PERCEIVED REPUTATION AND ALLIANCE BUILDING IN THE PUBLIC AND PRIVATE SECTORS

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ABSTRACT: *This study investigated the relationship between the self/partner cooperation reputation, the starting condition of a cooperation, payoff structure, and the willingness to cooperate of alliance partners in the context of real business settings. An experimental study was conducted with 816 private-sector professionals and a comparison group of 169 public-sector managers. It was hypothesized that cooperation reputation would reduce the impact of payoff structure. Results indicated that perceived reputation of the alliance partner had a significant impact on participants' willingness to cooperate. These results challenge the perceived importance of payoff structure and further support Parkhe's (1993a) suggestions that perceived reputation is an important aspect of alliances, seldom included in empirical studies. It was also demonstrated that, for both public and private sectors, maintaining a good cooperation image as well as maintaining effective relations throughout the alliance were associated with participant willingness to cooperate. Implications for both sectors are discussed.*

Nowadays, alliances play a relevant role in the corporate strategies of many organizations. The discussion about motives and objectives of such alliances, however, goes back to the 1950s and was initiated by Fusfeld (1958) who focused the exercise of monopoly power. West (1959) identified further motives such as diversification, government influence with regard to foreign direct investment, and pooling of resources. Other motives for alliances are, for example, time-to-market advantages, reduction of production and/or transaction costs, economies of scale and learning, risk reduction or risk diversification, access to knowledge, and shaping competition (e.g., Bronder 1993; Porter and Fuller 1985; Rupprecht-Däullary 1994). The formation of cooperative

arrangements is seen as increasingly relevant to be successful in a business world that increasingly requires flexibility (e.g., Picot, Reichwald, and Wigand 2001).

In empirical studies, however, the failure rates of alliances were found to lie between 30 percent and 70 percent (e.g., Nilsson 1997; Devlin and Bleackley 1988; Grunberg 1981; Killing 1983; Reynolds 1984; Porter 1987; Schaan 1988). In 1993, Parkhe commented on the high mortality rate of alliances and argued that greater emphasis on factors that perpetuate stable cooperation was needed. Parkhe argued that game theoretic work could potentially contribute to the field by identifying relevant factors (structural or otherwise) that influence the relationship between partners in an alliance in a positive way.

There are still many issues to address. During the period 1993 to 2000 only a handful of studies have been conducted into the relevance of game theory for alliance structuring (e.g., Parkhe 1993a, 1993b; Fulton, Popp, and Gary 1996). Furthermore, although the rate of newly established alliances appears to be growing (e.g., Rao and Schmidt 1998) the rate of alliance failure is still very high (e.g., Duysters, Kok, and Vaandrager 1999). The wide divergence in the above mentioned failure rates (i.e., 30 percent to 70 percent) indicates substantial variations in the definitions of failure. Regardless of the long-term success of alliances there is little doubt that the incidence of alliance formations are increasing as time goes on, giving credence to further research into the nature of alliances in the private sector. However, public-sector institutions, due to global economic slowdowns, also have to cope with scarcity of financial and other available resources. Cooperation (e.g., cooperative projects of universities, hospitals or state employment agencies) is one possible solution of the adherent problems in the public sector.

With regard to the increasing number of alliances it has to be questioned how such nets of incomplete contracts and bundles of diluted property rights are held together. Considerations of corporate identity, culture, and constitution are relevant for theory and practice in this area (e.g., Wagner 1994). Alliances between organizations are partly dependent on the ability and willingness of participating employees to cooperate. In literature, a fit between cooperating parties is seen as important for alliance success (e.g., Håkanson 1982, 281). Interaction processes between organizations are rather successful if cooperating organizations are similar (e.g., Håkanson 1982, 289). Schaan (1988, 7) explains that "incompatibilities in personalities" can lead to the failure of alliances. Strategic positioning and available resources often do not explain lack of alliance success. Bleicher and Hermann (1991, 40) show that in such cases social processes and emotional positions are most often responsible for failure. Gugler and Pasquier (1997, 140) in an empirical study come to the conclusion that "when partners lack compatible culture and values, expectations and trust between partner employees may not materialize and may lead to conflict."

Thus, employees involved in alliances are a central success factor of alliance building. Their cooperative (or noncooperative) behavior is an interesting point of departure for a study that aims to elaborate relevant aspects of cooperative behavior in the private as well as in the public sector. The employees as stakeholders of an organization and their behavior with regard to cooperation are relevant facets contributing to the success (or failure) of alliances. Thus, they are the unit of analysis in this research. The focus of this article will be to deal with a number of issues relating to

the interaction between reputation, starting condition of a cooperation, and willingness to participate in cooperation as well as the different impacts of these concepts for alliances in the public and private sectors. Generally speaking, how reputation influences the actual creation of alliances and how reputation influences the failure of such alliances in the public sector as opposed to the private sector will be investigated.

