

CULTURAL ACCOMMODATION AND LANGUAGE PRIMING: COMPETITIVE VERSUS COOPERATIVE BEHAVIOR IN A PRISONER'S DILEMMA GAME

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Cultural Accommodation and Language Priming Competitive versus Cooperative Behavior in a Prisoner's Dilemma Game

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Abstract

- This paper explores three arguments. First, cultural accommodation by living in another culture for a while may have a long-lasting but partially dormant influence on behavior. Second, foreign language is a prime, activating behavior associated with this language. Third, a foreign language is expected to be a particularly forceful prime for those who have lived in a country where this language is spoken. We explore this logic in a prisoner's dilemma quasi-experiment that focuses on competitive versus cooperative behavior.
- Testing our predictions with 358 Dutch students, we found that previous exposure to an Anglophone culture with higher values for masculinity, performance orientation and assertiveness negatively influences cooperative behavior in a prisoner's dilemma game when the game is played in English.

Keywords

National Cultures • Cultural Accommodation • Language • Competitive and Cooperative Behavior • Prisoner's Dilemma Game • Quasi-Experiment

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Introduction

In the current era of globalization, the influence of exposure to the Anglophone culture and the use of the modern *lingua franca* – English – is an important issue that triggers heated debates across the globe (see e.g. Pennycook 1994, and Tsuda 2002, for a critical view on the hegemony of English). This is not only true in the public domain, where citizens and policy-makers argue in favor of or against globalization for a wide variety of reasons (see e.g. Cavanagh/Mander 2004; Friedman 2005; Klein 2000; Legrain 2002), but also in the private arena of modern enterprises (see e.g. Feely/Harzing 2003; Fredriksson/Barner-Rasmussen/Piekkari 2006; Janssens/Lambert/Steyaert 2004; Luo/Shenkar 2006). After all, many organizations are exposed to similar influences, operating more and more in a business world that is dominated by Anglophone management practices and the use of the English language (see e.g. Marschan-Piekkari/Welch/Welch 1999; Pudelko/Harzing 2007; Smith/Meiksins 1995; Usunier 1998). For example, only in 2006, Royal Dutch Shell transformed into a British plc, adopting English as the company's *lingua franca*. We are only just beginning to explore the likely impact of such (changes in) cultural foci and language practices. In this paper, we investigate the impact of both exposure to Anglophone culture and the use of English on the level of competitive versus cooperative behavior.

A quest for a deepened understanding of the origins of competitive versus cooperative behavior has long been a key issue in the economic, management and social sciences. For instance, behavioral economics explores the mechanisms that may reconcile the assumption of self-interest with long-term cooperation (e.g. Fehr/Gaechter 2002; Camerer/Fehr 2006). This is an important issue because many macro-level outcomes of micro-level interaction may be either constructive or destructive, depending upon the cooperative or competitive nature of this interaction, as is succinctly illustrated in the many instances of the failure or success of producing public goods (e.g. Ostrom 2007). This is not different in the world of international business, as

is clear from the work on global alliances (e.g. Luo/Shenkar/Gurnani 2008). One important line of research explores this issue experimentally in economics, management and psychology (for early contributions, see Dawes 1980; Pruitt/Kimmel 1977; Rapoport/Guyer/Gordon 1976). In this research tradition, social dilemma games, such as the prisoner's dilemma (PD), have been extensively explored to study the antecedents of competitive versus cooperative behavior (Raiffa 1982). Being simple and powerful, the two-player version of PD games has proven to be particularly popular (Cox/Lobel/McLeod 1991; Pruitt/Kimmel 1977).

In the present study, we follow in the footsteps of this tradition by using a two-player iterative PD game. The game-theoretic details of the PD are well established by now (e.g. Rasmusen 1990). Here, it suffices to recall that the dilemma resides in the tension between individual and collective rationality. On the one hand, the best possible outcome for both players results when each player does not seek to maximize her or his immediate self-interest. On the other hand, however, no matter what the counterpart does, a player can always increase her or his short-run payoff by defecting unilaterally. Thus, it is to each individual player's advantage to defect, at least in the short run. When one of the players defects, trust tends to be undermined. Cooperation generally breaks down, and competition takes over. The final result is that when one of the players cannot resist the temptation to defect, both parties end up being worse off. It is this continuous tension between the long-run gains from cooperation versus the short-term incentives to compete that makes the game such a realistic simulation of real-world phenomena, and therefore interesting to study (Rasmusen 1990; Boone/De Brabander/van Witteloostuijn 1999a).

Experiments in the past have studied the impact of both situational (e.g. behavior of the other actors) and dispositional (e.g. personality characteristics or cultural background) determinants of cooperation. For instance, cooperative behavior has been shown to be related to personality characteristics such as locus of control (Lester 1992; Boone/De Brabander/van Witteloostuijn 1999b), demographic characteristics such as gender (Cook/Sloane 1985; Frank/Gilovich/-

Regan 1993; Mason/Phillips/Clifford 1991), and cooperative versus competitive behavior of the other actor in previous rounds of the game (Cox/Lobel/McLeod 1991). Several studies have also investigated the impact of ethnical cultural background on cooperative behavior (Cook and Chi 1984; Cox/Lobel/McLeod 1991), and found that Anglo-Americans are more competitively oriented than African and Asian Americans. Cox et al. (1991) indicate that both previous research and their study have established that the Anglo norm for the prisoner's dilemma game is to select the competitive response.

However, what has not been studied before is the extent to which adherence to national cultural norms and values (i.e. dispositional determinants) can be influenced by exposure to other cultures, or can be triggered by situational variables such as language. The latter trigger effect is called priming. The social psychology literature has identified this as one of the most promising areas of cross-cultural research (Oyserman/Coon/Kemmelmeier 2002). In the current study, we examine the influence of exposure to Anglophone culture as well as the impact of a key trigger variable – the English language – on the display of competitive versus cooperative behavior of non-English speakers from another than an Anglophone culture. Although the influence of language priming has been studied before (Bond/Yang 1982; Kemmelmeier/Cheng 2004; Ralston/Cunniff/Gustafson 1995; Trafimow/Silverman/Fan/Law 1997), these studies were limited in terms of the countries/languages they included (Hong Kong/Chinese in all four cases) and their focus on attitudes rather than behaviors. The current paper adds to the literature by focusing on the impact of exposure to (Anglophone) culture in a European country (the Netherlands) rather than an Asian country and the impact of (English) language priming on actual behaviors rather than attitudes. We hypothesize that a larger exposure to the Anglophone culture (through living in an Anglophone country for three months or more) and the use of the English language will both negatively impact on cooperative behavior, since both are expected to trigger a more competitive mindset. Moreover, we hypothesize that the latter impact will be stronger if

the player has been exposed to the Anglophone culture (by living in an Anglophone country for three months or more), implying that s/he has internalized the associated norms and values.

