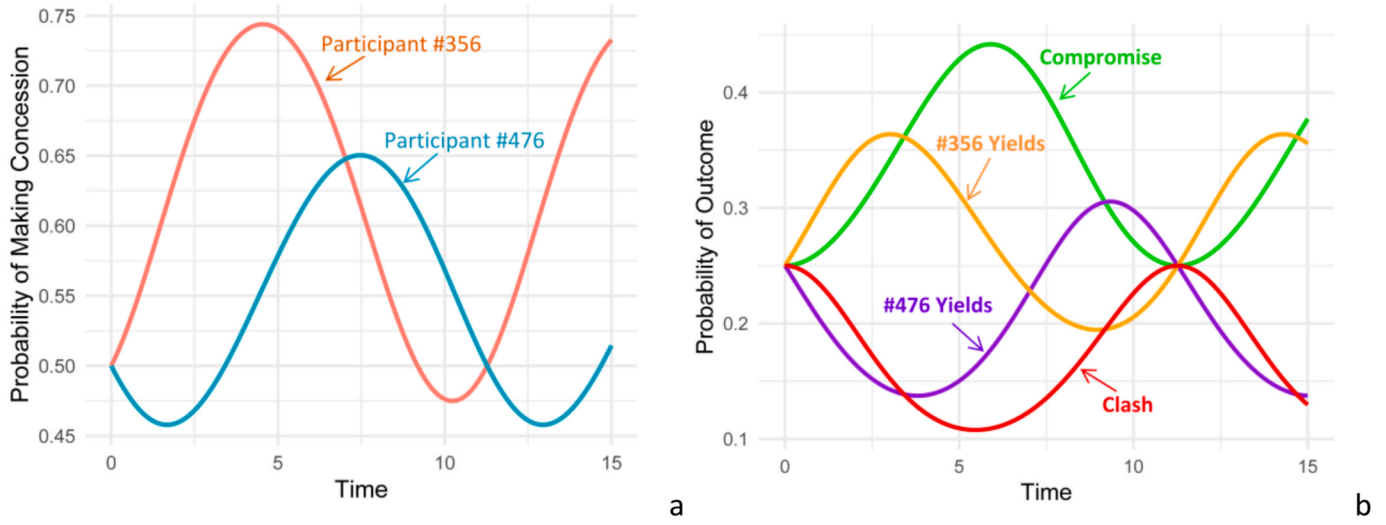

Fig. 4. Simulation of probability of making concessions (panel a) and outcomes of disagreements (panel b) for interactions between Study 1 participants #356 and #476. Participant #356 preferred to *Dominate* than to *Compromise* and preferred to *Yield* than to *Clash* (i.e., construed disagreements as a *Chicken Game*). Participant #476 preferred to *Compromise* than to *Dominate* and preferred to *Clash* than to *Yield* (i.e., construed disagreements as an *Assurance Game*).

those for *Compromising* but were weaker in magnitude.

Fig. 6 visually summarizes the results by plotting the endpoint of each outcome's summary vector on the interpersonal values circumplex. The figure highlights that the axis capturing the most variance in evaluations of disagreement outcomes extends from highly uncommunal and mildly agentic values (predictive of less negative evaluations of *Clashing*) to very communal and mildly unagentic values (predictive of more positive evaluations of *Compromising* and, to a lesser degree, *Yielding*).

The weak-to-moderate associations between CSIV and EDOS scores means that interpersonal values will often be a poor predictor of any one individual's evaluations of disagreement outcomes. Nonetheless, interestingly, after selecting the three participants for the simulations (based on their payoff matrices and without knowing their CSIV scores) I noticed that their evaluations of disagreement outcomes align with their interpersonal values quite well. Participant #173 (who unconditionally preferred making concessions) had a CSIV summary vector angle of 11°, placing her in the +C octant reflecting prioritization of personal connections and mutual support. Participant #476 (who preferred *not* to make concessions when that risked being exploited by an intransigent partner) had a vector angle of 185°, placing him in the –C octant reflecting prioritization of being guarded and self-protective. Participant #356 (who preferred *not* to make concessions when there were opportunities to dominate her partner) had a vector angle of 107°, placing her at the uncommunal edge of the +A octant reflecting prioritization of maintaining status and winning competitions.

9. Study 2

Study 2 aimed to replicate and extend the findings of Study 1 using a new sample and broader set of assessments. As in Study 1, participants completed the EDOS and CSIV, and the hypotheses predicted the EDOS would show adequate reliability and sensible associations with the CSIV. Study 2 also extended Study 1 in four ways.

First, the CSIV and EDOS both assess interpersonal preferences. Of course, whereas the EDOS assesses a narrow set of preferences for outcomes of disagreements, the CSIV assesses a wide range of preferences for experiences reflecting the entire interpersonal circumplex. Nonetheless, it may be that Study 1's findings of associations between evaluations of disagreement outcomes and the interpersonal circumplex apply only to circumplex dispositions reflecting preferences or motives. Accordingly, Study 2 explored whether the associations observed in Study 1 generalize to a different type of interpersonal trait—namely, *interpersonal problems* (i.e., dispositions to do certain behaviors too much or not enough). For example, we might expect someone who strongly dislikes *Clashing* but is untroubled by *Yielding* to be vulnerable to problems with being overly accommodating and self-sacrificing; in contrast, someone who strongly dislikes *Yielding* but is untroubled by *Clashing* might be vulnerable to problems with being overly callous and self-serving. Thus, in addition to assessing interpersonal values, Study 2 also assessed interpersonal problems associated with each circumplex octant using the *Inventory of Interpersonal Problems* (IIP-32; Horowitz et al., 2003).

Second, in addition to hypothesizing that evaluations of *Yielding*, *Compromising*, and *Clashing* would show prototypical profiles of correlations with the CSIV (Hypotheses V1a, V2a, V3a) and IIP (Hypotheses P1a, P2a, P3a), Study 2 preregistered the following more restrictive hypotheses regarding the specific angles of those profiles' summary vectors:

- *Yielding's* vector endpoint will be within the 292.5°—360° (J-K-L) segment of the interpersonal values circumplex (Hypothesis V1b) and interpersonal problems circumplex (Hypothesis P1b).
- *Compromising's* vector endpoint will be within the 315°—382.5° (K-L-M) segment of the interpersonal values circumplex (Hypothesis V2b) and interpersonal problems circumplex (Hypothesis P2b).
- *Clashing's* vector endpoint will be within the 135°—202.5° (C-D-E) segment of the interpersonal values circumplex (Hypothesis V3b) and interpersonal problems circumplex (Hypothesis P3b).

Following Study 1's findings, no hypotheses were formulated for evaluations of *Dominating*.

Third, to examine whether outcome preferences generalize beyond hypothetical contexts, Study 2 asked participants to evaluate the desirability of each potential outcome of a real-life interpersonal disagreement they were currently experiencing. The analyses tested whether preferences for outcomes of real disagreements showed sensible correlations with participants' EDOS, CSIV, and IIP scores. (These tests were preregistered as exploratory).

Fourth, if interpersonal dispositions predict evaluations of disagreement outcomes, then interpersonal disposition scores can be used to parameterize predicted payoff matrices. Following this logic, whereas Study 1 simulated disagreement interactions using *measured* outcome preferences, Study 2 will simulate interactions using the

Table 4
Correlations and Circumplex Summary Vector Parameters for Associations between the CSIV and EDOS – Study 1.