In this study reputation is defined as "the estimation of the consistency over time of an attribute or entity . . . This estimation is based upon the entity's willingness and ability to repeatedly perform an activity in a similar fashion" (Herbig, Milewicz, and Golden 1994, 23). Reputation can be interpreted as public information on the previous trustworthiness of an actor. At the same time, reputation of being a fair cooperation partner or the fear of losing this reputation by behaving opportunistically (which would result in decreasing future gains) can work as effective safeguards in a trust-based relationship. Therefore, in relation to cooperation reputation, we refer to consistency to cooperate. For the purposes of this research, partner cooperation reputation was defined as the perceived history of cooperation associated with a potential alliance partner. Self cooperation reputation was defined as the perceived history of cooperation by the organization the individual represents. These definitions can be interpreted as the ability to predict the likelihood of cooperation or non-cooperation, translating reputation into a cost-reducing attribute of rational decision making. Payoff structure is defined as the reward structure associated with a particular pattern of cooperation by alliance partners. Willingness to cooperate is defined as the attitude to work together as opposed to not being ready to engage in a common project.

GAME THEORY AND ALLIANCES

The classic prisoner's dilemma research finds that expectations of partner's behavior (i.e., cooperation or defection) impact the focal players' decisions (e.g., Kelley and Stahelski 1970; Dawes, McTavish, and Shaklee 1977). Several models have also been developed which incorporate expectations of the partner (e.g., Levine 1998; Rabin 1993). Alliances from this point of view are typically self-regulatory and vulnerable to selfish manipulation by one or more parties to ensure individual gain versus mutual benefit (e.g., Parkhe 1993a). Initial investigation of single instance games such as prisoner's dilemma identified the likelihood of self-interested orientations by participants, bearing out this argument in the experimental setting. Investigations of other types of games such as the stag hunt, chain store, and deadlock identified a similar orientation towards maximization of returns to the self over the selection of the mutual benefits of an alliance (e.g., Oye 1986).

These findings were extended by Axelrod (1984) who investigated games where events were extended beyond a single instance to multiple instances. Axelrod found that instead of choosing to focus on a self-oriented agenda, a higher tendency towards alliances was noticed. While this was argued to be a natural by-product of the pattern of payoff, the results identified another key aspect of the alliance phenomena: the shadow of the future. This shadow refers to the potential for future losses (or unrealized profit) based on current actions. For example, Heide and Miner (1992) found support for the relationship between cooperation and a long shadow of the future. To prolong the

shadow of the future, frequent interaction between partners and/or accurate and reliable information exchanged between the partners have been found to be important factors.

Put together, the findings have been insightful in that various authors have extrapolated the results and outcomes of such research as being relevant to alliance structuring. It has been argued that potential alliance partners consider the payoff of cooperation versus defection as well as the shadow of the future associated with such a decision. Yet these comments only form part of the picture.

The findings from the research have also been prescriptive. Axelrod (1984) found that particular strategies were more likely to be successful, assuming that only incomplete information can be obtained about a potential alliance partner. In response to incomplete information about a partner's predisposition to cooperate, the best strategy was identified to be tit for tat. This relatively simple strategy argues for the adoption of cooperation or defection depending on the partner's last strategic decision and is founded on the concept of reciprocity. These findings are based on assumptions that may not be entirely dissimilar from corporate operating environments. Typically, in business one partner does not know all there is to know about another. A point of divergence does exist, however, in that in normal business settings organizations do have access to some information prior to alliance formation. There is a link between publicity and reputation (e.g., Adobor 1996, 2). In business settings partners may assume that it is possible to get a picture of the reputation of a potential partner. The information collected about the reputation of the potential partner, however, may not necessarily be accurate. Here, we assume that regardless of the accuracy of the information, the perceived reputation of the partner influences the willingness to cooperate.

Reputation has been identified as a possible explanation for a number of inconsistencies in previous findings. For example Parkhe (1993a, 814) failed to identify any relationship between payoff structures and willingness to cooperate. He found that individuals often choose to cooperate even where the payoff does not consistently support cooperation, perhaps in the expectation that future occasions may arise (i.e., shadow of the future) where cooperation is optimal. Parkhe (1993a, 822) suggested that reputation maybe the factor that is responsible for these results. These comments have led to the current investigation of the effects of reputation and willingness to cooperate.

DEVELOPMENT OF THE RESEARCH QUESTION

One of the problems in extrapolating Axelrod's findings to organizational settings is that game theoretic experiments rarely impart any information about a partner's proclivity to cooperate other than that developed experientially over time as part of the experiment itself. Given the nature of organizational environments, normally some information can be obtained concerning an organization's cooperative reputation prior to alliance formation (i.e., the reputation of being a fair cooperation partner). However, little research has been conducted into the impact of cooperation reputation on alliance structuring (for an example, see Saxton [1997, 451-453], who found support for the hypothesis that there exists a positive relationship between partner firms' benefits from alliance participation and partner reputation). Organizational reputation is known to be a relevant factor in business settings. Although not specifically tested in relation to alliance

formation, the impact of reputation has been investigated largely in relation to deterring new market entrants (e.g., Sundali, Israeli, and Janicki 2000; Jung, Kagel, and Levin 1994; Kreps and Wilson 1982; Milgrom and Roberts 1982; Neral and Ochs 1992; Weigelt and Camerer 1988).

Dollinger, Golden, and Saxton (1997) analyze the impact that reputation has on the decision to proceed with an alliance. By manipulating a target firm's reputation in an experimental design, they came (among other things) to the conclusion that reputation is an influencing decision factor both in alliances with suppliers and in alliances with competitors (137). Further evidence that organizational reputation of the partner's company and one's own company is relevant to the process was identified by Parkhe (1993a, 820): "A firm's actions may be based on its partner's reputation and concern for its own reputation, as well as on the payoff structure, with the various influences combined in ways that are poorly understood."