Our research questions deal with fundamental issues of human nature that have not been studied before. Therefore, we decided to use a quasi-experimental research design, exploring fundamental relations in an artificial context with students playing a game (Bello/Kwok/Radebaugh/Tung/van Witteloostuijn 2009). Given this choice, we made three important decisions. First, we selected a version of the prisoner's game as our artificial context. In the long tradition of (quasi-)experimental research on competitive versus cooperative behavior, the prisoner's dilemma game has proven to be an appropriate stylized setting (cf. Boone/De Brabander/van Witteloostuijn 1999a). Second, we focus on two languages and their associated cultures and business systems: Dutch and English, being associated with Rhineland and Anglo-American business systems, respectively. Relatively speaking, the Rhineland culture and business system is cooperation-based, and the Anglo-American culture and business system is competition-based (Bachmann/van Witteloostuijn 2009). Third, we measured a limited number of control variables that are well known to affect competitive and cooperative behavior. Particularly, we control for gender, age, religiosity, locus of control, and the dynamics of the game. Below, we discuss these three issues in more detail, as well as the limitations implied by them.

In order to substantiate our hypotheses, we first review the literature on cultural differences between the Netherlands and Anglophone countries, cultural accommodation and language priming. Subsequently, the third section describes our dataset and method of analysis. After the fourth section has presented the findings of our empirical study, the fifth closes with a discussion and conclusion.

Literature Review and Hypotheses

In our study, the key cultural parameters are fixed: all participants are Dutch, and all games are played in either Dutch or English. So, to start with, we need to argue what differences

we expect across both cultures. Of course, we cannot be exhaustive here. Rather, we list a few key arguments that suffice to highlight the expected differences as to competitive versus cooperative behavior. We proceed in three steps. First, we highlight three national culture/business system arguments we believe are relevant for explaining competitive versus cooperative behavior between countries. Second, we argue that the Netherlands is different in this respect from the Anglosaxon world. Third, we add the role of language.

National Cultures/Business Systems and Cooperative versus Competitive Behavior

A concern with national culture arose in the management literature in the 1960s (Farmer and Richman 1965; Oberg 1963; Webber 1969), but the message that management might be culturally dependent remained revolutionary throughout the 1970s and 1980s (Brossard/Maurice 1976; Hofstede 1980; Laurent 1983; Tayeb 1988). Since then, however, the role of culture has been well-established, especially in the international management literature. After Hofstede's (1980) landmark study, a range of other studies were conducted that attempted to classify cultures based on a set of cultural dimensions (e.g. House/Hanges/Javidan/Dorfman/Gupta 2004; Lane/Distefano/Mazneskvi 1997; Schwartz 1999; Trompenaars 1993). However, not all of these studies include cultural dimensions that we would expect to be related to cooperative versus competitive behavior, and not all dimensions are different across each country pair. More specifically, we argue that Hofstede's masculinity/femininity dimension and House et al.'s performance orientation and assertiveness dimensions are the cultural values that are most closely related to the behavioral competition-cooperation dichotomy in our pair of cultures: the Anglosaxon versus the Dutch culture.

A first argument relates to Hofstede's masculinity/femininity dimension. When analyzing his IBM data on work goal importance, Hofstede (1980, p. 284) found significant gender differences. Men tended to express preferences for assertiveness (e.g. "high earnings" and "advance-

ment to higher level jobs”), whereas women tended to reveal preferences for the interpersonal aspect of work (e.g. “working with people who cooperate well with one another” and “having a good working relationship with your manager”). A factor analysis at the country level replicated what Hofstede termed the ego/social factor. It turned out that countries in his study differed significantly on this factor, which was subsequently termed masculinity/femininity. The focus of masculine countries on high earning and advancement creates a clear incentive for competitive behavior, whereas the focus of feminine countries on working together and social relationships comes with a clear preference for cooperative behavior. Recently some researchers have been very critical about Hofstede’s work, and in particular the masculinity/femininity dimension (see e.g. McSweeney 2002). However, Hofstede’s (1998) edited book *Masculinity and Femininity: The Taboo Dimension of National Cultures* clearly shows that this dimension is under-researched, but has considerable explanatory potential in cross-cultural studies.

A second argument involves two dimensions from GLOBE. There are two cultural dimensions in the House, Hanges, Javidan, Dorfman and Gupta (2004) study that bear some relation to Hofstede’s masculinity/femininity dimension: performance orientation and assertiveness. Performance orientation reflects “the extent to which a community encourages and rewards innovation, high standards and performance improvement” (House/Hanges/Javidan/Dorfman/Gupta 2004, p. 239). The House studies associate a high performance orientation with emphasizing results more than people, and valuing assertiveness, competitiveness and materialism, which creates a clear incentive for competition. A low level of performance orientation is associated with emphasizing loyalty, belongingness, and valuing relationships and harmony, which implies a clear preference for cooperation. Assertiveness reflects “beliefs as to whether people should be encouraged to be assertive, aggressive, and tough, or nonassertive, nonaggressive, and tender in social relationships” (House/Hanges/Javidan/Dorfman/Gupta 2004, p. 395). Societies that score higher on assertiveness value competition, whereas societies that score lower on assertiveness favor cooperation (House/Hanges/Javidan/Dorfman/Gupta 2004, p. 405).

In parallel to the development of cross-cultural management studies, which are grounded mostly in cross-cultural psychology, the business systems and comparative capitalism literature, grounded mostly in political economy and sociology, developed sophisticated thick descriptions of the different and mutually reinforcing elements of national business systems (see e.g. Whitley, 1999; Hall/Soskice, 2001; Jackson/Deeg, 2008). An important distinction for our study in this respect is between coordinated Rhineland and liberal Anglo-American business systems. Relatively speaking, the Rhineland business systems are cooperation-based, whereas the Anglo-American business system is competition-based (Bachmann/van Witteloostuijn 2009).

Cultural Differences and Cultural Accommodation

Now that we have identified a number of cultural and business system dimensions that might impact on competitive versus cooperative behavior, the next step is to assess the extent to which the Netherlands, our focal country in the current study, differs from Anglophone nation-states¹ in this respect. From there, we will argue that exposure to an Anglophone culture might affect someone with a Dutch background in a social dilemma setting, which refers to the issue of being imprinted by a culture other than one's own.

