The Effects of Culture in Anonymous Negotiations: Experiment in Four Countries

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Abstract

Internet technologies are increasingly used in various forms of communication, including negotiations. This paper explores the cultural implications in anonymous inter- and intra-cultural electronic negotiations. The negotiations were conducted via Inspire, a Web-based negotiation support system, and involved 166 subjects from Austria, Ecuador, Finland, and Switzerland. Hypotheses are formulated concerning the influence of cultural differences on negotiators ex ante expectations concerning the negotiations and their outcomes, the negotiation atmosphere and the negotiation process. The results confirm considerable, cultural differences in both expectations and process, and only weak ones in atmosphere.

1. Introduction

Information technology is creating a new situation for international negotiations. The Internet offers the possibility for direct contacts of a sophisticated nature among geographically dispersed negotiators who can use advanced tools that provide a comprehensive and active support [1-3].

The Internet allows individuals and organizations from different cultures to enter negotiations, often without being aware of their partner's nationality or culture. Assumptions about the opponents' culture cannot be based on their names, organizations or email addresses. For example, the negotiation experiment by Brett and Okumura (1988) involved Japanese negotiators who were temporarily based in a metropolitan area in the Midwest, U.S.A. If these negotiators were to conduct Web-based negotiations with Peruvian or American negotiators of Japanese ancestry the assumptions of the opponents' culture based on the personal and organizational information would be incorrect.

One could argue that in the impersonal world of electronic information exchange, cultural differences no longer play an important role in negotiations. The purpose of this paper is to study, within an experimental framework, whether cultural influence can be detected in electronic negotiations.

The influence of culture on negotiations has been studied in various settings including case analysis, laboratory and classroom experiments, and recently, experiments between remote groups. Most experiments compare negotiations conducted in culture *X* with those conducted in culture *Y* [4, 5]. Classroom experiments are typically brief and they are either repeated in different countries or involve both local and foreign students. Thus, very little can be said about international and inter-cultural negotiation context. Exceptions are studies in which the intra-cultural negotiations are compared with cross-cultural ones [6, 7]. Although a face-to-face setting allows for natural and rich communication, it also introduces a natural bias since the subjects know the culture of their opponents and may try to modify their behavior to attune to their counterparts. Further, this type of negotiations makes it difficult to select participants who are representative for a foreign culture.

The paper discusses the results of experiments involving students from seven universities in four countries: Austria, Switzerland, Ecuador and Finland. They conducted electronic negotiations using the Inspire system [8]. The design of Inspire allows for detailed data collection describing the process and the parties, and for administering of questionnaires before and after the e-negotiation.

The experiments described in this paper differ from previous experiments in the following aspects:

1. The participants took part in the experiments at their respective home institutions; therefore the sample was not biased towards a group of foreign participants found at one particular location.

2. The negotiations were conducted over three weeks and the participants could terminate or extend the negotiations. This is in contrast with the experimental face-to-face negotiations which are performed in an unrealistically short period of time.

3. The exchange was performed via a Web-based system that allows for exchange of both structured and unstructured information. The system provides support tools to evaluate offers and counter-offers, and to view the negotiation history in both textual and graphical formats.

4. The negotiations were carried out anonymously; participants were initially not aware of their partners' cultures. Although they could state their nationality in messages if they wished to do so their counterparts could not verify their claims. The absence of clues reduces the influence of stereotypes and bias, which might be invoked when consciously negotiating with partners from a known, foreign culture.

The results of the experiment not only confirm that "culture influences negotiation through its effects on communication" [9], but also suggest a broader scope of these influences. Electronic negotiations do not remove the cultural influences; culture affects their expectations and behaviour, and it impacts the participants' use of the communication and analytical tools..

The concept and measurement of culture and previous studies of inter-cultural negotiations are discussed in section 2. Section 3 presents the framework underlying this research and formulates research hypotheses. The Inspire system and the participants are described in Section 4; the analysis of the empirical data is presented in Section 5 followed by conclusions and suggestions for further research.

2. Culture and negotiations

2.1. Dimensions of culture

In order to distinguish negotiators from the four countries we consider five well-known dimensions of culture: individualism/collectivism, power distance, masculinity, context and time orientation.

The *individualism/collectivism dimension* distinguishes whether or not the common values and beliefs of the community emphasize the needs of an individual or the needs of the group [10]. In collectivist cultures the goals of individuals are aligned with other members of the in-group and people tend to show more empathy towards each other [11]. In individualistic cultures there is an emphasis on personal needs and independent goals, irrespective of whether they negotiate with in-group or out-group members [12]. While Austria, Finland and Switzerland are basically individualistic cultures, Ecuador is a highly collectivist culture [13].

Power distance measures the perception of, and attitude towards, authority and power [10]. One pole of the continuum represents a high power distance culture characterized by a strong sense of hierarchy, a preference for differentiated status and restricted communication between members belonging to different levels of the hierarchy. At the other end of the continuum, social status differences exist as well, but people are less receptive to power difference. In negotiations, power and social status are considered equal [14].

In high power distance cultures, negotiations may be dominated by discussions on social norms and standards, as negotiators attempt to determine social status [5, 14]. Ecuador has a relatively high Power Distance Index (PDI) whereas Austria has one of the lowest among the cultures examined by [10, 13]; Finland and Switzerland are in-between.

