An Experimental Study of the Reputation Mechanism in a Business Game

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Abstract

Reputation enables different parties to establish a trusting and cooperative relationship, a key factor in integrative negotiations referred to as “win-win” negotiations. Thus, a good reputation mechanism can bring simulations closer to reality. In this study we review the reputation mechanisms applied to the online business game WIN WIN MANAGER, where the players’ reputations are decided by their counterparts at the end of each negotiation. We then compare two reputation mechanisms and hypothesize that the best mechanism will be more positively correlated with the negotiation outcome which is measured by a scoring algorithm. Using non-parametric statistics, we highlight that the reputation mechanism in earlier versions of the game seems to produce values unrelated to the score, whereas the new mechanism produces values significantly positively correlated with the score. Such results can be useful to scholars who conduct experiments on negotiation, as well as online markets in which users are allowed to negotiate with one another

Keywords: business game; game-based learning; negotiation outcome; online negotiation; reputation mechanism; serious game; WIN WIN MANAGER.
Basic Data.

**Instructional (learning) objectives.** To improve and evaluate negotiation skills.

**Simulation/game objectives.** To achieve the maximum score and the maximum reputation level.

**Debriefing format(s).** Feedback is generated by the software according to each negotiation outcome. Players can send subjective feedback to their counterparts at the end of each negotiation session. Instructors can provide additional feedback pointing out the negotiation techniques adopted by the players and the correct methods of preparing the negotiation.

**Target audience.** MBA, engineering and economics students; businessmen; dealers and lobbyists. While not essential, a basic knowledge of negotiation techniques is useful. The game focuses on business-related scenarios and has been used for training purposes in business courses and suggested to engineering and economics students in order to improve their negotiation skills.

**Playing time.** The game is played through an asynchronous bulletin board. Players can start a negotiation whenever they want; however, once a negotiation is started, the negotiators are asked to post at least one message every 36 hours until the bargaining process has come to a close. A typical negotiation takes 3-4 days.

**Number of players required.** Minimum 2 players

**Computer/internet.** Web-only participation

Only a small niche of “Serious Games” focus on negotiation, and only a few of these are software-based. To the best of our knowledge, WIN WIN MANAGER (WWM) is the first online business game to allow players to negotiate with one another. During its development, we decided to introduce two score levels: one focused on each negotiation outcome and one focused on the negotiators’ behaviour, which we define as “reputation score”. Regarding this last point, we experimentally examine the behaviour of the reputation mechanisms implemented in WWM in order to assign a reputation score to players. Finally, we suggest a few upgrades which will be implemented in the next edition of the game.

**Introduction**

The Online Cambridge Dictionary defines reputation as “the opinion that people in general have about someone or something, or how much respect or admiration someone or something receives, based on past behaviour or character.” Anderson & Shirako (2007) refer to reputation as “the set of perceptions a community forms about the personal qualities of one of its members.” Therefore, reputation is understood to be a collective concept that relies on past interactions, as well as expectations regarding positive future interactions (Wasko & Faraj, 2005). Opinions and perceptions about others are built and developed through repeated interactions (Yee & Korba, 2003). Thus, individuals willing to keep good and enduring reputations over time should engage in consistent behaviours (Torgersen & Rivers, 2005). This leads to a social process known as the social construction of reality, introduced by Berger & Luckmann (1966) and later examined by Weick (1979, 1995). According to their studies, individuals build mental representations of others by observing their actions while interacting in a social network. If such actions are frequently repeated, they lead to “habitualization” and become embedded routines, habits and norms within the institutional structure of society. In other words, individuals share their perceptions with others building a perceived image of reality based on social interactions. Reality, therefore, might be considered a social construction produced through human activity that depends on how people interact within a particular context (Walsh & Wigens, 2004).

Weick (1979) argues that "reality is selectively perceived, rearranged cognitively, and negotiated interpersonally." To put it simply, people interpret reality through their own backgrounds, attitudes, values, beliefs, biases, heuristics, and stereotypes (Morgan & Dennehy, 2002).