	Correlations with CSIV Scales							Summary Vector Parameters						
EDOS Scale	(PA) +A	(BC) +A–C	(DE) –C	(FG) –A–C	(HI) –A	(JK) –A+C	(LM) +C	(NO) +A+C	Communal Vector *[CI]*	Agentic Vector *[CI]*	Vector Angle *[CI]*		Vector Length *[CI]*	R^2
Compromising	−0.11	−0.44	−0.37	−0.04	0.00	0.39	0.29	0.24	0.36 *[0.29,0.43]*	−0.12 *[-0.21,0.05]*	341.2°	*[330.2°,352.3°]*	0.38 *[0.31,.046]*	0.92
Dominating	0.08	−0.03	−0.03	−0.02	−0.07	0.01	0.00	0.08	0.03 *[-0.05,0.12]*	0.05 *[-0.03,0.12]*	55.5°	*[322.0°,145.6°]*	0.06 *[0.02,.014]*	0.66
Yielding	−0.07	−0.13	−0.13	−0.10	0.15	0.14	0.11	0.02	0.13 *[0.04,0.21]*	−0.08 *[-0.17,0.00]*	327.8°	*[296.8°,1.3°]*	0.15 *[0.06,0.25]*	0.90
Clashing	0.02	0.49	0.34	−0.06	0.05	−0.35	−0.17	−0.30	−0.31 *[-0.39,-0.24]*	0.10 *[0.04,0.15]*	162.7°	*[153.8°,171.8°]*	0.33 *[0.26,0.40]*	0.73

Note. $N = 478$. Correlations > 0.12 are significant at $p < 0.01$. *CSIV* = Circumplex Scales of Interpersonal Values. *EDOS* = Evaluation of Disagreement Outcome Scales. *CI* = Confidence interval computed using resampling procedures implemented by the *circumplex* package for R (Girard, Zimmerman, & Wright, 2024).

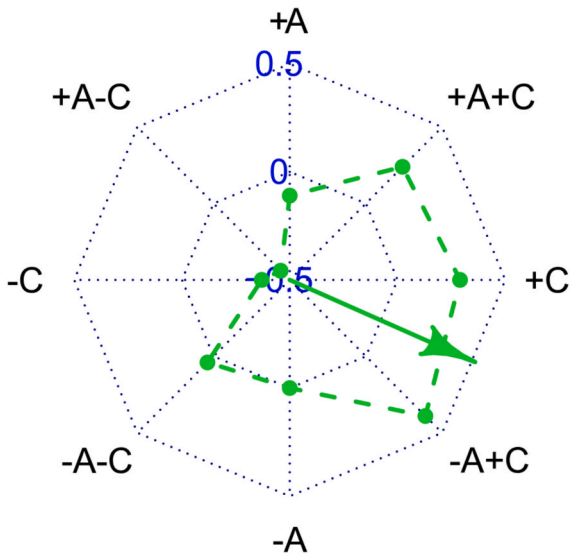

Fig. 5. The eight points show correlations between evaluations of *Compromising* and each CSIV octant scale in Study 1. Within each octant, the scale ranges from $r = –0.5$ (at the circle's midpoint) to $r = +0.5$ (at the circumference). The arrow shows the vector sum of the eight correlations.

outcome preferences *predicted* given individuals' CSIV scores.

10. Method

10.1. Participants and sample size

A power analysis indicated a sample size of 211 was adequate to detect a small-to-moderate associations ($r = 0.20$) with 90 % power at a one-tailed $\alpha = 0.05$ (consistent with Study 2's directional hypotheses). Assuming 5 % of respondents would fail the preregistered inclusion criteria, the preregistration proposed recruiting 222 participants. Data was collected via an online Qualtrics survey between 14-October 2024 and 04-April 2025 from undergraduates who participated in exchange for extra credit in University of Idaho Psychology or Communication courses. Since the study remained available to the participant pool for a predetermined period, 262 participants ended up completing the survey. Fifteen participants failed the inclusion criteria by either (a) providing the same response to > 90 % of the CSIV items or > 90 % of the IIP items, or (b) incorrectly answering at least two of three attention-check items. Thus, the final sample size was 247 (181 women, 59 men, 6 non-binary, 1 unknown; *M* age = 20.5 years, *SD* = 4.2, *range* = 18–53; 185 White/Caucasian, 29 Hispanic/Latino, 15 Asian/Pacific, 18 other or unreported).

10.2. Measures

10.2.1. Interpersonal motives and problems

As in Study 1, interpersonal motives were assessed using the CSIV-32. Interpersonal problems were assessed using the 32-item (four-items per octant) Inventory of Interpersonal Problems (IIP-32; Horowitz et al., 2003). Example items include "I argue with other people too much" (+A) and "I try to please other people too much" (+C). Respondents rated how much each problem caused them distress on scales ranging from *not at all* (0) to *extremely* (4).

Supplemental Table S1 reports the descriptive statistics for each CSIV and IIP scale. McDonald's ωs ranged from 0.70 to 0.90 for all scales except the CSIV +A and +A–C scales whose ωs were 0.54 and 0.67. These octant scale reliabilities are adequate because the main analyses use circumplex summary parameters which aggregate associations across the eight octant scales.

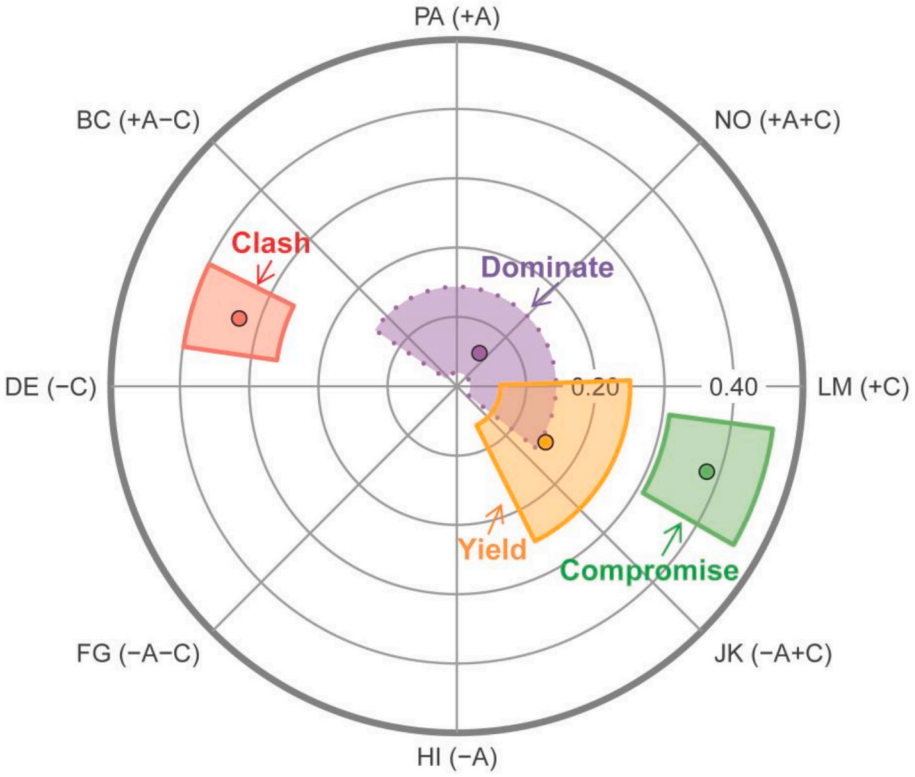

Fig. 6. Associations of Evaluations of Disagreement Outcomes Scales with the interpersonal values circumplex in Study 1. The scale ranges from r = 0 (at the center) to r = 0.5 (at the circumference). Dots represent correlations averaged across octants and tinted regions represent bootstrapped 95 % confidence intervals (computed/plotted using the R circumplex package; Girard et al., 2024). The dashed borders around the Dominating results indicate that its fit (R^2) was < 0.7.

Replicating Study 1, on the CSIV a typical participant considered communal (+C, +A+C, and –A+C) goals the most important and uncommunal and agentic-and-uncommunal (–C and +A–C) goals the least important. The pattern was similar but shifted slightly clockwise for the IIP, with people being most distressed by communal and unagentic (+C, –A+C, and –A) problems and least distressed by agentic and agentic-and-uncommunal (+A and +A–C) problems.

As in Study 1, conformity of the CSIV octants and IIP octants to a two-dimensional circular model was tested in two ways. First, PCAs on the octant scales' intercorrelations showed the first two components accounted for 67.2 % of the variance in CSIV scores and 64.7 % of the variance in IIP scores, consistent with two-dimensional structures. Second, hypothesized order relations tests (Tracey, 2000) showed that the CSIV octants' intercorrelations met 286 of the 288 predicted pairwise orderings, indicating a correspondence coefficient of 0.99 and almost perfect fit to a circular model. The IIP octants' intercorrelations met 257 of the 288 predictions, yielding a correspondence coefficient of 0.78, reflecting imperfect but nonetheless adequate fit to a circular model.

