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Steering sales reps through cost information: An investigation into the black box of cognitive references and negotiation behavior

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ABSTRACT

As previous research demonstrates, few firms provide full pricing authority to their sales representatives (in the following: sales reps), and those sales representatives who do have full pricing authority may offer too many price concessions in their effort to close the sale. Thus, many sales managers lose the opportunity to use salespeople's superior customer knowledge to exploit their customers' willingness to pay. This study investigates how a company might steer sales reps during price negotiations while still giving them full pricing authority. The proposed instrument is simple to understand, easy to implement, fairly inexpensive, and effective; it posits that the kind of cost information that sales reps receive affects both their cognitive references and their negotiation behavior, which in turn affect negotiated prices. Electronically mediated negotiations in an experimental setting with 119 student dyads (Study 1), as well as replications of the findings using 41 dyads of key account managers (Study 2), indicate that undifferentiated cost information (full costs without information on direct costs) leads to higher reference prices (reservation price, target price, and first offer), as well as stronger attacking behavior and weaker coordinating behavior. These effects yield higher sales prices, and therefore more profit for the company. These results offer sales managers valuable insights into the "black box" of negotiations, which may be particularly helpful for steering sales reps in a situation in which they have full pricing authority.

1. Introduction

Industrial goods, especially if they are tailor-made, regularly require sales negotiation processes, in which prices are not set, but rather negotiated individually (e.g., Angelmar & Stern, 1978; Bonoma & Johnston, 1978; Boyle, 1996). To increase effectiveness and efficiency, industrial companies often delegate pricing authority to salespeople, who have better knowledge of customers and can better assess customers' willingness to pay (Bhardwaj, 2001; Lal, 1986; Le Bona & Merunka, 2006). However, empirical findings reveal that salespeople with pricing authority might offer too many price concessions to close a sale because they tend to "always play it safe to get the order" (Dolan & Simon, 1996, p. 313; see also Joseph, 2001; Langerak, 2001; Stephenson, Cron, & Frazier, 1979).

Plinke (1985) considers whether negotiated prices might depend on the cost information that sales reps receive. In a laboratory experiment, he finds that highly aggregated cost information (i.e., no distinction of direct costs and overhead expenses) leads to higher selling prices than does disaggregated cost information. This result contradicts normative pricing theory, which states that in a situation of idle capacity, direct costs constitute the lower price limit. As a result, a sales rep needs to know the exact amount of direct costs to fix the lower price limit. However, from the sales manager's perspective, disclosing direct costs might be unfavorable, as it could evoke a strong gross margin orientation among salespeople and minimize their efforts to cover overhead expenses (Stephenson et al., 1979). For suppliers in industrial markets, systemic problems would result from disclosing direct costs, as many of these markets contain complex products and processes that induce considerable overhead expenses (e.g., Kaplan & Cooper, 1998). Sales managers therefore might provide salespeople with rough cost information that lacks an explicit breakdown into direct costs and overhead expenses.

However, to the best of our knowledge, Plinke's (1985) idea has not been discussed further; he only analyzes the relationship between a stimulus (S) (cost information) and a response (R) (sales price) without considering the organism (O) variables that might mediate this relationship. As Luft, Haka, and Ballou (1998, p. 111) assert, the

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"impact of accounting information characteristics on bargaining behavior has received little research attention."

The organism component entails the "complex, multifaceted aspects of human behavior" (Bagozzi, 1986, p. 46); excluding them from the analysis eliminates information about *how* a stimulus produces responses and thus provides an incomplete picture of underlying relationships. Neale and Northcraft (1991) consider it insufficient to study static context variables (e.g., cost information) and their influence on negotiation outcomes; instead, they demand investigations into the "black box" between these variables. White, Valley, Bazerman, Neale, and Peck (1994, p. 441) similarly appeal for more comprehensive models, asserting that "there is still more behavioral research to be done on what factors simultaneously influence price in negotiations."

We attempt to fill this research gap by developing a more comprehensive S–O–R model in which we analyze how the S–R effect evolves through two distinct routes. First, in our model of decentralized price negotiations, we integrate some important cognitive references that negotiators may consider, including the reservation price, the target price, and the first bid. Previous studies support the general relevance of these cognitive references in negotiations (e.g., White et al., 1994). Second, we analyze negotiators' actual behaviors during negotiations and their dependence on the extent of cost information that the negotiators possess. To measure negotiation behavior, we transform qualitative data (negotiation protocols) into quantitative data using a content analytic approach. We thus follow Weingart and Olekalns (2004, p. 154), who assert: "Much of this [previous] research focuses on the strategy–outcome link, and very little addresses the role of context in this relationship. Additional research in each domain is needed to continue to pry open the black box of the negotiation process."