The *masculinity/femininity dimension* reflects the degree to which either masculine norms such as achievement, and material orientation or feminine norms like relationship, people orientation and quality of life are important in a culture [13, p. 205]. An alternative label to this dimension is 'achievement' (for high masculinity) versus 'nurturance' (for low masculinity) cultures [15]. Austria and Switzerland are two of the five most masculine cultures, Finland is one of the five most feminine cultures and Ecuador has a rather masculine culture [13].

The *context dimension* distinguishes between high and low context cultures based on the importance of contextual factors in communication processes [16]. The content of a message can only be fully understood in the context of its transmission, i.e. nonverbal aspects of communication, physical environment, social status and power relationships, roles etc. In high context cultures, information is either in the physical context or internalized in the person and therefore an explicit coding is often not necessary, whereas in low context cultures messages are transmitted explicitly and directly [17].

Germans, Swiss and Scandinavians use a very high amount of explicit information transmission; these three societies are examples of the low-context cultures [16, p. 91]. Latin-American countries tend to be high-context cultures [18].

The *time dimension* describes the orientation of a culture towards time and is linked to the context dimension. High-context cultures tend to be polychronic, which means that people are involved in many different activities with different people at the same time [16, p. 150]. Additionally, this rather circular time perspective stresses high involvement of people (which produces a greater degree of context) and completion of transactions rather than adherence to a predetermined schedule and deadlines. People in monochronic cultures, on the other hand, have a linear time perspective, they prefer to undertake one activity at a time and emphasize priority setting, schedules, segmentation, and promptness [19]. Ecuador is a polychromic culture while the other three countries are monochronic.

The summary of the cultural differences for the four countries is given in Table 1. Numbers given in brackets are the culture-index scores from Hofstede (1980).

Table 1. Five dimensions of culture in four countries

Dimension	Austria	Switzerland	Finland	Ecuador
Individualism	high (55)	high (68)	high (63)	very low (8)
Power distance	very low (11)	moderate (34)	moderate (33)	high (78)
Masculinity	high (79)	high (70)	low (26)	high (63)
Context	low	low	low	high
Time	monochronic	monochronic	monochronic	polychronic

2.2. Cultural influences on negotiations

Negotiation studies consider seven interrelated constructs which we present in Figure 1 [6, 20, 21]. Negotiators' characteristics and situational constraints influence negotiators' expectations formed prior to entering the negotiation process. They also influence the negotiation process and its atmosphere. Expectations, the negotiation process, and atmosphere have a direct impact on the results which, in turn, influence the negotiator's assessment of the process, results and performance.

In this study we are concerned with direct and indirect effects which culture has on other constructs (see Figure 1). Culture is the only negotiator characteristic studied here. Other potentially important characteristics, e.g., previous experience in negotiations and gender, are not taken into account.

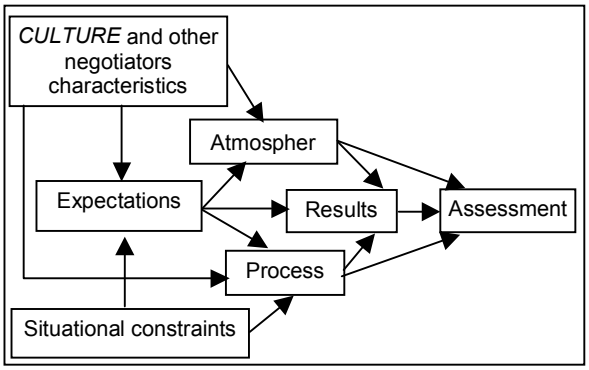

Figure 1. Cross-cultural e-negotiation framework

Since subjects were taken from a rather homogenous population of business students, other factors such as age and professional background are kept constant in the experiments.

Situational constraints refer to the circumstances of the negotiations and the constraints imposed on the process. They include the specifics of the negotiation problem, organization(s) within which the negotiation is conducted, and means and technologies of communication. The contextual factors are constant in the Inspire negotiations. All subjects deal with the same problem, which is administered to them in the same way.

The *negotiation atmosphere and process* have been thoroughly studied and found to play an important role in negotiations. The concept of 'atmosphere' includes variables describing the personal attitudes of the negotiators during the process. Chan, Graham and others suggest two main factors that contribute to the atmosphere and process: negotiation strategy and attractiveness [22-24].

Negotiation strategy reflects the negotiators' concern for their own outcome and their concern for the other party's outcome [23]. By combining the two dimensions of concern four strategies have been proposed. In the *contending strategy* negotiators are concerned mainly with their own and less with the other party's outcomes. Such negotiators tend to have high aspiration levels and they are making fewer concessions. The process is competitive, leading to "win-lose" agreements [23]. Negotiators' consideration of the other side's outcomes and their perception of the other party's outcomes as being instrumental for their own outcomes lead to a *problem solving strategy*. These negotiators consider the negotiation as a way of solving a common problem to the satisfaction of both sides. *Yielding* and *inactive strategies* incorporate low concern for own outcomes and are therefore of less interest in this context.

