Cross-cultural differences in playing centipede-like games with surprising opponents

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Abstract

In this paper, we study cross-cultural differences in strategic reasoning in turn-taking games, as related to game-theoretic norms as well as affective aspects such as trust, degrees of risk-taking and cooperation. We performed a game experiment to investigate how these aspects play a role in reasoning in simple turn-based games, known as centipede-like games, across three cultures, that of The Netherlands, Israel and India. While there is no significant main effect of nationalities on the behaviour of players across games, certain unexpected interactive effects are found in their behaviour in particular games.

Keywords: intercultural differences; game theory; reasoning in games; trust and trustworthiness; risk considerations; cooperation

Introduction

Cognitive science is not only concerned with universal patterns of cognition, but also variations in those patterns, induced by relevant factors. As D'Andrade (1981) and Levinson (2012) argue, studying variation, and in particular cross-cultural differences, provides important insights. In this article, we study cross-cultural differences in strategic reasoning in turn-taking games, as related to affective aspects such as trust, degrees of risk-taking and cooperation. To this end, we performed a game experiment in three countries: The Netherlands, India and Israel.

Cross-cultural differences and games

It has been known for a long time that in turn-taking games of perfect information, people in general do not act exactly according to the prescriptions of game theory, which are based on the common knowledge of the rationality of participants (Aumann, 1995; Nagel & Tang, 1998). There has been a lot of interest in the possible differences between people from different countries with respect to adherence to game-theoretic predictions (Camerer, 2011). Note that national cultures should not be interpreted in an essentialist way: Cultural tendencies can be induced by incentives (Peysakhovich & Rand, 2016). For our experiments, we are mainly interested in four aspects:

- adherence to strategies defined in game theory, namely, forward versus backward induction;
- degree of trust and degree of trustworthiness;
- degrees of risk-taking;
- cooperative versus competitive tendencies.

As far as we know, our experiment is the first one to compare adherence to forward induction versus backward induction reasoning between different nationalities. The notions of forward and backward induction are explained in the next subsection on games.

With respect to trust and cooperation, however, there have been a number of previous cross-cultural studies, using both games in which participants meet an opponent only once and games in which they repeatedly interact with the same opponent (Roth et al., 1991; Ho & Weigelt, 2005; Henrich et al., 2005). Differences in trust, cooperativeness, and risk-taking between British and Japanese participants in turn-taking centipede games have been studied in Krockow et al. (2017).

Trust and trustworthiness Yamagishi & Yamagishi (1994) have distinguished two types of trust:

- *assurance-based trust* needed in relationships with high social certainty with an expectation of future interaction;
- *general trust* needed in encounters with strangers with low social certainty and low expectation of long-time future interaction.

Yamagishi & Yamagishi (1994) have also shown that different cultures score very differently on these two types: Assurance-based trust is high in cultures like Japan, as incentivized by long-time employment by the same company. In the United States and Great Britain, in contrast, high general trust corresponds with the prevalence of short-time employment and commerce with strangers. Based on the literature, we expect that trust for strangers is relatively low in India (where assurance-based trust is high, like in Japan) and high in The Netherlands (like in Great Britain), with Israel probably in between.

Cooperation, competition, and self-interest According to Hofstede (1991) (see the left part of Figure 1), Israel is an interesting mix between collectivist cultures such as India, which are expected to be more cooperative in nature,

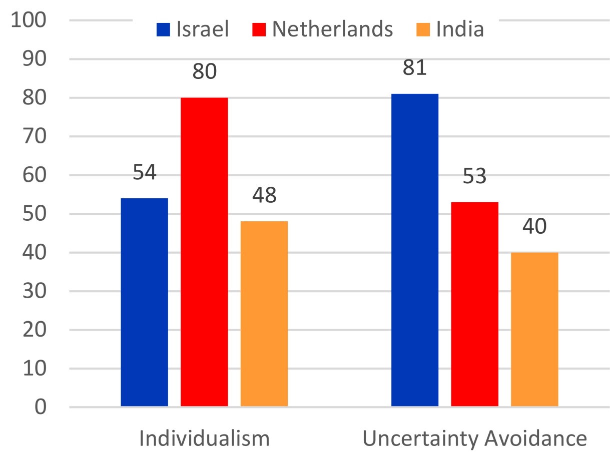

Figure 1: Individualism and uncertainty avoidance ratings of Israel, the Netherlands and India. The numbers for the countries were provided by the country comparison tool on Hofstede's website `https://www.hofstede-insights.com/`, based on the six dimensions distinguished by Hofstede (1991).

and individualist ones such as the Netherlands, in which self-interested behaviour is more common.

