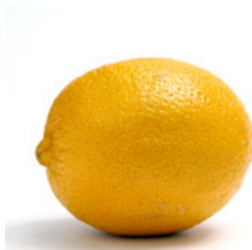


# Lemon car game



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## Abstract

This article presents two versions of a negotiation game, the LEMON CAR GAME, that is used to investigate cross-cultural variation in negotiation behaviour. The game is about trading a second-hand car with a possible hidden defect. One version is a specific research set-up destined to investigate face to face negotiation between participants with different acculturation on the cultural dimension of power distance. The other is a first Web-based version of the game. Both games are described. At the time of writing there are no experimental data yet.

## Introduction

Understanding issues of trust and transparency in business relationships is important (G. J. Hofstede, 2006b; G. J. Hofstede, Jonker, Meijer, & Verwaart, 2006). Negotiating is an activity in which these issues are particularly salient. In today's globalizing world, many negotiations are cross-cultural. This may cause misunderstandings if people misinterpret one another's style. A classic example is the North-West European who goes to the Mediterranean and finds himself confronted with negotiable prices rather than fixed ones. In fact Dutch companies sometimes work with different price lists in view of the different requirements for price reductions that prevail in various parts of the world. But other examples abound. Purchasing personnel in companies that source internationally are confronted with different attitudes towards deadlines and quality issues, and those attitudes may hide cultural differences.

This article introduces a game that is meant to investigate negotiation in a simple situation. The crux is that although the economic value of the article, a second-hand car, is known within reasonable limits, there may be a hidden quality defect. The buyer and seller have to not only negotiate the price but also whether the buyer trusts the seller, whether a third party check for defects is required, whether this happens up front or after the sale, and who pays for it.

Using simulation games to investigate human behaviour in a business context is recently becoming more popular (G. J. Hofstede, 2006a). The idea of using a hidden quality attribute is taken from earlier games (Jonker, Meijer, Tykhonov, & Verwaart, 2006; Meijer, Hofstede, Beers, & Omta, 2006).

The paper will start by introducing the culture dimension of power distance as introduced by Hofstede (2001) and its role in trade and negotiation. After this it presents first the face to face version of the game, then the Web-based one. Some discussion about the problems of acquiring valid empirical data terminates the paper.

## LEMON CAR GAME

The LEMON CAR GAME involves sale of a second-hand car. The buyer found only one offer. Two cars are available to the seller; one is good, a “jewel”, whereas the other looks identical but has a hidden defect, the “lemon”. The jewel is worth approximately €2800 - €3000 while the lemon is worth approximately €2300 - €2500. The sale could be about either car and the buyer’s only way to find out whether he is purchasing the lemon is to have an independent quality check performed. Such a quality check costs €300.

The incentive structure is as follows: if both cooperate, the sale will be truthful and the pair of traders will spare the cost of checking. If the seller expects to be distrusted, (s)he could either sell the lemon or have a quality check performed up front or offer to pay for one. If the buyer distrusts the seller, the result depends on whether the buyer wants to have the jewel or does not care; in the former case the check will be needed, but in the latter the lemon will be sold. If the check is required, it can be negotiated who pays for it and what happens in case a pretended jewel turns out to be a lemon.

So it turns out that the expectation of trust is important in this game, alongside a preference for high quality or low price. In reality we expect the relationship to be potentially important too. That is why a number of demographics will be collected, as a proxy for personality and culture data.

### ***Culture and power distance in trade***

Can traders predict the behaviour of potential partners depending on which part of the world they come from? Basing themselves on recent literature, Hofstede, Jonker and Verwaart {Hofstede, 2008 #9} argue that they can. For this traders need knowledge about the socialization that the potential partners underwent in childhood, in other words their culture. In many cases, nationality is a good predictor of the basic values regarding social life acquired by the participants. For instance, business in China tends to be done over a meal, and observing social hierarchy during meals is important. In the Netherlands, business is done during working hours and little concern is given to the formal status of traders. This statement is wrong for some Chinese and some Dutch traders but it is certainly more true than its opposite would be. The work of Hofstede (G. Hofstede, 2001; G. Hofstede & Hofstede, 2005) characterizes these values in the form of five basic dimensions of social life that pertain to identity, power distance, gender roles, fear of the unknown, and gratification of needs. The dimension of power distance is central in the present paper. Hofstede (ibid.) defines power distance as the extent to which the less powerful accept and expect that power is distributed unequally. The dimension runs from egalitarian (*small power distance*, e.g., in Anglo, Germanic and Nordic cultures) to hierarchical (*large power distance*, in most other cultures). Table 1 displays relevant distinctions for this paper.