Attractiveness describes the personal "chemistry" between the negotiators. Both negotiation strategy and attractiveness can be observed only during the bargaining process. Nevertheless, they are commonly referred to in the literature as independent variables and not as process consequences [5, 24]. Process characteristics, on the other hand, involve the timing of offers, the amount of concessions made, arguments and their support, and other dynamic aspects of negotiations.

Results and post-negotiation assessments are task-related and satisfaction-related outcomes [25, 26]. The former are objective outcomes defining the achieved compromise and possibly the compromise utility levels. The satisfaction-related assessment is a subjective evaluation of the negotiation, the results, and the negotiator's and the counterpart's performance.

In the proposed model the influence of culture on the negotiation results is indirect (see Figure 1). If negotiators from different countries obtain different results, it is not because they are from different countries but because they have different expectations and behave differently during negotiations. These differences should be captured by variables describing the negotiation process or atmosphere.

3. Hypotheses

Following the framework presented in the previous section we formulate ten hypotheses about the impact of culture on expectations, atmosphere and process.

3.1. Negotiators' expectations

Expectations that negotiators hold prior to the bargaining process are directly influenced by culture [27]. This includes the relationship between expectations regarding outcomes and the degree of achievement-orientation. Negotiators with individualistic attitude who emphasize their own needs expect to negotiate better deals than those who represent collectivistic cultures. Therefore, we hypothesize that masculinity/feminity and individualism/collectivism affect negotiators' expectations concerning outcome and the atmosphere, and specifically that:

H1: High masculinity cultures (AT, CH, EC) have higher expectations concerning outcomes, higher reservation levels and expect less friendly negotiations than cultures with low masculinity (FI). A similar relation is hypothesized with respect to the expectations of individualistic cultures (AT, CH, FI) as compared to collectivistic cultures (EC).

Graham suggests that the role (e.g. buyer or seller) and status of the negotiators' influence negotiations in some cultures [5, 24]. For instance, he reported significantly different individual profits for Japanese buyers and sellers but no differences for American buyers and sellers. As one possible explanation for cultural differences in behavior with respect to roles and social status, Graham proposes Hall's high- versus low context dimension. The content of communication and behavior can only be understood in the context of situational constraints, i.e. status and power relationship, roles of participants, nonverbal aspects. etc.

The two roles and their status are also related to Hofstede's concept of power distance: in high power distance cultures, social status and roles are more important than in low power distance cultures [14]. Furthermore, as social status and specific roles imply power, individuals with lower status concede to higher-status individuals who, in turn, take care of the needs of lower-status negotiators. Thus expectations of negotiators should also be influenced by their role and status with culture having a moderating effect.

The difference in the economic situation of Ecuador on one hand and Austria, Finland and Switzerland on the other is the basis for the assumption that the seller has more power for Ecuadorians than the buyer. This power difference coupled with power distance which for Ecuadorians is significantly higher than for the other participants lead us to hypothesize that:

H2: Negotiators from cultures with high power distance (EC), assigned the role of a seller, have higher expectations concerning outcome and higher reservation levels than negotiators from cultures with rather low power distance (AT, CH, FI) in the same role.

3.2. Atmosphere

The negotiation atmosphere as a construct refers to the negotiation process and it involves both sides of the negotiation simultaneously. However, the atmosphere may also be influenced by cultural traits of individual negotiators. In the framework depicted in Figure 1, the atmosphere of a negotiation is determined by the strategy of negotiation partners and by perceived attractiveness between them. Earlier results suggest that negotiators from highly individualistic cultures show less problem solving behavior and are less cooperative than other negotiators [5, 24]. At the individual level, we thus expect that:

H3: Negotiators from more individualistic countries (AT, CH, FI) exhibit more contending behavior and less problem-solving attitude than negotiators from more collectivist countries (EC).

The negotiation strategy can be also examined at the dyad level, especially with respect to intra- versus intercultural negotiations. Negotiators are reported to behave differently if they negotiate with a partner from the same culture than if the partner is from a different culture [6, 7, 28]. Perceived dissimilarity and communication problems make the use of a problem solving strategy more difficult and thus less likely to appear in inter-cultural interactions [22].

We cannot compare dyads consisting of only collectivist countries with dyads containing only individualistic countries because of the low number of participants from Ecuador (the only strongly collectivist country in this experiment). Therefore we expect that:

H4: Negotiators in an intercultural setting rely more on the contenting strategy than on the problem solving strategy while the reverse is true for negotiators in intracultural setting.

The second component of the atmosphere is the personal attractiveness of negotiators and it also can be viewed at the individual and the dyad level. With respect to cultural differences it is useful to concentrate on the dyad level: perceived similarity between negotiators should enhance attraction between negotiation partners [29]. Thus hypothesize that:

H5: Negotiators in an intracultural setting perceive their negotiation partners more friendly, show higher interest to meet and work with them, and they disclose their own identity more often than the negotiators in intercultural settings.

3.3. Negotiation process

Cultural norms and values provide not only schemas for the interpretation of the situation and behavior of others but also scripts for appropriate social action [7]. We therefore expect culture-based differences to appear not only in expectations and atmosphere, but also in the dynamics of the negotiation processes.

The time orientation of cultures may play an important role in the process [19]. In monochronic cultures, priority setting and time schedules are frequently used to plan and organize activities. Members from monochronic cultures should thus try to organize the negotiation, communicate at similar intervals and make use of the structured offers. They should attempt to complete negotiations well before the deadline. Members of polychronic cultures may on the other hand be less inclined to pursue the timely completion of negotiations.

