Coordination and Cooperation

Pedro Dal Bó
Brown University

Guillaume R. Fréchette*
New York University

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Abstract

An extensive experimental literature has documented miscoordination in establishing cooperative relationships when they can be supported in indefinitely repeated games: some people systematically try to cooperate, while others do not. The literature has had little success in finding personal characteristics that correlate systematically with these behaviors. We show that subjects who play the risky but efficient action in a simple coordination game (i.e., play stag in a stag hunt game) are significantly more likely to cooperate in indefinitely repeated games. This suggests that subjects who are less susceptible to strategic uncertainty are more likely to attempt to establish cooperative relationships. *JEL codes: C7, C9.*

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1 Introduction

The tension between opportunistic behavior and cooperation is central to many human interactions. Game theory has shown that repeated interactions can help overcome this tension and lead to efficient outcomes: bad outcomes that can be supported in equilibrium can be used as threats to support cooperation (see Friedman (1971) and Fudenberg & Maskin (1986)). However, multiple equilibria may exist, often both cooperative and non-cooperative outcomes are possible. Great strides have been made to understand when cooperation is likely to emerge. Leveraging concepts from the literature on equilibrium selection in coordination games, the experimental literature on indefinitely repeated games has clearly established that average cooperation increases with the robustness of cooperation to strategic uncertainty (see Blonski et al. (2011), Dal Bó & Fréchette (2011), and Dal Bó & Fréchette (2018)). In other words, the emergence of cooperation depends crucially on strategic considerations.

This literature has also found a great degree of heterogeneity in behavior across subjects: even when conditions are favorable for establishing cooperative relationships, some subjects consistently attempt to coordinate on cooperation while others do not. However, little to no progress has been made in understanding the source of this heterogeneity even though multiple articles have explored the potential role of personal characteristics and attitudes. In particular, risk preferences, patience, psychological traits (Big Five), gender, major, altruism, IQ, and trust have all been investigated (Murnighan & Roth 1983, Sabater-Grande & Georgantzis 2002, Dal Bó 2005, Sherstyuk et al. 2013, Dreber et al. 2014, Proto et al. 2019, Davis et al. 2016, Proto et al. 2022, Aoyagi et al. 2023, Gill & Rosokha 2024, Kölle et al. 2025). The published results find, in the best case, a weak relation between these personal characteristics and cooperation.[1]

In this article, we study the relationship between cooperation and an additional personal characteristic: the susceptibility to strategic uncertainty. We conjecture that some people may be more likely to attempt coordinating on an inefficient but

[1]One exception is intelligence for which Proto et al. (2019) and Proto et al. (2022) find that when groups are sorted on the basis of IQ, high IQ groups cooperate more than low ones. Jones (2014) finds that IQ correlates positively with cooperation in a more complex dynamic game where the stage game (a 3x3 modified prisoner's dilemma) is randomly determined. One other recent finding for sorted groups is that cooperating as the second player in a sequential one-shot prisoner's dilemma is correlated to cooperation in an indefinitely repeated prisoner's dilemma where groups are formed on the basis of the sequential choice (Kölle et al. 2025).

safe equilibrium (i.e. playing always defect) rather than on an efficient but risky one (i.e. mutual cooperation), as they may be unsure about the intentions of the other player. We measure the susceptibility of subjects to strategic uncertainty by studying their behavior in a simple coordination game: the stag hunt game. In this 2x2 game, subjects may attempt to coordinate on a Pareto efficient but risky equilibrium (stag, stag) or on a Pareto inefficient but less risky equilibrium (hare, hare). This measure is both grounded in prior evidence, and implemented in a way that offers an easily implementable and portable measure of the tendency to cooperate in situations where it is an equilibrium to do so.

Our paper includes two new *augmented* meta-data of experimental studies (one for the stag hunt game and one for indefinitely repeated prisoner's dilemma with perfect monitoring), a novel meta-data of indefinitely repeated prisoner's dilemma with perfect monitoring where additional measurements were elicited, and a new laboratory experiment.[2]

The two augmented meta-data are used to confirm that the strategic environment, in particular the extent of strategic uncertainty, has a robust impact on choices in these two respective games. Furthermore, we show that there is cross subjects variation in choices for a given level of strategic uncertainty.

The new laboratory experiment allows us to study the connection between behavior in stag hung games and indefinitely repeated prisoner's dilemma games at the individual level. We conducted the laboratory experiments in five cities (Buenos Aires, Cairo, Nottingham, Osaka, and Providence) in which subjects participate in both a stag hunt game and ten indefinitely repeated games.[3] We find that subjects who choose stag have a cooperation rate in the first repeated game that is 64% higher than that for those who play hare. Even after playing several repeated games, subjects who choose stag are more cooperative than those who choose hare. This is consistent with the idea that subjects who are less susceptible to strategic uncertainty are more likely to attempt to establish cooperative relationships.

We also assemble a meta-data set from previous experiments on indefinitely repeated prisoner's dilemma games that measured personal characteristics. Using the

[2]The augmented stag hunt meta-data increases the number of subjects by 27% relative to Dal Bó et al. (2021). The augmented prisoner's dilemma meta-data adds 58% more subjects relative to Dal Bó & Fréchette (2018). The prisoner's dilemma meta-data with individual traits and characteristics includes 10 variables (besides the one proposed in this paper).

[3]The specific cities were selected because they allowed us access to a laboratory across the five main continents. Our goal was to verify the robustness of our measure.

meta-data, we can pool different studies that have measured the same trait to revisit the impact of that trait on cooperation with more power and using a unified methodology. These associations provide a benchmark for comparing the magnitude of the effect of our measure. We show that the previously studied characteristics have largely non-significant and non-robust relationships with cooperation, contrary to what we find for playing stag. In terms of magnitudes, focusing on the first prisoner's dilemma choice (the first round of the first supergame), we find that an increase of one standard deviation in choices of stag increases cooperation by nine percentage points. By contrast, the same increase for previously studied characteristics has at most an impact of six percentage points, with an average of around two percentage points.

These results stress the importance of strategic uncertainty in explaining behavior in indefinitely repeated games at the individual level. Behavior in stag hunt games can be used to measure people's susceptibility to strategic uncertainty and provides a portable measure that predicts strategic cooperation. The measure is simple enough that it can be implemented using pen and paper, and thus is potentially useful in other contexts.

For example, there is a growing literature using experimental games to understand how preferences or personal attitudes affect economic behavior and outcomes outside the laboratory.[4] These studies have explored a variety of games and traits, with trust being one of the most common. When it comes to cooperation, they have focused on one-shot games where cooperation is never an equilibrium outcome under the assumptions of selfish preferences, and thus must result from other-regarding preferences or confusion (see Cardenas & Carpenter (2008)). However, it seems at least equally interesting to explore strategic aspects of cooperation when it can be supported in equilibrium: different people and groups may resolve equilibrium multiplicity in different ways. Understanding whether there are systematic patterns with regards to the tendency for strategic cooperation across people or groups could inform this literature. No one has investigated this aspect so far, most surely because implementing an indefinitely repeated game is not easily done outside of a laboratory. Using behavior in stag hunt games as a proxy for a tendency for strategic cooperation could contribute to this literature.

[4]See, for example, Karlan (2005), Benz & Meier (2001), Carpenter & Myers (2010) Finan & Schechter (2012), Ligon & Schechter (2012) and the reviews by Cardenas & Carpenter (2008) and Nunn (2022).

Section 2 reviews the literature on the stag hunt game and the evidence connecting robustness to strategic uncertainty and behavior in that game. Section 3 does the same for the literature on indefinitely repeated prisoner's dilemma games. Section 4 presents the experimental design and results, including a comparison of magnitudes with other personal characteristics or attitudes. Section 5 concludes.

2 The Stag Hunt Game

The stag hunt game is a coordination game with two players and two actions with Pareto-ranked equilibria. It is a simple game that allows us to study how strategic uncertainty (the fact that a player may be uncertain about the action of the other player) may affect behavior.

In a generic stag hunt game each player independently chooses whether to hunt the stag or a hare. If both players choose to hunt the stag, they both obtain a high payoff G (G for *group effort*). If both hunt a hare, they both obtain a smaller payoff $I < G$ (I for *individual effort*). If the row player chooses hare and the column player chooses stag, the row player obtains a payoff $E < G$ (E for *egoist*). If the row player chooses stag and the column player chooses hare, then the row player obtains a payoff $B < I$ (B for *blindsided by the other player*). The payoffs of a player can be represented with the following matrix where the rows denote the action of the player and the columns the actions of the other player:

	stag	hare
stag	G	B
hare	E	I

.

This game has two Nash equilibria in pure strategies: $(stag, stag)$ and $(hare, hare)$, with the former dominating the latter in terms of payoffs. This game also has a Nash equilibrium in mixed strategies in which both players chose hare with probability $\frac{G-E}{G-E+I-B}$. The greater the cost of unilaterally deviating from the efficient equilibrium $(stag, stag)$ relative to the cost of deviating from the inefficient pure equilibrium $(hare, hare)$, the greater the probability of hare in the mixed strategy equilibrium.