10.2.2. Evaluations of disagreement outcomes

Participants completed the same EDOS used in Study 1. In addition, participants were asked to briefly describe "an actual current disagreement between yourself and someone you know—i.e., a friend, acquaintance, roommate, partner, family member, or co-worker. Think of a disagreement where you want the other person to do something they don't want to do, while the other person wants you to do something you don't want to do". Participants indicated who the other person was, what was the disagreement, and (on −3 to +3 scales) how negative or positive it would be if the outcome was *Yielding* (you make more concessions), *Dominating* (other person makes more concessions), *Compromising* (you and other person make equivalent concessions), or *Clashing* (neither make concessions and the disagreement remains unresolved). Scale intercorrelations for both the EDOS and evaluations of real disagreement outcomes are reported in Supplemental Table S2.

10.3. Procedure

Participants completed an online questionnaire in which they completed, in order, the CSIV, the EDOS, the IIP, and ratings of potential outcomes of a current disagreement from their own life. The EDOS scenarios were presented in random order. The order of item presentation was randomized within each scenario as well as within the CSIV and the IIP. Age, gender, and ethnicity were recorded at the end of the survey but were not part of the preregistered hypotheses or analysis plan.

11. Results

Because the survey required participants to answer every item before moving to the next section, there was no missing data. Data outliers were not removed.

11.1. EDOS Properties and associations with interpersonal values and problems

Table 2 (rightmost columns) reports descriptive statistics and reliability estimates for the EDOS. There were reliable (ω > 0.8) individual differences in evaluations of *Dominating*, *Yielding*, *Compromising*, and *Clashing*, thereby supporting Hypothesis 1. On average, people evaluated *Compromising* as a somewhat positive outcome, *Dominating* as a slightly positive outcome, *Yielding* as a neutral outcome, and *Clashing* as a somewhat negative to very negative outcome. Study 1 produced similar findings, suggesting this normative pattern of outcome preferences is robust across samples.

Supplemental Table S3 reports the correlations between the EDOS and the CSIV and IIP, and Table 5 (upper half) reports the circumplex summary parameters for each profile of correlations. Fig. 7 plots the

Table 5
Circumplex Summary Parameters for Associations between Interpersonal Problems or Values and Evaluations of Disagreement Outcomes – Study 2.

	Interpersonal Values (CSIV)					*Interpersonal Problems (IIP)*				
Outcome	Vector Angle *[CI]*		Vector Length *[CI]*		Fit	Vector Angle *[CI]*		Vector Length *[CI]*		Fit
EDOS Scales										
Compromising	344.5°	*[324.2, 8.2]*	0.22	*[0.12, 0.33]*	0.89	302.1°	*[279.7 ,324.4]*	0.22	*[0.11, 0.33]*	0.97
Dominating	163.3°	*[11.4, 328.2]*	0.04	*[0.01, 0.16]*	0.21	133.3°	*[81.9, 194.5]*	0.13	*[0.03, 0.26]*	0.87
Yielding	295.6°	*[226.9, 3.3]*	0.11	*[0.03, 0.24]*	0.82	298.6°	*[227.5, 355.9]*	0.12	*[0.03, 0.24]*	0.87
Clashing	161.4°	*[142.1, 178.7]*	0.25	*[0.16, 0.35]*	0.90	136.8°	*[117.9, 158.6]*	0.24	*[0.14, 0.35]*	0.95
Real Disagreement										
Compromising	339.8°	*[307.8, 25.0]*	0.20	*[0.07, 0.34]*	0.79	315.9°	*[279.7, 359.7]*	0.15	*[0.04, 0.27]*	0.89
Dominating	101.1°	*[305.2, 257.5]*	0.03	*[0.01, 0.15]*	0.27	136.9°	*[348.3, 297.8]*	0.05	*[0.01, 0.16]*	0.60
Yielding	8.7°	*[326.4, 56.1]*	0.15	*[0.06, 0.26]*	0.88	347.1°	*[314.0, 41.3]*	0.14	*[0.06, 0.25]*	0.94
Clashing	180.4°	*[46.5, 320.4]*	0.05	*[0.02, 0.19]*	0.78	130.5°	*[39.8, 267.1]*	0.08	*[0.02, 0.21]*	0.69

Note. $N = 247$. *CSIV* = Circumplex Scales of Interpersonal Values. *IIP* = Inventory of Interpersonal Problems. *EDOS* = Evaluation of Disagreement Outcome Scales. *CI* = 95 % confidence interval computed using resampling procedures implemented by the *circumplex* package for R (Girard et al., 2024).

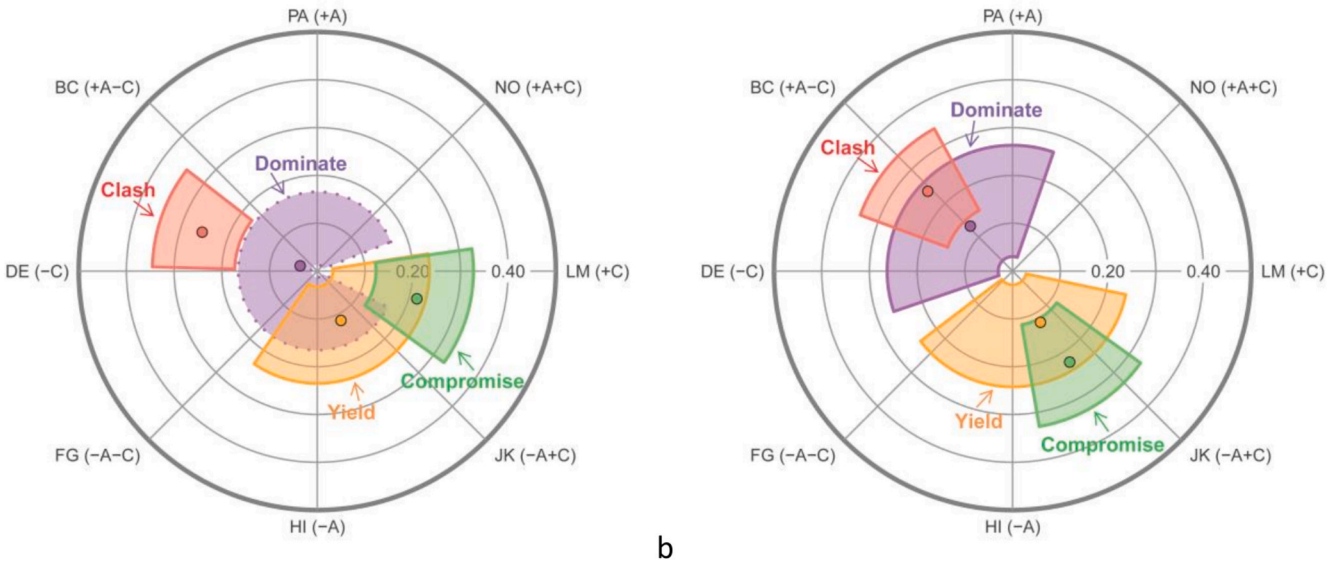

Fig. 7. Associations of Evaluations of Disagreement Outcomes Scales with the interpersonal values circumplex (panel a) and interpersonal problems circumplex (panel b). The scale ranges from r = 0 (at the center) to r = 0.5 (at the circumference). Dots represent correlations averaged across octants and tinted regions represent bootstrapped 95 % confidence intervals (computed/plotted using the R circumplex package; Girard et al., 2024). The dashed borders around the Dominating results indicate that its fit (R^2) was < 0.7.

endpoint of each circumplex summary vector on the values circumplex (panel a) and problems circumplex (panel b).

Correlations between evaluations of *Compromising* and *Clashing* and the CSIV and IIP unambiguously exceeded the criteria for prototypical circumplex profiles, thereby supporting Hypotheses V2a/P2a and V3a/P3a. Correlations between *Yielding* and the CSIV and IIP also showed wavelike patterns (R^2s > 0.80) but, since they were weaker, their vector lengths were slightly below the threshold for an interpretable profile; thus, Hypotheses V1a/P1a received only partial support. As in Study 1, evaluations of *Dominating* showed no perspicuous pattern of associations with the CSIV; however, their associations with the IIP displayed a clear wavelike pattern ($R^2 = 0.87$) whose vector length (0.13) almost reached the threshold for a prototypical profile, suggesting a weak but meaningful link between interpersonal problems and attitudes toward *Dominating*.