Sociologists argue that reputation only exists in the minds of individuals. For instance, Wartick (2002) states that “reputation, be it corporate or otherwise, cannot be argued to be anything but
purely perceptual.” Eberl & Schwaiger (2005) argue that reputation is “an attitude-like construct that exists and operates in the general public’s mind,” and Emler (1990) refers to it as a “collective phenomenon and a product of social processes, and not as an impression in the head of any single individual.” Therefore, reputation can only be acquired through complex social interactions and it is the product of social construction and validation (Rao, 1994). Such interactions develop word-of-mouth networks - also known as “reputation networks” - that represent an ancient solution to the problem of trust-building. In fact, reputation was the primary enabler of economic and social activity for most medieval communities (Dellarocas, 2006).

Reputation’s role in the exchange of goods and services is still very important in today’s markets: thus, reputation is an intangible resource that may increase a firm’s performance and leads to a sustained competitive advantage (Deephouse, 2000; Barney, 1991). Compared to face-to-face communication, reputation is even more critical in computer-mediated marketplaces such as eBay or Amazon, where buyers and sellers are frequently anonymous and asynchronous communication makes it more difficult to signal trustworthiness and encourage cooperation (Bolton, Katok, & Ockenfels, 2004; Brosig et al., 2003). In order to reach an agreement, the buyer must “trust” that the seller is being truthful in the item description. Moreover, the buyer often pays in advance and needs to trust that the seller will send the purchased items by the agreed deadlines. Thus, effective reputation mechanisms are necessary to ensure cooperation and efficiency in a world of “e-strangers”.

Online reputation mechanisms (Dellarocas, 2003), or reputation systems (Resnick, Zeckhauser, Friedman, & Kuwabara, 2000), are Internet-based systems used to collect, aggregate and distribute feedback on participants’ past behaviour regarding previous transactions. Online reputation mechanisms help to build solid partnerships among participants. In fact, possessing information about others helps people decide who to trust, encourages trustworthy behaviour, and deters participation by those who are dishonest (Anderson & Shirako, 2007).

When individuals interact with one another over time, the history of past interactions with other users provides them information about the other party’s skills. In other words, people learn whether they can count on their counterpart or not. As Axelrod (1984) suggests, the expectation of reciprocity or retaliation in future interactions encourages trustworthy behaviour. Axelrod refers to this as the “shadow of the future”: “an expectation that people will consider each other’s past in future interactions.”

Resnick & Zeckhauser (2002), however, demonstrated that it is very difficult to build trust among strangers. When reputation mechanisms are not implemented, strangers have no evidence of past interactions and are not influenced by the prospect of future interactions. Furthermore, the absence of any negative feedback may generate an incentive for opportunistic behaviour.

Reputation systems, therefore, “seek to restore the shadow of the future to each transaction by creating an expectation that other people will look back upon it” (Resnick, et al., 2000). Regarding this perspective, Wilson (1985) argues that the predictive power of reputation depends on the supposition that individuals’ past behaviours are indicative of their future behaviours.

The literature summarized here illustrates how reputation plays a dramatic role in negotiation. For that reason, several scholars have undertaken experimental research aimed at quantifying the impact of reputation in the outcome of a negotiation. This paper is inspired by research performed by Chen, Hogg & Wozny (2004) in which a series of bargaining experiments were executed in order to examine the behaviour of reputation mechanisms. By revealing differing amounts of information about the participants’ transaction history, the researchers were able to focus on the effects of past
transaction information and defined the information policy as a treatment variable. The information policies were classified as follows:

1. Low information: participants were given historical information about their own transactions only.
2. High information: participants were given historical information about all transactions.
3. Self-reported ratings: after each contract was completed participants had to rate their opponents and no historical information about past transactions was made available.

Each signed contract outlined two separate actions: the payment sent by the buyer and the goods sent by the seller; each of which may be either fulfilled or not. The study results showed that the use of reputation mechanisms revealing “high information” produced a meaningful increase in the number of fulfilled contracts.

Given the results from past research, we have been challenged to choose a good reputation mechanism for an online business game focussed on negotiation. It is hypothesized that if an effective reputation system is provided, the conduct of the negotiation is improved, thus encouraging integrative (win-win) outcomes. In fact, Anderson & Shirako (2007) demonstrated that “negotiators who have achieved high integrative outcomes would develop a reputation as being more cooperative.”