An extensive literature has studied behavior in coordination games and found that people do not necessarily coordinate on the efficient equilibrium (see Cooper et al. (1990), Van Huyck et al. (1990), and Cooper et al. (1992)). This is consistent with the idea that people may not be sure about the likely action of the other player and hence miss-coordination payoffs (B and E in the stag hunt game) may affect behavior. Those payoff parameters can affect the robustness of the efficient equilibrium to strategic uncertainty (see Harsanyi & Selten (1988)). For example, the lower B is, the less attractive playing stag becomes for a player who is unsure about the action of the other player.

As discussed in Dal Bó et al. (2021), the robustness of $(stag, stag)$ to strategic uncertainty can be measured by the highest probability of the other player choosing hare that still results in stag being a best response. This number is equal to the probability of hare in the mixed strategy Nash equilibrium ($\frac{G-E}{G-E+I-B}$). We refer to this number as the size of the basin of attraction of stag. If the basin of attraction of stag is greater than one-half, stag is said to be risk dominant (Harsanyi & Selten (1988)).

Based on data from previous one-shot stag hunt experiments and new treatments, Dal Bó et al. (2021) find that subjects are more likely to play stag the greater is the size of the basin of attraction of stag, with the effect increasing with experience. We extend the meta-data in that article by adding new treatments to their analysis. These data come from two treatments in Dal Bó et al. (2021) that were not part of their meta-data and from two treatments in Kendall (2022).[5]

Consistent with the results in Dal Bó et al. (2021), panels A and B in Figure 1 show that the prevalence of stag increases with its basin of attraction and that this effect increases with experience. This result highlights the role of strategic uncertainty in explaining behavior in stag hunt games.

Note that there is substantial heterogeneity across subjects in many of the treatments, as there are many stag hunt games in which behavior is largely split between the two actions. While many subjects attempt to coordinate on the efficient equilibrium, many others do not. This is consistent with different subjects responding differently to strategic uncertainty.

[5]These additional datasets result in an increase of 18% in the number of sessions and 27% in the number of subjects relative to the meta-data used by Dal Bó et al. (2021). In total, there are 106 sessions and 1232 subjects for a total of 50,040 choices. See Table A1 in the Supplemental Appendix for details on the articles from which the data are derived and their characteristics.

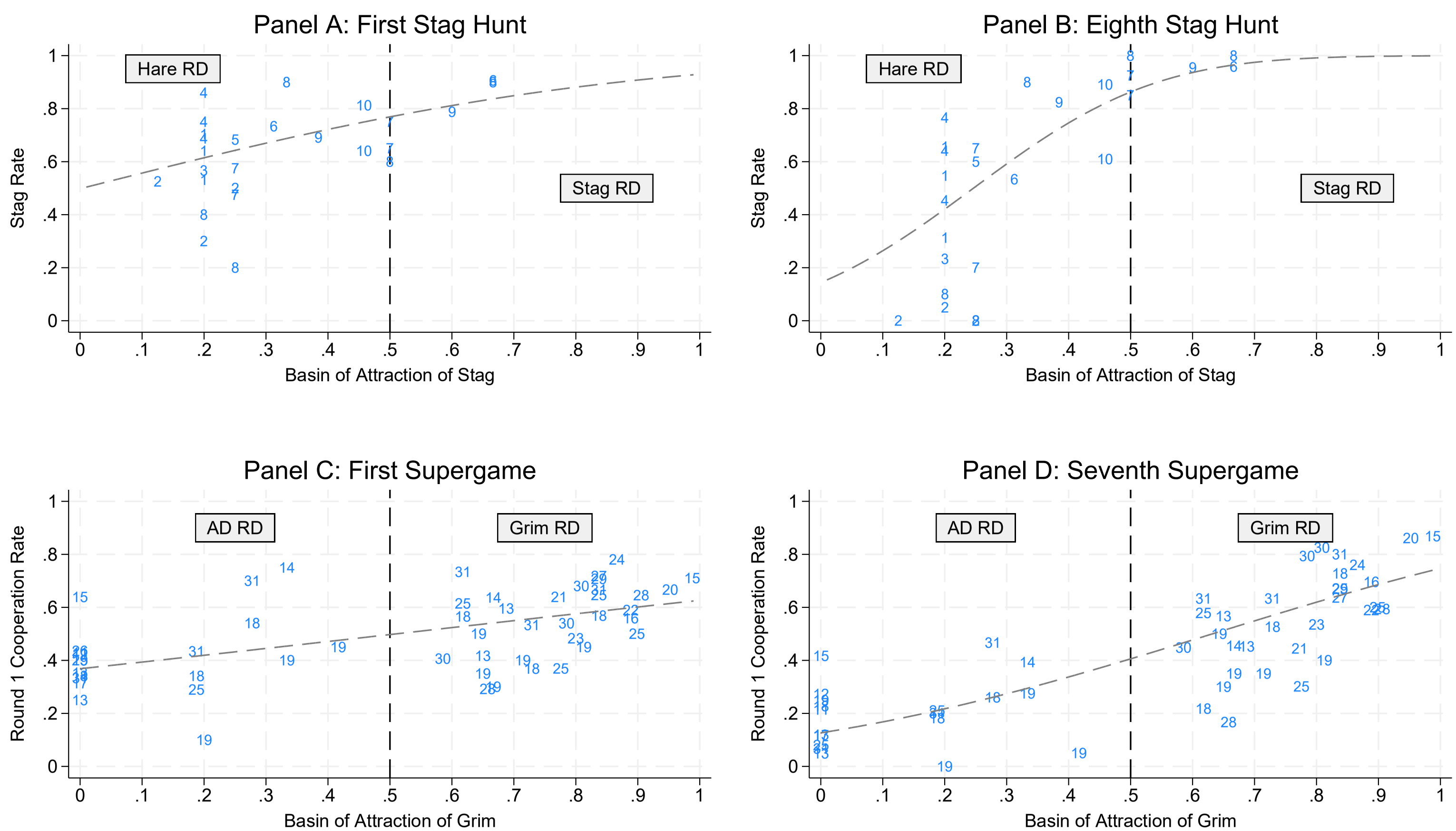


Figure 1: Strategic Uncertainty and Behavior in Stag Hunt and Indefinitely Repeated PD Games

Note: Each observation is a treatment in an article. Number labels denote articles: 1 Battalio et al. (2001), 2 Clark et al. (2001), 3 Cooper et al. (1992), 4 Dubois et al. (2012), 5 Duffy & Feltovich (2002), 6 Feltovich et al. (2012), 7 Schmidt et al. (2003), 8 Straub (1995), 9 Dal Bó et al. (2021), 10 Kendall (2022), 11 Andreoni & Miller (1993), 12 Cooper et al. (1992), 13 Dal Bó (2005), 14 Dreber et al. (2008), 15 Aoyagi & Fréchette (2009), 16 Duffy & Ochs (2009), 17 Dal Bó et al. (2010), 18 Dal Bó & Fréchette (2011), 19 Blonski et al. (2011), 20 Fudenberg et al. (2012), 21 Bruttel & Kamecke (2012), 22 Sherstyuk et al. (2013), 23 Kagel & Schley (2013), 24 Fréchette & Yuksel (2017), 25 Dal Bó & Fréchette (2019), 26 Dal Bó et al. (2018), 27 Proto et al. (2019), 28 Honhon & Hyndman (2020), 29 Proto et al. (2022), 30 Aoyagi et al. (2023), 31 Ghidoni & Suetens (2022). The dashed line denotes the predicted probability of stag (panels A and B) or round one cooperation (panels C and D) from a probit analysis with the size of the basin of attraction as explanatory variable.

3 The Infinitely Repeated Prisoners' Dilemma Game with Perfect Monitoring

An infinitely repeated prisoner's dilemma game is a simple dynamic game that allows us to study how cooperation can be supported when players will meet again; that is when subjects interact "under the shadow of the future" (see Friedman (1971), Axelrod (1984), Fudenberg & Maskin (1986), Abreu et al. (1990) and Fudenberg et al. (1994)). Our focus is on games with no randomness in outcomes and perfect monitoring: players know the history of actions at every point.

In a generic prisoner's dilemma game (PD), each player independently chooses whether to cooperate (C) or defect (D). If both cooperate, they both obtain a payoff R (R for *reward from mutual cooperation*). If both defect, they both obtain a smaller payoff $P < R$ (P for *punishment*). If the player cooperates and the other player defects, the player obtains a payoff $S < P$ (S for *sucker*). If the player defects and the other player cooperates, the player obtains a payoff $T > R$ (T for *temptation*).[6]

If we assume that two players with identical discount factor δ play the PD repeatedly forever (or with a probability of continuation equal to δ), then there is an infinite number of strategies from which players can choose from. The analysis can be greatly simplified by focusing on two strategies: Always Defect (AD) and Grim (G). Always Defect chooses D regardless of past histories. Grim chooses C in the first period and continues to choose C unless D has been chosen before. The resulting discounted payoffs of this simplified game are as follows for the row player:

	G	AD
G	$\frac{R}{(1-\delta)}$	$S + \frac{\delta}{(1-\delta)}P$
AD	$T + \frac{\delta}{(1-\delta)}P$	$\frac{P}{(1-\delta)}$

This simplified game is not meant to be descriptive of how people play, but rather, as we will see below, serves as a useful device to construct a measure of robustness to strategic uncertainty—see Blonski & Spagnolo (2015).