**Table 1.** Some distinctions between norms in hierarchical and egalitarian societies

Large power distance	Small power distance
Might is right	No privileges and status symbols
Formal speech; acknowledgement	Talk freely in any context
Dictate, obey	Negotiate
Show favour to mighty business partners	Treat all business partners equally

There are some pairs of countries in the Hofstede database that differ on power distance more than they do on other dimensions. They are Russia - Israel, Costa Rica - Guatemala, and France - Austria. Still it would not do to take subjects from these pairs of countries, have them negotiate, and attribute the results to difference in power distance without further ado. To

begin, the effect of power distance is likely to be moderated by the values of the other dimensions. Furthermore, differences in perceived identity, historical antecedents, personality factors and a host of other context factors have to be taken into account.

In the Web-based version, software agents are planned for later use, as they are in Hofstede et al. {Hofstede, 2008 #9}. In this way these other contextual factors can be excluded and power distance can be isolated. However, it will have to be perceived as an abstraction that cannot be extrapolated to the real world without much caution. Isolating one dimension for the sake of experiment is a decidedly artificial method. In real life, the dimensions always operate as one whole, a cultural Gestalt, together with contextual factors. One of the contextual factors is personality: in any trade situation it matters what personalities the partners bring to the table. As it turns out personality and culture are not independent. In a meta-analysis of their mutual cross-country data Hofstede and McCrae (G. Hofstede & McCrae, 2004) found that power distance correlates negatively with extraversion and openness to ideas and positively with conscientiousness.

In spite of the limitations of isolating a single dimension, we argue that the experiment is worthwhile carrying out. Empiric evidence for the relevance of the power distance dimension for negotiation processes is given for instance in Adair et al. (2004).

The game can also be used to investigate negotiation for any other pair of traders, whether culturally different or not. The Web-based version will be used for this purpose.

### ***Face to face version***

In this experiment two groups are pitted against one another. They are selected to be matched samples, differing only in culture. More specifically, the effect of the culture dimension of power distance (G. Hofstede & Hofstede, 2005) on negotiation behaviour is the focus.

### **Method**

The face to face LEMON CAR GAME involves sale of a second-hand car. Two cars are available to the seller; one is good and the other has a hidden defect. A quality check is possible but costly. One game session involves two people, one from either group. The game can be used to compare any two groups. The present application involves groups from two societies that differ vastly on Hofstede's cultural dimension of power distance and very little on his other four dimensions of culture: Russia and Israel.

### **Hypothesis**

Hofstede & Hofstede (2005) argue that power distance will affect the influence of the negotiators' status on negotiation process and outcome. Therefore, the two roles have very clearly different statuses attached to them. It is hypothesized that status will matter very little in negotiators from egalitarian cultures, who will negotiate based on financial rationality, but that it will matter very much to participants from authoritarian cultures. The latter will tend not to dare oppose negotiators of higher status, and will impose their own terms on negotiators of lower status.

### **Results**

At the moment of writing, no sessions have been conducted yet. They are planned for this summer.

# Lemon Car Game

## ***Experimental design***

The experiments are played with participants from two countries. In the first experiment these have national cultures that differ considerably on the power distance index, but are similar on all of the other Hofstede dimensions. All players are of similar age class and educational background. The experiment can be played with 4, 8, 16, or 32 players of each nationality. The players are not informed that they are involved in an experiment about national cultures.

The experiments model the processes of trade partner selection, negotiation, and delivery. The case is about selling and buying second hand cars. The players are assigned a role of higher (white collar) or lower (blue collar) social status. The blue and white collar roles are equally distributed among the players of each nationality.