Andreoni and Miller (1993) found in an experimental design that subjects were significantly more cooperative in a finitely repeated prisoner's dilemma than in a single shot game. In addition, reputation building could be improved by strengthening the beliefs of a subject about the probability that their partner will behave in a cooperative fashion. A point of departure for this research is that we focus on (cooperation) reputation assessed prior to partnership, instead of exclusively focusing on the reputation that is build up in the run of the cooperation.

RESEARCH QUESTIONS

The goal of this research is to investigate the interrelationship between (cooperation) reputation and willingness to cooperate. In this research, instead of looking at organizational entities as a whole, we focus on relevant elements of organizations, namely, the behavior of employees who are basically involved in cooperative arrangements and who play an essential part with regard to the success of alliances. The results should give insights into organizational design possibilities for alliance. However, our results are also relevant in settings such as cooperation between university departments, between units within a government agency, or among workers within and between units. Here, cooperation is also likely to be undersupplied because of prisoner's dilemmas, coordination problems, high transaction costs, and the like.

Based on questions that remain unanswered in game theoretic literature a number of research questions are posited: (1) Does partner cooperation reputation influence willingness to cooperate? This research question clearly connects to the research already done in this area and described above. (2) Does self cooperation reputation influence willingness to cooperate? This research question takes a new element into consideration. Up to now in the game-theoretic literature the influence of self reputation on the willingness to participate in an alliance is not questioned, even though, for example, Parkhe (1993a, 820) suggests that "a firm's actions may be based on [...] concern for its own reputation." This led us to further investigate the influence of the self reputation on the willingness to cooperate. (3) What role does the starting condition play in influencing participants' willingness to cooperate? With this question we want to gather insight into whether perceived self/partner reputation is the main factor influencing the willingness

to cooperate, or if there are other aspects such as the first impression (i.e., the starting condition) a partner transmits of her- or himself, and thereby contribute to fill a gap in research. (4) For research questions (1) to (3) it is then investigated if there are differences between the public and private sectors with regard to the answers.

THE HYPOTHESES

The aim of the study was to address the lack of research into the relationship between self/partner cooperation reputation, starting condition and willingness to cooperate. It was expected that investigation of these areas might lead to new insights and greater understanding of alliances for both the public and private sectors. To add greater relevance, this research aimed to use individuals who were holding professional or managerial positions at the time of testing (see Singer and Sewell 1989). Based on studies of game theory, four scenarios and related hypotheses are posited. Table 1 summarizes the four scenarios.

Four conditions are outlined where reputation of the self and the partner can be either high or low. This leads to four scenarios. In each scenario the starting condition can be either cooperation or defection and the payoff structure can be either supportive of mutual cooperation (prisoner's dilemma) or variable (deadlock and prisoner's dilemma). Prisoner's dilemma is supportive of mutual cooperation in the sense that this structure rewards cooperative behavior of both partners with the highest joint reward for both partners. That is not always the case when a variable payoff structure is set. The game theory literature (see e.g., Axelrod 1984) shows that with regard to short-time cooperation it can be advantageous to defect instead of playing fair (i.e., in a cooperative fashion). In the long run, however, risky advances in the form of trust outlays in cooperative arrangements pay off (e.g., Koch, Möslein, and Wagner 2000). Deadlock payoff structures give an incentive to defect and usually result in mutual defection, which is disadvantageous for both partners. The following hypotheses were tested to evaluate the presented model.

Hypothesis 1: Higher perceived cooperation reputation of the alliance partner will be associated with higher participant willingness to cooperate.

TABLE 1
Four Scenarios of Cooperation

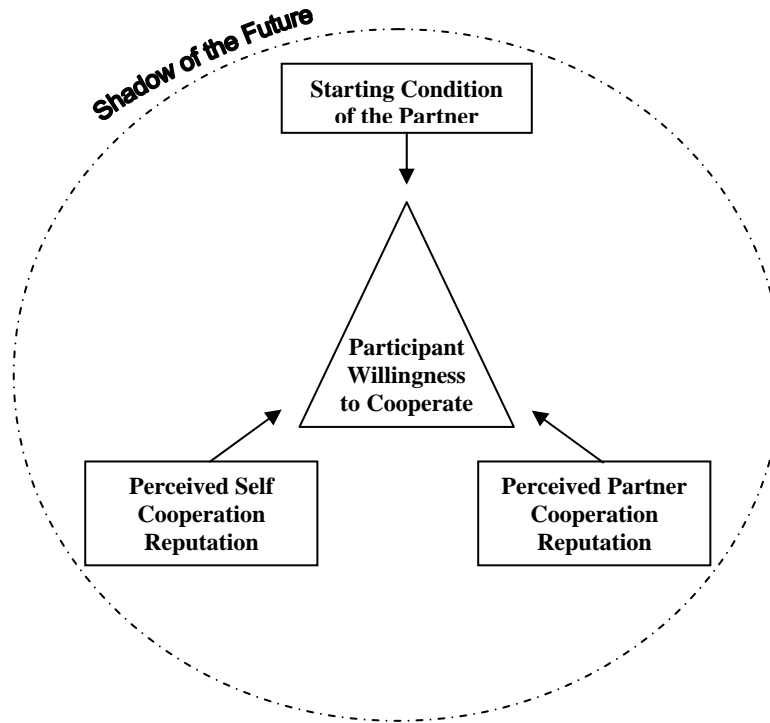|		Partner reputation	
		high	*low*
Self reputation	*high*	Start with cooperation: (1) Start with defection: (3)	Start with cooperation: (5) Start with defection: (7)
	low	Start with cooperation: (2) Start with defection: (4)	Start with cooperation: (6) Start with defection: (8)

FIGURE 1. The Interdependencies between the Variables

Hypothesis 2: Higher perceived cooperation reputation of one's own organization will be associated with higher participant willingness to cooperate.