Integrative outcomes are typically measured in terms of joint profit, by summing each negotiator’s individual outcome (Bazerman, Magliozzi & Neale, 1985; Mannix & Neale, 1993). Thus, we measure the correlation coefficients between players’ scores and reputation values obtained at the end of each negotiation in order to evaluate the reputation mechanism. We argue that such a mechanism is quite reliable, if the score is properly calculated.

In the next section, we will introduce the online business game WIN WIN MANAGER and describe its main features. We will provide some details about the scoring algorithm and the reputation mechanism implemented in the game. Then, negotiation outcomes will be analyzed, and particular attention will be paid to how strategies chosen by the players produce mistakes or generate good choices. Subsequently, we will present some statistical evidence for the online reputation mechanisms we have implemented in WIN WIN MANAGER and we will highlight some limitations of this study.

WIN WIN MANAGER

WIN WIN MANAGER is an online negotiation game in which players conduct up to ten bilateral negotiations. The negotiations are pursued through private threads on the general board of the game. The players are given both qualitative and quantitative information regarding their role, their objectives and the general background of each scenario. Each player’s Best Alternative to a Negotiated Agreement, BATNA, (Fisher, Ury, & Patton, 1991) can be extrapolated on the basis of the provided data. The BATNA often represents the player’s reservation price, or rather the higher (lower) price that the buyer (seller) is willing to pay (earn) for a specific bundle of products or services. The software generates quantitative information, which complies with some constraints in order to guarantee the existence of a Zone Of Possible Agreement (ZOPA). The ZOPA describes the positive zone between two parties’ BATNAs. Within this zone, an agreement is possible (Lewicki, Minton & Saunders, 1999). For example, in a bargaining situation, if the seller’s reservation price is €5 and the buyer’s reservation price is €8, the ZOPA is the set of possible agreements from 5 to 8 inclusive. In a win–win negotiation, the agreement grants all parties a fair
mark-up on each individual BATNA. Such results may be achieved by following the tips on “principled negotiation” provided by Fisher, et al., (1991). WIN WIN MANAGER is meant to help participants improve their skills and attitudes thus allowing a negotiation to be carried on in a principled or, at least, a collaborative way.

In WIN WIN MANAGER the players negotiate in an asynchronous way, posting their offer or counteroffer in turn. The players cannot read other players’ private negotiation threads and generally do not know the real identity of their counterparts as each player chooses a nickname (often different from their real names) when signing up on the homepage for the first time. Thus, we argue that players are negotiating anonymously (Greco & Murgia, 2007).

**Scoring algorithm and reputation system**

In accordance with the negotiation outcome, each player is given a score (Figure 1). Scores are in the range of 0 to 200. The algorithm assigns 100 points when the negotiation result coincides with the player’s BATNA. When players accept an agreement worse than their BATNA, their behaviour may be considered unsuccessful. The system assigns 200 points when the signed agreement coincides with the counterpart’s BATNA.

For example, let us consider a negotiation about the purchase of an item: the seller’s BATNA is S, the buyer’s BATNA is B. In every WWM negotiation B>S. If the amount the buyer pays matches S, the resulting buyer score will be 200, and the seller’s score will be 0. The algorithm assigns penalties when the player exceeds the counterpart’s BATNA (for example, paying less than S will result in the assignment of a penalty to the buyer, see Figure 1) so as to disincentivize hard bargaining styles and simulate the effect of a loss of reputation for the hard bargainer. The players are also allowed to submit a “non-agreement” when they cannot reach an agreement with their counterparts. In this case, generally the algorithm assigns both players 100 points (meaning that both recurred to their own BATNA). In some cases, the text of the scenario can highlight that non-agreements would seriously damage one or both parties (for example, configuring a loss of public image); and less than 100 points would be assigned.