Given that $S < P$, the strategy pair (AD, AD) is a Nash equilibrium of the simplified game. However, this may not be the only equilibrium. As $T > R > P$, the strategy pair (G, G) is also a Nash equilibrium if δ is sufficiently large ($\delta \geq \frac{T-R}{T-P}$). If this condition on δ is satisfied, the simplified infinitely repeated PD game is equivalent

[6] It is also often required that $2R > T + S$ so that alternating between cooperation and defection cannot be more profitable than joint cooperation.

to the stag hunt game studied in the previous section. It has two Nash equilibria in pure strategies and one in mixed strategies, with the equilibrium (G, G) being Pareto efficient.

As is the case for coordination games, the previous literature has shown that strategic uncertainty affects behavior in indefinitely repeated PD experiments (see Dal Bó & Fréchette (2011), Blonski et al. (2011), and Dal Bó & Fréchette (2018)). In particular, Dal Bó & Fréchette (2018) shows that the prevalence of cooperation is positively related with a measure of the robustness of (G, G) to strategic uncertainty: the size of the basin of attraction of Grim.[7] To show this, they use experimental data from fifteen articles on indefinitely repeated or one-shot PD games. We extend this analysis here by including data from six new articles (Dal Bó et al. (2018), Proto et al. (2019), Honhon & Hyndman (2020), Proto et al. (2022), Aoyagi et al. (2023), and Ghidoni & Suetens (2022)).[8]

Panels C and D in Figure 1 show the prevalence of round one cooperation as a function of the size of the basin of attraction of Grim for each treatment (a combination of payoff parameters, discount factor, and article). The left panel presents data from the first repeated game, and the right panel from the seventh repeated game.[9] This figure shows that the more robust (G, G) is to strategic uncertainty, the greater the prevalence of cooperation. Moreover, this relationship becomes more pronounced as subjects gain experience. This result stresses the importance of strategic uncertainty in explaining behavior in repeated games.

Note that heterogeneity across subjects is important in many of the treatments. There are a number of treatments where behavior is largely split between cooperation and defection. While many subjects attempt to coordinate on a cooperative equilibrium by cooperating in the first round, many others do not. As was the case for stag hunt games, this heterogeneity of behavior is consistent with different subjects

[7]The basin of attraction of Grim is equal to $\frac{R-[(1-\delta)T+\delta P]}{R-[(1-\delta)T+\delta P]+P-[(1-\delta)S+\delta P]}$ if Grim can be supported in equilibrium.

[8]Only experiments with indefinitely repeated or one-shot standard PD games with perfect monitoring are considered. These additional datasets result in more than a 50% increase in the number of sessions and subjects relative to the data set used in Dal Bó & Fréchette (2018). In total, there are 3,809 subjects from 232 sessions, which combined represents 235,574 choices. See Tables A2 and A3 in the Supplemental Appendix for details on the articles from which the data are derived and their characteristics.

[9]Dal Bó & Fréchette (2018) focus on the seventh supergame as this allows them to study behavior after the subjects have some experience without losing any treatment as different treatments have a different total number of supergames.

responding differently to strategic uncertainty.[10] This raises the question of whether subjects who play stag are also more likely to cooperate in indefinitely repeated PD games.

4 Coordination and Cooperation: the experiment

4.1 Experimental Design

The main objective of the experiment is to compare behavior in a stag hunt game with behavior in an indefinitely repeated PD game at the subject level. The experiment has two parts. Subjects are first randomly matched to play one round of a stag hunt game with the following payoffs: $G = 90$, $B = 10$, $E = 85$, and $I = 50$. They are not informed of their opponent's choice in the stag hunt game until the end of the experiment.

After playing the stag hunt game, subjects play ten indefinitely repeated PD games with payoffs $T = 100$, $R = 75$, $P = 45$, and $S = 10$, and a probability of continuation of 0.75.

Subjects are randomly matched for each repeated game. In the repeated game, subjects receive feedback about the choices of the other player from previous rounds of the current supergame, and also have access to the history of actions for both subjects from their own previous supergames.

The game parameters are chosen to obtain behavior close to 50-50, both in the stag hunt and in the first round of the repeated game, based on the analyses of Dal Bó & Fréchette (2018) and Dal Bó et al. (2021). This 50-50 goal aimed to generate maximum diagnosticity. With these game parameters, the basin of attraction of stag versus hare is 0.111, and the basin of attraction of Grim versus Always Defect is 0.65.

The experiment has a single stag hunt game, but multiple repeated games. The many supergames are meant to explore whether the predictive power of our measure extends beyond the first supergame given that, with experience, individual tendencies may become less important as subjects react to others.

[10] This could be because for a given level of strategic risk, some subjects have more pessimistic beliefs than others. Indeed, Aoyagi et al. (2023) report important heterogeneity across subjects in terms of their beliefs in indefinitely repeated PDs. They also find that as the basin of attraction of Grim decreases (across games), beliefs about the cooperation of others become more pessimistic. Alternatively, different subjects could use different criteria to determine which equilibrium to select.

The experiment was conducted in five experimental laboratories in cities around the world: Buenos Aires, Cairo, Nottingham, Osaka, and Providence.[11] These locations were chosen for convenience and are not intended to be representative of the population of each continent. The experiment was run in five cities to study the degree of robustness of the results across continents. The experiments were not conducted in a way that differences across locations can be clearly attributed to cultural differences. Implementation details vary across locations, such as the person conducting the experiment or whether this person is a native speaker (see Roth et al. (1991) for a careful experimental design that allows for cross-country comparisons). This being said, the different subject pools appear to be the main difference.

The sessions were in English in Cairo, Nottingham, and Providence. The sessions in Buenos Aires were in Spanish, and the sessions in Osaka were in Japanese. All payments were made in local currency, with the experimental points to local currency exchange rates chosen to obtain experimental payoffs according to the usual ones in each laboratory (see Table A4 in the Supplemental Appendix). Subjects earned a show-up fee plus the value of the cumulative experimental points from the stag hunt game and all repeated games. The experiments lasted an hour and a half or less.

The random realization of the length of supergames was drawn in advance with the same realization being used for each session number across places (e.g. the length of supergames is the same across places for all the nth sessions).

Enough sessions were conducted to have at least one hundred subjects in each city, with an average of 5.8 sessions per city and a maximum of 9 sessions in Buenos Aires and a minimum of 3 sessions in Cairo. This resulted in 110 subjects in Buenos Aires, and 102 in all other cities (see Table A5 in the Supplemental Appendix). In total there are 518 subjects who earned on average around $20. Sample instructions in English are presented in the Supplemental Appendix. Instructions in Spanish and Japanese are available from the authors.

[11] The experimental laboratories are the Plataforma para Experimentos de la Universidad Torcuato Di Tella, the Experimental and Behavioural Economics Laboratory at the British University in Egypt, the Centre for Decision Research and Experimental Economics (CeDEx) at the University of Nottingham, the Institute of Social and Economic Research at Osaka University, and the Brown University Social Science Experimental Laboratory (BUSSEL). The software by Greiner (2015) was used to recruit subjects in some of these labs. The o-Tree software was used to conduct the experiments (see Chen et al. (2016)).

4.2 Experimental Results

Considering all cities together, we find that 67.76% of subjects chose stag in the stag hunt game. Furthermore, 48.07% chose to cooperate in the first round of the first supergame, and 42.66% cooperated in the first round of the last supergame. Considering all supergames, 45% chose to cooperate on average in the first round. See Table A6 in the online Supplemental Appendix.

While the prevalence of stag is greater than our goal of 50%, there is enough variation of behavior in the stag hunt game to study its relationship with behavior in repeated games.[12] Behavior in the repeated games was very close to the 50% we aimed for in supergame one.

4.2.1 Are people who play stag more likely to cooperate?

We focus on behavior in the first round of the repeated games as behavior in later rounds is affected by the outcomes of previous rounds (a subject who wanted to establish a cooperative relationship may defect in the second round if the partner defected in the first round).

As shown in Table 1, which presents the results from estimating a linear probability model for choosing cooperation as a function of stag choice, subjects who play hare cooperate 33.53% of the time in the first round of the first supergame, while those who play stag cooperate 54.99% of the time. This increase in cooperation of more than 20 percentage points is highly statistically significant and represents an increase of 64% in cooperation relative to those who play hare. Interestingly, even after playing 9 supergames, the cooperation rate of subjects who play stag is 44% greater than for those who played hare, and this difference is statistically significant at the 5% level. This can seem surprising as one could expect that the role of personal characteristics in cooperation would be greatly reduced as subjects learn from the behavior of others.[13]

If we consider all supergames together, we find that subjects who play hare cooperate in the first round 35.21% of the time, while those who play stag cooperate 50.43% of the time (in this case, the statistical analysis presented in Table 1 considers

[12] Importantly, all sessions had subjects playing both actions of the stag hunt game, which will allow us to use session fixed effects for some of the analysis.