The Netherlands occupies a rather unique position in Western Europe. As its geographical location suggests, it is on the crossroads of Anglophone, Germanic and Nordic influences. In terms of Hofstede's dimensions, it shares a relatively low level of power distance with all of these cultural clusters. It has a very high level of individualism in common with the Anglophone countries (shared 4th/5th place). Its medium level of uncertainty avoidance places it between the Germanic and Anglophone clusters, whereas its extremely low level of masculinity (3rd lowest) locates it squarely amongst the countries in the Nordic cluster. The most significant difference between the Netherlands and the Anglophone cluster can clearly be found on the masculinity/femininity dimension. Vunderink and Hofstede (1998) fully replicate these results with a student audience in their chapter "Femininity Shock" about US exchange students in the Nether-

lands. In fact the scores for masculinity/femininity were virtually identical to the original IBM scores, with female American students scoring more masculine than Dutch male students. They show that U.S. students value earnings, advancement, and benefits as well as serving their country and security of employment relatively more than the Dutch students, who tended to value freedom on the job, being consulted by their boss, and training opportunities as well as helping others and contributing to the success of their company. Qualitative interview data confirmed these differences. Hofstede indicates that one of the reasons why collaboration between Dutch and English firms is often very successful (e.g. Shell and Unilever) is that their national cultures are well matched, whereas the remaining differences on masculinity/femininity can be seen as complementary. Dutch/English collaborations are likened to a happy marriage between complementary but not too dissimilar partners (Hofstede 2001, p. 447).

In the House, Hanges, Javidan, Dorfman and Gupta (2004) studies, the Netherlands is one of the lowest-scoring countries on both performance orientation and assertiveness values (6th from bottom out of 60 countries for both dimensions). For performance orientation, the Netherlands falls in band D (the one but lowest band), whereas all Anglophone countries are in band B (the one but highest band). For assertiveness, the Netherlands is located in band C (the lowest band), with all of the Anglophone countries scoring high in band B (which includes the majority of countries).

Finally, in the related literature on business systems, the Netherlands falls in the category of the more cooperation oriented Rhineland business systems, whilst the Anglophone countries in our study all display characteristics of the more competition oriented Anglo-American business system. In addition, in a detailed study of the Netherlands in the business systems tradition, van Iterson (2001) characterizes Dutch organizations by the three Cs: consultation, consensus and compromise. All three of those characteristics are more conducive to cooperation than to competition and combined they clearly place the Netherlands in the more cooperative domain.

In conclusion, the Netherlands clearly differs substantially from Anglophone countries on the very dimensions that we expect to be related to competitive versus cooperative behavior, and hence forms an ideal setting for our empirical work. However, in contrast to earlier studies, our interest is not in the impact of cultural differences on competitive versus cooperative behavior *per se*. Our study investigates to what extent more competitive values are assimilated by Dutch students through active exposure to an Anglophone culture. The existence of cultural assimilation or acculturation in second-culture exposure, i.e. the internalization of some of the new cultural norms and values, is well-established in the cross-cultural psychology literature (see e.g. Tadmor/Tetlock 2006 for a recent summary of research in his area). However, we explore the extent to which cultural accommodation as a result of living in a foreign country still has an impact on behavior after returning home. Hence, in the context of the Anglophone *vis-à-vis* Dutch culture contrast and our PD setting, we propose

Hypothesis 1. Dutch students who have lived in an Anglophone country for a period of time will display a lower proportion of cooperative choices in playing the prisoner's dilemma game than Dutch students who have not done so.

Language Priming

Actual exposure to a foreign culture (through living in the country in question) might be expected to create the highest likelihood of assimilation of different cultural norms and values. However, simply using the language of the culture in question might also cause individuals to accommodate their thoughts and behavior to the cultural norms and values associated with that language. Yang and Bond (1980) suggest that when learning a second language, individuals might be subconsciously influenced by the culture of that language. They acquire some of the cultural attitudes and values associated with that language, a process called cultural accommodation. This assumption is informed by what linguists call the Saphir-Whorf hypothesis. According to the strong version of this hypothesis, language determines the way we think. People who

speak different languages are argued to “live in different worlds; they do not live in the same world with different labels for objects, events, and concepts” (Hulin/Mayer 1986, p. 83). This strong version does not have many adherents in the present day. However, a weaker version of the Sapir-Whorf hypothesis that argues that language might influence the way we think is generally accepted in psycholinguistics (Crystal 2002).

Research into the norms and values of bi-culturalals also has shown that priming can lead bi-culturalals to act in a way that is more reflective of the culture that is primed. Priming temporarily focuses the participant’s attention to different cultural values (Oyserman/Coon/Kemmelmeier 2002). The literature argues that priming is most often done through cultural icons (e.g. national flag, movie stars and cartoon heroes, see Hong/Benet-Martinez/-Chiu/Morris 2003). However, several studies have found that language can serve as a situational cue for bicultural individuals as well (Bond/Yang, 1982; Kemmelmeier/Cheng 2004; Ralston/Cunniff/Gustafson 1995; Trafimow/Silverman/Fan/Law 1997). Harzing, Maznevski et al. (2002) showed that, even for mono-cultural respondents, the simple fact that a questionnaire was offered in English led them to give responses that were closer to the English-language control groups than when they replied to the same questionnaire in their native language. The dominance of Anglophone countries in the world economy means that even mono-cultural respondents will have been exposed to Anglophone values to some extent. Although previous research has only established that language influences responses to questionnaires (attitudes), we suggest it might also impact upon the actual choice between cooperation and competition, and hence actual behavior. From this, we suggest

Hypothesis 2. Dutch students who are playing the prisoner’s dilemma game in English will display a lower proportion of cooperative choices than Dutch students playing the game in Dutch.

Language Priming Reinforces Cultural Accommodation

Even though language priming might impact on responses and behavior for both mono-cultural and bi-cultural respondents, we would expect its effect to be stronger for respondents who – even though they are not, strictly speaking, bi-cultural – have had some active exposure to the culture in question. We would therefore expect that for Dutch students who have lived in an Anglophone country for a certain period of time, the priming effect of language will be stronger than for Dutch students without this active exposure to the Anglophone culture. That is, the English language operates as a trigger further activating the largely dormant imprints of those who have lived in a culture where this language is spoken. So, in our setting, we have

Hypothesis 3. The negative effect of playing the prisoner’s dilemma game in English on cooperative behavior will be stronger for Dutch students who have lived in an Anglophone country for a period of time than for Dutch students who have not done so.