Three versions of WIN WIN MANAGER have been released so far. The most relevant changes are described in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Version 1.0</th>
<th>Version 2.0</th>
<th>Version 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoring algorithm</td>
<td>Linear shape of the score function, score range from -100 to +100 (0 matches the BATNA)</td>
<td>Logistic shape of the score function, score range from 0 to 200 (100 matches the BATNA)</td>
<td>No changes</td>
</tr>
<tr>
<td>Scenarios</td>
<td>Ten business-related scenarios</td>
<td>Replacement of several scenarios, a comprehensive review of others</td>
<td>No changes</td>
</tr>
<tr>
<td>Reputation system</td>
<td>At the end of each scenario each player evaluates his/her overall satisfaction. Such value represents his/her counterpart’s reputation</td>
<td>No changes</td>
<td>At the end of each scenario each player evaluates separately his/her satisfaction with the negotiation outcome and with the behaviour of</td>
</tr>
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Reputation Mechanism

| score in the scenario. | his/her counterpart. The mean of the two values represents the counterpart’s reputation score in the scenario. |

Table 1 – Relevant changes among the three versions of WIN WIN MANAGER

It is important to highlight that the shape of the scoring function and its rationale allow almost 75% of the players to gain scores higher than 100 in both versions 2.0 and 3.0. Figure 2 shows box-plots of the score distribution in versions 3.0 (n=90) and 2.0 (n=236) - scores refer to the two scenarios provided in both versions. Minor changes have been implemented in the informative texts of version 3.0 scenarios, in order to clarify them and to allow players to easily understand the BATNA. Such changes probably caused the increase of the lower quartile to the 100 threshold. For brevity, we do not show the box-plots of the score distribution in the two scenarios separately, as they show similar results. The results do not change even if we disaggregate the data according to the target audience (MBA students versus undergraduates).

![Figure 1 - A graphic representation of the score trend of the “Buyer” (continuous line) and the “Seller” (dotted line) in a buy-and-sell negotiation, given the counterparts’ BATNA](image-url)
In WWM each player’s score is meant to be compared with the other players’ score. This is one of the major innovations being implemented in WWM, when compared to other negotiation experiments where scores are provided. For example, Raiffa (1982) conducted several experiments in which a seller’s score could not be compared to a buyer’s score, while two sellers’ or two buyers’ scores could be compared to one another. The score is very important in WIN WIN MANAGER, because it allows the players to gain valuable prizes offered by any private sponsors. As a matter of fact, this kind of incentive reinforces the naturally challenging characteristics of a game which provides a public hall of fame. Moreover, some students received a bonus on their final mark in a Management Engineering examination by playing WIN WIN MANAGER.

Along with an automatically assigned score, a reputation score is assigned at the end of every negotiation. Before a score is assigned by the software, each player grades the reputation score of his or her opponent. The reputation mechanism will be described in depth later. The game provides a reputation hall of fame, and the best reputation player is awarded a prize. This feature is meant to incentivize a less positional negotiation style and, therefore, to promote a more collaborative negotiation approach.

**Debriefing**

In the WIN WIN MANAGER’s free version, the software generates the feedback automatically on the basis of each negotiation outcome. In each scenario we have chosen a number of relevant parameters and prepared feedback composed of sentences and comics. The algorithm displays one or more of them according to very simple rules, such as “if parameter x<10 show figure A else show sentence f”. The feedback style is often humorous, especially when it points out a mistake in order to reduce the negative motivational impact. Moreover, the players are free to send their counterparts a personal message on their own behaviour during the negotiation. The message is to be written in the same form the parameters of the agreement must be filled in. Therefore, it will be
sent to the player before the score is generated by the software. In doing so, we avoid the risk of messages “on the rebound” and increase their usefulness and plausibility.

Customized feedback is provided to those players involved in a private tournament such as a customized MBA edition of the game. In this case, feedback can be provided on the strategies chosen by the player, the communication mistakes and the good moves. Moreover, an “optimal” solution of the negotiation might be suggested to the players using a bulletin board or a traditional lesson.

In order to debrief properly, the faculty member needs to be an expert in negotiation techniques and must have full access to all confidential information being provided to the players. Up to now, instructors who have used WWM in their classes have always asked WWM staff to debrief and grade the players’ performances. Debriefings have been structured as follows: when all the members of a class end a scenario, the WWM expert shares a standard debriefing text which describes the scenario’s technical specifics, i.e., characters’ BATNAs, reservation prices, alternatives, etc., and both characters’ potential strategies in order to accomplish their own goals. Then, the expert speaks (or writes, in cases of interaction through the bulletin board) to the class, pointing out the techniques being tried by the players and highlighting their proper or wrong application.