[13] The correlation of behavior between the two games is 0.20 in supergame 1 and 0.14 in supergame 10. We focus on the difference in cooperation rates between stag and hare players rather than the correlation as 1) we are interested in the marginal impact and 2) it allows for the use of session fixed effects and clustering of standard errors.

one observation per subject with the outcome being the average round one cooperation rate for that subject). This increase in cooperation of 15 percentage points is highly statistically significant and represents a 43% increase in cooperation relative to those who play hare.[14]

Table 1: Stag Hunt Behavior and Round One Cooperation - Linear Probability Model

	Supergame			**Supergame**		
	1	10	All	1	10	All
Stag	0.215	0.144	0.152	0.190	0.153	0.150
	(0.041)	(0.057)	(0.032)	(0.042)	(0.058)	(0.033)
Constant	0.335	0.329	0.352			
	(0.028)	(0.049)	(0.034)			
Session FE	No	No	No	Yes	Yes	Yes
Observations	518	518	518	518	518	518

Note: Standard errors clustered at the session level. One observation per subject.

The last three columns in Table 1 include session fixed effects. Session fixed effects allow us to study the relationship in behavior between the two games across subjects while controlling for any characteristic that is common to all subjects in a session (and thus also location). We find that the coefficient of stag on cooperation is not affected much by the inclusion of session fixed effects. Even after controlling for session fixed effects, subjects who play stag are at least 43% more likely to cooperate in the indefinitely repeated PD game.

In conclusion, we find a strong relationship in behavior between the stag hunt game and the indefinitely repeated PD games at the individual level. This is consistent with the idea that subjects who are less susceptible to strategic uncertainty in the stag hunt game, and hence more likely to play stag, are also less susceptible to strategic uncertainty in the indefinitely repeated PD game and more likely to cooperate.

4.2.2 Do results differ by city?

Subjects who play stag cooperate at a higher rate in all cities, but this effect is not always statistically significant at the standard levels—see Table A8 in the Sup-

[14]Table A7 shows a similar analysis for every supergame. We find that the difference in behavior between those who played stag and those who played hare varies across supergames, but is statistically significant at the 10% in all supergames except supergames 4 and 9.

plemental Appendix which presents estimates of a linear probability model allowing for differences across the five cities. Without session fixed effects, the relationship between playing stag and cooperation in the first repeated game is statistically significant at the 10% level in all five cities. With session fixed effect, the relationship is no longer significant for Nottingham. In the last supergame, the relationship in behavior between the two games is significant at the 10% level in only two cities. The magnitudes of the relationship decrease more with experience in cities which observe greater decrease in cooperation as subjects gain experience (Cairo and Nottingham). In these cities, subjects may be more likely to have modified their behavior after observing many defections which may have reduced the impact of their own inclinations on behavior.

While the magnitude and significance of the relationship between playing stag and cooperating change across cities, we do find that there is a positive relationship in all cities. For the first supergame, this relationship is the weakest in Osaka. Nonetheless, subjects who play stag are 37% more likely to cooperate than those who play hare. Even when the relationship decreases with experience, in the city with the lowest relationship for the last supergame (Cairo), subjects who play stag are 23% more likely to cooperate in the last supergame, but this increase is not statistically significant. Moreover, when we test for equality across cities in the relationship between playing stag and cooperation, we cannot reject the null that there are no differences between cities at the 10% level in five of the six specifications presented in Table A8.

4.3 Comparison with Other Personal Traits

Many previous articles have studied the correlation between personal characteristics and behavior in indefinitely repeated games (see Murnighan & Roth (1983), Sabater-Grande & Georgantzis (2002), Dal Bó (2005), Fudenberg et al. (2012), Sherstyuk et al. (2013), Dreber et al. (2014), Jones (2014), Davis et al. (2016), Proto et al. (2019), Proto et al. (2022), Aoyagi et al. (2023), Gill & Rosokha (2024)). Our previous summary of the literature in Dal Bó & Fréchette (2018) concluded that "There is no robust evidence that risk aversion, economic training, altruism, gender, intelligence, patience, or psychological traits have a systematic effect on cooperation in indefinitely repeated games in which cooperation can be supported in equilibrium." As we have mentioned earlier, one exception to the lack of robust results is that intelligence has been shown to correlate with cooperation in two cases where cooperation can be supported in equilibrium: either when subjects are sorted into groups based on their intelligence (see Proto et al. (2019) and Proto et al. (2022)), or if the game is modified to be more complex by requiring state dependent strategies with a randomly determined stage game in each round (Jones 2014).[15]

However, these results are based mainly on experiments considered in isolation. It may be that when multiple studies are brought together, different findings emerge. Here, we do this to provide a benchmark against which to compare our finding of the relation between the stag hunt and the indefinitely repeated PD. We focus on published articles with standard PD games with perfect monitoring, *hot play* (no strategy method), and in which no other game with feedback was played before the repeated ones (as that experience can affect behavior and the role of personal characteristics). We only consider treatments in which cooperation can be supported in equilibrium (under the assumption of selfish preferences) as our focus is on repeated games with multiple equilibria. We do not consider treatments in which subjects were sorted into groups as a function of any personal characteristic or previous decisions and subjects are made aware of such a sorting (the reason being that knowledge of such sorting could affect behavior on itself).[16]

The data comes from seven articles, in addition to the experiment introduced in this paper, with a total of 134 experimental sessions, 18 different treatments (combination of game parameters and article), and more than two thousand subjects—see Table A9 in the Supplemental Appendix. As not all articles considered all characteristics, there are large variations in the number of sessions, treatments, maximum number of supergames played, and observations across the different personal characteristics.

The personal characteristics studied in these articles are whether the subject studies economics, age, gender, IQ, patience, risk preferences, the Big 5 psychological traits, social preferences and trust. Risk preferences were elicited differently across papers. Hence, to have a comparable measure, we estimate the curvature of a utility function with constant relative risk aversion by subject. Social preferences are measured in two different ways depending on the type of dictator game implemented. In Fudenberg et al. (2012) and Proto et al. (2019), the dictator game was implemented as subjects deciding how much of a fixed amount of money to give to the other sub-

[15]Fréchette et al. (2025) also study the role of intelligence, but in a game with imperfect public monitoring.

[16]Results are robust to focusing on sessions in which subjects were not sorted. See the Supplemental Appendix.

ject. For these two articles we measure pro-social behavior as the percentage given to the other subject. We denote this measure of pro-social behavior as *Share Dictator*. Ghidoni & Suetens (2022) implemented a series of binary dictator games in which subjects have to decide between an outcome with payoffs equal to those from unilateral defection in the PD game they study and a given equal amount for both subjects. This equal amount varied across dictator games. One of those values corresponds to the value from mutual cooperation in the PD game they study. We take the behavior from that dictator game for our analysis, as it provides the most directly relevant measure. We denote this measure of pro-social behavior as *Binary Dictator*. Trust was elicited using a survey question (see Proto et al. (2019)).

To be able to compare the magnitude of the relationship of the different personal characteristics with cooperation, we regress cooperation in round one of the first repeated game on each standardized personal characteristic. Figure 2 presents the estimated coefficients from four model specifications, which vary based on the inclusion of session fixed effects and whether standard errors are clustered at the session level.

For all the different relationships presented in Figure 2, none of the other characteristics beside stag have a statistically significant relationship at the 5% level with cooperation in the first supergame. Furthermore, the magnitude of the relationship between playing stag and cooperation is greater than the relationship of cooperation with any of the previously studied personal characteristics. While a one standard deviation increase in playing stag corresponds to an increase in more than 9 percentage points in cooperation (averaging across the four specifications), an increase of one standard deviation for the other characteristics of any specification has at most an impact of 6 percentage points with an average around 2 percentage points.