The associations between evaluations of *Compromising* and *Clashing* and interpersonal values paralleled those observed in Study 1. Communal (+C, –A+C, +A+C) values were positively associated with evaluations of *Compromising* and negatively associated with evaluations of *Clashing*. Inversely, uncommunal and agentic-and-uncommunal (–C, +A–C) values were positively associated with evaluations of *Clashing* and negatively associated with evaluations of *Compromising*. Thus, the overall vector angle for *Compromising* (344.5°) fell squarely within the preregistered K-L-M region (315°–382.5°) while the overall vector angle for *Clashing* (161.4°) fell squarely within the preregistered C-D-E region (135°–202.5°), thereby supporting Hypotheses V2b/V3b.

Unagentic-and-communal (–A, –A+C, +C) problems were positively associated with evaluations of *Compromising* and negatively associated with evaluations of *Clashing*. Inversely, agentic-and-uncommunal (+A, +A–C, –C) were positively associated with evaluations of *Clashing* and negatively associated with evaluations of *Compromising*. Thus, *Compromising* and *Clashing* showed patterns of associations with the IIP that were rotated about ¾ of an octant clockwise relative to their associations with the CSIV. Nonetheless, the summary vector for *Clashing* (136.8°) still fell within the predicted C-D-E region (135°–202.5°), thereby supporting Hypothesis P3b. However, the summary vector for *Compromising* (302.1°) fell just beneath the predicted K-L-M region (315°–382.5°), pointing instead to the slightly less communal more unagentic "J" segment of the problems circumplex (and thereby failing to support Hypothesis P2b).

The associations between interpersonal problems and evaluations of *Yielding* and *Dominating* mirrored those for *Compromising* and *Clashing*, respectively, but were much weaker in magnitude. The vectors summarizing associations between evaluations of *Yielding* and interpersonal values (295.6°) and interpersonal problems (298.6°) both fell within the preregistered J–K–L region (292.5°–360°), thereby supporting

Hypotheses V1b/P1b.

11.2. Real disagreements

Participants also evaluated the potential outcomes of a real ongoing disagreement. The disagreements participants reported almost always involved close others—i.e., spouse/partner (28 %), roommate (24 %), family member (23 %), or friend (21 %). The remaining disagreements were with acquaintances (2 %) or coworkers (3 %).

Table 2 (rightmost columns) shows the descriptive statistics for the ratings of outcomes of real disagreements. Participants typically rated *Compromising* most positively and *Clashing* most negatively. In between were *Dominating* and *Yielding*, with *Dominating* being more desirable than *Yielding*. Thus, participants' normative responses to real disagreements roughly mirrored their responses to hypothetical disagreements presented on the EDOS; however, Table 2 also reveals some differences. Compared to when they were considering hypothetical disagreements, when considering real disagreements participants evaluated *Clashing* less negatively (paired-samples $t[246] = 4.52$), *Compromising* less positively ($t = 4.36$), and *Yielding* much less positively ($t = 9.47$), $ps < 0.0001$. A likely explanation is that offering concessions feels less appealing when immersed in a real disagreement than when merely imagining a hypothetical one.

Evaluations of outcomes on the EDOS predicted evaluations of the corresponding outcomes in real situations. Specifically, the correlations between outcome evaluations in hypothetical and real situations were 0.23 for *Compromising*, 0.24 for *Dominating*, 0.25 for *Yielding*, and 0.27 for *Clashing*. The correlations were modest in size, but this will be partly due to only assessing one real disagreement. Aggregating across multiple real-life disagreements would produce a less noisy measure of an individual's typical evaluations and thus stronger correlations.

Supplemental Table S4 reports the correlations of evaluations of real disagreement outcomes with the CSIV and IIP scales. Table 5 (lower half) reports the circumplex summary parameters for each profile of correlations. Evaluations of *Compromising* and *Yielding* showed interpretable profiles of correlations with both the CSIV and IIP. Evaluations of *Compromising* and *Yielding* correlated positively with communal and unagentic-and-communal values and problems and negatively with uncommunal and agentic-and-uncommunal values and problems. These results are roughly similar to those obtained using the EDOS, although positive evaluations of *Yielding* were associated with significantly more communal and less unagentic values when considering real versus hypothetical disagreements. Although *Dominating* and *Clashing* also showed sensible patterns of correlations with the CSIV and IIP, the effect sizes were very small.

In sum, individuals' evaluations of outcomes of real disagreements were to some degree predictable from both their EDOS scores and—for *Compromising* and *Yielding*—their interpersonal values and challenges.

11.3. Predicted outcome evaluations as a function of CSIV and IIP scores

The circumplex summary parameters in Table 5 can be used to predict the outcome's correlation with interpersonal dispositions reflecting *any* circumplex angle using the following formula (Gurtman & Pincus, 2003; Zimmermann & Wright, 2017):

$$r_i = \cos(\theta_i - \theta_{OUTCOME}) \times VL_{OUTCOME}\ , \quad (3)$$

where $\theta_{OUTCOME}$ and $VL_{OUTCOME}$ are the outcome's summary parameters, r_i is the predicted correlation at target angle θ_i, and the angles are expressed in radians.

Equation 3 shows that while the maximum r_i ($VL_{OUTCOME}$) occurs at the outcome's summary angle ($\theta_{OUTCOME}$), the actual r_i is moderated by the angular distance between $\theta_{OUTCOME}$ and target angle θ_i. That distance is captured by the coefficient of alignment, $\cos(\theta_i - \theta_{OUTCOME})$, which can range from +1 to –1. When the angles are *orthogonal*, the alignment coefficient and r_i are *zero*, meaning the interpersonal dispositions at that angle are *not* predictive of outcome evaluations. The more the angles point in the same direction, the more *positive* the alignment coefficient and r_i. The more the angles point in *opposing* directions, the more *negative* the alignment coefficient and r_i.

For example, Table 5 shows the association between the CSIV and the EDOS *Compromise* scale has a summary vector of length 0.22 in the 345° direction. Consequently, for interpersonal values pointing in the 345° direction (alignment coefficient = +1), the r_i with Compromise ratings is +0.22. For interpersonal values in the 300° direction (45° from $\theta_{OUTCOME}$ and thus alignment coefficient = 0.707), r_i is 0.22 x 0.707 = 0.16. And for values pointing towards 165° (alignment coefficient = -1), r_i is −0.22.

We can use these correlations to predict how individuals with different levels of interpersonal dispositions at *any* angle will evaluate each outcome using the following formula:

$$\hat{Y}_j = M_{OUTCOME} + r_i \times VL_{ij} \times SD_{OUTCOME}\ . \quad (4)$$

$\hat{Y}_j$ is person *j*'s predicted outcome rating. VL_{ij} is Person *j*'s interpersonal disposition towards circumplex angle *i*. VL_{ij}, a vector length, is computed as follows:

$$VL_{ij} = Communal_j \times \cos(\theta_i) + Agentic_j \times \sin(\theta_i)\ , \quad (5)$$

where $Communal_j$ and $Agentic_j$ are person *j*'s agentic and communal summary vectors (computed using the formulas in Footnote 3). In Equation 4, VL_{ij} is standardized relative to other individuals' vector lengths at angle θ_i. The product of VL_{ij} and r_i is how many standard deviations (*SD*s) j's outcome evaluation is predicted to predicted the mean outcome evaluation ($M_{OUTCOME}$). Multiplying that product by the *SD* of the outcome evaluation ($SD_{OUTCOME}$) converts j's predicted deviation from *SD*s to raw score units. Finally, adding that product to $M_{OUTCOME}$ yields j's predicted outcome rating.

For example, here is how to predict the EDOS *Compromise* score for someone whose CSIV vector in the uncommunal direction ($\theta_i = 180°$ or 3.14 rad) is 2 SDs above average ($VL_{ij} = 2$). Tables 2 and 5 provide the following information about the EDOS *Compromise* scale: $M = 1.92$, $SD = 0.79$, CSIV $\theta_{OUTCOME} = 345°$ (6.02 rad) and $VL_{OUTCOME} = 0.22$. Using Equation 3, $r_i = \cos(3.14 - 6.02) \times 0.22 = -0.21$. Entering the above information into Equation 4, this uncommunal person's predicted score is: $\hat{Y}_j = 1.92 - 0.21 \times 2 \times 0.79 = 1.59$.