H6: Negotiation dyads in which both members are from monochronic cultures (AT, CH, FI) will negotiate more efficiently (finish earlier) than dyads containing at least one member from a polychronic culture (EC).

At the individual level, we expect that:

H7: Negotiators from monochronic cultures (AT, CH, FI) will exhibit a higher amount of activity close to the negotiation deadline than negotiators from polychronic cultures (EC).

H8: Negotiators from polychronic cultures (EC) will exhibit larger intervals between their actions (offers and/or messages) than negotiators from monochronic cultures (AC, CH, FI).

Members of polychronic cultures are more long-term- and relationship-oriented than those from monochronic (and individualistic) cultures [19]. This may imply that the former will be interested in a frequent exchange of long messages. Individualism, on the other hand, should have an opposite effect.

The differences in information exchange during communication between high- and low-context cultures may also have a direct impact on information sharing and the process [7]. High-context cultures tend to use indirect information sharing, whereas low-context cultures tend to use direct information sharing. In Graham's research [28], the Japanese, being a high-context culture, shared much less information directly than other negotiators. Instead, they shared information through the use of a relatively large number of offers and counteroffers [7]. However, in anonymous electronic communication, context can only be established by transmitting additional information that goes beyond mere offers. This leads us to the following two hypotheses:

H9: Negotiators from high-context cultures will use more text messages and/or attach more text messages with offers than negotiators from low context cultures.

H10: Negotiators from high context cultures will attach messages with a larger fraction of their offers than negotiators from low context cultures.

4. Method

4.1. Simulation

The data were collected in experiment involving a simulated buyer-seller business negotiation for one commodity. The simulation, "Itex-Cypress," involves negotiations conducted between representatives of two companies: Itex Manufacturing, a producer of bicycle components and Cypress Cycles, a builder of bicycles. The case is written in English. In writing the case an effort had been made to make it as much as possible 'culture neutral', which means that we tried to exclude any names that are indicative to a specific culture.

The simulation describes a negotiation problem that users from almost any country are familiar with and no additional explanations are necessary. As the users' language proficiency might be low the case is fairly simple and well structured. The case description fits one and a half pages. There are four issues that both sides have to discuss: the price of the components, delivery times, payment arrangements and terms for the return of defective parts. For each issue there is a given set of options, i.e., issue values. Altogether, there are 180 complete and different potential offers (alternatives) that contain all four issues.

The participants are not given the issue priorities. Thus they have to decide if, for example, the price is more important than the delivery time. They also have to determine the specific trade-off values between issues.

Both parties are presented with their side of the case, told that they are to represent Itex (or Cypress), and that their companies are interested in achieving a compromise. They are also informed that there are other suppliers and buyers; a participant may terminate negotiations and request new negotiation. Hence a breakdown in negotiations is possible if a good deal cannot be reached; there were, however, no such breakdowns in this experiment.

There is no specification as to what indicates a good deal. Each side, however, is given a clear indication as to the desirability of the options (issue values) but in terms of the direction rather than specific trade-off values. There are several reasons for requesting the participants to specify their own preferences, rather than impose them. Firstly, there are strong arguments for preference structure being culturally dependent. Hofstede's study, for example, gives grounds for culturally dependent utility functions that reflect differences in the risk attitude [10]. In the simulation the participants' partial utilities (part-worths) could be linear as well as non-linear (convex or concave).

An imposition of preferences could introduce the experimenters' cultural bias. Finally, by avoiding the specification of preference values the participants are able to establish their own priorities within each issue and—we expected—to be more involved in the role-playing, and pursuance of their own negotiation style.

4.2. Procedure

The negotiations were conducted via Inspire [8, 30]. The system facilitates anonymous bilateral e-negotiations. Inspire users use aliases and each has his/her own part of the "virtual negotiation table" that is not accessible by any other user. Instructions, glossary and explanations can be accessed at any time. Other components of the system, for example, the case description, preference specification page and offer construction page can be accessed only in a given sequence.

Exchanges of offers and messages are conducted via the system to protect users' anonymity; users do not know their counter-parts identity, as would be the case when using direct contact via e-mail. In addition to the case, the system provides the following key facilities: preference elicitation and utility construction, offer construction and rating, messaging, graph of negotiation dynamics, negotiation history with all offers and messages, and post-settlement efficiency analysis. In addition, users—upon the completion of the negotiation—may agree to disclose their utilities allowing them to view the negotiation 'dance graph'.

In the Inspire negotiations, data is collected with the use of three instruments: (1) Negotiation transcripts which are automatically generated and contain the participants' preference structure, offers and their ratings, messages and time stamps; (2) The pre-negotiation questionnaire, which every participant fills in after her/his utility function has been constructed and before the negotiation can begin; and (3) The post-negotiation questionnaire, which is not mandatory.

4.3. Participants

166 participants were recruited from classes held at seven participating universities in four countries for the total of 83 dyads. The participants did not know who they were paired up with; they did not know the country of their counter-parts, nor did they have any information regarding their education, profession or gender.