Attitudes toward risk According to Hofstede (1991), people in Israel predominantly try to avoid uncertainty, while people in The Netherlands are rather neutral and people in India can handle uncertainty and risk most easily, see the right part of Figure 1.

The main focus of this paper is an experiment to investigate how the above-mentioned aspects play a role in reasoning in simple turn-based games, known as centipede-like games, across the three cultures. The games are introduced in the next subsection.

Games for the experiment

The participants in our experiments played a turn-based game called Marble Drop (Figure 2) against a computer opponent, and accordingly, we denote the two players by 'C' and 'P'. An important advantage of using computer opponents in experiments with turn-taking games is that the experimenter can control the strategies used by the computer opponent, which allows better interpretation of the participants' decisions. The choice of the Marble Drop games was inspired by (Halder et al., 2015; Ghosh et al., 2017; Verbrugge et al., 2018). These games can be visually represented as binary tree structures (Figures 3 and 4). The difference between Game 1 and Game 2 lies in the payoff of player C when choosing a at C_1. That payoff of player C after choosing a is also the only difference between Game 3 and Game 4. In addition, the only difference between Game 1 and Game 2 on the one hand and Game 3 and Game 4 on the other hand is the payoff of player P after choosing h at P_2. Since the structure of these games is reminiscent of a centipede, with its body extending from top left to bottom right, the games are termed as 'centipede-like' games.[1]

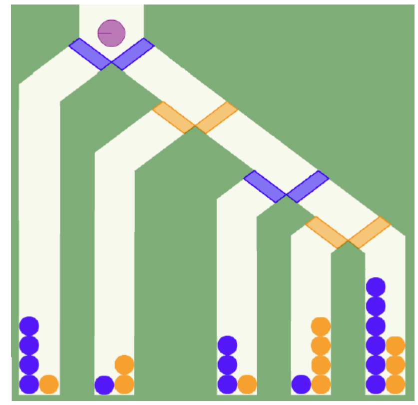

Figure 2: Marble Drop game. Players, assigned blue and orange, control the marble's course by opening the left or right trapdoor of their color once the purple marble arrives there. When the purple marble ends up in a certain bin, each player earns the marbles of their color in that bin. This example payoff structure corresponds to Game 1 of Figure 3 below.

In the textbook approach of solving such turn-based games in game theory, players who are commonly known to be rational use the *backward induction* (BI) strategy (Perea, 2010): one should ignore previous information, and work backwards from the end of the game tree to reach a decision. For example, in the 'orange' player's last turn in the marble drop game (Figure 2), he has to decide between going to the left or to the right, for payoffs of 4 or 3 orange marbles, respectively. Using BI, because 4 is more than 3, he chooses to go left, delivering the outcome pair (1,4): 1 for the blue player, 4 for the orange player. One can then continue backwards to compare the left and right choices in the blue player's second turn: going right gives (1,4) while going left gives (3,1); because 3 is more than 1, the blue player would choose to open the left blue trapdoor. One then continues to reason backwards to compare the actions in the orange player's first turn, where the outcome is (1,2) when playing left and (3,1) by playing right. One assumes that, 2 being more than 1, the orange player chooses to open the left orange trapdoor. Finally, one compares the actions in the blue player's first turn, where going left leads to (4,1) and going right leads to (1, 2). Because 4 is more than 1, the blue player will choose to open the left trapdoor to obtain 4 points. Note that playing rationally by BI does not necessarily lead to the outcome with the highest sum of players' payoffs – that would have been achieved by both players choosing to open their right trapdoors at all four decision points and ending up with a combined payoff of 6+3.

The 'surprising opponent' component of these experimental games comes from the fact that player C (blue) when starting the game does not always play according to the strategy

[1] The games we consider do not always comply with the conditions on payoffs of the original centipede game (Rosenthal, 1981).