We next study how the relationships between personal characteristics and cooperation evolve as subjects gain experience across supergames (see Figure 3). There is no significant relationship at the 5% level in any of the supergames for nine of the fourteen previously considered personal characteristics. Among the other five, male is statistically significant at the 5% level in half of the supergames, including the last one. The magnitudes remain below 5 percentage points. The importance of IQ increases over supergames, reaching 8 percentage points in supergame 10. The relationship of IQ with cooperation is statistically significant in 6 of the 10 supergames. On average, its magnitude is close to 4 percentage points. IQ is the only previously studied personal characteristic that shows some robust relationship with cooperation

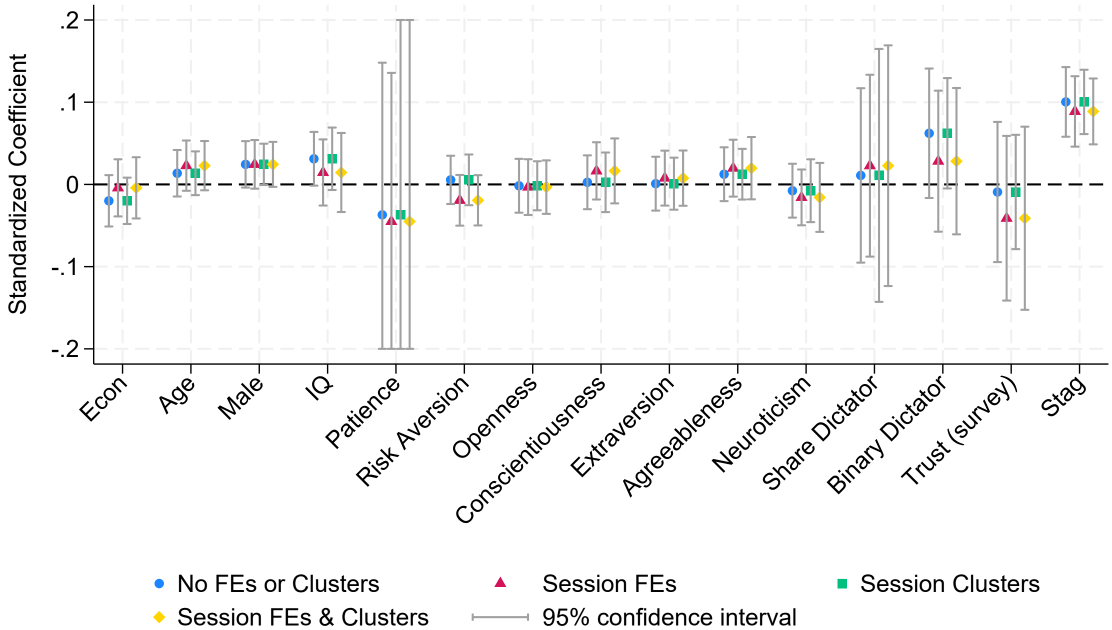


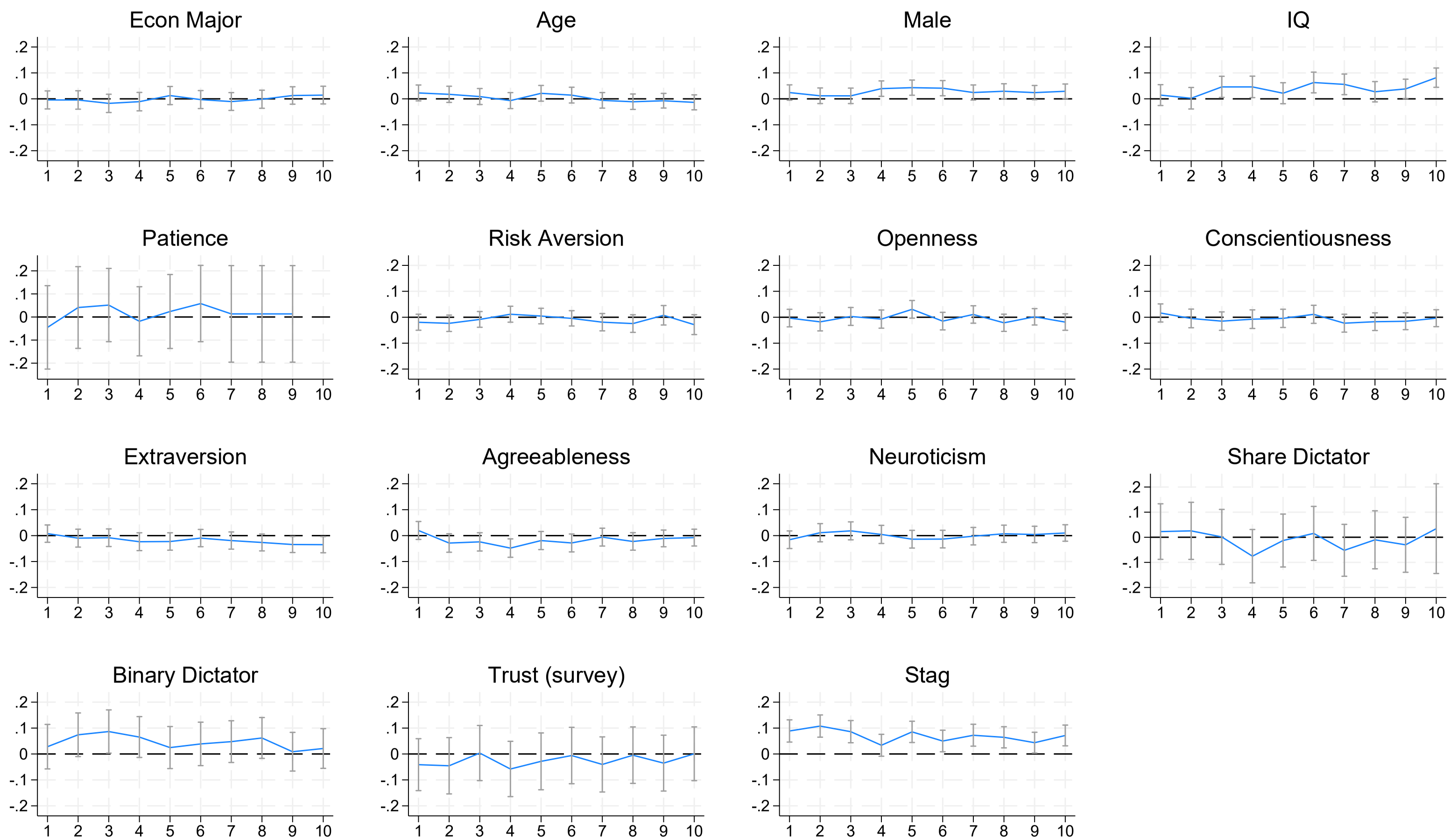
Figure 2: Comparison of Personal Characteristics Relationship with Cooperation in the First Supergame (Round One)

Note: Confidence intervals only shown between -0.2 and 0.2.

after subjects gain experience. Two of the Big 5 measures have some significant coefficients; extroversion in rounds 9 and 10, and agreeableness in round 4. Their magnitudes remain small. Behavior in the binary dictator game has a significant relationship with cooperation at the 5% level in supergame 3. This relationship dissipates with experience.

As shown in section 4.2.1, the relationship between playing stag and cooperation does not disappear with experience. The last panel in Figure 3 shows the relationship between playing stag and cooperation after standardizing stag and adding session fixed effects. The relationship is on average 7 percentage points and is significant at the 5% level in all but one supergame. In conclusion, of the fourteen personal characteristics studied in this section, playing stag is the only one that displays a consistent relationship with cooperation from the first supergame onward.

Figure 3: Evolution of Relationship between Personal Characteristics Relationship and Cooperation (Round One)



Note: Each panel shows the coefficients of the standardized explanatory variable in a regression with round one cooperation as the dependent variable. Analysis includes session fixed effects and no clustering of standard errors.

5 Conclusions

We introduce a new measure of an individual's propensity to cooperate in settings where repeated interactions make cooperation sustainable in equilibrium. This measure is simply how a person behaves in one stag hunt game. As in indefinitely repeated games in which cooperation can be supported, stag hunt games have multiple equilibria that can be Pareto ranked. One equilibrium is efficient but risky, and one equilibrium is inefficient but safe. Hence, the optimal choice depends on how confident a person is in predicting the behavior of others—that is, on the degree of strategic uncertainty. We interpret stag hunt behavior as revealing the susceptibility of the person to strategic uncertainty: a subject who chooses the efficient but more risky choice of stag is less susceptible to strategic uncertainty.

In a set of experiments conducted around the world, we find that behavior in the stag hunt game is predictive of cooperative tendencies in indefinitely repeated PD games in which cooperation can be supported in equilibrium: subjects who choose stag are 64% more likely to cooperate in their first choice than those who choose hare. As our focus is on situations in which cooperation can be supported in equilibrium, this measure captures an inclination for *strategic* cooperation, as opposed to other instances where cooperation is not an equilibrium outcome and must result from other-regarding preferences or biases.

We also put together a meta-data set of experiments in indefinitely repeated games that gather data on personal characteristics or attitudes. We find that none of the characteristics or attitudes studied previously have a significant relationship with initial cooperation since the first indefinitely repeated games. Moreover, the magnitude of the relationship between playing stag and cooperation is greater than that of any other characteristic studied previously.

An advantage of measuring cooperative tendencies with a simple stag hunt game is that it is easily implementable, as it does not require multiple stages as indefinitely repeated games do. This simplicity can allow its use in field applications, where a better understanding of variations in strategic considerations and beliefs with respect to cooperation could prove useful.