Method

Sample and Data Collection Procedures

First-year students from three different Bachelor degrees at one of the Netherlands’ fourteen universities participated in a prisoner’s dilemma quasi-experiment in September 2005: the Dutch-language Bachelor program “Economie en Management” (Economics and Management), and two English-language Bachelor programs International Economics and Business, and International Business and Management. Each degree included international students. We composed a nationally and culturally homogeneous group of Dutch students only, meaning that students were sorted into a group defined by country of birth (the Netherlands) and native language (Dutch). Next, this group was subdivided into two: one experimental group which would be exposed to the experimental condition – English language – and the control group that would be addressed in its native language. In this respect, our design reflects a quasi-experiment, rather

than an experiment, as we assigned students randomly to either treatment condition for one of our dependent variables (i.e., Dutch or English), but not for the other (i.e., Anglosaxon experience). We could not *ex ante* assign students to different treatment groups on the basis of their Anglosaxon experience, as this was measured *ex post* through the questionnaire. However, in the regression model (see below), the Anglosaxon experience variable is entered as a main effect, as well as in interaction with the language treatment variable.

In effect, to assign students randomly across language groups, we used alphabetization of last names: the first half of the alphabet would be placed in the native-language group, and the second half in the English-language group. To rule out possible effects of attitudinal differences between degrees, the students were equally distributed over language groups. Students were not informed about the research aim of the study, but they were told that the teaching aim of the study was to enhance their understanding of behavior in a game-theoretic setting. Strict confidentiality was guaranteed with regard to the information provided in the questionnaire (see below). Lastly, three prizes were offered by way of incentive: the top-three players with the highest amount of money at the end of the game would receive 100, 50 and 25 euros, respectively.

The basic material for the quasi-experiment consisted of two documents. The first document included the set of five prisoner's dilemma games as described in Boone, De Brabander and van Witteloostuijn (1999a). Below, we will briefly introduce this quasi-experimental design. The second source of information was a questionnaire with questions concerning students' demographic background, locus of control, their study life and behavior, and opinions on matters such as jobs and international orientation. The latter two sets of questions are not used in this study. In addition, questions were asked about international experience and English-language competence. The original English version of both documents was translated into Dutch. After back-translation, it was verified by native speakers. The currency was also adapted.

For the Dutch-language group, the euro was used, whereas the instructions in the English-language groups referred to dollars.

Quasi-Experimental Procedure

Table 1 provides the version of the well-known prisoner's dilemma Bertrand (i.e. price) duopoly game used in the current study.

[Insert Table 1 about here]

Firms *I* and *II* operate in the same market. The firms are identical, offering the same homogeneous product and being equally efficient, and neither firm faces a binding capacity constraint. Both firms can choose from two price (*P*) strategies: setting a low price (*L*) or setting a high price (*H*). Consumers select their preferred product on the basis of price only. The profits depend on the pair of price strategies chosen. Each cell contains the possible profit combinations (W_I, W_{II}), where W_I and W_{II} are the (negative or positive) profits of firms *I* and *II*, respectively. The four profit combinations are the following:

1. $P_I^L = P_{II}^L$ (Cell 1). Both firms *I* and *II* choose to set the same low price. The profit margins are negative. Both firms generate a loss of €\$ 30,000.
2. $P_I^L < P_{II}^H$ (Cell 2). Firm *I* offers a lower price than firm *II*. The customers of firm *II* prefer to buy from the 'cheaper' firm *I*. The profit of firm *I* is therefore €\$ 600,000, and the loss of firm *II* amounts to €\$ 600,000.
3. $P_I^H > P_{II}^L$ (Cell 3). Firm *II* underprices firm *I*. The resulting profit combination is the mirror image of the second case. Firm *I* generates a loss of €\$ 600,000, and firm *II* reaps a profit of €\$ 600,000.
4. $P_I^H = P_{II}^H$ (Cell 4). Both firms *I* and *II* choose to set the same high price. The profit margins are positive. Both firms gain a profit of €\$ 300,000.²

Both firms select their price strategies simultaneously. Low prices are associated with competitive behavior, and high prices with cooperative behavior. Our dependent variable immediately follows from the nature of the game reflected in Table 1 – the discrete choice of each individual for cooperative versus competitive behavior in each round of each game, or *Competitive/cooperative behavior* – was measured by a dichotomous variable that took the value of 1 for a cooperative choice (i.e. a high price) and 0 for a competitive choice (i.e. a low price). Note that, as we will explain below in greater detail, we fully exploit the repeated nature of the game by taking each round's choice as the unit of observation, rather than an average choice over all games as a whole.

In our quasi-experiment, Table 1's game was played in five different versions for both treatments (in Dutch or English). Game 1 produced a benchmark measure of every player's tendency to play high or low prices (i.e. to behave cooperatively or competitively). Game 1 was a one-shot version of Table 1, where a player had to decide about prices for twelve months in a row, without any feedback about the behavior of a fictitious counterpart. In game 2 (not used in this study), game 1 was repeated after receiving the information that the fictitious counterpart had played twelve high prices in a row in game 1. The games of central interest here, games 3 to 5, were iterative versions of Table 1 with a crucial difference: every student played face to face against another student, one round after the other. Games 3 and 5 were finite prisoner's dilemma games of twelve rounds each, where game 5's payoffs were manipulated without affecting the game-theoretic nature of the choice (see the note below Table 1). In game 4, Table 1 was played after announcing that the game leader would randomly select the final round with a probability of 0.1 after round 8 (the games were stopped, in both treatment groups, in round 12).

Students were, as said above, randomly assigned to the native-language or English-language treatment group. Also, the students were randomly coupled in pairs. The layout of the room was such that the distance between players was large enough to avoid verbal communication. This paper's third author was the game's leader, offering clear and neutral instructions

throughout the quasi-experiment. The game leader was assisted by a number of colleagues, who monitored and disciplined the players, if needed. Verbal communication was not allowed and there were no breaks between the various games. In the iterative games, price choices were exchanged on command with little pieces of paper. Figure 1 provides an overview of the quasi-experimental setup.

[Insert figure 1 about here]

Other Measures

Our two independent variables were binary variables, with a value of 1 (*Game in English*, and *Lived in an Anglophone country for more than three months*) or 0 (*Game in Dutch*, and *Not lived in an Anglophone country for more than three months*). Dutch students in our sample had lived in four different Anglophone countries: United States of America, United Kingdom, Australia, and Canada. However, nearly two thirds of the Dutch students with experience in an Anglophone country had lived in the US. We used the three-month threshold, as we believe that such an extended stay is needed to really experience the local culture beyond a ‘holiday’ feel. Note that we will not use both dummy independents to construct sub-groups. That is, we will not run sub-group analyses, but rather estimate our models for the whole sample after adding all our independent and control variables (see below for greater detail).