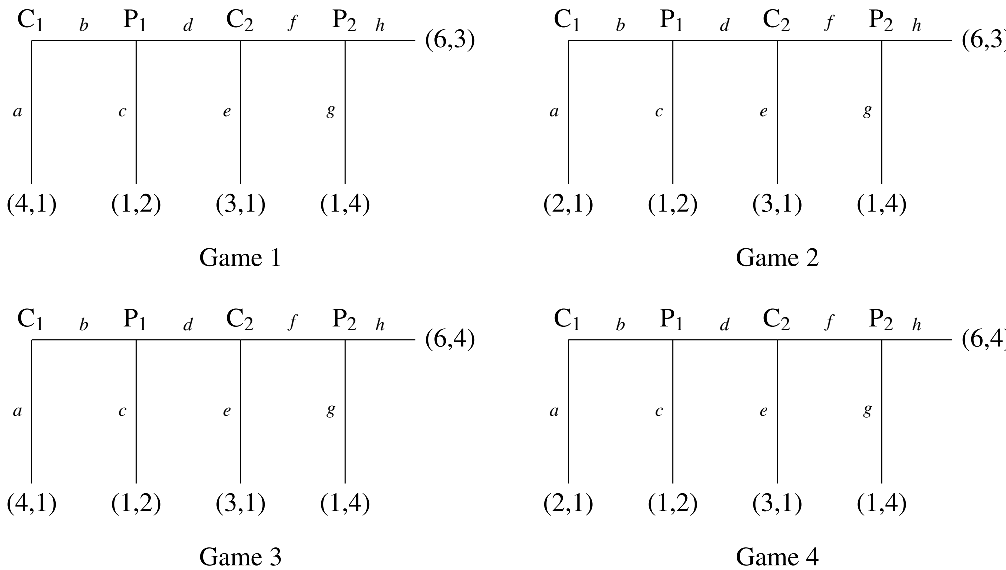

Figure 3: Collection of the main games used in the experiment. The ordered pairs at the leaves represent payoffs for the computer (C) and the participant (P), respectively.

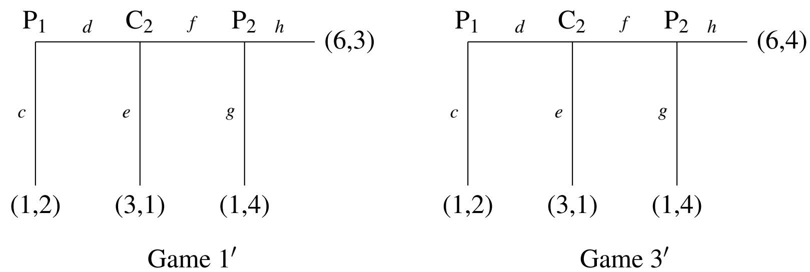

Figure 4: Game $1'$ corresponds with the parts of Games 1 and 2 from P_1 onwards. Game $3'$ corresponds with the parts of Games 3 and 4 from P_1 onwards.

described above. Note that in Games 1-4 in Figure 3, the BI strategy suggests for player C to choose a at the first decision node. In our experiment, the computer player often goes to the right to give player P (orange) a turn to move in the game. The orange player may or may not take into account this 'surprising' move of the blue player while considering his future moves. He can disregard his opponent's past move and play as if he is playing a 'new' game from the current turn and continue according to the BI strategy. Such players would play as if they were playing Game $1'$ or Game $3'$ (see Figure 4). Alternatively, the orange player can play according to a completely different strategy as described below.