In addition to this analysis of the black box, we consider electronically mediated negotiations, whereas Plinke (1985) employs a face-to-face negotiation setting. Electronically mediated negotiations systematically have been gaining in importance in the past two decades as technical innovations continue to facilitate complex transactions that require negotiation (Rangaswamy & Shell, 1997). In this context, newly developed electronic negotiation systems can enable more economically productive negotiation processes (Kersten & Noronha, 1999; Rangaswamy & Shell, 1997). However, electronic negotiations also may change the way people interact, as electronic media generally cannot effectively transmit personal cues (e.g., Tan, Wei, Watson, & Walczuch, 1998). We thus investigate whether Plinke's (1985) findings, derived in a face-to-face setting, persist in electronic negotiations.

Our study shows that the level of cost information shared with salespeople affects cognitive references, negotiation behavior, and negotiation outcomes (i.e., sales price) of the salespeople. Specifically, the provision of only approximate cost information instead of detailed information regarding the breakdown into direct costs and overhead expenses leads to a higher reservation price, which aligns with a higher target price and, ultimately, a higher first bid. We find a natural hierarchy in these cognitive references, which ensures a "transmission" of effects from the negotiation context to the negotiation outcome. Furthermore, the results show that rough cost information changes the salesperson's negotiation behavior, such as the greater use of attacking and the lesser use of coordinating negotiation strategies. Both groups of variables—higher reference prices and increased attacking (lesser coordinating) behavior—eventually result in higher sales prices and thus higher profits for the seller. These results offer sales managers some valuable insights into the black box of negotiations, which should be particularly helpful for guiding sales reps in situations where they have full pricing authority.

The remainder of this paper is structured as follows. First, we describe the conceptual framework that serves as the basis for our analysis. Second, we present the hypotheses. Third, we describe the data collection and methods. Fourth, our model is tested empirically. Fifth, we close with a discussion and suggestions for further research.

2. Conceptual framework

2.1. Theoretical model of negotiation

To integrate findings from behavioral research on two-party bargaining, Neale and Northcraft (1991) propose a behavioral negotiation concept that distinguishes (static) context variables, (dynamic) interaction variables, and outcome variables. Whereas context variables determine the negotiation setting, dynamic variables (the "black box") refer to negotiators' cognitive (e.g., planning, information processing) and interaction processes (communication and influence tactics). According to this model, context variables provide a basis for negotiations, but exert only indirect effects on the negotiated outcomes through the dynamic variables. The dynamic variables correspond to the S–O–R scheme's organism component, the focus of our study.

2.2. Negotiation context

According to Neale and Northcraft's model, the kind of cost information a sales rep possesses represents a static factor, as it is a structural parameter that sets the negotiation context for the seller. The dynamic variables should depend on this cost information. In support of this claim, we draw on the basic idea of behavioral accounting, which analyzes individual responses to accounting issues or information (Borkowski, Welsh, & Zhang, 2001; for the foundations of behavioral accounting, see Arnold & Sutton, 1997; Burns & DeCoster, 1969).

2.3. Seller's cognitions

Regarding sales reps' cognitions, we integrate empirical findings from other studies regarding the relevance of certain cognitive reference points in negotiation contexts. The most widely discussed reference points are reservation price, target price, and first bid (e.g., Kristensen & Gärling, 1997; Van Poucke & Buelens, 2002; White et al., 1994). Sales reps evaluate information (e.g., offers) in relation to these cognitive references (e.g., Blount, Thomas-Hunt, & Neale, 1996). In turn, we analyze the important thoughts and expectancies—which Bagozzi (1986, p. 60) defines as cognitions—of the sales reps. The reservation price is generally defined as the highest acceptable price (Blount et al., 1996), which reflects the buyer's perspective. We use the same term for a seller, though in this case, the reservation price is the lowest acceptable price. To distinguish between the two terms, we specify the terms as the "buyer's reservation price" and the "seller's reservation price." However, both reservation prices depend on individual information levels. The target (or aspiration) price is usually defined as the best outcome that a negotiator can reasonably expect (Blount et al., 1996). The first bid represents the first price mentioned and the first counteroffer (Van Poucke & Buelens, 2002), and both establish the zone of possible agreements (Raiffa, 1982).

2.4. Negotiation strategies

Negotiation strategies are interaction patterns (behavior) used by participants to achieve resolution (Ganesan, 1993). Research in the field of dyadic bargaining reveals a broad range of strategies, though in the context of distributive bargaining (i.e., zero-sum games; Pruitt, 1981), researchers generally refer to three strategies (see Alexander, Schul, & Babakus, 1991; Clopton, 1984; Donohue, 1981): (1) attacking, (2) defending, and (3) integrating or coordinating.