The distribution of participants is given in Table 2. To achieve comparability and disallow for communication other than electronic, subjects from different universities and different cities in the same country conducted intra-cultural negotiations. Because in Ecuador and Switzerland students from only one university participated in the experiment, only Austrians and Finns conducted intra-cultural negotiations.

Table 2. Negotiating dyads

	Austria	Switzerland	Finland	Ecuador
Austria	9	--	--	--
Switzerland	14	0	--	--
Finland	13	14	13	--
Ecuador	4	0	16	0

The participants did not receive any financial reward; they used Inspire as a course assignment which was not related to this study. The assignments were not evaluated on the basis of their performance. All students were informed that their instructors would not obtain information about the offers, messages and either the compromise they achieved or the negotiation breakdown.

In this study the country of residence is considered an adequate indicator of culture. All participants from Ecuador and Finland were born in these countries; 95% of Austrian and 60% of Swiss participants were born in Austria and Switzerland respectively. The remaining 40% of the Swiss participants were residents of Switzerland**.** A similar homogeneity could be observed with respect to native languages. 90% of the participants from Austria and Ecuador and over 80% of the participants from Finland can be considered as homogenous. Swiss participants are about evenly divided into German-speaking and French-speaking.

5. Results

5.1. Expectations

We use three variables to measure expectations: *utility of the expected compromise*, *utility of the worst acceptable compromise*, and *expected friendliness of the negotiation*. The first two variables are computed using the participant's direct and indirect input. Each participant formulated in the pre-questionnaire the expected compromise and the reservation levels in terms of issues and their values. After filling in the questionnaire the negotiators are requested to specify their preferences, and then their utility function is constructed. This allows calculating the utility values of the expected and worst compromise. The mean utility of the expected compromise is 70.21 (SD = 18.61) and 44.80 (SD = 25.33) for the worst compromise. The expected friendliness of the negotiations is a Likert-type variable with 1 being "very friendly" and 5 – "very hostile"; the sample mean is 2.4 (SD = 0.81).

The samples of Austrian, Swiss and Finnish negotiators appear to share similarities in their expectations. The average utility of the expected compromise is 64, 68 and

69 respectively (with SD respectively equal 21, 12 and 17) with the minimum utility value being 0 and maximum -100. In contrast; the average utility of the expected compromise of the Ecuadorian negotiators is 87 (SD = 11.7).

With respect to the friendliness of their negotiations Austrian, Swiss and Finnish negotiators (M = 2.51, 2.61 and 2.34; with SD = 0.73, 0.78 and 0.86 respectively) also appear to have expectations lower than Ecuadorians; (M = 1.95, SD = 0.69). The differences are not as apparent regarding the average utility of the worst acceptable compromise for AU, CH, EC and FI (M = 40, 45, 43 and 48; with SD = 24, 23, 39 and 22).

First, we tested for the differences between the four countries without consideration of any cultural dimension. Using one-way ANOVA we obtained a significant difference in the utility of the expected compromise ($F_{1, 152} = 4.85$, $p < .001$); a weakly significant difference in the expected friendliness of negotiations ($F_{1, 152} = 2.23$, $p = .055$) and no significant result for the utility of the worst acceptable compromise ($F_{1, 152} = .60$, p = .702).

Finns differ from other negotiators in their low masculinity orientation. This difference, however, does not reflect on the three expectation variables according to the ANOVA results. Hypothesis 1 that Finnish negotiators have different expectations must be rejected for these variables. The difference in the utility of the expected compromise ($F_{1, 152} = 0.11$, $p = .74$), the utility of the worst acceptable compromise ($F_{1, 152} = 3.25$, $p = .06$) and the expected negotiation friendliness ($F_{1, 152} = .09$, $p = .77$) are not statistically significant.

The second part of Hypothesis 1 has been confirmed: the Ecuadorian negotiators, who are from an individualistic, polychronic and high power distance culture, have different expectations than the other negotiators. As anticipated, for Ecuadorians (M = 87.40, SD = 11.68) the utility of the expected compromise is significantly higher than for the Austrian, Swiss and Finnish (M = 67.74; SD = 18.96) negotiators ($F_{1, 152} = 20.27$, $p < 0.001$). The utility of the worst acceptable compromise (M = 45.90 vs. 45.19, SD = 31.59 and 22.20, $F_{1, 152} = 0.02$, p = .90) did not exhibit a significant difference, but for expected negotiation friendliness (M = 1.95 vs. 2.41, SD = 0.69 and 0.82, $F_{1, 152} = 5.76$, p = .018) the hypotheses has also been confirmed.

Hypothesis 2 links the same expectation variables to power distance and the role of negotiators. To test this hypothesis, we used a one-way ANOVA using only data from sellers and established that the Ecuadorian sellers have different expectations regarding the expected compromise and negotiation friendliness than the sellers from the other three countries. The utility of the Ecuadorian sellers' expected compromise is significantly higher (M = 87.40 vs. 69.27, SD =11.68 and 15.54, $F_{1, 75} = 22.63$, $p < 0.001$) and the expected friendliness significantly lower (M = 1.95 vs. 2.53, SD = 0.69 and 0.83, $F_{1, 75} = 7.82$, $p = .007$) than that of the remaining sellers. This hypothesis must be rejected, however, for the utility value of the worst acceptable compromise (M = 45.90 vs. 48.41, SD = 31.59 and 21.20, $F_{1, 75} = 0.16$, $p = .69$).