Hypothesis 3: A starting condition marked by partner cooperation will be associated with higher participant willingness to cooperate than one marked by partner defection.

Figure 1 summarizes the interdependencies between self reputation, partner reputation, starting condition, and willingness to cooperate postulated in the hypotheses.

METHODOLOGY

Experiment

The experiment involved 816 employees drawn from the Australian private-sector professional services industry. Of these, 240 (29 percent) were female and 576 (71 percent) were male. The modal age bracket was 36 to 40 years of age. They represented mainly accountants and engineers from the middle management of consulting firms. An additional group of 169 Australian public-sector professionals were added to investigate possible differences in the approach to willingness to cooperate. Of these respondents, 63 (37 percent) were female and 103 (63 percent) were male. They represented mainly

middle managers from the area of accounting. All conducted tests showed no general differences between these two analyzed groups.

Procedure

As part of an analysis of the structuring of high and low reputation partnerships, participants completed ten decision-stages as part of a controlled experiment into cooperative behavior. The study was based on Axelrod's (1984) seminal work on game theoretic design and includes a number of important modifications. Participants were given hypothetical information based on the cooperation reputation of the firms they represented as well as the cooperation reputation of their potential alliance partner. Participants were also given information on the payoff schedule associated with cooperation and defection.

To control the impact of these variations, participants were randomly allocated to one of sixteen experimental conditions. Table 2 outlines the various characteristics of each condition. Respondents were distributed priming information that formed an integral part of the experiment (see appendix). Depending on the various conditions, respondents were then given information as part of each of the ten decision-stages.

TABLE 2
Experimental Conditions and Final Sample Sizes

| | | | | | Stage 10 Sample Size | |
Condition	Payoff*	Reputation of Self	Reputation of Other	Starting Condition	Private Sector	Public Sector
1a	Pris Dill	High	High	Cooperate	35	8
2a	Pris Dill	Low	High	Cooperate	38	5
3a	Pris Dill	High	High	Defect	33	7
4a	Pris Dill	Low	High	Defect	36	9
5a	Pris Dill	High	Low	Cooperate	38	7
6a	Pris Dill	Low	Low	Cooperate	37	9
7a	Pris Dill	High	Low	Defect	40	8
8a	Pris Dill	Low	Low	Defect	36	7
1b	Variable	High	High	Cooperate	36	8
2b	Variable	Low	High	Cooperate	41	8
3b	Variable	High	High	Defect	40	6
4b	Variable	Low	High	Defect	36	9
5b	Variable	High	Low	Cooperate	41	8
6b	Variable	Low	Low	Cooperate	41	7
7b	Variable	High	Low	Defect	29	8
8b	Variable	Low	Low	Defect	30	9

Note: *Prisoner's dilemma payoff structure rewards mutual cooperation with the most points. In the variable condition prisoner's dilemma payoff was varied with deadlock payoff randomly. Deadlock payoff does not reward mutual cooperation. In the variable condition the quickest way to the highest score was still by mutual cooperation when the prisoner's dilemma payoff was in play (even though participants in the variable condition were not aware of the payoff until after each decision).

The decision information indicated that a hypothetical game was to be played in which there would be a particular schedule of payoff for cooperation and defection (either prisoner's dilemma or variable), and that it was up to the respondent to maximize the number of points they were to receive. For example, for those allocated to the high self reputation and high other reputation conditions the decision information suggested that both they and their intended alliance partner were recognized for the high degree of cooperation with other organizations and that the organizations they represented typically valued cooperation over self-interest. For those allocated to the lower reputation conditions, it was emphasized that they represented organizations where the commitment to organizational stockholders was greater than any alliance. In all instances the decision information indicated that the information on the other's reputation was based on the best information available (but was not necessarily accurate) and that the choice in any particular decision-stage was entirely dependent on the participant.

The nature of the payoff schedule was also varied. Half of each condition were told that they were allocated to the prisoner's dilemma only payoff schedule, whereas the other half were told that the payoffs for any particular decision instance would vary from prisoner's dilemma (one that rewards mutual cooperation with the highest possible joined payoff as opposed to the worst joint payoff in the case of mutual defection) to deadlock payoff schedules (one that doesn't reward mutual cooperation) and that they would not know which until after each decision. Participants were randomly allocated to each condition. Each of the sixteen conditions was comprised of fifty-one people for the private sector and between ten and eleven people for the public sector.