In order to isolate the effect of exposure to the English culture and language, we included a wide range of demographic and game-specific control variables in our study. Earlier evidence has revealed that a set of five variables is associated with a tendency to behave competitively or cooperatively. In terms of basic demographic variables, both *Age* and *Gender* were included, which is standard in laboratory PD work. As Guiso, Sapienza and Zingales (2003) conclude that in comparison to non-religious respondents, religious respondents are significantly more likely to trust other people and hence will be more likely to collaborate in the context of a PD game we

also included *Religiosity* as a control variable. Earlier studies have shown *Locus of control* to influence competitive behavior (Boone/De Brabander/van Witteloostuijn 1999b); hence it was included as a control variable. Finally, we controlled for the participant's level of *English-language competence* to ensure that our results would not just reflect differential capabilities in this language. As our participants were first-year Bachelor students, there was no need to include previous education as a control variable. In the Netherlands, all Dutch first-year Bachelor students have passed a similar six-year high school program, including six years of compulsory education in English. Hence, all Dutch students can be expected to have achieved a good level of competency in English. Of course, more can be said about the underlying mechanisms that link our five control variables to competitive / cooperative behavior. However, being control variables, we refrain from doing so, and rather refer to the studies indicated above for more detail.

Age and *Gender* (male = 1, and female = 0) were measured simply by asking the participants to indicate their age and gender in the questionnaire. *Religiosity* was measured by asking the participants what their religious background was. Subsequently, this variable was recoded as 0 (not religious) and 1 (religious, in most cases Protestant or Catholic). *Locus of control* was measured with the widely used Rotter scale (Rotter 1966). The original scale contains 29 forced-choice items, 6 of which are filler items. For the remaining 23 items, respondents had to choose between an "internal" and "external" alternative. A representative choice would be "What happens to me is my own doing" and "Sometimes I feel that I don't have enough control over the direction my life is taking." The total locus of control score was obtained by counting the number of external choices. In order to measure *English-language competence*, we asked students to assess their capability to understand written English on an eight-point scale (from very weak to fully bilingual). As some of the categories had very few observations, we collapsed the eight categories into four (very weak-average, good, very good, and excellent-bilingual).

With regard to the game-based control variables, we first of all included the participant's *Basic cooperative attitude* as a control variable, as this can be expected to influence her/his tendency to make cooperative choices. In addition, we took on board two control variables to account for the dynamics of game behavior: the *Number of the round* (reflecting the 1st till 36th round of the three successive iterative games) and the *Partner's choice in the previous round* (cf. Boone/De Brabander/van Witteloostuijn 1999a). The *Number of the round* was included to account for the fact that cooperation tends to increase steadily over the three iterative games, due to the differences in the games' nature and individual learning. The second variable was taken on board to account for the history of the game. Even though individuals make independent choices in each specific round, these choices are not independent of the choices made by the other party in the previous round.

Of the game-related control variables, *Basic cooperative attitude* was measured by counting the number of cooperative choices in the first game as a proxy for the basic cooperative mindset of the participant in the absence of other influencing factors. The *Number of the round* was simply measured as 1 to 36, reflecting the total number of rounds played in the three iterative games. The *Partner's choice in the previous round* was measured by a dichotomous variable that took the value of 1 for a cooperative choice (i.e. a high price) and 0 for a competitive choice (i.e. a low price).

Statistical Procedures

We interpret the data of the three iterative repeated games as a pooled cross-section/time series sample (see Boone/De Brabander/van Witteloostuijn 1999a). The dependent variable, *Competitive/cooperative behavior*, is therefore the discrete price choice of each individual in each of the 36 rounds of the three iterative games. Hierarchical logistic regression analyses were performed to predict the likelihood of individual cooperation in each round. The first model includes control variables only, and the second both control and independent variables (Game in

Dutch or English, and (not) lived in an Anglophone country), whereas the third model captures control and independent variables plus the interaction between *Game in Dutch / English*, on the one hand, and *(Not) Lived in an Anglophone country for more than three months*, on the other hand.³

Table 2 reports the descriptive statistics of the study and shows that multicollinearity is not an issue. A majority (70 percent) of the group of students who participated in the quasi-experiment is male. On average, students are just under 20 years of age, with around half of them being non-religious.⁴ The mean of the locus of control scale suggests that participants view their life as partially determined by external factors, and partially influenced by themselves. The level of student's English-language competence is rather high, which is typical for the Netherlands. Their level of experience of living in an Anglophone country is relatively low. The general level of cooperation, measured by the number of high-price choices in the first game, is medium with an average of 5.32 choices out of 12 being cooperative. So, the students tend not to play the Nash equilibrium, a result well known in the literature (Boone/De Brabander/van Witte-loostuijn 1999a). Cooperation declined somewhat in the second game, when the players heard that their fictitious competitor had offered high prices all the time. When playing with a known competitor – a fellow student – in the three iterative games, the average level of cooperation went up again.

[Insert Table 2 about here]

Results

Table 3 reports on the hierarchical logistic regression results from our study. Of our control variables, *Age* and *English-language competence* do not have a significant impact on cooperative behavior. The same is true for *Locus of control*. *Gender* does matter, though. Female participants show less cooperative behavior than male participants do. This finding contradicts widely held beliefs and the majority of previous research, but confirms Rapoport, Guyer and

Gordon (1976), Cook and Sloane (1985), and Boone, De Brabander and van Witteloostuijn (1999a). *Religiosity* is significant, too. Being religious has a strong positive impact on the extent of cooperative behavior. As expected, all game-related control variables have a significantly positive impact on cooperative behavior. Cooperative behavior is positively related to having a *Basic cooperative attitude* and to a cooperative choice by the partner in the previous round. Cooperative behavior also increases steadily over the three iterative games, due to the games' differences and learning effects.

Turning to our independent variables, we find that exposure to an Anglophone culture by living in an Anglophone country for three months or more has a significant negative impact on cooperative behavior, although the effect is not very strong. This offers some support for our Hypothesis 1. In line with Hypothesis 2, Table 3 shows that playing the game in English has a significantly negative effect on cooperative behavior. Hypothesis 3 predicts that this effect will be stronger for participants who have lived in an Anglophone country for more than three months. The interaction effect in Table 3 reveals that this effect is indeed very significant, providing support for Hypothesis 3. Figure 1 displays this effect visually. An independent language effect is present even for participants who have not had extensive active exposure to Anglophone culture. However, this effect is much stronger for participants who have had extensive active exposure to this culture. Playing the game in English is associated with 37 per cent cooperative choices, whereas playing the game in Dutch is associated with 51 per cent cooperative choices. Interestingly, playing the game in Dutch actually resulted in a slightly higher proportion of cooperative choices for participants with extensive active exposure to Anglophone culture than for participants who did not have this exposure.