Students often ask for clarification on their scores. Perfect knowledge of the scenario’s quantitative information is needed in order to provide a proper and thorough answer. Moreover, a simulator of the scoring algorithm (e.g. an Excel worksheet) helps the instructor show the score trend, as the variables in the scenario change.

**WIN WIN MANAGER’s Reputation Mechanism**

This section of the paper will present and analyze the structure of the reputation mechanisms used in WIN WIN MANAGER in order to evaluate them as tools for rendering the negotiation process in this simulation as close to reality as possible. One of WIN WIN MANAGER’s goals is to allow players to obtain integrative outcomes. The reputation concept represents a key factor in this context. Versions 1.0 and 2.0 of the game implemented a reputation mechanism similar to the “Self-reported ratings” policy described by Chen, et al. (2004). That is, at the end of each negotiation the players were asked to evaluate, on a scale from 1 to 10, their satisfaction with the just concluded negotiation.

The following value was used to evaluate the reputation of the opponent:

\[
R_i = \frac{1}{n} \sum_{k=1}^{n} s_i^k
\]

with \(1 \leq s_i^k \leq 10\),

- \(R_i\) being the reputation of the i-th player,
- \(s_i^k\) being a generic satisfaction value expressed by the opponent of the i-th player at the end of the k-th scenario, and
- \(n\) being the number of scenarios completed by the i-th player by that time.

Consequently, the opponent’s reputation was evaluated indirectly on the basis of the player’s satisfaction with the negotiation.
Since such a mechanism does not allow the parties to directly evaluate their opponents, its effectiveness as a valid tool for building a real reputation of the players might be questioned. Nevertheless, the satisfaction of a player might be influenced by two factors: the counterpart’s behaviour and the negotiation’s outcome. The more the counterpart acts cooperatively and is able to persuade the player on the profitability of the agreement, the higher the \( R \) value will be. WIN WIN MANAGER players are assigned their counterpart according to a constrained random function that prevents the same pair from bargaining in two consecutive scenarios. This solution avoids the memory effect linked to any opportunistic behaviour. Moreover, players having a strong tendency to negotiate with a positional approach, which can have detrimental effects on the negotiation outcome, are prevented from penalizing the same counterparts. In addition, the larger the number of different people faced at the negotiating table, the larger the number of alternative negotiation strategies being learned.

In order to improve the reliability of the reputation algorithm, we have modified it in version 3.0 of the game as follows:

\[
R'_i = \frac{1}{n} \sum_{k=1}^{n} \frac{S^k_i + G^k_i}{2}
\]

with \( 1 \leq S^k_i \leq 10 \) and \( 1 \leq G^k_i \leq 10 \)

\( R'_i \) being the reputation of the \( i \)-th player,
\( S^k_i \) being the satisfaction value with the signed agreement expressed by the opponent of the \( i \)-th player at the end of the \( k \)-th scenario,
\( G^k_i \) being a rating of the \( i \)-th player’s negotiating behaviour expressed by the opponent, and
\( n \) being the number of scenarios completed by the \( i \)-th player by that time.

Sometimes \( R \) has been extremely understated, particularly by those players wanting to penalize the unfair behaviour of their opponents, even if the negotiation outcome had satisfied them. \( R' \) allows the players to evaluate their counterparts in both direct and indirect ways, narrowing the effects of a potential “penalizing aim” which might derive from the direct evaluation of the counterpart. Such effects are highlighted by the reputation scores box-plots in Figure 3. For the sake of brevity, we do not show the box-plots of the reputation scores distribution in the two scenarios separately, as they highlight similar results. Once again, the results do not change even if we disaggregate the data according to the target audience.
Is the reputation mechanism adopted by WIN WIN MANAGER realistic and effective in allowing the players to make an accurate evaluation of the opponent’s reputation? Figure 3 shows that \( R' \) produces reputation scores, on average, higher than those produced by \( R \). However, such a result does not indicate whether \( R' \) is more effective than \( R \) in evaluating the “correct” reputation of the players. Thus, our challenge is to quantitatively determine the effectiveness of a qualitative and subjective indicator.