Each of ten decision-stages was distributed to respondents over a ten-day period. At each decision-stage participants were also informed of the results of the previous decision, the number of points accumulated to date, and required the participant to make a decision to cooperate or defect from future partnership. At the end of the ten-day period an overall score of participants' cooperation was calculated. Participants earned two points for each instance of cooperative behavior, one point for each defective behavior, and zero points for each instance of nonparticipation, for a possible score of twenty points. So, each time willingness to cooperate existed (operationalized in terms of explicitly agreeing on working together for the following round), the participant earned two points. Contrary to what they were told, the participants were not paired with each other but with a computer agent that just reacted to their behavior by using a tit for tat strategy. The only aspect we affected was the starting condition; for the rest of the ten decision-stages the participants only worked with themselves. The computer agent in 50 percent of the cases was set to start with cooperation, and in 50 percent of the cases to start with defection. After this set starting condition the computer agent only reacted to what the experiment participant did by using a tit for tat strategy (i.e., rewarding cooperation with cooperation and defection with defection). The effect of the starting condition was only in the first step, then tit for tat immediately took over in one half of the cases (prisoner's dilemma payoff structure) or was delayed in the other half of the cases (variable payoff structure). So, after the first step the participants only reacted to their own behavior and could only gain points if they acted in a cooperative fashion (i.e., we did not measure the payoff structure of both 'partners' interacting–we only measured how often the actual participant chose to cooperate/defect with the computer agent).

TABLE 3
Longitudinal Attrition Rate and Sample Sizes by Sector

Sector	Stage	1	2	3	4	5	6	7	8	9	10
Private	Sample size	816	743	691	679	664	660	653	642	630	587
	Attrition rate	0	73	52	12	15	4	7	11	12	43
Public	Sample size	169	169	164	159	155	131	128	126	123	123
	Attrition rate	0	0	5	5	4	24	3	2	3	0

Five hundred eighty-seven private-sector respondents completed all ten decision-stages, representing a response rate of 71.9 percent. One hundred twenty-three public-sector respondents completed all ten decision-stages, which represented a response rate of 72.8 percent. The attrition rates were investigated prior to evaluation of the hypotheses (see table 3).

RESULTS

To determine the effect of reputation and starting condition on willingness to cooperate in alliances, a range of statistical analyses were run on the experimental data. All analyses were undertaken using SPSS for Windows.

Private Sector Attrition Rate

Investigation of private-sector participants who did not complete all ten decision-stages highlighted some interesting results (see table 3). Chi-squared analyses revealed that those choosing not to complete the study were more likely to have a defect starting condition [$\chi^2(1) = 4.425$, $p < .05$]. The attrition rate was not uniform across all experimental conditions, with the highest remaining cell size being 41 and the lowest being 29 (see table 2). Extensive homogeneity of variance testing (i.e., visual examination [Zresid vs Zpred] plot in regression, Levene's Test for equality of variances, Goldfeld-Quandt test, Breusch-Pagan test, White test) indicated no violations of assumptions.

Further investigation of the attrition group was conducted by comparing the mean cooperation scores across the ten decision-stages. For example, for those individuals leaving prior to the completion of the study a mean score was calculated on the basis of the stages they had completed. The attrition group was compared to the nonattrition group to investigate if any differences in the mean scores were evident. Two independent sample t-tests were conducted for both cooperate and defect starting conditions, respectively. Each t-test investigated whether mean cooperation scores varied across the attrition and nonattrition groups. For the defect starting condition, a significant difference was found between attrition and nonattrition groups [$t(1, 406) = -5.207$, $p < .01$]. The means for the attrition group were significantly lower than that for those choosing to remain in the study. For the cooperate starting condition, no significant difference was found between the two groups [$t(1, 406) = 1.663$, $p > .05$]. These results should be considered when interpreting the results of the hypothesis testing.

Reputation, Starting Condition, and Willingness to Cooperate in the Private Sector

Investigation of the hypotheses was conducted via an ordered logit analysis (Amemiya 1981; see table 4). We implemented ordered logit analysis to test the relationship between the independent variables and likelihood of cooperating. An ordered logit model is a qualitative choice model and is an appropriate procedure when the dependent variable has ordinal properties but is not ratio-scaled. Preliminary investigation of the data indicated that all assumptions of normality, homogeneity of variance, and outliers were not violated.

The results indicated that those given more positive information about their partner's reputation for cooperation (H1, $p<.001$), those given more positive information about

TABLE 4
Private versus Public Sector Predictors of Willingness to Cooperate[a]

Variable	Private Sector		Public Sector	
Main Effects				
Self	-0.31*	(0.13)	0.20	(0.27)
Other	-1.62***	(0.14)	-0.42	(0.27)
Payoff	-0.46**	(0.13)	-0.20	(0.27)
Start	2.51***	(0.15)	1.94***	(0.30)
Two Way Interactions				
Self * Other	-0.68***	(0.18)	-0.28	(0.33)
Self * Payoff	-0.34*	(0.16)	-0.06	(0.32)
Self * Start	0.79***	(0.17)	0.36	(0.33)
Other * Payoff	-0.58**	(0.18)	-0.38	(0.33)
Other * Start	0.22	(0.16)	0.46	(0.33)
Payoff * Start	0.59***	(0.17)	0.35	(0.33)
Three Way Interactions				
Self * Other * Payoff	-0.96***	(0.07)	-0.48***	(0.10)
Self * Other * Start	0.20***	(0.05)	0.19	(0.10)
Self * Payoff * Start	0.59***	(0.05)	0.25*	(0.10)
Other * Payoff * Start	0.14**	(0.05)	0.23*	(0.10)
Four Way Interaction				
Full interaction	0.01	(0.02)	0.07	(0.04)
Log Likelihood	605.10		322.70	
Chi-Square	428.48***		60.61***	
Number of cases	816		169	