Fig. 8 shows the results of using this approach to compute $\hat{Y}_j$ for individuals whose interpersonal dispositions are 2 SDs above average in *every* direction around the circumplex. Specifically, Fig. 8 shows the predicted evaluations for both real disagreements and hypothetical disagreements using CSIV scores (panels a and c) and IIP scores (panels b and d). Graphing the results this way can aide interpretation by (a) converting the results from a correlational metric to the metric of the original −3 to + 3 rating scale and (b) foregrounding patterns in how individuals reflecting each circumplex segment evaluate all four outcomes simultaneously.

Fig. 8 foregrounds several interesting patterns. Broadly speaking, the CSIV and IIP produced similar results. Across the entire spectrum of interpersonal values and problems almost everyone's most desired outcome was *Compromising* and least desired outcome was *Clashing*. However, while most individuals may eventually seek to resolve disagreements by making concessions, individuals with relatively strong agentic or weak communal values and problems may feel more conflicted about doing so because for them the distance between evaluations of *Compromising* versus *Dominating* and evaluations of *Yielding* versus *Clashing* is narrower.

Comparing hypothetical and real disagreements, while the overall patterns remained consistent there were also some intriguing differences, most notably for *Yielding*. Participants evaluated *Yielding* more negatively when contemplating real disagreements, and this was especially true for individuals whose uncommunal dispositions to protect

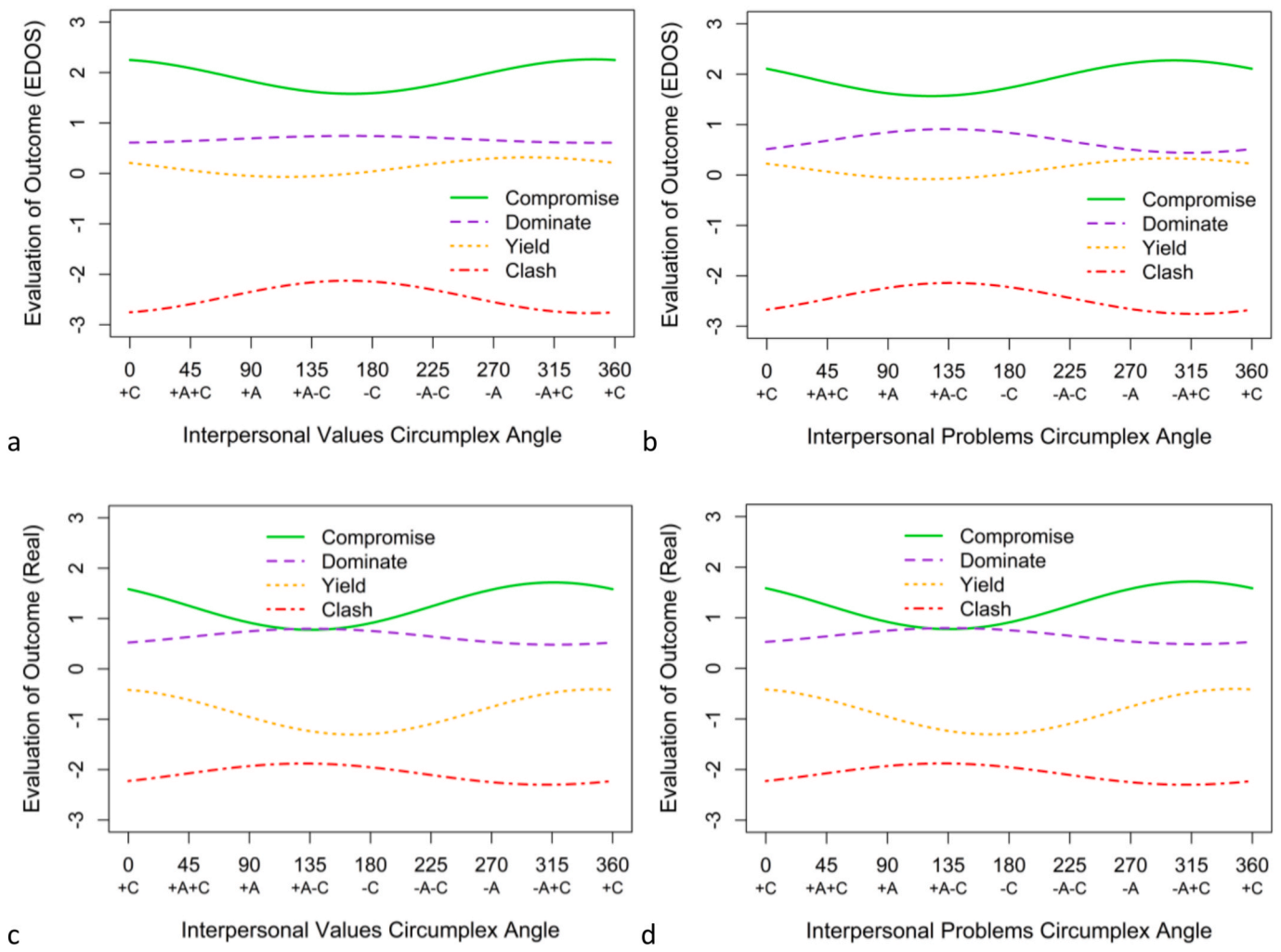

Fig. 8. Cosine curves showing the predicted rating of each disagreement outcome by individuals whose circumplex summary vector is 2 *SD*s above average along that angle of the interpersonal values circumplex (panels a and c) or interpersonal problems circumplex (panels b and d). Panels a and b show the results for hypothetical disagreements on the *Evaluation of Disagreement Outcome Scales* (EDOS); Panels c and d show the results for real disagreements. Because circumplex dimensions are bipolar, predictions for individuals 2 *SD*s below average at any angle are located at the opposite angle; e.g., the predicted score for individuals 2 *SD* below average in the 90° (+A) direction is the predicted score for individuals 2 *SD* above average in the 270° (–A) direction.

themselves were much stronger than their communal dispositions to enjoy mutual support. Also, whereas evaluations of *Yielding* peaked in the unagentic-and-communal (–A+C) octant when considering hypothetical disagreements, they peaked in the communal (+C) octant when considering real disagreements. One possible explanation is that in real relationships an openness to *Yielding* may mainly express communal values, which reflect concern for the other person and the relationship.

11.4. Simulating disagreement interactions from predicted preferences

The following section shows how to use the outcome evaluations predicted from individuals' interpersonal dispositions (computed in the previous section) as inputs to game theory simulations of disagreement interactions. Whereas Study 1 simulated disagreement interactions using individuals' *reported* outcome preferences, this section will simulate a disagreement interaction using the preferences *predicted* from individuals' scores on a personality inventory.

Specifically, the following example uses associations between CSIV scores and evaluations of a real disagreement. As Fig. 8 (panel c) highlights, almost everyone reports the normative pattern of deeming *Compromising* the best outcome and *Clashing* the worst outcome. Accordingly, most individuals are predicted to construe disagreements as a *Harmony Game* and resolve their disagreements by *Compromising*. However, individuals with very strong +A–C values—specifically, with summary vectors 2 SDs above average in the 122°-181° range—are predicted to feel slightly more positively towards *Dominating* than *Compromising*, thereby construing disagreements as a *Chicken Game*. To explore how disagreements between these individuals and a typical individual might unfold, the following simulates an interaction between hypothetical Person A whose CSIV vector is 2 SD above average through the center of the +A–C octant (135°) and hypothetical Person B whose CSIV vector is 2 SD above average through the center of the –A+C octant (315°). Table 6 shows their predicted payoff matrix; Fig. 9 shows the resulting dynamics. Equation 1 predicts that +A–C Person A will favor making concessions as long as Person B refuses to make concessions

Table 6
Outcome matrix for disagreement between Person A with +A–C values and Person B with –A+C values – Study 2.