We assume that the reputation score should be strongly positively correlated with the cooperativeness of the player’s behaviour during the negotiation. Most scholars suggest that a cooperative approach can lead to an improvement in negotiation outcomes, as opposed to positional approaches, which are known to destroy the value for both parties (Fisher, et al., 1991). As mentioned before, WIN WIN MANAGER provides a fair algorithm for the outcome evaluation. Thus, we formulate the hypothesis that the score and the reputation values provided at the end of each scenario should be positively correlated, if the reputation mechanism is effective. Since both scores and reputation values are unlikely to be normally distributed, we use non-parametric correlation statistics such as Spearman’s (\( \rho \)) and Kendall’s (\( \tau \)) rank correlation coefficients, in order to verify the hypothesis.

We cannot reject the null hypothesis for version 2.0 of the game, if we consider all the data which we are analyzing in both the scenarios (\( \rho = -0.02, p<0.4; \tau = 0.01, p<0.4; n=236 \)). Thus, on one hand, \( R \) seems to be unrelated to the score. On the other hand, if we consider \( \alpha = 0.1 \) as a statistical significance threshold, \( R' \) is significantly positively correlated with the score, considering both Spearman’s and Kendall’s coefficients (\( \rho = 0.14, p<0.1; \tau = 0.1, p<0.1; n=90 \)). Similar results can be achieved if we consider the two scenarios separately.

If we take into account the differences in the target audience, it is interesting to point out that both correlations increase when we restrict the sample to MBA students. We still cannot reject the null
hypothesis for version 2.0 ($\rho=0.06$, $p<0.35$; $\tau=0.05$, $p<0.35$; $n=39$), but we can reject it with more confidence for version 3.0 ($\rho=0.23$, $p<0.05$; $\tau=0.18$, $p<0.05$; $n=56$). Such results can be considered as consequences of the “Negotiation Techniques” lessons which MBA students attended while playing WIN WIN MANAGER. Such lessons probably provided the students with a more holistic comprehension of the negotiation dynamics and the opponents’ behaviour.

Even if, from a theoretical and technical perspective, both players have the same chances to gain 200 points in all scenarios, in practice, one role is frequently more difficult than the other because of the scenarios’ text elements that might seem non-influential to the story boarder, but happen to influence the negotiation outcome. Therefore, we propose to de-bias the score as follows:

$P_t^k = 200 \times \frac{R_t^k(r)}{\max_r R_t^k(r)} \quad \forall k, \quad r \in (a,b)$

$P_t^k(r)$ being the score assigned to the i-th player, at the end of the k-th scenario,

$r$ being the role the player “takes on” during the k-th scenario,

is the top score being achieved among all players taking on the role $r$ in the k-th scenario, and

$P_t^k$ is a corrected measure of the score which might be considered a more reliable measure of the player’s negotiation efficacy.

In fact, if we consider the correlation coefficients between reputation and $P'$ in the two overviewed versions of the game, we obtain better results. However, we still cannot reject the null hypothesis for version 2.0 ($\rho=0.05$, $p<0.3$; $\tau=0.03$, $p<0.3$; $n=236$), but we can reject it with more confidence for version 3.0 ($\rho=0.17$, $p<0.05$; $\tau=0.13$, $p<0.05$; $n=90$). Results do not change in any significant way if we use $P'$ in place of $P$ when calculating correlation coefficients of MBA students.