Note: [a] Cell entries are unstandardized coefficient estimates. Numbers in parentheses are standard errors. Model intercepts are not reported.
    * p<.05   ** p<.01   *** p<.001

their own reputation (H2, *p*<.05), and those who are put in the situation where the partner cooperates on the first instance (H3, *p*<.001) are more likely to cooperate themselves. Furthermore, the interaction term between these main effects (seen in the three-way interaction terms) suggests that there is an additive effect, albeit slight, of putting both conditions together. For example, those given high reputation information and who witness cooperation by their partners in the first instance are more likely to cooperate than might otherwise be expected. Payment schedule was also found to be a significant predictor. The results indicated four significant three-way interactions but a nonsignificant four-way interaction. Interactions were identified between reputation of self and other and the payment schedule (*p*<.001), reputation of self and other and starting condition (*p*<.001), reputation of self and payment schedule and starting condition (*p*<.001), and reputation of other and payment schedule and starting condition (*p*<.01).

Parameter estimates suggested that the interaction effects were relatively small when compared to the main effects of starting condition and reputation of the partner. This small effect was particularly evident when considering the mean differences between subgroups (e.g., high and low self reputation by high and low partner reputation). It is suggested, therefore, that looking at the main effects for starting condition and perceived reputation of the partner may be more meaningful here. Consideration of the relative size of the parameter estimates revealed the main effects for starting condition (2.51) and reputation of other (1.62) were the largest factors (see table 4) in determining overall model fit ($\chi^2 = 428.48$, *p*<.001, $r^2 = 40.3\%$). These findings add greater support for hypotheses 1 and 3.

In summary, two large main effects (reputation of other and starting condition) and two smaller main effects (reputation of self and payoff schedule) were identified with a range of interaction terms. Specifically, it was evident that perceived reputation of alliance partner and starting condition were associated with participant willingness to cooperate. It was identified that a nonrandom group of participants chose to exit the study before the completion of all ten decision-stages. The use of ordered logit with exiting participants scoring zero in the scenarios that they did not participate in was used to keep the sample intact and factor in the effect of attrition as part of an ordinal dependent variable.

Public Sector Attrition Rate

Investigation of public-sector participants who did not complete all ten decision-stages also highlighted some interesting results (see table 3). Chi-squared analyses revealed that those choosing not to complete the study were not significantly different from those choosing to remain in the study [$\chi^2(1) = 1.012$, *p* >.05].

Reputation, Starting Condition and Willingness to Cooperate in the Public Sector

Investigation of the hypotheses was again conducted via an ordered logit analysis. Preliminary investigation of the data indicated that all assumptions of normality, homogeneity of variance, and outliers were not violated. The results indicated significant interactions between reputation of self, reputation of the other, and payoff (*p*<.001),

TABLE 5
Mean Plot of Main Effects (Reputation of Self, Reputation of Partner, Starting Condition, and Payoff Schedule) for Private-sector Sample

Main Effect	Private Sector		Public Sector	
	High reputation	*Low reputation*	*High reputation*	*Low reputation*
Reputation of Self	14.15	13.82	13.79	12.87
	High reputation	*Low reputation*	*High reputation*	*Low reputation*
Reputation of Partner	15.28	12.70	14.21	13.44
	Prisoner's dilemma	*Variable*	*Prisoner's dilemma*	*Variable*
Payoff Schedule	14.34	13.64	14.07	13.60
	Defect	*Cooperate*	*Defect*	*Cooperate*
Start condition	11.89	16.09	12.06	15.58

Note: Scores are willingness to cooperate scores calculated by combining results of the ten decision-stages.

reputation of self, payoff, and starting condition ($p<.05$), and reputation of the other, payoff and starting condition ($p<.05$). As with the private-sector analysis, examination of the parameter estimates revealed the largest predictor of overall model fit ($\chi^2= 60.61$, $p<.001$, $r^2 = 30.1\%$) was offered by the main effect for starting condition (table 4; 1.94, p<.001). However, no other main effects were identified for the public-sector sample. In this way, only hypothesis 3 was supported for the public sector.

The results for the public-sector sample appeared to support only one of the three hypotheses. The largest effect was witnessed in relation to the main effect for starting condition (H3) and then the interaction terms between payoff and reputations of self and partner. Interestingly, two smaller but significant three-way interactions were also identified between reputation of self, starting condition, and payoff (p<.05), and reputation of other, starting condition, and payoff (p<.05; see table 5).

In summary, the starting condition main effect with indication of three smaller interactions involving payoff structure were found. The largest of the interactions demonstrated that perceived reputation of self, perceived reputation of partner, and payoff were associated with participant willingness to cooperate. Results suggested that public-sector managers were primarily motivated to starting condition but became more sensitive to the reputation of the partner, and self, when the payoff structure clearly demonstrated the benefit of cooperation. The attrition effect was incorporated into the study via a logit analysis.

Comparison of Private- and Public-Sector Mean Scores

Comparison of the overall mean willingness to cooperate scores for private and public sectors identified a significant difference [$F(1,710)=53.67$, p<.001], where public sector scored lower than private sector.