		Person B (–A+C values)	
		Makes Concessions	No Concessions
Person A (+A–C values)	Makes Concessions	*Compromise*: 0.677,1.816	+A–C *Yields*: −1.135,0.541
	No Concessions	–A+C *Yields*: 0.738,−0.574	*Clash*: −1.994,−2.184

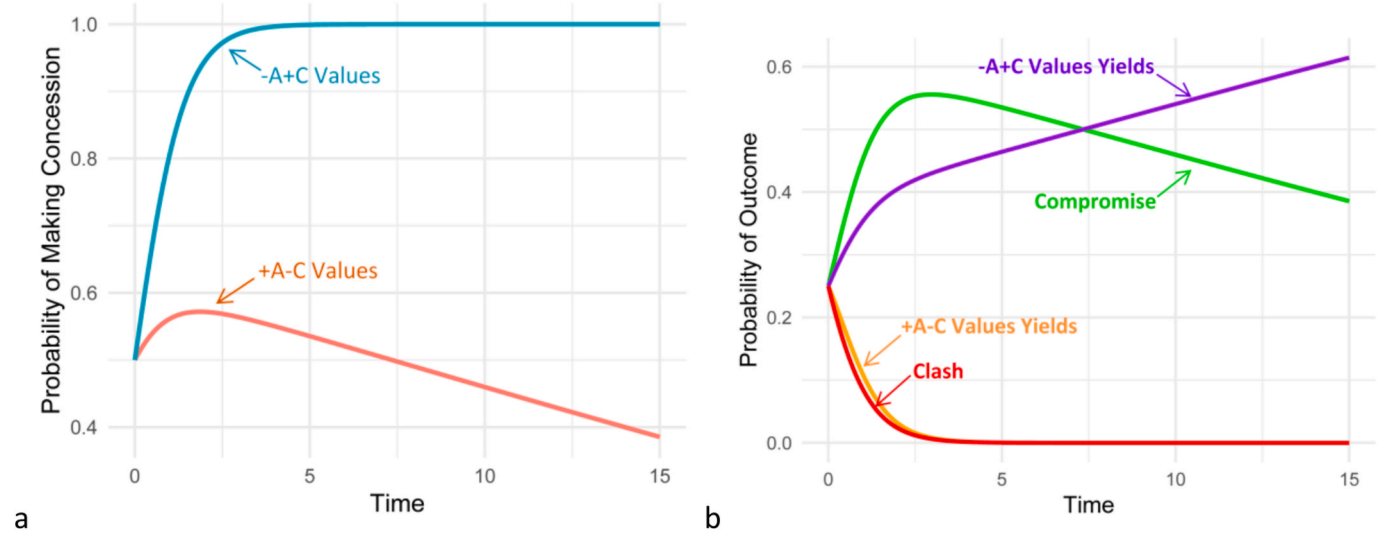

Fig. 9. Simulation of probability of making concessions (panel a) and outcomes of disagreements (panel b) for interactions between person with agentic-and-uncommunal (+A–C) values and person with unagentic-and-communal (–A+C) values.

during at least 7 % of their exchanges. But since –A+C Person B soon offers concessions at every turn, Person A's intransigence soon gets invariably rewarded with *Dominating* rather than *Clashing*. Consequently, Person A becomes increasingly inflexible, and the dyad becomes increasingly mired in +A–C Person A *Dominating* and –A+C Person B *Yielding*.

The preceding example illustrates a more general pattern that emerges from applying evolutionary game theory to these data: Disagreements between someone with strong +A–C values and someone without strong +A–C values are predicted to end up with the +A–C person *Dominating*; moreover, that will happen quicker the closer the +A–C person's values are to—and the farther the other person's values are from—the center of the 122°-181° region. And this in turn reflects an even more general pattern: If Person A approaches disagreements as a *Chicken Game* and Person B approaches it as a *Harmony Game*, then as Person A becomes increasingly sure Person B will offer concessions, Person A will increasingly refuse to offer their own concessions. Indeed, Study 1′s Simulation #2 embodied the same payoff structure and produced the same dynamic, albeit faster largely because actual Participant #356′s actual preference for *Dominating* was stronger than the hypothetical +A–C person's predicted preference (see Table 3 and Fig. 3).

12. Discussion

In two preregistered studies, participants evaluated the desirability of potential outcomes of everyday disagreements. The results revealed reliable individual differences in preferences for *Dominating*, *Yielding*, *Compromising*, and *Clashing*, and systematic links between outcome preferences and interpersonal values and problems.

13. Normative patterns

Unsurprisingly, most people evaluated *Dominating* (getting exactly what they wanted) positively and evaluated it more positively than *Yielding* (the other person getting exactly what they wanted). Nonetheless, most people considered *Compromising* (both parties showing flexibility and making some concessions) the *most* desirable outcome. The most *un*desirable outcome was *Clashing*: Even when the other person refuses to make concessions, people generally say they would rather yield and let the other person get what they want than clash and let the conflict fester without any resolution.

These normative patterns align with previous findings suggesting that people generally approach everyday interactions as coordination (e.g., *Assurance* or *Harmony*) games that invite cooperation. For example, when evaluating conflict resolution strategies, participants rated various forms of negotiation highest and various forms of power assertion lowest (Graziano et al., 1996). And in a study of social interactions in daily life, interactants generally reported having corresponding (versus competing) interests and being mutually dependent on each other to achieve those interests (Columbus et al., 2021). These findings also fit with the finding that on the CSIV participants generally rated communal goals (to get along with others) as more important than uncommunal and agentic goals (to prioritize and protect their own interests).

Overall, the picture that emerges is that *on average* people want to be—and think they are—nice and cooperative; accordingly, when disagreements arise they generally favor resolving them by exchanging mutually acceptable concessions that preserve harmonious relations, even at the cost of not getting exactly what they want. Nonetheless, in addition to these normative patterns, individuals also differed in their evaluations of disagreement outcomes and—as detailed below—these differences were related to their interpersonal values and problems.

14. Mapping evaluations of disagreement outcomes onto the interpersonal circumplex

Individual differences in evaluations of *Yielding*, *Compromising*, and *Clashing* showed prototypical wavelike profiles of correlations with the interpersonal circumplex, characterized by positive correlations with one region and negative correlations with the opposite region. In general, with a few minor exceptions, the profiles were consistent across hypothetical and real disagreements and across values and problems circumplexes, and the angular locations of the positive and negative correlations were consistent with the preregistered hypotheses. Overall, interpersonal values and interpersonal problems were equally strong predictors, suggesting that preferences for disagreement outcomes are associated with both behavioral and motivational dispositions.

The circumplex had its clearest and strongest associations with evaluations of *Compromising* and *Clashing*. *Clashing* was viewed least negatively by individuals whose values and problems were more uncommunal than communal and (to a lesser extent) more agentic than unagentic—i.e., with interpersonal dispositions in the "CD" segments of the circumplex. Conversely, *Compromising* was viewed most positively by individuals whose values and problems were more communal than uncommunal and (to a lesser extent) more unagentic than agentic—i.e., with interpersonal dispositions in the "KL" segments. Associations between interpersonal circumplex dispositions and evaluations of *Yielding*

roughly mirrored those for *Compromising* but were significantly weaker in magnitude. Stronger communal-and-unagentic values were likewise found to predict preferring *Compromising* to *Dominating* and preferring *Yielding* to *Clashing* when addressing an intergroup disagreement (Locke, 2014).

The links between interpersonal dispositions and evaluations of disagreement outcomes make intuitive sense. Openness to *Compromising* correlated with interpersonal dispositions to seek *mutuality*—mutual contentment, mutual support, mutual accommodation—versus wanting unilateral control. Openness to *Yielding* correlated with interpersonal dispositions to prioritize untroubled relations ("going along to get along") rather than striving to appear dominant or powerful. Openness to *Clashing* correlated with interpersonal dispositions to minimize the importance of harmony and mutuality and instead prioritize gaining and not ceding unilateral advantage. The latter uncommunal and agentic dispositions and preferences are likely tightly entangled, since claiming to be unconcerned about the other person and the relationship—and thus unconcerned about potentially harming them by refusing to make concessions—can be a way of asserting autonomy and the other person's lack of power over you.