An attacking strategy refers to when a negotiator pursues an offensive strategy (Alexander et al., 1991), such as proposing non-concessional offers, uttering threats, offering warnings and commands, or even making disparaging remarks about the opponent or offers. If the opponent fails to respond adequately, negative consequences will be

imminent (Donohue, 1981), and the main objective is to achieve unilateral concessions from the opponent (Ganesan, 1993). Defensive strategies instead stabilize the negotiator's expected outcome(s) to make them less vulnerable to attack (Donohue, 1981), such as by supporting one's own position (bolstering mechanism) or rejecting the offers or statements of the opponent (blocking mechanism) (Alexander et al., 1991; Donohue, 1981). Finally, an integrative strategy represents a coordinated approach in which bargainers adopt a problem-solving orientation based on concessions from both parties (Clopton, 1984). Such an approach might involve open exchanges of information, communication of at least some flexibility, or concessions (Pruitt, 1981).

2.5. Negotiation outcomes

To identify adequate outcome measures, we follow Thompson (1990), who considers two types of outcomes: economic outcomes and social–psychological outcomes. Negotiation effectiveness can similarly be conceptualized according to profits and satisfaction (Graham, 1986). The economic outcome of a specific price negotiation involves the agreed price and perhaps the quantity of units sold. However, in many industrial negotiations (particularly in project businesses), the quantity is equal to 1, as is the case in our study. Therefore, the sales price minus the direct costs equals the (transactional) profit. Thus, for our study, the sales price is equivalent to the profit, as the direct costs are fixed. With regard to social–psychological outcomes, satisfaction with the result is often relevant in industrial markets, as business relationships rely on personal relationships (Palmatier, Scheer, Houston, Evans, & Gopalakrishna, 2007), and mutual trust also plays an important role (Weitz & Bradford, 1999). Perceptions of success in negotiation thus may influence future interactions.

3. Hypotheses development

We organize our hypotheses into blocks related to different facets of Neale and Northcraft's (1991) conceptual model. We differentiate among these hypotheses with regard to the links (1) between context variables and dynamic variables, (2) within dynamic variables, (3) between dynamic variables and negotiation outcomes, and (4) between outcome measures. We illustrate the research model, including the hypothesized links we later develop, in Fig. 1. The model reflects the seller's perspective, as the variable of interest (i.e., cost information) applies only to the selling side.

3.1. Link between context variables and dynamic variables

Sales reps who know only the total amount of costs remain uncertain about the reservation price. Because the reservation price equals the direct costs, these sales reps must estimate the proportion of overhead expenses. However, they mainly need to spend time gathering and processing information about the sales situation, selling techniques, and product features (Spiro & Weitz, 1990; Weitz, 1981). To be safe with regard to costs, these salespeople likely do not accept price concessions far beyond the full costs; their uncertainty should strengthen their orientation toward the only information they have: full costs. This intuition is supported by the empirical finding that people who must make quantitative estimations under uncertainty tend to align their estimation with a specific anchor (Kahneman & Tversky, 1979). In contrast, sales reps with differentiated cost