DISCUSSION

The results clearly indicate the association between perceived partner reputation and perceived self reputation and willingness to cooperate. It was argued that real-world alliance settings are somewhat different from Axelrod's tests of game theory. Axelrod (1984) used game theory experts to develop computer programs. These results suggest that humans may interact on the basis of more complex and not necessarily rational understandings. In real-world settings, information about the potential alliance partner can be gathered prior to alliance formation. The impact of this information on willingness to cooperate is little understood. In this study the impact of perceived partner reputation was investigated. In interpreting the results, it should be mentioned that a scenario was used in which no communication was allowed and where only two options of behavior existed: cooperate or defect. In real business settings there is, of course, communication, and there are many choices or options available. However, to find answers to the posited research question, certain simplifications are necessary to be able to conduct an experiment into the behavior of individuals representing organizations. We think that with our design involving real business people in the experiment we at least made one step forward concerning the creation of a possibly real setting. In addition we tried to impart information about partners' proclivity to cooperate other than that developed experientially over time as part of the experiment itself, which usually is not done.

The first hypothesis stated that higher perceived cooperation reputation of the alliance partner would be associated with higher participant willingness to cooperate. This hypothesis was supported by the private-sector sample. The effect size identified was small; however, the results were the outcome of an experiment in which the only information given to respondents were general statements about an unknown alliance partner's reputation. In real-world settings, individuals would have access to more information, would know who their partners were, and be able to collect information from multiple sources (e.g., from other organizations that had a past alliance with the potential partner). It is conceivable that under such circumstances the effect of reputation on willingness to cooperate (or not) would be greater. That backs the position of a number of theorists who state that reputation as an unfair cooperation partner can have negative effects on future possibilities (i.e., shadow of the future) to cooperate (e.g., Ring and Van de Ven 1994, 94; Kanter 1994, 108).

The second hypothesis was associated with an individual's perceptions of the organization that (s)he represented. It was hypothesized that the higher the perceived cooperation reputation of one's own organization, the higher the willingness to cooperate. This hypothesis was not supported for the public sector. A number of differences between our experimental manipulations and real-world experiences of self reputation maybe relevant here. Cooperation reputation of private-sector firms and public-sector firms may be defined in different ways. Yet we used a standard definition in all of our manipulations, regardless of sector. These real-world differences might account for the lack of findings in relation to this hypothesis in the public sector. Respondents were allocated to various self reputation conditions. They were asked to consider a hypothetical condition, which may have been discrepant with their personality or real-world conditions at the time. Real-world conditions, in which the individual

would have spent many years experiencing the culture and climate of cooperation (or lack thereof), may be difficult to cast aside for the purposes of the experiment. This problem does not exist for partner reputation because real-world partner reputation information is more commonly sourced from outside the individual, a method consistent with the experimental technique employed in this study. Whether self reputation is an influencing factor is yet to be fully evaluated. A departure point for future research would be to find a way to measure an individual's perception of self reputation more adequately and to include this measure into a similar experimental design.

One point of departure in this context would be to posit the question if this result could be explained because organizations with high cooperation reputations do not want to cooperate with organizations with low cooperation reputation or organizations which defect on the first play. Organizations with high self cooperation reputation otherwise would taint their own reputations. Usually, competitive negotiators driven by narrow self-interest do well in individual negotiations but not as well as cooperators in the long term because, given their self reputations, the competitive negotiators are asked to participate in fewer deals.

The assignment of a specific self reputation, however, may also have proved to be too naive and should be changed in further experimental studies. That could be done, for example, by letting the participants give a self estimate of their reputation as a good cooperation partner. It is worth noting that self reputation did feature as part of interactions for both sectors. This identified some interesting patterns that might become apparent with improved experimental manipulations.

It seems likely from the research that private-sector managers were better game players than were public-sector managers. This was supported by the greater degree of sensitivity of private-sector managers to the payoff conditions as suggested by the interaction terms between payoff structure and the other variables. When the benefits of cooperation became less clear the relevance of partner, self, and starting conditions also became less clear. (The prisoner's dilemma payoff structure used was Cooperate A/B = [+5], Cooperate A/Defect B = [-10], Defect A/Cooperate B = [+5], Defect A/Defect B = [0].) The argument that private-sector managers were better game players could explain why perceived self reputation had a greater effect with this group. In this respect, private-sector managers may have been more willing to play out the roles allocated to them than were public-sector managers. This finding was an interesting one, which may help to further investigate different success factors applicable to alliances in the public and private sectors.

The third hypothesis stated that a starting condition characterized by a cooperative partner would be associated with higher willingness to cooperate than one characterized by a defecting partner. This hypothesis was clearly supported. We have identified an interaction between the starting condition and perceived partner reputation in an innovative experimental design that involved the decision processes of real-life professionals. These results indicate that participants modify their perception of partner reputation based on the starting conditions. Our results do not just highlight the importance of reputation, but also the relevance of first impressions in the alliance partnership process. In our experimental design the participants modified their willingness to cooperate after the first interaction with their partners. Perceived reputation (which is dependent on information collected prior to any interaction) has an

impact on willingness to cooperate. However, if the subsequent pattern of interaction is discrepant with the perceived reputation, individuals are likely to modify their perceptions according to the specific pattern of cooperation for the partnership.