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Supplemental Appendix

Coordination and Cooperation

Pedro Dal Bó and Guillaume R. Fréchette

A1 Additional Tables and Figures

Table A1: General Information About Stag Hunt Games Data Sets Used

	Basin Stag	**Sessions**	**Subjects**	**Periods**
Battalio et al. (2001)		**24**	**192**	
	0.2	8	64	75
	0.2	8	64	75
	0.2	8	64	75
Clark et al. (2001)		**5**	**100**	
	0.125	2	40	10
	0.2	2	40	10
	0.25	1	20	10
Cooper et al. (1992)	0.20	**3**	**30**	22
Dubois et al. (2012)		**24**	**192**	
	0.2	8	64	75
	0.2	8	64	75
	0.2	8	64	75
Duffy and Feltovich (2002)	0.25	**3**	**60**	10
Feltovich et al. (2012)		**10**	**186**	
	0.313	6	90	20
	0.667	4	96	40
Schmidt et al. (2003)		**16**	**160**	
	0.25	4	40	8
	0.25	4	40	8
	0.5	4	40	8
	0.5	4	40	8
Straub (1995)		**5**	**50**	
	0.2	1	10	9
	0.25	1	10	9
	0.333	1	10	9
	0.5	1	10	9
	0.667	1	10	9
Dal Bó et al. (2021)*		**8**	**134**	
	0.385	4	68	15
	0.6	4	66	15
Kendall (2022)*		**8**	**128**	
	0.458	4	64	75
	0.458	4	64	75
Total		**106**	**1232**	

Note: a row for each combination of payoff parameters. * denotes data sets added to meta-data in Dal Bó et al. (2021).

Table A2: General Information About PD Data Sets Used in Dal Bó & Fréchette (2018)

	δ	**Basin Grim**	**Sessions**	**Subjects**	**Supergames**
Andreoni & Miller (1993)	0	0	**1**	**14**	**200**
Cooper et al. (1996)	0	0	**3**	**33**	**10**
Dal Bó (2005)			**6**	**276**	
	0	0	2	72	7
	0	0	2	102	9
	0.75	0.65	1	60	10
	0.75	0.688	1	42	7
Dreber et al. (2008)			**2**	**50**	
	0.75	0.333	1	28	21
	0.75	0.667	1	22	27
Aoyagi & Fréchette (2009)			**4**	**74**	
	0	0	2	36	75
	0.9	0.987	2	38	10
Duffy & Ochs (2009)	0.9	0.889	**9**	**102**	**13**
Dal Bó et al. (2010)	0	0	**28**	**424**	**10**
Dal Bó & Fréchette (2011)			**18**	**266**	
	0.5	0	3	44	71
	0.75	0.1875	3	44	33
	0.5	0.278	3	50	72
	0.5	0.618	3	46	77
	0.75	0.729	3	38	47
	0.75	0.838	3	44	35
Blonski et al. (2011)			**10**	**200**	
	0.5	0	1	20	11
	0.75	0.2	1	20	11
	0.75	0.333	2	40	11
	0.75	0.417	1	20	11
	0.75	0.643	1	20	11
	0.875	0.65	1	20	8
	0.75	0.667	1	20	11
	0.875	0.714	1	20	8
	0.75	0.813	1	20	11
Fudenberg et al. (2012)	0.875	0.952	**3**	**48**	**9**
Bruttel & Kamecke (2012)	0.8	0.773	**3**	**36**	**20**
Sherstyuk et al. (2013)	0.75	0.889	**4**	**56**	**29**
Kagel & Schley (2013)	0.75	0.8	**6**	**114**	**39**
Fréchette & Yuksel (2017)	0.75	0.867	**3**	**50**	**12**
Dal Bó & Fréchette (2019)			**41**	**672**	
	0.5	0	3	50	37
	0.75	0.188	8	114	25
	0.5	0.618	8	140	46
	0.9	0.776	10	168	21
	0.75	0.838	10	164	24
	0.95	0.898	2	36	7
Total			**141**	**2415**	

Table A3: General Information About Additional PD Data Sets Used

	δ	**Basin Grim**	**Sessions**	**Subjects**	**Supergames**
Dal Bó et al. (2018)	0	0	**28**	**528**	**5**
Proto et al. (2019)	0.75	0.8375	**8**	**110**	**65**
Honhon & Hyndman (2020)			**5**	**72**	
	0.7	0.658	2	24	23
	0.9	0.906	3	48	12
Proto et al. (2022)	0.75	0.8375	**8**	**106**	**42**
Aoyagi et al. (2023)			**24**	**398**	
	0.875	0.586	8	128	12
	0.875	0.785	8	126	12
	0.875	0.809	8	144	12
Ghidoni & Suetens (2022)			**18***	**180**	
	0.5	0	3	30	50
	0.75	0.188	3	30	50
	0.5	0.2778	3	30	50
	0.5	0.618	3	30	50
	0.75	0.729	3	30	50
	0.75	0.838	3	30	50
Total			**91**	**1394**	

* For Ghidoni & Suetens (2022) "sessions" denotes the number of matching clusters.

Table A4: Experimental Exchange Rates

	To Local Currency		**To US Dollars**	
	Stag Hunt (100 points)	**PD** (1000 points)	**Stag Hunt** (100 points)	**PD** (1000 points)
Buenos Aires	3300	1100	7.02-14.35*	2.34-4.78*
Cairo	360	120	7.66	2.55
Nottingham	12	4	15.19	5.06
Osaka	1425	475	10.04	3.35
Providence	15	5	15	5

* A range is provided for Buenos Aires as several exchange rates existed at the time.

Table A5: General Information About Experiment

	Sessions	**Subjects**	**Ave. Payoff $**
Buenos Aires	9	110	11.82-24.16*
Cairo	3	102	12.55
Nottingham	4	102	26.27
Osaka	5	102	20.75
Providence	8	102	27.57
Total	29	518	19.67-22.29

* Range provided for Buenos Aires as many exchange rates existed at the time.

Table A6: Behavior in Stag Hunt and Indefinitely Repeated PD (%)

		Round One Cooperation Supergame		
	Stag	**1**	**10**	**All**
Buenos Aires	63.61	36.36	33.64	39.73
Cairo	73.53	47.06	30.39	38.24
Nottingham	68.63	48.04	33.33	37.25
Osaka	63.73	50.00	51.96	50.00
Providence	69.61	59.80	64.71	62.84
All	67.76	48.07	42.66	45.52

Table A7: Stag Hunt Behavior and Round One Cooperation by Supergame - Linear Probability Model

Panel A: No session fixed effects

	Supergame									
	1	2	3	4	5	6	7	8	9	10
Stag	0.215	0.248	0.194	0.081	0.179	0.103	0.159	0.115	0.085	0.144
	(0.041)	(0.034)	(0.050)	(0.051)	(0.037)	(0.040)	(0.038)	(0.044)	(0.056)	(0.057)
Constant	0.335	0.347	0.341	0.389	0.311	0.353	0.365	0.389	0.359	0.329
	(0.028)	(0.036)	(0.038)	(0.043)	(0.043)	(0.045)	(0.031)	(0.055)	(0.057)	(0.049)
Observations	518	518	518	518	518	518	518	518	518	518

Panel B: Session fixed effects

	Supergame									
	1	2	3	4	5	6	7	8	9	10
Stag	0.190	0.230	0.184	0.072	0.183	0.107	0.155	0.138	0.093	0.153
	(0.042)	(0.037)	(0.049)	(0.049)	(0.041)	(0.044)	(0.040)	(0.046)	(0.060)	(0.058)
Observations	518	518	518	518	518	518	518	518	518	518

Note: Standard errors clustered at session level.

Table A8: Stag Hunt Behavior and Round One Cooperation - Linear Probability Model by City

	Supergame			**Supergame**		
	1	10	All	1	10	All
Stag x	0.14*	0.14	0.14***	0.12*	0.19*	0.15***
Buenos Aires	(0.069)	(0.090)	(0.046)	(0.070)	(0.098)	(0.051)
Stag x	0.24*	0.06	0.16*	0.19*	0.07	0.16*
Cairo	(0.118)	(0.148)	(0.094)	(0.104)	(0.149)	(0.082)
Stag x	0.20*	0.08	0.10	0.18	0.04	0.07
Nottingham	(0.116)	(0.168)	(0.072)	(0.117)	(0.174)	(0.070)
Stag x	0.15***	0.18**	0.09**	0.12**	0.16	0.08
Osaka	(0.042)	(0.085)	(0.042)	(0.047)	(0.104)	(0.069)
Stag x	0.35***	0.28***	0.29***	0.36***	0.31***	0.32***
Providence	(0.071)	(0.066)	(0.057)	(0.087)	(0.068)	(0.059)
Buenos Aires	0.28***	0.25***	0.31***			
	(0.080)	(0.080)	(0.059)			
Cairo	0.30***	0.26***	0.26***			
	(0.016)	(0.035)	(0.012)			
Nottingham	0.34***	0.28	0.31***			
	(0.064)	(0.172)	(0.092)			
Osaka	0.41***	0.41***	0.44***			
	(0.031)	(0.095)	(0.079)			
Providence	0.35***	0.45***	0.43***			
	(0.055)	(0.069)	(0.069)			
Session FE	No	No	No	Yes	Yes	Yes
Observations	518	518	518	518	518	518
Equal interactions p-value	0.181	0.494	0.103	0.215	0.389	0.068