In *forward induction* (FI) reasoning, a player takes into account his opponent's past moves and tries to rationalize the past behaviour in order to assess that opponent's future moves (Perea, 2010). We consider a particular kind of forward induction reasoning here, namely, *extensive-form rationalizability* (Pearce, 1984). The underlying idea is that when a player is about to play at a decision point that has been reached due to some strategy of the opponent that is not consistent with common knowledge of rationality for each of the players, the player may still rationalize the opponent's past behaviour. For example, suppose that the participant P has the opportunity to play at her first pair of orange trapdoors in the marble drop game (Figure 2, corresponding to Game 1 of Fig. 3), which has been reached because the computer C has chosen to open the right blue trapdoor. This first move is inconsistent with the choice determined by the assumption of rationality of both players (see BI example above), that is to open the left blue trapdoor. The participant might reason as follows: "The computer will definitely refrain from choosing the left trapdoor at his next choice getting 3 marbles, because he could have got more (4) marbles had he chosen the left trapdoor in his first decision node. He must be thinking that I would choose the right trapdoor in my second decision node if it is reached, in which case he would get 6 marbles, which is more than 4. So, if I choose the right orange trapdoor now, he will choose the right blue trapdoor at his next choice, and then I could choose the left trapdoor which would give me 4 marbles, more than the 2 marbles I would get if I chose the left trapdoor now." According to extensive form rationalizability, it would therefore be irrational for a computer opponent C to choose b at C_1 only to choose e later at C_2 in Game 1 and in Game 3. However, it would be possible for the computer opponent to behave in this way in Game 2 and in Game 4. Similarly, extensive form rationalizability would also consider it rational for a computer opponent C to play e at C_2 in Game $1'$ and in Game $3'$.

Ghosh et al. (2017) investigated whether people are inclined to use forward induction in centipede-like games, rather than backward induction, in an experiment performed in The Netherlands. They found that in the aggregate, participants showed forward induction behaviour in response to their opponent surprisingly deviating from backward induction behaviour right at the beginning of the game. However, participants' verbalized strategies most often mentioned their own attitudes towards risk and those they assigned to the computer opponent, sometimes in addition to considerations about cooperativeness and competitiveness, rather than game-theoretic considerations. In our current study, we investigate variations in reasoning strategies across nationalities.

Hypotheses

We first note that in all these games, we are trying to study participants' reasoning methods in terms of their moves (i.e., participants' behaviour). There are certain challenges regarding linking behaviour in games to the underlying reasoning processes of players. For example, one can explain a given action in a turn-based game with different reasoning patterns. In this paper, we interpret the moves with respect to particular reasoning patterns they represent, namely, game-theoretic reasoning strategies such as backward and forward induction reasoning as well as strategies influenced by affective aspects like trust, degrees of risk-taking and cooperation.

In Game 1 and Game 3, the action c at P_1 would suggest backward induction reasoning performed by the participant. In addition, the same action might also suggest uncertainty avoidance or risk-averseness in the participant. On the other hand, the action d might suggest a risk-taking attitude in addition to extensive-form rationalizable (forward induction) reasoning. Taking note of such variations in reasoning patterns, we now formulate hypotheses about the cultural differences that we expect, based on the relevant features discussed in the Introduction.

Backward versus forward induction, uncertainty avoidance and trust Taking a cue from the fact that at P's first decision point, the uncertainty avoidance action is the same as the backward induction reasoning action in all our experimental games, we argue that there is a link between these two reasoning patterns in the present context. Accordingly, because of highest uncertainty-avoidance we expect that backward induction reasoning is strongest in Israel, then the Netherlands, then India. So we expect the 'safe' choice of c (backward induction) at the first decision point P_1 in all the games of Figure 3 to be most prevalent in Israel, followed by The Netherlands, and least in India.

Looking more specifically at game items, the higher level of generalized trust in The Netherlands than the two other countries leads us to expect higher choices of d especially in Game 1 and Game 3, based on forward induction and/or trust that the other player will reciprocate and choose f at C_2.

Cooperation and trustworthiness With respect to self-interested goals, in Games 3, 4 and $3'$, choices g and h provide the same number of points to the participant, namely 4. Among these, g is the competitive choice (allowing only 1 point to C) and h the cooperative one (allowing 6 points to C). Based on the collectivist culture in India, we expect h to be chosen most in India (we expect more than 50 % h), followed by Israel (mix of collectivist and individualist), followed by The Netherlands (individualist).

Methods

The experiment was conducted at the Indian Statistical Institute in Kolkata, The Open University of Israel, and the Institute of Artificial Intelligence at the University of Groningen, The Netherlands. In each of the three countries, a (different) group of 50 Bachelor's and Master's students from several disciplines took part. That is, the experiment included 50 Indian students (44 male, mean age 24.0), 50 Dutch students (26 male, mean age 23.8), and 50 Israeli students (23 male, mean age 27.1).[2] The participants had little or no knowledge of game theory.