CONCLUSIONS

In summary, our experimental design proved to be able to identify the association between reputation, starting conditions, and willingness to cooperate. Real business professionals were involved in the experiment. Many other researchers into alliance structuring have chosen to use either computer-based modeling (e.g., Axelrod 1984) or student-based experiments (e.g., Friedland 1990; Dollinger, Golden, and Saxton 1997). Furthermore, experimental studies involving human participants have tended to be small. They are only capable of evaluating differences associated with large effect sizes using statistical techniques (e.g., Andreoni and Miller [1993] involved 54 people in their experiment; Friedland [1990] studied groups of less than 100; Dollinger, Golden, and Saxton [1997] included 170 students in their experiments). The current study suggests that business professionals are likely to be more suitable for experiments on alliance structuring than computer programs or students. Additionally, larger numbers of participants are needed to evaluate the effects associated with reputation.

From the differences between public- and private-sector professionals, it seems that cooperation has to be especially fostered in the public sector due to the lower mean level of willingness to cooperate. A reason for the lower willingness to cooperate in the public sector might be that in this sector cooperation is not as common as in the private sector. Recent economic and organizational developments, however, indicate that this will change in the near future. Thus, it is even more important to foster the willingness to cooperate in the public sector.

The findings suggest that reputation information collection does have an impact on partnerships and that organizations should foster a positive cooperation reputation. Based on private-sector data it appears that starting condition has a greater effect than perceived reputation. We were led to the conclusion that reputation changes or evolves over time rather than being something which is fixed in the beginning of an alliance. We also conclude that for some alliances the starting condition can determine if the partners give each other any opportunity to cooperate.

The other relevant difference in cooperative behavior between public- and private-sector professionals was that perceived self reputation had greater effect for private-sector participants. It seems likely that private-sector respondents were more concerned with their self-image than their public-sector counterparts. In our design it seemed rather difficult to make sure that the public-sector employees would make our suggestion of self cooperation reputation of the company they presented their own. This was not the case for the private-sector professionals. For them it had a positive impact on cooperative behavior if we told them that they represented a company with a high self cooperation reputation. This behavior might be explained by the different kind of training and socialization of private-sector professionals with regard to a culture used to following instructions. Partnerships in private-sector organizations maybe influenced by factors associated with corporate image (e.g., culture change, mission) to a greater extent than that for public-sector organizations.

For follow-up studies, it would be useful to get a deeper understanding of the special aspect of alliances in the public sector to gain more insight into the special success factors relevant in this area. It seems inadequate to just transfer the knowledge we have from research in business alliances to the public sector. Rather, it appears to be necessary to conduct further studies, especially in the area of alliances in the public sector.

Implications for further research in the public sector should focus on a better way to build self cooperation reputation in the experimental design. Here it could be useful to gather information on participants and the correlation with cooperative or defective behavior. That could be done by limiting participants to a few firms and look for firm effects (similar to what was done in this study for the public and private sectors). If significant effects can be found it would make sense to gather other data on firm reputation and see if they correlate.

Departure points for further research can also be seen in our findings concerning the expectancy disconfirmation which suggested that individuals are likely to modify their perceptions according to the specific pattern of cooperation in the partnership, such as when the subsequent pattern of interaction is discrepant with the perceived reputation. Further experiments may develop more comprehensive conclusions about the reaction to a high reputation partner who defects or a low reputation partner who cooperates.

APPENDIX: PRIMING INFORMATION TO PARTICIPANTS

Dear ####,

Thank you for agreeing to participate in the study. We are about to begin an experiment into alliances. The experiment will begin by pairing you with another decision-maker (your alliance partner). Each of you represent a hypothetical company. The process will require you to make 10 decisions in which you will have to decide whether you want to cooperate with your partner or to defect. Various points will be awarded to you on the basis of your combined decision. The various possible conditions are as follows:

1.	You cooperate	Your partner cooperates	(you win-they win)
2.	You defect	Your partner defects	(you lose-they lose)
3.	You cooperate	Your partner defects	(you lose-they win)
4.	You defect	Your partner cooperates	(you win-they lose)

The aim is for you to score the most points possible. You will be told what the pay off for each condition, what the reputation of the organization you represent, and what the reputation of your alliance partner's organization is. You will have no way of contacting your partner. You will not know what course of action they will take (cooperate or defect) until after each decision-stage is completed. At this time you will also be told your current score.

The first decision period begins tomorrow and you will be sent the relevant information in the morning. Please make sure to reply within 5 hours of receiving the message. A reminder will be sent after 3 hours. If a reply is not received within 5 hours you will be removed from the experiment. This may seem harsh but we need to have the data collated quickly so that we can distribute the next round of information and decisions on the next day.

Again, thank you for agreeing to participate in the study. A final report will be sent to you at the end of the process and your overall ranking of the 816 individuals involved in this study will be sent to you. As part of this information you will be told your rankings to the nearest 25th percentile. Those in the top 25th percentile will be told their exact percentile. A summary of your strategy profile in reaction to the payoff schedule and your partner's behaviour will also be sent to you. You may find this an interesting insight into your behaviour towards new partners. If you do not complete all 10 decision-stages you will be issued with only the summary of the decisions that you completed and not receive the overall ranking.

Sincerely
Roland Simons

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