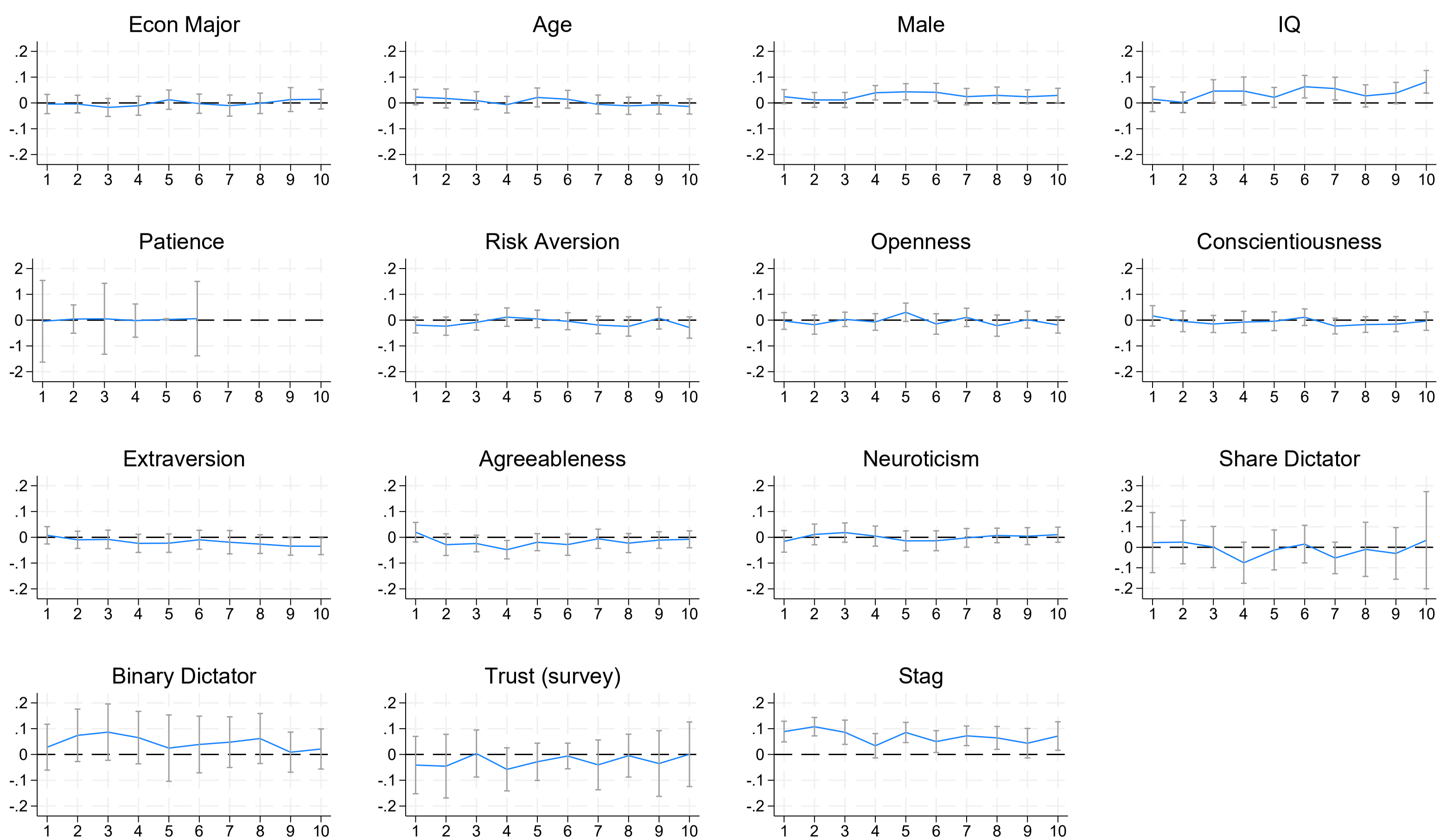
Note: Standard errors clustered at the session level. One observation per subject.

Table A9: Information about Meta-Data on Personal Characteristics and Cooperation

	Sessions	Treatments	Supergames	Subjects	Economics	Age	Gender	IQ	Patience	Risk	Big 5	Share Dictator	Binary Dictator	Trust	Stag
Dal Bó (2005)	2	2	10	102	102	0	0	0	0	0	0	0	0	0	0
Dreber et al. (2008)	2	2	27	50	49	49	49	0	0	0	0	0	0	0	0
Fudenberg et al. (2012)	2	1	9	30	0	30	30	0	30	0	0	30	0	0	0
Sherstyuk et al. (2013)	4	1	29	56	56	56	56	0	0	0	0	0	0	0	0
Proto et al. (2019)	40	2	131	586	565	586	586	586	0	451	586	48	0	114	0
Proto et al. (2022)	16	1	42	214	135	214	214	214	0	189	214	0	0	0	0
Ghidoni & Suetens (2022)	15	5	50	150	0	150	150	0	0	0	0	0	150	0	0
Aoyagi et al. (2023)	24	3	12	398	0	0	0	0	0	395	0	0	0	0	0
This Paper	29	1	10	518	0	0	0	0	0	0	0	0	0	0	518
Total	134	18		2104	907	1085	1085	800	30	1035	800	78	150	114	518
Total sessions					64	79	79	56	2	76	56	10	15	8	29
Total treatments					8	12	12	3	1	6	3	2	5	1	1
Supergames					131	131	131	131	9	131	131	65	50	90	10

Note: “Supergames” denotes the highest supergame reached. For Ghidoni & Suetens (2022), “sessions” denotes matching clusters.

Figure A1: Evolution of Relationship between Personal Characteristics Relationship and Cooperation (Round One)



Note: Each panel shows the coefficients of the standardized explanatory variable in a regression with round one cooperation as the dependent variable. Analysis includes session fixed effects. Standard errors clustered at the session level.

Table A10: Information about Meta-Data on Personal Characteristics and Cooperation (Non-sorted sessions)

	Sessions	Treatments	Supergames	Subjects	Economics	Age	Gender	IQ	Patience	Risk	Big 5	Share Dictator	Binary Dictator	Trust	Stag
Dal Bó (2005)	2	2	10	102	102	0	0	0	0	0	0	0	0	0	0
Dreber et al. (2008)	2	2	27	50	49	49	49	0	0	0	0	0	0	0	0
Fudenberg et al. (2012)	2	1	9	30	0	30	30	0	30	0	0	30	0	0	0
Sherstyuk et al. (2013)	4	1	29	56	56	56	56	0	0	0	0	0	0	0	0
Proto et al. (2019)	8	1	65	110	108	110	110	110	0	88	110	48	0	0	0
Proto et al. (2022)	8	1	42	106	58	106	106	106	0	92	106	0	0	0	0
Ghidoni & Suetens (2022)	15	5	50	150	0	150	150	0	0	0	0	0	150	0	0
Aoyagi et al. (2023)	24	3	12	398	0	0	0	0	0	395	0	0	0	0	0
This Paper	29	1	10	518	0	0	0	0	0	0	0	0	0	0	518
Total	94	17		1520	373	501	501	216	30	575	216	78	150	0	518
Total sessions					24	39	39	16	2	40	16	10	15	0	29
Total treatments					7	11	11	2	1	5	2	2	5	0	1
Supergames					65	65	65	65	9	65	65	65	50	0	10

Note: “Supergames” denotes the highest supergame reached. For Ghidoni & Suetens (2022), “sessions” denotes matching clusters.