A strength of interpersonal circumplex inventories is that they can insert constructs into an expanding nomological network of other constructs that have circumplex profiles. The current research found that evaluations of disagreement outcomes were most effectively predicted by the circumplex dimension that extends from the highly-uncommunal-and-somewhat-agentic "CD" octant to the highly-communal-and-somewhat-unagentic "KL" octant. Other psychological constructs whose circumplex summary vectors point towards the "KL" pole of that dimension include Big-5 Agreeableness (Du et al., 2021), HEXACO Agreeableness and Honesty-Humility (Barford et al., 2015), and Schwartz's Universalism values (Ponikiewska et al., 2020), while constructs whose summary vectors point towards the "CD" pole include "Dark Triad" Machiavellianism and psychopathy (Dowgwillo & Pincus, 2017) and symptoms of paranoid and antisocial personality disorders (Wilson et al., 2017). Given their similar locations in the nomological network, we might expect evaluations of *Compromising* or *Yielding* to be positively associated with agreeableness, honesty-humility, and universalism values and negatively associated with Machiavellianism, psychopathy, and paranoia; and we might expect the opposite pattern of associations between those constructs and evaluations of *Clashing*.

Circumplex models not only expect constructs loading on a particular dimension to correlate with other constructs loading on that dimension, but also *not* to correlate with constructs loading on the orthogonal dimension. Since outcome evaluations correlated strongest with the dimension anchored by the "CD" and "KL" octants, the circumplex predicts they will correlate *weakest* with constructs whose summary vectors align the orthogonal dimension anchored by the "GH" and "OP" octants. Examples of constructs whose vectors align with that dimension include (pointing in the –A–C "GH" direction) neuroticism and negative affectivity (Du, 2021; Horner et al., 2025) and avoidant personality disorder symptoms (Wilson et al., 2017), and (pointing in the +A+C "OP" direction) extraversion, optimism, positive affect, and self-esteem (Du et al., 2021; Horner et al., 2025; Smith et al., 2013).

As this nomological network expands, it continually reveals how every interpersonal circumplex angle is associated with different psychological dispositions. For example, the dimension extending between the "OP" and "GH" segments appears associated with dispositions related to experiencing social interactions as rewarding versus punishing. Shifting clockwise, the dimension extending between the "LM" and "EF" segments appears associated with dispositions related to experiencing attachment security versus attachment avoidance. And the current research adds evidence that the dimension extending between the "KL" and "CD" segments appears associated with dispositions related to how people prefer to resolve disagreements. In this way, the current research not only enriches our understanding of the interpersonal dispositions shaping disagreement interactions but also enriches our understanding of the interpersonal circumplex.

15. Measurement and methodological contributions

Beyond the empirical results discussed above, the current work makes several other contributions. First, the research introduced the EDOS, a novel instrument for assessing individual differences in evaluations of outcomes of everyday interpersonal disagreements. The scales demonstrated robust internal consistency and were significant (albeit modest) predictors of evaluations of potential outcomes of real disagreements. While further validation is warranted, these findings suggest the EDOS could be a useful instrument in future studies of interpersonal disagreements. The EDOS may prove useful in practical settings as well. For example, in therapeutic contexts the EDOS may help individuals recognize how their outcome evaluations (e.g., a strong aversion to *Yielding*) contribute to experiencing conflict or rejection at work; or help couples understand how their preferences (e.g., favoring flexibility when their partner is intransigent and intransigence when their partner shows flexibility) contribute to dysfunctional cycles.

Second, this paper introduced a novel way to depict associations between a circumplex inventory and an external outcome variable. If the outcome has a prototypical wavelike profile of correlations with the circumplex inventory, then at each angle we can graph not only the predicted correlations—which existing software does (Girard et al., 2024)—but also predicted outcomes. This translation of results from a correlational metric to the outcome's original metric may help facilitate their interpretation or application, especially when comparing patterns of scores across multiple outcomes measured on comparable scales. For example, in the current research, the four outcomes were measured on the same scale which was centered around a meaningful zero point (see Fig. 8). An analogous use case would be interpreting associations between a circumplex inventory and a symptom inventory comprising subscales reflecting different psychiatric syndromes.

Third, the current work showed how to model probable trajectories of disagreement interactions by applying evolutionary game theory to individuals' outcome evaluations (i.e., payoff matrices). The current work further showed that if personality dispositions predict outcome evaluations, then personality dispositions can also be used to predict the dynamics of disagreement interactions. For example, the simulations predict that interactions between individuals who prefer *Compromising* to *Dominating* will settle into a stable equilibrium of mutual concessions. Thus, since a typical person preferred *Compromising* to *Dominating*, if two typical individuals have a disagreement, then preemptively and consistently offering concessions will be a beneficial strategy. But individuals with strong agentic-and-uncommunal dispositions are prone to prefer *Dominating* to *Compromising*. And the simulations predict that when a typical harmony-seeking individual interacts with a very +A–C dominance-seeking individual, the dominance-seeking individual will become increasingly intransigent while the harmony-seeking individual will become increasingly resigned to *Yielding*. These simulation results are consistent with Amistad et al.'s (2018) results regarding effects of HEXACO personality traits on negotiations: Individuals high in Agreeableness obtained better outcomes than those low in Agreeableness when negotiating with partners high in Honesty-Humility (who share their +C–A inclinations) but obtained worse outcomes when negotiating with partners low in Honesty-Humility (with more +A–C inclinations).

16. Limitations and Conclusions

In order to isolate and illustrate the impact of dispositional components of outcome evaluations, the game-theoretic simulations omitted many of the complexities of real life. One simplification is that the simulations treated interactants' payoff matrices as fixed dispositions. But in reality, outcome preferences can vary across relationships and situations and even during a single interaction. For example, when calmly entering an interaction, Person A may favor *Compromising*; but if

Person B repeatedly acts disrespectfully, Person A may angrily shift toward favoring *Clashing*. Another simplification is that the simulations gave interactants no opportunity to reduce or eliminate interdependence with an unsatisfying partner. But in reality, as emphasized by interdependence theory (Thibaut & Kelley, 1959), if the outcomes people experience in an interaction or relationship fall below what they believe they deserve (their *Comparison Level*) and believe they could obtain if they exited that interaction or relationship (their *Comparison Level for Alternatives*), they will—if possible—withdraw from the interaction or relationship. While the current simulations were narrowly focused on clarifying dispositional determinants of disagreement dynamics, future modeling efforts could better capture real-world complexities by incorporating other parameters (e.g., thresholds at which interactants adjust preferences or exit interactions).

An alternative way to analyze dyadic dynamics is offered by contemporary interpersonal theory, which uses the interpersonal circumplex to depict "interpersonal transaction cycles" (Wagner, Kiesler, & Schmidt, 1995; Wright et al., 2023). An interpersonal transaction cycle formulation of a disagreement interaction is: Person B makes or withholds concessions → Person A perceives B's behavior as expressing degrees of communion and agency (e.g., A perceives B's making a concession as somewhat warm and mildly submissive) → based on that perception, Person A responds by making or withholding concessions → Person B perceives A's behavior as expressing degrees of communion and agency → based on that perception Person B responds → and so on. In contrast, in evolutionary game theory, Person A's responses are shaped not by perceptions of B's behaviors, but rather by evaluations of joint outcomes produced by both interactants' behaviors. An evolutionary game-theoretic formulation of a disagreement interaction is: Person A's and Person B's current probabilities of offering concessions → A's and B's subjective evaluations of the resulting dyadic outcomes (e.g., *Compromising*, *Clashing*) → reinforcement/punishment of offering concessions → A's and B's updated probabilities of offering concessions → and so on. Thus, interpersonal theory and game theory both model interpersonal dynamics over time but emphasize different, complementary causal influences: Interpersonal theory emphasizes evaluations of the other's warmth and dominance, while evolutionary game theory emphasizes the role of evaluations of joint outcomes.

Regarding the empirical studies, the generalizability of their findings may be limited by the nature of the participants and disagreements they sampled. Although the studies included both undergraduate and general population samples, both were recruited in the United States. Additionally, the studies focused on ordinary everyday disagreements occurring predominantly in ongoing warm relationships between friends, family, partners, roommates, and colleagues. Such situations—where there is investment in the relationship, mutual dependence on each other to resolve the disagreement, and expectations of future interdependence—promote cooperative behavior (Rusbult & Van Lange, 2008). People may be less inclined to make concessions when disagreements are more personally consequential or arise in more distant or transient relationships. Accordingly, it would be informative to replicate the current studies in other relational and cultural contexts.