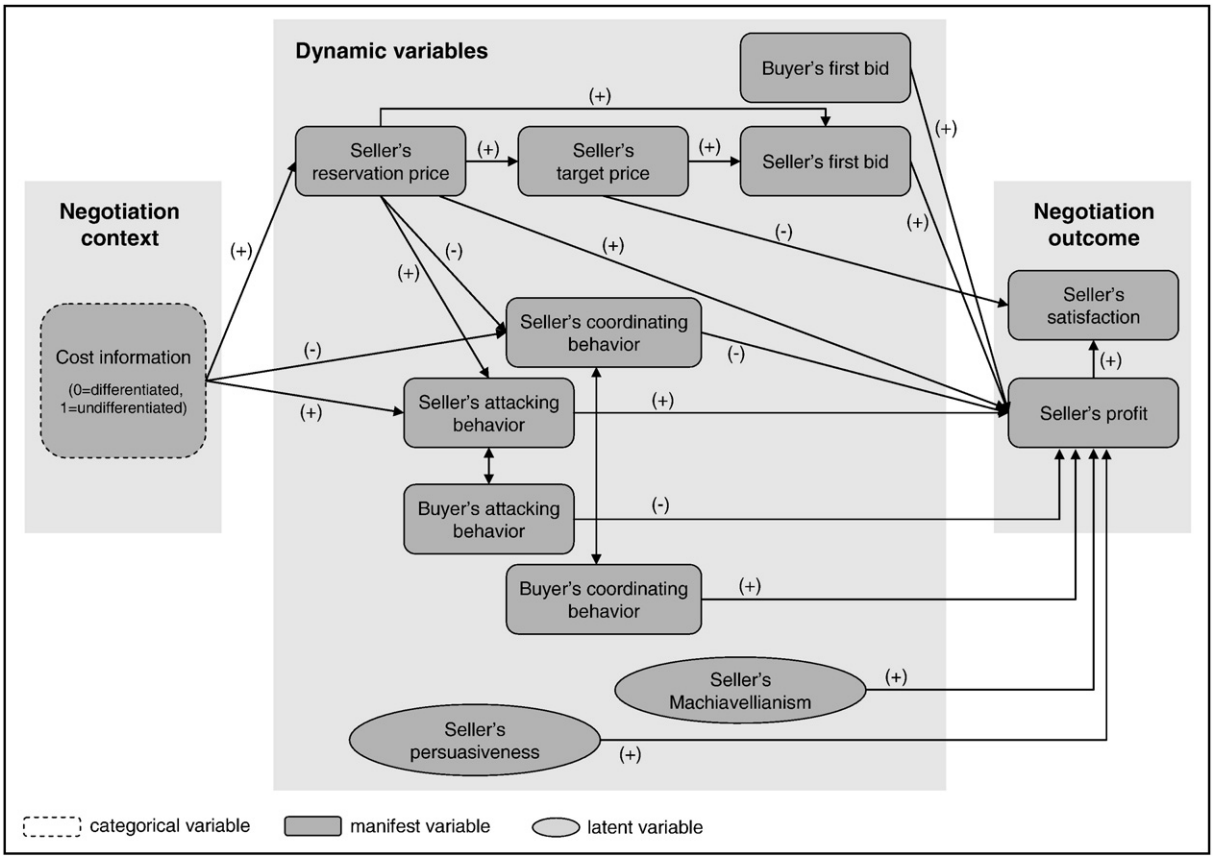

Fig. 1. Behavioral negotiation model.

information should draw on direct costs to determine the lower price limit, as they know about the decomposition into direct costs and overhead expenses. An industrial selling context is marked by a considerable amount of overhead expenses, so we hypothesize:

H1. Compared with differentiated cost information, undifferentiated cost information possessed by a salesperson leads to higher reservation prices of the salesperson.

Similarly, sales reps with undifferentiated cost information might perceive concessions as more risky: "When stakes are very high, a negotiator may more carefully scrutinize the situation before making a concession than when the stakes are not so high" (De Dreu, 2004, p. 115). Accordingly, these sales reps should systematically adopt fewer coordination strategies, which typically indicate flexibility in one's position and generally result in more concessions. Instead, they should exhibit more motivation to forcefully pursue a negotiation strategy that increases their perceived chance of achieving a better negotiation outcome. In turn, we assume that sales reps with undifferentiated cost information will be tougher and more persistent in applying a promising, though more challenging, negotiation behavior. Previous studies often assume that the systematic use of aggressive negotiation strategies results in fewer concessions (e.g., Ganesan, 1993), which means a higher sales price for the seller. The use of an attacking strategy also implies a higher risk of failing to complete the contract, but sales reps with undifferentiated cost information may be more willing to take this risk (see also Westbrook, 1996). Moreover, sales reps who know only few details about the cost structure have less potential information to offer their opponent (a coordinating tactic), so they should use coordinating behavior less systematically. Therefore, we pose two complementary hypotheses:

H2. Compared with differentiated cost information, undifferentiated cost information possessed by a salesperson leads to (a) an increase in the use of an attacking negotiation strategy and (b) a decrease in the use of a coordinating negotiation strategy.

We refrain from hypothesizing the presence of an effect of cost information on the sales reps' adoption of a defending strategy because a defending strategy involves passive behavior in response to an opponent's behavior. We therefore posit that the use of a defending strategy cannot systematically be ascribed to cost information. This claim is in line with our empirical analysis, in which we analyze defending behavior only indirectly by calculating the relative frequencies of both attacking and coordinating strategies, as we explain in Section 4.3.

3.2. Link within dynamic variables

Typically, sales reps aspire to achieve a higher price than their reservation price to earn a transaction-specific profit. Accordingly, the target price equals the reservation price plus a desired order-related profit. This reasoning leads to the following hypothesis:

H3. A higher reservation price set by the seller leads to a higher target price set by the seller.