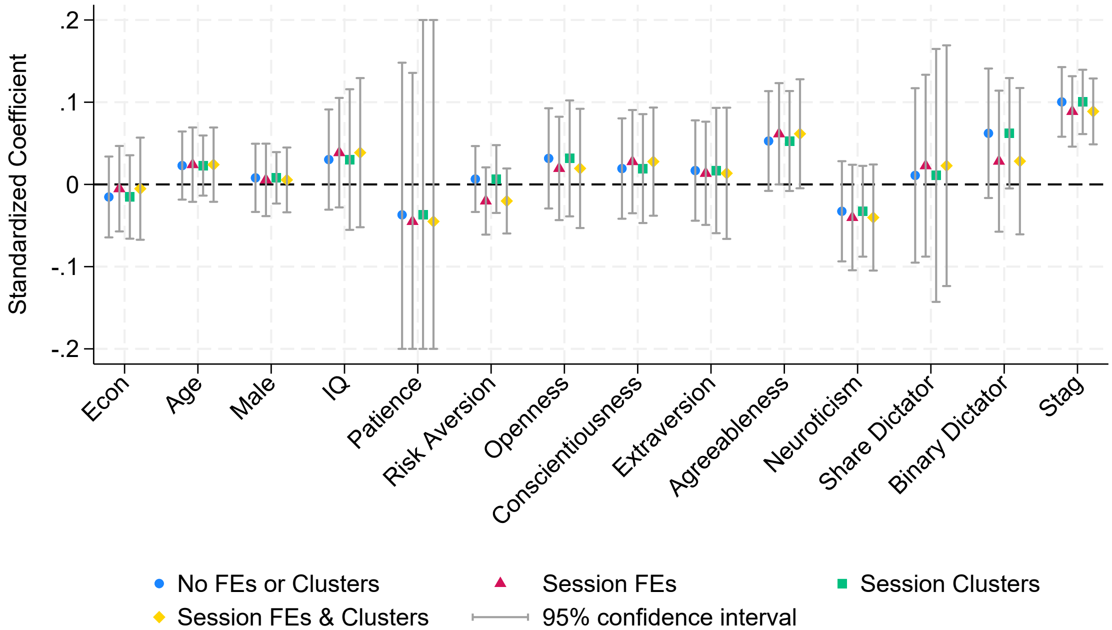
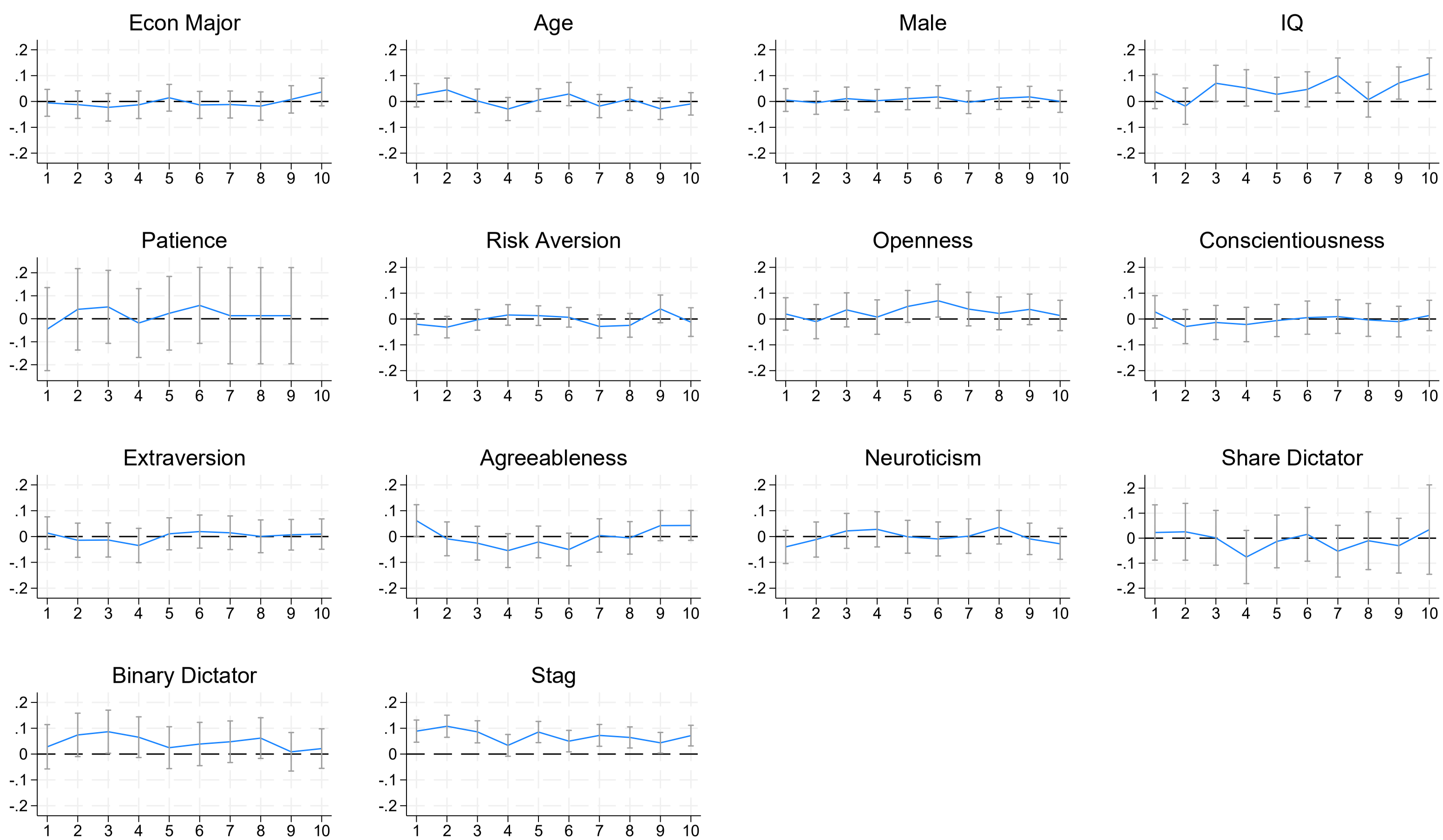


Figure A2: Comparison of Personal Characteristics Relationship with Cooperation in the First Supergame (Round One) of Non-Sorted Sessions

Note: Confidence intervals only shown between -0.2 and 0.2. Only sessions in which subjects were not separated into group based on their characteristics are included.

Figure A3: Evolution of Relationship between Personal Characteristics Relationship and Cooperation (Round One) of Non-Sorted Sessions



Note: Each panel shows the coefficients of the standardized explanatory variable in a regression with round one cooperation as the dependent variable. Only sessions in which subjects were not separated into group based on their characteristics are included. Analysis includes session fixed effects and no clustering of standard errors.

A2 Instructions (Providence)

INSTRUCTIONS

1. You are about to participate in an experiment on decision-making. What you earn depends partly on your decisions, partly on the decisions of others, and partly on chance. Please turn off cell phones and similar devices now.

2. The entire experiment will take place through computer terminals. Please do not talk or in any way try to communicate with other participants.

3. We will start with a brief instruction period. If you have any questions during this period, raise your hand and your question will be answered so everyone can hear.

4. This experiment has two parts.

Part 1

These instructions are for the first part. Once this part is over, instructions for the next part will be given to you. Your decisions in this part have no influence on the next part.

You will be asked to make one decision: choose either action A or action B. Your earnings will depend on your choice and the choice of the participant you are paired with. The choices and the points you may earn in part 1 are as follows:

		Other's Choice A	Other's Choice B
Your Choice	A	$90, 90$	$10, 85$
Your Choice	B	$85, 10$	$50, 50$

The first entry in each cell represents your points, while the second entry represents the points of the participant you are paired with. That is if:

- You select A and the other selects A: you each make 90 points.
- You select A and the other selects B: you make 10 points while the other makes 85 points.

- You select B and the other selects A: you make 85 points while the other makes 10 points.
- You select B and the other selects B: you each make 50 points.

At the end of the experiment you will receive your payment from Part 1, in addition to the payment for Part 2. The points you earn in Part 1 will be converted to dollars at an exchange rate of 0.15 dollars per point, that is, 100 points are worth $15.

Are there any questions?

Before we start, let me remind you that:

- You will be paired with a random participant.
- You will be asked to make one decision.
- Your earnings depend on your decision and the decision of the participant you are paired with.

Part 2

In this part, you will be asked to make decisions in several matches and rounds.

You will be randomly paired with someone for a sequence of rounds. Each sequence of rounds is referred to as a match.

In each round, you will be asked to choose either action 1 or action 2.

Your payoffs for the round will depend on your choice and the choice of the participant you are paired with as follows:

		Other's Choice	
		1	2
Your Choice	1	75, 75	10, 100
	2	100, 10	45, 45

The first entry in each cell represents your points, while the second entry represents the points of the participant you are paired with. That is, if:

- You select 1 and the other selects 1: you each make 75 points.

- You select 1 and the other selects 2: you make 10 points while the other makes 100 points.

- You select 2 and the other selects 1: you make 100 points while the other makes 10 points.

- You select 2 and the other selects 2: you each make 45 points.

Once you and the participant you are paired with have made your choices, those choices will be highlighted and this will inform you of your payoff for the round.

The length of a match is randomly determined. After each round, there is a probability of 75% that the match will continue for at least another round.

Whether a match continues is decided as follows. After each round, we draw a random number between 1 and a 100 and check whether the number is greater than 75. If the random number is greater than 75, the match ends; if the number is not greater than 75, the match continues. So, for instance, if you are in round 2, the probability there will be a third round is 75%; and if you are in round 9, the probability there will be another round is also 75%.

On the left side of the screen, you will be able to see what happened in all rounds of the current match, and you can also access the history of your previous matches.

Once a match ends, you will be randomly paired with someone for a new match. There will be 10 matches in Part 2 of the experiment.

Your earnings for Part 2 will be the sum of all the points you earned over all rounds and matches, and they will be converted to dollars at the exchange rate of 0.005 dollars per point: that is, 1000 points are worth $5. The payment from Part 2 will be added to the payment from Part 1.

Are there any questions?

Before we start, let me remind you that:

- You will participate in 10 matches.

- You will be paired with a random participant for each match.

- You will play with the same person for the entire match.

- The length of a match is randomly determined.

- After a match is finished, you will be randomly paired with someone for a new match.