[Insert Table 3 and Figure 2 about here]

Discussion

Main Findings and Implications for Theory

Previous research has shown that cultural background impacts on the level of cooperative behavior (Cook/Chi 1984; Cox/Lobel/McLeod 1991). Our study extends these findings and contributes to theory in field by showing that exposure to another culture associated with different norms and values can influence cooperative behavior as well. We found that even a relatively brief exposure to an Anglophone culture with higher values for masculinity, performance orientation and assertiveness is associated with more competitive behavior in a Bertrand duopoly prisoner's dilemma game. This has important implications for the study of cultural norms and values. If even a relatively brief exposure to a foreign culture has the ability to influence an individual's norms and values, we might wonder how stable these norms and values are. Olivas-Luján, Harzing and McCoy (2004) also touched on this question when investigating a change in power distance values for US students after September 11. However, their study found that over time values moved back closer to their pre-September 11 values again. Similarly, the relative recency of the Anglophone experience in our sample⁵ might have caused a change in values that is only temporary.

Previous research has also shown that language might impact on the way people respond to questionnaires on attitudes (see e.g. Bond/Yang 1982; Harzing/Maznevski et al. 2002; Harzing et al. 2005). Our study extends these findings and contributes to theory in the field by establishing that language impacts not just on attitudes, but also on behavior (the number of cooperative choices in a prisoner's dilemma game).⁶ Our results reveal that playing a PD game in English has a significantly negative impact on the number of cooperative choices. This result shows that the weak version of the Sapir-Whorf hypothesis (Crystal 2002), which argues that language influences the way we think, might possibly be expanded to including behavior as well as thought.⁷ Of course, our design implies that we cannot determine the precise nature of the underlying mechanism. For instance, rather than reflecting cultural accommodation to Anglophone norms and values with regard to cooperation versus competition, the effect of using English as a foreign language might also be that this frees participants of the norms, prescriptions and values

of their own culture, here implying a move away from cooperation to competition. Future research could explore these mechanisms in more detail.

Finally, previous research has emphasized the importance of priming (Oyserman/Coon/Kemmelmeier 2002). Our study extends these findings and contributes to theory in field by revealing that language might well be a very important priming mechanism that can activate previous cultural experience, even for participants who are not, strictly speaking, biculturals. For participants who had experienced more active exposure to an Anglophone culture, playing a PD game in English resulted in a very significantly reduced number of cooperative choices. The interaction effect between language and cultural exposure turned out to be stronger than any of the other effects in the study. Interestingly, students with more Anglophone cultural exposure only showed less cooperative choices when the game was played in English. When the game was played in Dutch, they even displayed slightly more cooperative behavior. Hence, language appears to be a very powerful priming mechanism even for people with limited cross-cultural experience. This, too, would merit further investigation.

The results of our study might be open to two alternative explanations. First, given that English is now the language of international communication, our participants might simply be assuming that they are dealing with out-group members from a different culture (not necessarily Anglophone) when playing the game in English, and as a result make more competitive choices.⁸ However, this is a very unlikely explanation in our setting for two reasons. First, the Dutch students were well aware of the fact that they shared the room with other Dutch students; moreover, the students played face to face and were able to see each other. Second, it would not explain why participants who had spent time in an Anglophone country responded stronger to the language priming than participants without this experience. A second alternative explanation could be that rather than language triggering a change of values leading to more competitive behavior, the English language leads our participants to display defensive behavior. When playing the game in English, they might expect their counterpart to behave more competitively, and

hence display competitive behavior in defense. Although this would negate our argument that a value change might be triggered by using a different language, it does not invalidate our main argument that the choice of language impacts on behavior.

Gender Differences in Cooperative Behavior

In addition to the findings for our main hypotheses, we found some interesting results with regard to gender. The fact that female participants showed less cooperative behavior seems to contradict general gender stereotypes and most (though not all) previous research. One possible explanation for this is that previous research generally studied gender differences in an Anglo-Saxon (i.e. masculine context), whereas the Netherlands is a more feminine country. Although in masculine (feminine) countries, both men and women hold more masculine (feminine) values, value differences between men and women are smaller in more feminine countries (Hofstede 1980, p. 279). Hence, other factors influencing cooperation might more easily suppress gender effects in feminine countries. Hofstede even found a role reversal in the two most feminine countries (Sweden and Norway), where women scored more masculine than men. The same may be true to some extent in the Netherlands.

Another explanation could be that the type of female participants differed between studies. Hofstede found large differences in masculinity/femininity scores across occupations that might counteract gender differences, with the average female systems engineer scoring more masculine than the average male clerk. Boone, De Brabander and van Witteloostuijn (1999a/b) found higher type-A behavior for Dutch female than for Dutch male participants, and suggested that women studying Economics might be different from other women, as a result of *ex ante* self-selection and/or *ex post* adaptation. The same might be true for women in our sample.

Finally, it should be noted that in the one-shot first game (that measured basic cooperative behavior), women were very significantly ($t = 14.553$, $p = 0.000$) more cooperative than men, whereas in the second one-shot game this difference was no longer significant. It was only when

playing against a known competitor – a fellow student – that female participants made less cooperative choices than male participants ($t = 2.713, p = 0.007$). In comparison to their basic cooperative behavior in the benchmark game, female participants became less cooperative (5.93 versus 5.33 cooperative choices out of 12), whereas male participants became more cooperative (5.06 versus 5.64).

Therefore, another area for further research unrelated to the main focus of our study would be to explore gender differences in cooperative behavior in more detail. As we have seen, previous research has produced contradictory findings. Our results suggest that women make more cooperative choices with an imaginary partner than with a real-life partner. We suggest that when playing with an imaginary partner, women may be likely to imagine the partner to be similar to themselves (i.e. relatively cooperative). However, when faced with a real-life partner, who, in our sample, is more likely to be male than female, women might attribute more competitive behavior to their counterpart and hence be more competitive themselves. The reverse might be true for men. It would therefore be very interesting to investigate whether cooperative behavior depends on the gender of the counterpart.

Implications for Management

Given the quasi-experimental nature of our study, implications for management are not straightforward. However, we speculate that our results may be relevant from the angle of corporate cultures, in relation with intra and inter-organizational behavior, because an ever-growing number of organizations has made and will make English their corporate language. Looking at the Netherlands – the setting of our quasi-experiment – a large number of annual reports of companies listed at the Amsterdam Stock Exchange (ASE) are already available in English.⁹ Moreover, the number of non-Dutch top managers of ASE-listed enterprises is increasing rapidly. The introduction of English as the corporate language may have two effects. Firstly, the corporate culture may become more competitive than it used to be. This effect will be felt

mostly in what Hall and Soskice (2001) refer to as ‘Coordinated Market Economies’, such as the Netherlands.