5.2. Negotiation strategy

Following [22] we used factor analysis to derive a problem solving attitude (PSA) index from five Likert-scale variables *cooperation*, *exploitation*, *honesty*, *informativeness* and *persuasiveness* of the opponent, which were measured in the post-negotiation questionnaire. The factor loadings obtained for the first two principal factors are given in Table 3.

Table 3. Factor loadings for problem solving and contending strategies

Opponent perceived as...	Factor 1	Factor 2
Cooperative	0.34482	-0.23239
Exploitative	- 0.10318	0.84860
Honest	0.34733	0.00204
Informative	0.30366	0.29680
Persuasive	0.27938	0.27509

The first factor can be interpreted as problem solving strategy. The loading associated with variable "exploitative" has the opposite sign from the other variables because exploitativeness describes a negative attitude. Persuasiveness may be interpreted in both directions. It is positively correlated with the other characteristics, indicating perhaps that an opponent with positive characteristics is also more persuasive than one with negative characteristics. In interpreting the following results, it should be noted that, due to the scaling of variables used in the questionnaire, high values imply a low degree of problem solving attitude. We use Factor 1 to construct the problem solving strategy variable as the weighted sum of the five variables.

Interpretation of the second factor is more difficult. Given the orthogonality property of factor analysis, it encompasses effects not explained by the first factor. Factor loadings for this factor are particularly high for the question describing exploitativeness. An opponent with a high score on the second factor could probably be described as a "tough" negotiator, pursuing contending strategy, i.e. showing low concern for the partner's outcome. Separate factor analyses were computed for the individual countries. The factor loadings, however, were similar to those in Table 3, indicating a low influence of cultural effects on bargaining strategy. This lack of influence was confirmed by the test of hypotheses H3 and H4.

We used ANOVA to test Hypotheses 3 on the influence of individualism and collectivism on the problem solving and contending strategies as measured by the two factors. This hypothesis must be rejected for both variables: For problem solving strategy, the mean scores are 0.11 (SD = 1.01) for collectivist, and -0.07 (SD = 0.95) for individualistic countries ($F_{1, 101} = 0.46$, $p = .50$). For contending strategy, the corresponding values are M = -0.13 vs. 0.01, SD = 0.54 and 1.01, $F_{1, 101} = 1.47$, $p = .228$. Similarly, at the 5% level we must reject Hypothesis 4 that the use of these two strategies depends on intra- vs. intercultural negotiations (M = -0.04 vs. -0.06, SD = 0.60 and 1.04, $F_{1, 101} = 0.01$, $p = .91$ for problem solving strategy, and M = 0.05 vs. -0.05, SD = 0.86 and 0.99, $F_{1, 101} = 0.22$, $p = .642$ for contending strategy). This confirms recent results for face-to-face negotiations that culture has little influence on the negotiators' problem solving strategy [22].

5.3. Opponent's attractiveness

Hypothesis 5 is about negotiators' perception of their opponent measured with two Likert-type variables: the *friendliness of the opponent* (1- completely, 7 - not at all) and the *interest to meet the opponent* (1- extremely interested, 5 - not at all). Overall, the negotiators perceive their counterparts to be rather friendly (M = 2.68, SD = 1.34) and are also fairly interested in seeing their opponent (M = 2.40, SD = 1.27).

Negotiators who are from the same country find their opponent friendlier than those who are from different countries (M = 2.18 vs. 2.82, SD = 0.85 and 1.42, $F_{1, 99} = 4.05$, $p = .047$). There is, however, no difference between inter- or intra-cultural negotiations in their willingness to see the opponent (M = 2.73 vs. 2.30, SD = 1.32 and 1.24, $F_{1, 99} = 1.94$, $p = .17$).

To test for differences in the disclosure of identity, a two by two contingency table was used. The χ^2 test failed to indicate a significant relationship between type of negotiation and disclosure of identity ($\chi 2 = 0.10$, df =1, N = 101, p = .75).

5.4. Negotiation process

Hypothesis H6 is connected to monochronicity of cultures and the efficiency of negotiations as measured by the time difference between the conclusions of negotiations and the deadline. Although dyads composed only of members from monochronic cultures concluded their negotiations earlier (M = 200.89, SD = 110.04) than dyads containing one member from Ecuador, which is a polychronic culture (M = 157.66, SD = 109.77), a one way ANOVA indicates that this difference is not significant at the 5% level ($F_{1,110} = 3.52$, p = .063).

To test hypothesis H7 (more activities before deadline for monochronic dyads), we considered the fraction of offers made during the last four, two and one days of the negotiation. A one-way ANOVA indicated that this hypothesis must be rejected for all three intervals ($F_{1,152} = 1.43$, p = .23 for 1 day; $F_{1,152} = 1.67$, p = .20 for two days; $F_{1,152} = 0.55$, p = .46 for four days).

However, when we consider the composition of dyads at a country per country level and not only the distinction between mono- and polychronic cultures, a significant difference exists between dyads concerning activities taking place during the last day of negotiations as shown by the ANOVA results in Table 4.