A final limitation is that the current research assessed how participants *prefer* to resolve disagreements, not how they *actually* resolve them. While preferences provide important inputs to game-theoretic models and likely influence behavior, research assessing both preferences and behaviors is needed to determine how well preferences—and simulations based on those preferences—predict what people do when encountering disagreements.

Despite these limitations, the current work makes several advances. It introduced a theoretically grounded tool for assessing preferences for potential outcomes of everyday disagreements. Responses to the EDOS and to real disagreements revealed reliable individual differences in outcome evaluations and systematic associations between those evaluations and the agentic and communal values and problems encompassed by the interpersonal circumplex. In showing meaningful connections between interpersonal circumplex models and outcome payoff matrices, this project synthesized core structural constructs of contemporary interpersonal theory (Wright et al., 2023) and game theory models of strategic interactions (Rapoport et al., 1976; Halevy & Katz, 2013). Using those payoff matrices as inputs to game-theoretic simulations demonstrated how outcome preferences—and interpersonal dispositions underlying those preferences—can shape how dyads try to resolve disagreements over time.

In conclusion, by constructing conceptual and methodological bridges between personality psychology and game theory, this work contributes to a psychologically sophisticated and mathematically precise understanding of the dispositional and interpersonal determinants of disagreement interactions. In doing so, it promises to enhance our capacity to predict and improve how people navigate disagreements in their everyday lives.

CRediT authorship contribution statement

Kenneth D. Locke: Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jrp.2025.104691.

Data availability

The research data and analysis code are publicly available on the Open Science Framework.

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Supplemental Table S1

Interpersonal Circumplex Inventory Descriptive Statistics

	CSIV - Study 1			CSIV - Study 2			IIP - Study 2		
Octant	M	*SD*	ω	M	*SD*	ω	M	*SD*	ω
(PA) +A	1.72	*0.79*	.67	1.97	*0.67*	.54	0.73	*0.72*	.79
(BC) +A-C	0.83	*0.86*	.84	0.87	*0.65*	.67	0.59	*0.66*	.79
(DE) -C	0.99	*0.82*	.78	1.18	*0.72*	.70	1.11	*0.86*	.78
(FG) -A-C	1.57	*0.88*	.78	1.74	*0.83*	.76	1.74	*1.05*	.88
(HI) -A	1.45	*0.84*	.83	1.81	*0.77*	.74	1.86	*1.14*	.90
(JK) -A+C	2.28	*0.80*	.75	2.69	*0.78*	.80	1.93	*1.03*	.82
(LM) +C	2.00	*0.90*	.85	2.42	*0.83*	.80	1.93	*0.96*	.82
(NO) +A+C	2.20	*0.80*	.76	2.59	*0.66*	.70	1.24	*0.95*	.83

*Note. N*s = 478 in Study 1 and 247 in Study 2. Ratings were on 0-to-4 scales. ω = McDonald's total omega. *CSIV* = Circumplex Scales of Interpersonal Values. *IIP* = Inventory of Interpersonal Problems.

Supplemental Table S2

Correlations among the EDOS (Studies 1 and 2) and the Evaluations of Outcomes of Real Disagreements (Study 2)

	EDOS				Real Disagreement (Study 2)			
Outcome	*Compromising*	*Dominating*	*Yielding*	*Clashing*	*Compromising*	*Dominating*	*Yielding*	*Clashing*
EDOS (Study 1)								
Compromising	—							
Dominating	.29	—						
Yielding	.32	.39	—					
Clashing	-.54	-.12	.09	—				
EDOS (Study 2)								
Compromising	—							
Dominating	.12	—						
Yielding	.30	.36	—					
Clashing	-.55	-.07	-.05	—				
Real Disagreement (Study 2)								
Compromising	**.23**	.02	.03	-.14	—			
Dominating	.14	**.24**	.12	-.06	-.09	—		
Yielding	.04	.13	**.25**	.00	.17	-.22	—	
Clashing	-.15	.00	.07	**.27**	-.33	.04	-.04	—

*Note. N*s = 478 in Study 1 and 247 in Study 2. *EDOS* = Evaluation of Disagreement Outcomes Scales.

Supplemental Table S3

Correlations between the EDOS and the CSIV or IIP – Study 2

EDOS Scale	(PA) +A	(BC) +A-C	(DE) -C	(FG) -A-C	(HI) -A	(JK) -A+C	(LM) +C	(NO) +A+C	Communal Vector *[CI]*	Agentic Vector *[CI]*
Circumplex Scales of Interpersonal Values										
Compromising	-.05	-.25	-.23	-.01	.01	.17	.18	.18	.21 *[0.12,0.32]*	-.06 *[-0.14,0.02]*
Dominating	.08	.00	-.03	.10	-.06	.00	-.06	-.04	-.04 *[-0.13,0.07]*	.01 *[-0.10,0.12]*
Yielding	-.08	-.07	-.11	.02	.14	.14	-.02	-.03	.05 *[-0.05,0.15]*	-.10 *[-0.21,0.01]*
Clashing	.05	.28	.30	-.01	-.02	-.22	-.22	-.14	-.24 *[-0.33,-0.14]*	.08 *[0.01,0.16]*
Inventory of Interpersonal Problems										
Compromising	-.16	-.21	-.16	.06	.21	.20	.14	-.10	.12 *[0.03,0.20]*	-.19 *[-0.29,-0.08]*
Dominating	.10	.14	.03	.04	-.07	-.14	-.13	.05	-.09 *[-0.19,0.01]*	.09 *[-0.02,0.21]*
Yielding	-.10	-.10	-.09	.06	.12	.07	.11	-.07	.06 *[-0.04,0.15]*	-.11 *[-0.21,0.00]*
Clashing	.18	.16	.23	.03	-.19	-.24	-.20	.04	-.18 *[-0.26,-0.09]*	.17 *[0.06,0.26]*

Note. N = 247. Correlations > .16 are significant at $p < .01$. *CSIV* = Circumplex Scales of Interpersonal Values. *IIP* = Inventory of Interpersonal Problems. *EDOS* = Evaluation of Disagreement Outcome Scales. *CI* = 95% confidence intervals computed using resampling procedures implemented by the R *circumplex* package (Girard et al., 2024).

Supplemental Table S4

Correlations between Evaluations of Outcomes of Real Disagreements and the CSIV or IIP – Study 2

Real Outcome	(PA) +A	(BC) +A-C	(DE) -C	(FG) -A-C	(HI) -A	(JK) -A+C	(LM) +C	(NO) +A+C	Communal Vector *[CI]*	Agentic Vector *[CI]*
Circumplex Scales of Interpersonal Values										
Compromising	-.06	-.24	-.25	.06	.05	.08	.21	.14	.18 *[0.05,0.31]*	-.07 *[-0.18,0.05]*
Dominating	.12	-.03	.00	.01	-.04	-.03	-.01	-.02	-.01 *[-0.11,0.09]*	.03 *[-0.06,0.12]*
Yielding	-.04	-.03	-.12	-.14	-.05	.09	.20	.09	.15 *[0.04,0.25]*	.02 *[-0.08,0.13]*
Clashing	.00	.05	.06	.02	-.02	-.01	-.05	-.07	-.05 *[-0.16,0.05]*	.00 *[-0.11,0.11]*
Inventory of Interpersonal Problems										
Compromising	-.14	-.12	-.11	-.05	.16	.10	.12	.01	.11 *[0.01,0.21]*	-.10 *[-0.20,0.00]*
Dominating	.06	.05	-.02	.05	-.04	-.04	-.04	-.01	-.03 *[-0.12,0.05]*	.03 *[-0.07,0.13]*
Yielding	-.08	-.11	-.12	-.08	.02	.12	.12	.12	.14 *[0.05,0.23]*	-.03 *[-0.13,0.07]*
Clashing	.05	.02	.09	.02	-.07	-.11	-.08	.08	-.05 *[-0.14,0.03]*	.06 *[-0.05,0.17]*

Note. N = 247. Correlations > .16 are significant at $p < .01$. *CSIV* = Circumplex Scales of Interpersonal Values. *IIP* = Inventory of Interpersonal Problems. *EDOS* = Evaluation of Disagreement Outcome Scales. *CI* = 95% confidence intervals computed using resampling procedures implemented by the R *circumplex* package (Girard et al., 2024).