However, the change of corporate language is only relevant for the upper layers within a company. Top and middle management may have to communicate in English, but lower management and the operational core will continue to use their native language. Consequently, secondly, it may lead to increased cultural distance within companies, as higher levels use a different language and – associated with that language – have a different attitude compared to the rest of the company. Moreover, between companies, contract negotiations may be tougher than needed when English is used as the *lingua franca*. Negotiations may become tougher when a competition-inducing language is used; when firms try to collaborate, the building of trust and commitment between them may be impeded. As a result, one may therefore expect that the use of English might increase transaction costs of inter-organizational exchange.

Limitations and Suggestions for Further Research

Although our study provides some significant insights into the role of cultural accommodation and language priming in the choice between cooperative and competitive behavior, it is not without limitations. For one, although our prisoner’s dilemma setup is widely used in social psychology because of its general and realistic nature, our study’s generalizability suffers from the usual limitations associated with quasi-experimental work. This issue of generalizability can be explored in future research in a variety of directions. First, replication in different experimental designs can help to better understand the external circumstances that are particularly sensitive to language priming. It might be, for instance, that our PD protocol is associated with a bias toward competitive behavior. Interesting extensions could involve, therefore, cooperative protocols and team-level tasks. Second, a natural next step is to do field work. An interesting setting could be top management teams with members from different countries and with different mother tongues.

A second limitation is that our study involves a between-participant rather than a within-participant design. A within-participant approach would conduct the same quasi-experimental game in two different languages for every respondent. As the prisoner's dilemma game was part of the normal teaching program in the university, it was not feasible to have each participant play the same game twice. We therefore followed the between-participant approach and split up the group of participants so that each participant only played the game in one language. A disadvantage of this approach is that the two groups might differ on factors unrelated to language. Therefore, we took care to distribute students from different educational programs equally (and randomly) over the different language groups. We also included various demographic characteristics as control variables. Moreover, whereas a within-participant design might provide a greater level of control, it would introduce another potentially serious distortion: the fact that participants learn over time which type of behavior displays the highest pay-off would introduce a treatment-order effect. In future work, we would like to explore this issue in more detail.

As we did not measure the students' norms and values directly at different points in time, we cannot establish whether the acculturation effect is due to self-selection, a (temporary or more permanent) change of values, or a combination of both. Future studies might want to consider a longitudinal design, including a more direct measurement of cultural values and/or of the level of identification with Anglophone cultures. However, although the possibility of self-selection would potentially negate our results with regard to acculturation, it does not in any way invalidate our results with regard to the priming effect of language.

Another limitation may be that, in this study, we only involved Dutch students, and limited the languages to Dutch and English. Clearly, since previous studies looking at the impact of language have focused on Chinese/English in Hong Kong, this means that our study does provide an interesting new context. Also, given the cultural similarity between the Netherlands and Scandinavian countries, we might expect our results to be valid for that region as well. However, without direct replication of our findings in other countries and with other languages, we

cannot be sure whether the effects found in this study are generalizable to other country/language pairs. We do believe, though, that our study revealed a fundamental issue – that language has an effect on actual behavior. However, more work is needed to increase our understanding of the underlying mechanisms. For example, rather than acting as a culture prime, a foreign language may simply operate as a trigger to free the participants of their own cultural norms and values.

We should point out, though, that the quasi-experiment we conducted can only be applied to a limited number of all possible country/language pairs. The language effect we studied requires that people in a specific country are familiar with both the language and the culture of another country, which rules out a large number of possible country/language combinations. For instance, we may safely assume that Dutch students are familiar with both language and culture of the US, but we may equally safely assume that the reverse might not hold: maybe a number of US students will carry knowledge about the Dutch culture, but hardly any of them will be able to understand the language. Hence, the Dutch – English pair is not symmetrical: we can only study the influence of English as language. This relates to another issue. English may have a unique effect due to its role as the world's *lingua franca* in business, culture and politics. This is why, ideally, future research should explore language pairs not involving English, to find out whether or not English is a special case.

In general, given the requirements of knowledge of culture and language of the other country, the quasi-experiment presented in this paper could be conducted in two different situations. First, the largest number of possible country/language pairs will be asymmetrical: one carries knowledge about the other, but not *vice versa*. This will often occur when it concerns countries that are linked in history as colonizer and colony; or country/language pairs in which one country influences the other for another reason, as it the case with the US versus other countries. The second situation concerns a symmetrical pair, in which inhabitants of both countries carry

knowledge about each other's culture and language. Neighboring countries (e.g. the Netherlands and Germany) are the most probable candidates for this second category.

Conclusion

In this paper, we investigated the behavioral impact of exposure to a culture other than one's own. We showed that cultural accommodation by living in another culture has a long-lasting, but partially dormant, influence on behavior, which can be activated by using the language associated with this culture as a priming mechanism. More specifically, we found that previous exposure to an Anglophone culture with higher values for masculinity, performance orientation and assertiveness negatively influences cooperative behavior in a prisoner's dilemma game when the game is played in English. In addition, we found that the use of English is an influential factor in itself: it elicits competitive behavior even when an active cultural imprint is not present. With the increasing use of English as a *lingua franca*, these preliminary results suggest that Anglophone-dominated globalization may well have potentially far-reaching consequences for international business. We therefore strongly encourage further research in this area.

Endnotes

¹ We are fully aware that there might be large differences between the various countries in the Anglophone cluster. However, on a world scale, they share many similarities. For the cultural dimensions that we studied, the Anglophone countries generally score very similar to each other and noticeably different from the Netherlands. Furthermore, in studies that cluster countries on cultural dimensions (e.g. Hofstede 1980; Ronen/Shenkar 1985; Ashkanasy/Trevor-Roberts/Earnshaw 2002), Anglophone countries are generally found in the same cluster.

² In the game setup profits and losses were treated as equal, although we are aware of the fact that profits and losses may differ regarding their impact: "losses loom larger than corresponding gains" (Tversky/Kahneman 2000, p. 144).

³ Our data of games 3 to 5 reflect, in a way, a dyadic panel. After all, we have a cross-section of individuals that play interactively in fixed pairs over time. So, three types of correlations or interdependencies simultaneously affect the per-individual – per-round observation of the high or low price choice: (a) each individual i in each pair affects the decision made by the partner j (the dyadic nature); (b) the decision of each individual i in round t might be correlated with this individual i 's decision in round $t-1$ (the time series nature); and (c) each individual i 's decisions may reveal autocorrelation due to individual i 's time-invariant features (the cross-section nature). For such data, a 'one size fits all' estimation strategy is not available. In the analyses that will be reported below, we decided to control for (a) to (c) by adding *Partner's choice in previous round* (a), *Number of round* (b), and a series of player variables ranging from *Gender* to *Basic cooperative attitude* (c). Alternatively, we could have opted for another estimation strategy. With correlated data as ours, the estimation strategy should, in the end, be determined by substantive reasons, based upon the question at hand (Zorn, 2001). In our case, in principle, two candidates for alternative estimation strategies are the generalized estimating equation (GEE) and the random-effect model (REM) (a third option, the fixed-effects model (FEM) does not work in our case given our already large number of dummies and the rather extensive list of time-invariant covariates). As GEE requires a selection of one of three working correlation matrices and REM can be estimated with GLS or ML, this gives five alternative estimation strategies, in total. We refer to Zorn (2001) for an explanation of the pros and cons of both estimation strategies and their sub-variants. Here, it suffices to remark that the overall sign pattern of results is not affected by the choice of estimation strategy. However, significance levels are, as the significance of our main and interaction independent variables often drops below the standard threshold level of ten per cent. The reason for this is the large degree of autocorrelation of choices at the level of an individual player. Because our theory does predict such a (treatment-dependent) autocorrelation to begin with, we believe that the results reported below imply a better fit to our central research question.