## ***Preparation***

Participants choose their own hypothetical status before the game, on a three-point scale (high – average – low), so that they can avoid being placed in a status they are uncomfortable with.

## ***Trade partner selection***

Each player gets one out of two roles, and is given the following text.

*Assume that you are a person of (show status) in the age of 42. You want to buy a second-hand car for your daughter, who has just passed the test for her driving license. Several people have a car for sale, according to newspaper ads. Trust is an important issue in the car market, but you do not know the potential sellers and you have no references about their reputations. How much would you prefer these sellers? (answer on a 5-point scale)*

(1: very much...2...3...4 ...5: not at all)

1. Your boss
2. A subordinate
3. A colleague
4. Your neighbour
5. Your brother
6. A member of your sporting club
7. A man
8. A woman
9. Someone you know
10. A stranger
11. A person from your own country
12. A person from another country
- A. An army colonel
- B. A bricklayer
- E. An electrician
- F. A factory owner
- M. A medical director of a hospital
- P. A plumber
- Q. A university professor

Subsequently, the players are assigned new roles for the negotiation experiment, but their roles remain in the blue or white collar category according to their roles in the partner selection experiment.

### Negotiation

The negotiation experiment is played in two or four rounds. The players are assigned equal roles in both rounds with respect to profession and role as a seller or a buyer. In the first round players are matched with opponents of the same nationality; in the second round with opponents of different nationality.

	<i>a</i>	<i>B</i>	<i>c</i>	<i>D</i>
<i>Round 1</i>	A1 – E1 B1 – F1 E2 – A2 F2 – B2	A1 – F1 B1 – E1 A2 – M2 B2 – P2	A2 – E2 B2 – F2 E1 – A1 F1 – B1	A2 – F2 B2 – E2 A1 – M1 B1 – P1
<i>Round 2</i>	A1 – B2 B1 – A2 F2 – E1 E2 – F1	A1 – M2 B1 – P2 A2 – F1 B2 – E1	A2 – B1 B2 – A1 F1 – E2 E1 – F2	A2 – M1 B2 – P1 A1 – F2 B1 – E2
<i>Round 3</i>	A1 – F1 B1 – E1 A2 – M2 B2 – P2	A1 – E1 B1 – F1 E2 – A2 F2 – B2	A2 – F2 B2 – E2 A1 – M1 B1 – P1	A2 – F2 B2 – E2 A1 – M1 B1 – P1
<i>Round 4</i>	A1 – M2 B1 – P2 A2 – F1 B2 – E1	A1 – B2 B1 – A2 F2 – E1 E2 – F1	A2 – M1 B2 – P1 A1 – F2 B1 – E2	A2 – M1 B2 – P1 A1 – F2 B1 – E2

Table 1: experimental set-up. The letters correspond to status levels. The figures denote the two experimental groups.

- Roles are assigned according to table 1 . The capital characters indicate the professions introduced in the partner selection phase. The numbers indicate the nationality of the players. The left hand role: seller – the right hand role: buyer.
- if 4 players of each nationality are available: play first column only
- if 8 players of each nationality are available: play columns a and b
- if 16 players of each nationality are available: play all columns
- if 32 players of each nationality are available: additionally mirror the 16 player-scheme

Players are given five minutes to read their roles and think their strategy.  
(give players some symbol of their roles, e.g. T-shirts, ties).

#### *The seller's case:*

*Assume you are a person of (show status) in the age of 42. You and your partner have identical cars. You intend to drive less and want to sell one of the cars. In good shape, the value of the car is in the range 2800-3000 euro. One of the cars is in good shape indeed, but the other one has been repaired after serious damage in an accident. The value of the repaired car is in the range 2300-2500 euro. However, the damage has been camouflaged excellently and an expert inspection would be required to reveal it (inspection cost 300 euro). The damage is invisible for the buyer. You have placed an advertisement in a newspaper and the only person that has reacted so far is a ... (show status).*

*The buyer's case:*

*Assume you are a ... (show status) in the age of 42. You want to buy a second-hand car for your daughter, who has just passed the test for her driving license. You scanned the newspapers and found only one attractive offer, which was made by a ... (show status). The value of the car is in the range of 2800-3000 euro and it has no visible defects. An expert inspection to reveal possibly hidden defects would cost you 300 euro.*