The tasks that the participants had to perform in these experiments are mentioned in Table 1. Participants were instructed by an experimenter at the university, who was also available for questions. The participants played the turn-based games through a graphical interface on the computer screen (Figure 2). Participant were informed that each round, they would play against a different computer opponent (C, blue). Each of these opponents would play according to some plan that was a best response to some plan of the participant. The participant's goal was that the marble should drop into the bin with as many orange marbles as possible. The computer's goal was that the marble should drop into the bin with as many blue marbles as possible. Before the experiment itself, participants played 14 games to familiarize them with the game and its controls, the colored marbles, and the turn-taking aspect of the game.

In some rounds of each game, the participants' were asked certain multiple-choice questions regarding the choices of their opponent: (i) "The computer just chose to go [direction computer just chose]. If you choose to go [direction corresponding to playing d], what do you think the computer would do next?" or, (ii) "The computer first chose to go [direction computer chose at its first decision point]. When you made your first choice, what did you think the computer would do next if you chose to go [direction corresponding to playing d]?" Three options were given regarding the likely choice of the computer: "I think the computer would most likely open the left side" or "I think the computer would most likely open the right side" or "Both answers seem equally likely". The first two answers translated to the moves e or f of the computer, respectively. In case of the third answer, we assumed that the participant was undecided regarding the

[2] We'd like to thank the experimenters Eric Jansen, Saikat Palit, Aviel Swissa and Stav Edry.

computer's next choice.

Participants were paid according to the number of marbles they gained in one of the experimental games, selected at random for each participant. Participants were paid proportionally to the number of marbles they gained (1-4), irrespective of the number of marbles gained by the computer opponent. The amounts were balanced across countries so that the minimum payout would be enough to go out for coffee, while the maximum amount would pay for going out for pizza.

For the current study, we compare data between the participants of India, Israel and The Netherlands, all of whom performed the same tasks.

Step 1	- Introduction to the experiment. - Instructions to the participants.
Step 2	Practice Phase: 14 marble drop games.
Step 3	- Experimental Phase: 48 marble drop games, divided into 8 rounds of 6 different games each, distinguishing factor being the pay-off structures. - Each of the 6 games of Figures 3, 4 occurs once in each round; the 6 games occur in a random order in each round. - Questions were asked about computer's behaviour in several rounds.
Step 4	Questions were asked at the end of the experiment regarding decisions at all nodes of a sample game.

Table 1: Steps of the experiment

Results

As mentioned in the description of the marble drop game, participants face up to two decision points, P_1 and P_2, when playing the games represented in Figures 3 and 4. The first is whether to stop the game by choosing c or continue playing by choosing d at their first decision point P_1. To determine to which extent nationality influences this decision, we performed logistic regression of their first decision on Game (1, 2, 3, 4, $1'$, $3'$), nationality (India, Israel, The Netherlands), and their interaction.

Trust versus uncertainty avoidance, forward versus backward induction

Figure 5 depicts the proportion of d choices in Games 1, 2, and $1'$. In addition, Table 2 shows the estimation results of logistic regression of the participants' tendency to choose d in these games. In this regression, Dutch nationality and Game 1 are taken as the base case scenario and each coefficient is read as a change in the likelihood of playing d when compared to a Dutch participant playing Game 1.

Table 2 shows that there is no significant main effect of nationality on the behaviour of players. On average, we therefore find no differences in the levels of trust and uncertainty avoidance across nationalities for their first decision. However, we do observe a significant main effect of Game 2. Recall that participants who engage in forward induction reasoning would be more likely to pick d in Game 1 than in Games 2 and $1'$. The results in Table 2 are consistent with forward induction reasoning, since the coefficients of Game $1'$ and Game 2 are both negative. Interestingly, only the difference between Game 1 and Game 2 is significant. That is, even though Game $1'$ and Game 1 provide participants with different information on their opponent's strategy, participant choices do not differ significantly.

Variable	Coefficient	z value
India	-0.035	-0.250
Israel	-0.334	-1.240
Game $1'$	-0.100	-0.489
Game 2	-0.609	-2.787**
Israel × Game $1'$	0.557	2.038*
Israel × Game 2	0.724	2.593**
India × Game $1'$	0.337	1.316
India × Game 2	0.510	1.875

Table 2: Estimated logistic regression coefficients for the proportion of d choices in Games 1, 2, and $1'$. Coefficients represent the difference in d choices compared to Dutch participants in Game 1. Significance at the 5% level and 1% level are indicated by * and **, respectively.