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<tr>
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<th>P</th>
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<tbody>
<tr>
<td>v.2.0 (R, P)</td>
<td>-0.02</td>
<td>0.01</td>
<td>236</td>
</tr>
<tr>
<td>v.2.0 (R, P')</td>
<td>-0.05</td>
<td>-0.03</td>
<td>236</td>
</tr>
<tr>
<td>v.2.0 (R, P) MBA</td>
<td>0.06</td>
<td>0.05</td>
<td>39</td>
</tr>
<tr>
<td>v.3.0 (R', P)</td>
<td>0.14*</td>
<td>0.10*</td>
<td>90</td>
</tr>
<tr>
<td>v.3.0 (R', P')</td>
<td>0.17**</td>
<td>0.13**</td>
<td>90</td>
</tr>
<tr>
<td>v.3.0 (R', P) MBA</td>
<td>0.23**</td>
<td>0.18**</td>
<td>56</td>
</tr>
</tbody>
</table>

Table 2 – Summary of the correlation coefficients between score and reputation. Asterisks indicate significance at 0.05 (**) and 0.10 (*) levels

On the whole (see Table 2), the correlation coefficients point out that $R'$ seems to provide a better interpretation of players’ performances than $R$. The low correlation coefficients suggest that improvements should be implemented in order to give the players a better comprehension of their opponents.
Building solid relationships among parties is a long and complex process, which is fundamental to promote integrative negotiations. In this context it might appear simplistic to determine a person’s reputation just through a number. According to the results of the experiments conducted by Chen, et al. (2004), and observations made by Dellarocas’ (2006), it might be interesting to give the players the opportunity to read all opponents’ previous negotiations in addition to the current reputation mechanism implemented in WIN WIN MANAGER. The additional application of such evaluation tool should lead to a decrease in the number of conflict situations (Falk, Fehr, & Fischbacher, 2003). We will measure the efficacy of such an approach in the game’s next editions, by comparing our current data with future results. Of course, this method would be time-consuming for the players and we argue that only a small group of them would actively adopt it.

Limitation of the research

Even if $R'$ appears to be significantly positively correlated with the score, both $\rho$ and $\tau$ are quite low values. Such results might be distorted by negotiation situations between “hard bargainers” and “soft bargainers”. In this kind of negotiation, hard bargainers often force their counterparts to sign unfair agreements that allow them to gain high scores, while their opponents assign them very low reputation values; this – coupled with their high scores - reduces correlation coefficients. Perhaps the score algorithm should be modified in order to reduce any incentive to “hard” negotiation styles. The data available on WIN WIN MANAGER’s version 3.0 is less than that of version 2.0 (90 versus 236): an extension of the sample could increase the reliability of the results and influence the correlation coefficients.

Conclusion and Future Developments

Most scholars agree on the importance of reputation in negotiation; ultimately influencing the negotiation approach, conduct and outcome. Thus, it is not surprising that most bidirectional negotiation websites use reputation mechanisms (Dellarocas, 2006). Most of the time, such mechanisms are very direct, and ask users to evaluate their counterparts using a five-star based system and/or a brief comment. Such mechanisms can be very effective after many evaluations are made. In WIN WIN MANAGER players receive at most ten evaluations (one for each scenario); therefore, the reputation value must be as reliable as possible from the beginning, in order to relay relevant information to the counterpart in the following scenarios. We tried to solve this problem by providing an indirect reputation mechanism, as to narrow the distortions in the evaluation. We tested this innovation by considering the non-parametric correlation of score and reputation, assuming that a good reputation score should be correlated with the negotiations outcome. Results showed that the new reputation mechanism ($R'$) is significantly correlated with the score, whereas the previous mechanism ($R$) did not show any significant correlation with it. Both correlation and confidence increase, if we take into account the specific target audience of MBA students. We suggest that these results ensue from the specific training of the players.

As a future development we plan to give players the opportunity to read their opponents’ past negotiations, in order to understand their negotiation style. We expect this to reduce any conflict situations, which can be measured by the number of non-agreements between the players. In the meantime, we will explore the possibilities of including more reputation mechanisms by involving the scoring algorithm, and resorting to an independent evaluator: a moderator who reads the negotiations without intervening, and who manually assigns reputation scores. We will measure
the outputs of our future efforts referring to correlation coefficients among the scores and the new $R$” reputation values. We believe that our research in a simulated environment will help the evolution of reputation mechanisms in real online markets, where users are able to negotiate among one another.

Acknowledgements
We would like to thank the three reviewers for their detailed comments. We believe that their insightful suggestions improved this paper a lot. We would like to thank Anthony Carson for his valuable support.

Declaration of Conflicting Interests
The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.
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