Table 4. ANOVA of late activities vs. dyad composition

	Source	DF	F	Pr > F
Fraction of offers made 1 day before deadline	Negotiator's country of residence	3	1.08	0.36
	Opponent's country of residence	3	1.01	0.39
	Interaction effect	5	2.45	0.04
	Error	129		
	R^2= 0.123, MSE= 0.004			

Our data suggests that these effects may be related to polychronicity in some way. For example, negotiators from Ecuador performed no activity at all during the last day, while in negotiations between Austrians about 8% of all activities took place during the last day. However, the precise nature of this relationship cannot be identified from the results we have obtained so far.

Hypothesis H8 concerns intervals between negotiator's activities, which were taken from the negotiation log created by Inspire. A significant ($F_{1, 152} = 8.92$, p = .003) difference in the time distance between offers sent by the negotiator was found between negotiators from a polychronic culture (M = 6.83 days, SD = 2.56) and those from monochronic cultures (M = 4.98 days, SD = 2.56).

Hypotheses H9 postulates a difference in communication behavior between high- and low context cultures. Communication behavior is represented by the number of text messages a negotiator sends and the number of offers which are accompanied by text. Although negotiators from Ecuador did send more text messages (M = 1.55, SD = 1.36 vs. M = 1.16, SD = 1.28 for the other countries), this difference was not significant ($F_{1,152} = 1.62$, p = .205). But as the low mean values indicate, the possibility to send text messages separately from the offers exchanged during the negotiation process was in general not heavily used.

Communication behavior is also reflected in the number of offers accompanied by text messages. This feature

of the system was used more by negotiators from a high context culture (M = 4.70, SD = 1.34) than by negotiators from low context cultures (M = 3.58, SD = 1.85) and this difference is statistically significant ($F_{1,152} = 6.76$, $p = .01$).

In contrast to H9, hypothesis H10 refers to the fraction of offers accompanied by messages rather than their absolute number. Although negotiators from Ecuador, a polychronic and high context culture, sent a larger fraction of their offers with messages (M = 98.33%, SD = 5.13) than negotiators from other countries (M = 90.12%, SD = 24.46), this hypothesis had to be rejected at an α-level of 5% ($F_{1,151} = 2.23$, $p = .138$).

This research has thus uncovered several effects of culture on both the expectations of negotiations prior to the negotiation, as well as their behavior during the process. On the other hand, the hypotheses relating culture to negotiation atmosphere were mostly rejected.

6. Conclusions

This study shows that culture affects the process of electronic negotiations. When first confronted with this research agenda, one might consider it to be a contradiction in itself: when most obvious signs of culture like physical distance people try to keep, their facial expressions, manners, etc. are removed, is there any possibility left for cultural differences to manifest themselves?

Artifacts and behavioral patterns are present at the surface level and are the most obvious manifestations of culture, but they are the result of underlying cultural traits at the level of values, norms and traditions. Studies of anonymous negotiations may help to uncover the underlying factors with little interference of the surface manifestations. In face-to-face negotiations subjects may modify their behavior and attitudes according to their perceptions of the counterparts' culture. In anonymous negotiations, participants cannot rely on these clues and thus are more likely to base their behavior on scripts inherent to their own culture.

This study has shown that cultural differences exist in the way negotiators approach the negotiation, particularly in the expectations they form before actual bargaining begins. We have seen that the Internet-based communication is sufficiently rich for cultural and behavioral differences to emerge in the negotiation process. However, these differences did not carry over into bargaining strategies and atmosphere to the extent we expected. The question remains open whether this indicates a point where we have reached the limits of the medium and significant differences in strategy and atmosphere would have emerged if we had used richer communication media. Given the ubiquitous nature the Internet has already reached, we feel it is also important to point out those aspects of negotiations where culture makes a difference.

Our results and the data we have collected from the experiments also indicate some promising paths for future research. Significant culture-based differences exist for several variables describing expectations and the negotiation process. While in many cases we were able to relate those differences to cultural traits based on the dimensions developed by Hofstede, the limited selection of countries used in our experiments in some instances impaired a precise identification of those traits that cause the differences. This is exhibited for example in hypothesis H7, which was rejected for the traits we studied (poly- vs. monochronicity), although we find significant differences in behavior.

The Inspire system allows conducting additional studies based on a broader selection of participating countries. By using carefully selected subjects and spreading out more differently across various cultural dimensions, we will be able to examine the specific causes of differences more precisely. Such a broad research, for which the current study provides a starting point, would not be possible without the use of internet-based negotiation tools.

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References

[1] G. E. Kersten, "Negotiation Support Systems and Negotiating Agents," presented at Modèles et Systèmes Multi-Agents pour la Gestion de l'Environement et des Territoire, Clermont-Ferrand, France, 1999.

[2] T. Bui, J. Yen, J. Hu, and S. Sankaran, "A Multi-Attribute Negotiation Support System with Market Signaling for Electronic Markets," *Group Decision and Negotiation*, 2001.

[3] H. Ehtamo, R. P. Hamalainen, P. Heiskanen, J. E. Teich, M. Verkama, and S. Ziontz, "Generating Pareto Solutions in a Two-party Setting: Constraint Proposal Method," *Management Science*, vol. 45, pp. 1697-1709, 1999.