Subsequently they are asked to negotiate. If they get to an agreement, they must make it in writing, including:

- the price of the car
- what if inspection reveals hidden defects
- who will pay for inspection

In case of no deal within 10 minutes, both have to pay a 500 euro penalty. The players are informed that in both the selling and the buying role, the player achieving the best result (i.e. amount of money + value of cars – penalty in case of no deal) with respect to the quality/price ratio of the car, including inspection cost, will be rewarded a gift. The conversation during the bargaining is recorded and a transcript is made in writing.

After contracting, it comes to delivery. The delivery is made immediately after each round of negotiating, and followed by a debriefing.

### **Delivery**

For the seller, the delivery consists of the question which of the two cars he will transfer. For the buyer, the delivery consists of the question if he will have the car inspected and follow up in case of hidden defects.

### **Debriefing**

Every participant fills out a questionnaire that contains the following questions, part of which are per round and depend on their role:

- Profession/education/age/gender/nationality
- Very important is prior relation of players, and dominance relation prior to playing. Ask if they had a prior relation and if they feel superior/inferior.
- Would you start bargaining with a person like this in reality?
- Would you deal with him again?
- What are your motives whether to bargain or not.
- How did you experience the negotiation?
- What did you think of your opponent's behaviour?
- Seller: Did you consider to deceive your opponent?
- Seller: Did you actually deceive him?
- Seller: Why did you (not)?
- Buyer: Did you trust seller's statements about the quality of car?
- Buyer: Did you actually have the car inspected?
- Buyer: Why did you (not)?
- Last question for both: did your decisions have any relation with the societal status of your role or that of your opponent's?

After two rounds, the winners (= those who got the best value for money) are rewarded in a common meeting and players are asked to discuss their opinion about the experiments. At the end of the game, the players are told the true setting and promised to be kept informed about the results. A general discussion is planned and conducted at a time when these results are available.

### **Web based version**

At <http://mmi.tudelft.nl/lemoncar/>, a beta-test version of the LEMON CAR GAME is available. Readers could give it a try if they wish. Players of the current version find themselves in a questionnaire-like environment. They can choose the role of buyer or seller and are then confronted with hypothetical moves by their opponent to which they can indicate what they would reply, and why they would reply in that way.

So far an alpha test has been carried out with selected volunteers from several countries and continents. It is being used to improve the prototype at the time of writing.

In later versions it is our intention to also use the game in person-to-person mode, as well as to replace one trader with a computer agent. A Turing test will at some point be used to check whether the agent behaves in a believable manner.

### **Discussion**

At present, in the absence of experimental data, the main question to be raised is whether it makes sense to try and isolate culture, let alone just one of its dimensions, from all the other circumstances of a negotiation. After all there are numerous potential other factors that could affect behaviour in the Lemon car game. To reiterate a few obvious candidates:

#### Relationship

- Is there a pre-existing relationship between the traders?
- Do the traders find one another sympathetic, and if so who likes whom?
- Does either have prejudices against the other based on symbolic attributes, e.g. perceived group membership?

#### Personality

- What are the traders' personality characteristics, e.g. in terms of neuroticism, that could affect their negotiation behaviour?
- How do the traders think about cars?

#### History

- What experiences do the players have with trading, with bargaining, with trading second-hand cars?
- Can the traders relate to the story that frames the game?

Our alpha test of the Web-based game already found a few context factors; for instance an Ethiopian-raised participant noted that to him, status would be less important than family membership in determining negotiation behaviour. From a research perspective this is good news for us; if we collect data about nationality, we can relate those to culture, and in this case a collectivistic culture is likely to turn out to be a co-determinant of negotiation behaviour. The caveat is that agent-based simulations should not stop at modelling just one dimension of culture if they are to be realistic.

If we wish to draw conclusions based on the Web-based game, the multitude of possible confounding factors indicates that a large set of respondents will be needed (Gert Jan Hofstede & Meijer, 2007). Depending on stratification, it will be desirable to have several thousands at least.

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