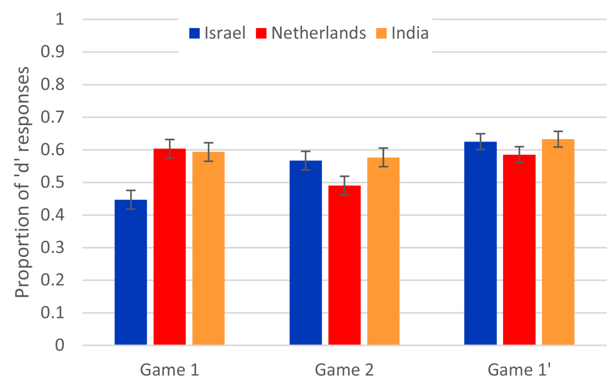

Figure 5: Proportion of d choices in games 1, 2, and $1'$ across nationalities. Whiskers indicate one standard error.

In addition, there is a significant interaction between Game 2 and Israeli nationality. Together, these results indicate that while Dutch participants are more likely to choose d in Game 1 than they are in Game 2, Israeli participants tend to choose d less in Game 1 than in Game 2. Thus, while some Dutch participants may have used forward induction, Israeli participants' behaviour does not show a lot of strategic reasoning per se.

Figure 6 shows the proportion of d choices in Games 3, 4, and $3'$. Table 3 shows the estimation results of the logistic regression for these games, where Game 3 and Dutch nationality are the base case scenarios. The table shows that only Game 4 has a coefficient that deviates significantly from zero, indicating that participants were less likely to choose d

Variable	Coefficient	z value
India	-0.373	-0.519
Israel	-0.601	-0.993
Game 3′	-0.184	-0.879
Game 4	-0.428	-1.989*
Israel × Game 3′	0.195	0.666
Israel × Game 4	0.117	0.249
India × Game 3′	0.162	0.559
India × Game 4	0.357	0.637

Table 3: Estimated logistic regression coefficients for the proportion of *d* choices in Games 3, 4, and 3′. Coefficients represent the difference in *d* choices compared to Dutch participants in Game 3. Significance at 5% level is indicated by *.

Variable	Coefficient	z-value
India	-0.942	-1.043
Israel	-1.714	-2.467*
Game 3	-0.344	-0.403
Game 3′	-0.279	-0.219
Israel × Game 3	0.276	0.138
Israel × Game 3′	0.097	0.442
India × Game 3	-0.516	-1.185
India × Game 3′	-0.744	-1.537

Table 4: Estimated logistic regression coefficients for the proportion of *h* choices in Games 3, 4, and 3′. Coefficients represent the difference in *h* choices compared to Dutch participants in Game 4. Significance at 5% level is indicated by *.

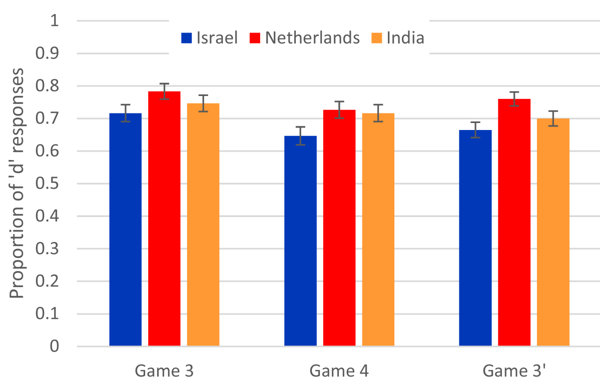

Figure 6: Proportion of *d* choices in Games 3, 4, and 3′ across nationalities. Whiskers indicate one standard error.