[4] N. J. Adler, J. L. Graham, and T. Gehrke, "Business Negotiations in Canada, Mexico, and the United States," *Journal of Business Research*, vol. 15, pp. 411-429, 1987.

[5] J. L. Graham, A. T. Mintu, and W. Rogers, "Explorations of Negotiation Behaviors in Ten Foreign Cultures Using a Model Developed in the United States," *Management Science*, vol. 40, pp. 72-95, 1994.

[6] N. J. Adler and J. L. Graham, "Cross-Cultural Interaction: The International Comparison Fallacy?," *Journal of International Business Studies*, vol. 10, pp. 515-537, 1989.

[7] J. M. Brett and T. Okamura, "Inter- and Intracultural Negotiation: U.S. and Japanese Negotiators," *Academy of Management Journal*, vol. 41, pp. 495-510, 1998.

[8] G. E. Kersten and S. J. Noronha, "WWW-based Negotiation Support: Design, Implementation, and Use," *Decision Support Systems*, vol. 25, pp. 135-154, 1999.

[9] O. Elgstrom, "Norms, Culture, and Cognitive Patterns in Foreign Aid Negotiations," *Negotiation Journal*, pp. 147-159, 1990.

[10] G. Hofstede, *Cultures and Organizations: Software of the Mind*, 2nd ed. New York: McGraw-Hill, 1997.

[11] H. C. Triandis, *Individualism and Collectivism*. Boulder: Westview Press, 1995.

[12] T. R. Lituchy, "Negotiations between Japanese and Americans: The effects of Collectivism on Integrative Outcomes," *Canadian Journal of Administration Sciences*, vol. 14, pp. 386-395, 1997.

[13] G. Hofstede, *Culture's Consequences, International Differences in Work-related Values.*, vol. 5, 1 ed. Newbury Park London: SAGE, 1980.

[14] J. M. Brett, W. Adair, A. Lempereur, T. Okumura, P. Shikkhirev, C. Tinsley, and A. Lytle, "Culture and Joint Gains in Negotiation.," *Negotiation Journal*, vol. 14, pp. 61-86, 1998.

[15] J. W. Chesebro, "Distinguishing Cultural Systems," in *Communication and Identity across Cultures*, D. V. Tanno and A. Gonzalez, Eds. Thousand Oaks: Sage, 1998, pp. 177-192.

[16] E. Hall, *Beyond Culture*. New York: Doubleday, 1976.

[17] S. Ting-Toomey and G. Gao, "Culture, Face maintenance, and Styles in Handling Interpersonal Conflict. A Study of Five Cultures," *International Journal of Conflict Management*, vol. 2, pp. 275-296, 1991.

[18] R. J. Volkema, "A Comparison of Perceptions of Ethical Negotiation Behavior in Mexico and the United States.," *International Journal of Conflict Management*, vol. 9, pp. 218-233, 1998.

[19] M. Mayfield, J. Mayfield, D. Martin, and P. Herwig, "Time Perspective of the Cross-Cultural Negotiation Process.," *American Business Review*, vol. 15, pp. 78-85, 1997.

[20] J. Z. Rubin and B. R. Brown, *The Social Psychology of Bargaining and Negotiation*. New York: Academic Press, 1975.

[21] J. Sayer and H. Guetzkow, "Bargaining and Negotiation in International Relations," in *International Behavior: A Social-psychological Analysis*, H. C. Kaleman, Ed. New York: Holt, Reinhart and Winston, 1965, pp. 464-520.

[22] R. J. Calantone, J. L. Graham, and A. Mintu-Wimsatt, "Problem Solving Approach in an International Context - Antecedents and Outcome," *International Journal of Research in Marketing*, vol. 15, pp. 19-35, 1998.

[23] C. W. Chan, "Transfer Pricing Negotiation Outcomes and the Impact of Negotiator Mixed-motives and Culture: Empirical Evidence from the U.S. and Australia," *Management Accounting Research*, vol. 9, pp. 139-161, 1998.

[24] J. L. Graham and A. Mintu-Wimsat, "Culture's Influence on Business Negotiations in Four Countries," *Group Decision and Negotiation*, vol. 6, pp. 483-502, 1997.

[25] P. Gray, D. Vogel, and R. Beauclair, "Assessing GDSS empirical research.," *European Journal of Operational Research*, vol. 46, pp. 162-176, 1990.

[26] A. Pinsonneault and K. L. Kraemer, "The Impact of Technological Support on Groups: An Assessment of the Empirical Research," *Decision Support Systems*, vol. 5, pp. 197-216, 1989.

[27] R. L. Tung, "Toward A Conceptual Paradigm of International Business Negotiations," *Advances in International Comparative Management*, vol. 3, pp. 203-219, 1988.

[28] J. L. Graham, "Cross-cultural Marketing Negotiations: A Laboratory Experiment," *Marketing Science*, pp. 130-146, 1985.

[29] N. C. Campell, J. L. Graham, and A. Jolibst, "Marketing Negotiations in France, Germany, the United Kingdom, and the United States.," *Journal of Marketing*, vol. 52, pp. 49-62, 1988.

[30] G. E. Kersten and S. Noronha, "Negotiations via the World Wide Web: A Cross-cultural Study of Decision Making," *Group Decision and Negotiations*, vol. 8, pp. 251-279, 1999.