⁴ According to the World Values Survey (WVS), the proportion of religious affiliation in the Netherlands was 53 per cent Catholic/Protestant and 43 per cent non-religious (Guiso/Sapienza/Zingales 2003). In our survey, the proportion of non-religious respondents was 52 per cent, whereas the proportion of Catholic/Protestant respondents was 45 per cent. The slight discrepancy is not surprising, as our respondents are younger than the general survey population in the WVS.

⁵ We did not ask the students when they spent time in an Anglophone country. However, it is most likely that this experience was part of their high school term for the majority of them. Given that the average age of our sample is just under twenty, the experience must have been relatively recent for most students (probably three or four years ago).

⁶ We acknowledge that listing a choice of cooperative versus competitive behavior when playing with a visible counterpart could be different from actual behavior in the real world. However, we do argue that this experimental setting brings us closer to measuring behavior than previous studies have.

⁷ Here, more fundamental research is needed, particularly by adding brain measures to our experimental design. It might be that different languages activate different parts of the brain, or might activate similar parts of the brain differently, biasing behavior in one way or the other. As it stands, we cannot be sure whether our main language effect is the result of cultural priming alone or more deeper-level processes within the human brain as well. Note that our particularly strong interaction effect indicates that cultural accommodation does play a key role.

⁸ We would like to thank Professor Michael Bond for this suggestion.

⁹ The legally relevant one may be the one in Dutch. However, our argument concerns the company culture.

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Table 1. Strategy-Profit Matrix Games 1 to 4

	FIRM II	
	Low price (P_I^L)	High price (P_I^H)
FIRM I Low price (P_I^L)	(- 30,000.-, - 30,000.-)	(+ 600,000.-, - 600,000.-)
High price (P_I^H)	(- 600,000.-, + 600,000.-)	(+ 300,000.-, + 300,000.-)

Note: The currency depended upon the game of the language. In the English-language game, amounts were in dollars, while in the Dutch-language game euros were used. In game 5, losses and profits were changed: when both players opted for the low price, they suffered a loss of 20,000.-; when both chose the high price, they would earn 600,000.-. When they chose different prices, the player that chose the low price would earn 800,000.-, while the high-price bidder would suffer a loss of 400,000.-. This change in the payoff structure has no effect whatsoever on the game's Nash or subperfect equilibrium, which still is the (Low price, Low price) combination in the one-shot and finite horizon versions of what continues to be a PD.

Table 2. Descriptive Statistics and Spearman Correlations

	Variable	Mean	SD	1	2	3	4	5	6	7	8
1	Gender	0.70	0.46								
2	Age	19.78	1.09	0.06							
3	Religiosity	0.48	0.50	-0.01	0.07						
4	Locus of control	12.47	3.74	0.16 **	0.20***	-0.02					
5	English-language competence	2.40	1.06	0.04	0.11 *	-0.09‡	0.07				
6	Lived in an Anglophone country	0.09	0.29	-0.02	0.21***	0.02	0.09	0.16 **			
7	Game in English	0.50	0.50	-0.02	0.04	-0.02	0.12 *	0.11 *	-0.02		
8	Basic cooperative attitude (= number of cooperative choices in game 1)	5.32	3.24	-0.13 *	-0.03	0.05	-0.08	-0.19***	-0.05	-0.05	
9	Sum of cooperative choices games 3 to 5	16.60	8.44	0.06	-0.03	0.11*	-0.01	-0.02	0.00	-0.11*	0.09‡
10	Partner's choice	0.46	0.50								
11	Number of the round	18.50	10.39								
	Valid N (listwise)	344									

‡ 0.10, * .05; ** .01 and *** .001 significance level (two-tailed).

Note that the variable 'Sum of cooperative choices games 3 to 5' is not our ultimate dependent variable: it is the summation of cooperative choices over all 36 rounds. In our regression analyses, we will analyze the choices per round. No correlations were calculated for the last two variables as they are time series variables.

Table 3. Explaining Cooperative Behavior

Block	Variables	Controls	Independents	Interactions
1	Constant	-0.502	-0.609‡	-0.597‡
	Player variables			
	Gender	0.151 ***	0.137 ***	0.124 **
	Age	-1.062‡	-0.838	-0.898
	Religiosity	0.205 ***	0.204 ***	0.203 ***
	Locus of control	0.024	0.081	0.087
	English-language competence	0.016	0.027	0.029
	Game variables			
	Basic cooperative attitude	0.411 ***	0.396 ***	0.408 ***
	Number of the round	0.013 ***	0.013 ***	0.013 ***
	Partner's choice in the previous round	0.752 ***	0.750 ***	0.751 ***
2	Lived in an Anglophone country		-0.147 *	0.068
	Game in English		-0.116 ***	-0.074 *
3	Game in English * Lived in an Anglophone country			-0.505 ***
	N	12175	12175	12175
	-2 log likelihood	16267.206	16254.212	16240.492
	Model chi-square	553.616 ***	566.610 ***	580.330 ***
	Delta chi-square		12.994 ***	13.720 ***

N = 12,180 [348 participants * 36 rounds – 348 observations for the first game].

‡ 0.10, * .05; ** .01 and *** .001 significance level (two-tailed, except for hypothesized effects).

Figure 1. Experiment Setup

<p>Experimental group (Dutch students): Game language English</p> <p>Game 1 12 rounds, playing alone; 'basic cooperative attitude'</p> <p>Game 2 12 rounds, fictitious competitor</p> <p>Games 3-5: 12 rounds each, real competitor</p>	<p>Control group (Dutch students): Game language Dutch</p> <p>Game 1 12 rounds, playing alone; 'basic cooperative attitude'</p> <p>Game 2 12 rounds, fictitious competitor</p> <p>Games 3-5: 12 rounds each, real competitor</p>
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Figure 2. Interactive Effect of Living in an Anglophone Country and Language of the Game on the Proportion of Cooperative Choices