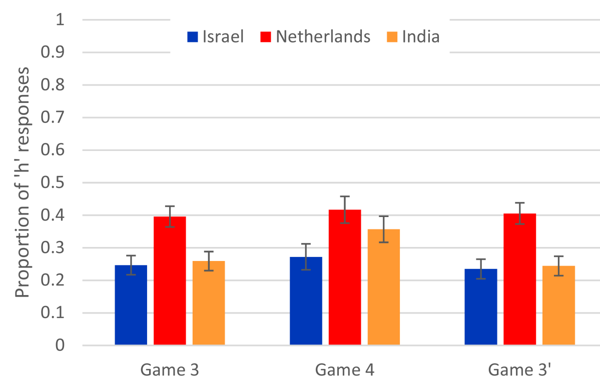

Figure 7: Proportion of *h* choices in Games 3, 4, and 3′ across nationalities. Whiskers indicate one standard error.

in Game 4 than they were in Game 3. Note that this is consistent with forward induction reasoning, which would lead a participant to be more likely to choose *d* in Game 3 than in Games 4 and 3′.

Similar to the findings presented in Table 2 for Games 1, 2 and 1′, Table 3 shows that none of the nationality-dependent coefficients differ significantly from zero. In particular, for the participants' first decisions in Games 3, 4 and 3′ , there appear to be no significant differences in trust and uncertainty avoidance across nationalities.

Competition, cooperation and trustworthiness

In addition to the decisions at the first decision point P_1, we performed a logistic regression on participants' choices at their second decision point P_2 to investigate differences in cooperation and trustworthiness. Since the choices of the participants affect their own payoffs in Game 1, 2, and 1′, our analysis of participant behaviour at decision point P_2 is limited to Games 3, 4, and 3′, in which their choice only affects the payoff of the computer opponent, their own payoff being 4 in all cases. Participants could choose the cooperative option *h*, which would yield the opponent a payoff higher than their own, or the competitive option *g*, which would leave the opponent with the lowest possible payoff.

Figure 7 depicts the proportion of *h* choices in Games 3, 4, and 3′. In addition, Table 4 shows the logistic regression results on the proportion of *h* choices, where Dutch nationality and Game 4 are taken as the base case scenarios. The results show no significant differences in the decision to choose *g* or *h* across games. That is, the interpretation participants have of the opponent's previous actions do not appear to affect participant choices at the second decision point significantly.

While Table 4 shows that the differences between Dutch and Indian participants are not significant, Israeli participants were significantly less likely to choose *h* than Dutch participants. Moreover, Figure 7 shows that across Games and nationalities, participants were more likely to choose the option that would yield the opponent a lower payoff. Overall, participant behaviour can therefore be described as competitive.

Discussion and conclusion

We hypothesized that at their first decision point, participants from Israel would show uncertainty avoidance behaviour most often in our experiment, followed by those from The Netherlands and finally India. However, our results suggest that on average, levels of uncertainty avoidance in centipede-like games are similar across nationalities. Based on our results, we were not able to distinguish any differences between Israeli, Dutch, and Indian participants in choosing a certain outcome over an uncertain outcome.

Interestingly, our results do confirm our hypothesis that actions of Dutch participants can be interpreted as indicative of forward induction. In contrast, the actions of Israeli participants showed no strategic behaviour at all. This may indicate that Israeli participants were more likely to distrust or to get confused by a surprising opponent.

We hypothesized that, based on the collectivist nature of Indian society, at least half of the Indian participants would show cooperative behaviour. In contrast, our results show high levels of competitiveness across nationalities. When faced with the choice of giving their opponent a high payoff or a low payoff at their last decision point, participants on average preferred to give their opponent a low payoff. In fact, while we expected Dutch participants to be more self-interested than Indian and Israeli participants, Figure 7 suggests Dutch participants to be the least competitive.

In general, the previous actions of the opponent did not influence participants' decisions to behave competitively or cooperatively. However, Figure 7 shows an interesting trend suggesting that Indian participants are cooperative towards opponents that have previously behaved cooperatively to them: the more often an opponent has surprised the an Indian participant by choosing the uncertain, possibly cooperative, option, the more likely they are to respond cooperatively.

In summary, the take-home message of our experiment is that the levels of uncertainty avoidance are similar across nationalities, and that Israeli participants are more likely to distrust an opponent. Levels of competitiveness are high for all three cultures, but surprisingly, the Dutch are the least stingy.

Future work This inter-cultural study is based only on the decisions made by the participants. In order to be able to draw conclusions about the reasoning strategies behind the decisions, we are currently looking at the reaction times of the participants, similar to Bergwerff et al. (2014). We intend to continue our study on the differential roles of affective and game-theoretic aspects, by designing new experiments based on both perfect and imperfect information turn-taking games. We will apply techniques such as eye-tracking and computational cognitive modeling to be better able to distinguish reasoning strategies (Meijering et al., 2012; Top et al., 2018).

References

Aumann, R. J. (1995). Backward induction and common knowledge of rationality. *Games and Economic Behavior*, *8*(1), 6–19.

Bergwerff, G., Meijering, B., Szymanik, J., Verbrugge, R., & Wierda, S. M. (2014). Computational and algorithmic models of strategies in turn-based games. In P. Bello, M.McShane, M. Guarini, & B. Scassellati (Eds.), *Proceedings of the 36th annual conference of the cognitive science society* (p. 1778-1783).

Camerer, C. F. (2011). *Behavioral game theory: Experiments in strategic interaction*. Princeton University Press.

D'Andrade, R. G. (1981). The cultural part of cognition. *Cognitive Science*, *5*(3), 179–195.

Ghosh, S., Heifetz, A., Verbrugge, R., & De Weerd, H. (2017). What drives people's choices in turn-taking games, if not game-theoretic rationality? In J. Lang (Ed.), *Proceedings of the 16th conference on theoretical aspects of rationality and knowledge (TARK XVI)* (pp. 265–284).

Halder, T., Sharma, K., Ghosh, S., & Verbrugge, R. (2015). How do adults reason about their opponent? Typologies of players in a turn-taking game. In *Cogsci* (pp. 854–859).

Henrich, J., Boyd, R., Bowles, S., & Camerer, C. e. a. (2005). "Economic man" in cross-cultural perspective: Behavioral experiments in 15 small-scale societies. *Behavioral and Brain Sciences*, *28*(6), 795–815.

Ho, T.-H., & Weigelt, K. (2005). Trust building among strangers. *Management Science*, *51*(4), 519–530.

Hofstede, G. (1991). *Cultures and organizations. Intercultural cooperation and its importance for survival*. (3rd edition 2010, with G.-J. Hofstede and M. Minkov)

Krockow, E. M., Takezawa, M., Pulford, B. D., Colman, A. M., & Kita, T. (2017). Cooperation and trust in Japanese and British samples: Evidence from incomplete information games. *International Perspectives in Psychology: Research, Practice, Consultation*, *6*(4), 227.

Levinson, S. C. (2012). The original sin of cognitive science. *Topics in Cognitive Science*, *4*(3), 396–403.

Meijering, B., Van Rijn, H., Taatgen, N. A., & Verbrugge, R. (2012). What eye movements can tell about theory of mind in a strategic game. *PLoS ONE*, *7*(9), e45961.

Nagel, R., & Tang, F. F. (1998). Experimental results on the centipede game in normal form: An investigation on learning. *Journal of Mathematical Psychology*, *42*(2), 356–384.

Pearce, D. (1984). Rationalizable strategic behaviour and the problem of perfection. *Econometrica*, *52*, 1029–1050.

Perea, A. (2010). Backward induction versus forward induction reasoning. *Games*, *1*, 168–188.

Peysakhovich, A., & Rand, D. G. (2016). Habits of virtue: Creating norms of cooperation and defection in the laboratory. *Management Science*, *62*(3), 631–647.

Rosenthal, R. (1981). Games of perfect information, predatory pricing and the chain-store paradox. *Journal of Economic Theory*, *25*(1), 92–100.

Roth, A. E., Prasnikar, V., Okuno-Fujiwara, M., & Zamir, S. (1991). Bargaining and market behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An experimental study. *The American Economic Review*, 1068–1095.

Top, J., Verbrugge, R., & Ghosh, S. (2018). An automated method for building cognitive models for turn-based games from a strategy logic. *Games*, *9*(3), 44.

Verbrugge, R., Meijering, B., Wierda, S., van Rijn, H., & Taatgen, N. (2018). Stepwise training supports strategic second-order theory of mind in turn-taking games. *Judgment & Decision Making*, *13*(1).

Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. *Motivation and Emotion*, *18*(2), 129–166.