To achieve a specific target price, sales reps likely consider the concessions they expect to grant to their counterpart when thinking about the first bid. Therefore, the first bid should equal the target price, plus an expected amount of concessions. In turn, the first bid should be higher for sales reps with high targets than for those with low targets:

H4. A higher target price set by the seller leads to a higher first bid set by the seller.

Moreover, we expect that the first bid depends directly on the reservation price, due to the high relevance of the reservation price as a crucial anchor in negotiations: The reservation price must be exceeded, whereas the target price represents an a priori reasonable aspiration that might be adjusted during the negotiation in response to unanticipated events (see also White et al., 1994). Therefore, we hypothesize:

H5. A higher reservation price set by the seller leads to a higher first bid set by the seller.

In H4 and H5, we refer specifically to how salespeople establish the opening offer. As Van Poucke and Buelens (2002, p. 74) suggest: "It is important to examine how negotiators decide on their opening offer. This question remains largely unanswered after decades of research on negotiation."

Furthermore, we expect these cognitive references to affect negotiation behavior. Specifically, bargaining research shows that bargainers with higher limits tend to increase their use of aggressive strategies (Ganesan, 1993; Kimmel, Pruitt, Magenau, Konar-Goldband, & Carnevale, 1980). We therefore predict a positive relationship between the reservation price and the likelihood that sales reps employ an aggressive negotiation strategy. Again, we infer two complementary hypotheses:

H6. A higher reservation price set by the seller leads to (a) an increase in the seller's use of an attacking negotiation strategy and to (b) a decrease in the seller's use of a coordinating negotiation strategy.

3.3. Link between dynamic variables and negotiation outcome

Many studies recognize that the first bids of both parties mark the zone of possible agreements and thus are decisive for the final outcome (Hamner & Yukl, 1975; Pruitt & Carnevale, 1993; Raiffa, 1982). Because our model reflects the seller's perspective, we formulate the following hypotheses:

H7a. A higher first bid set by the seller leads to a higher seller's profit.

H7b. A higher first bid set by the buyer leads to a higher seller's profit.

Similar to H5, we propose that the seller's profit is directly affected by the reservation price, which plays a crucial role in price negotiations. This claim follows the empirical finding that sales incentives often relate to profits, which in turn depend on the reservation price (see also Jackson, Schlacter, & Wolfe, 1995; Weinberg, 1975).

H8. A higher reservation price set by the seller leads to a higher seller's profit.

With regard to negotiation behavior, the sales rep's use of an attacking strategy aims to elicit concessions from the opponent without having to grant concessions. If the sales rep successfully executes an attacking strategy, he or she should exhibit less concessionary behavior and maximize his or her self-gain at the expense of the other party (De Dreu, 2004). In contrast, sales reps who mainly pursue a coordinating strategy seek rapid agreement and thus accept a position that is intermediate for both parties such that both parties must make concessions to reach an agreement (Ganesan, 1993). Therefore, we hypothesize:

H9a. An increase in the seller's use of an attacking negotiation strategy leads to a higher seller's profit.

H9b. An increase in the seller's use of a coordinating negotiation strategy leads to a lower seller's profit.

Again, we focus on a single transaction. In the context of a relational, repeated-interaction setting, the *relationship* profit would be appropriate for consideration, and the influences of an attacking or a coordinating strategy on the relationship profit might differ from that in our hypotheses.

Similar to the integration of the buyer's first bid into our model, we consider the buyer's negotiation behavior as a kind of control variable. Analogous to H9a and H9b, here we can assume that the buyer's profit increases (decreases) due to the greater use of an attacking (coordinating) negotiation strategy. Because we are faced with a distributive bargaining setting, we can formulate the following hypotheses from the seller's perspective:

H10a. An increase in the buyer's use of an attacking negotiation strategy leads to a lower seller's profit.

H10b. An increase in the buyer's use of a coordinating negotiation strategy leads to a higher seller's profit.

Satisfaction, the second outcome measure, explicitly includes the relationship between the sales rep's profit and his or her target price (Huber & Neale, 1986; Rinehart & Page, 1992). According to the expectancy–disconfirmation paradigm, satisfaction results when the transaction profit exceeds prior expectations (Churchill & Surprenant, 1982), whereas dissatisfaction results from a realized profit level perceived as inadequate. Two sales reps with different target prices but equal negotiation results should, therefore, evaluate the outcome differently, as follows:

H11. A higher target price set by the seller leads to a lower satisfaction of the seller with the negotiated outcome.

We further integrate results from socio-psychological negotiation research in our model, particularly with regard to how negotiator-specific characteristics might influence outcomes. Machiavellianism and persuasiveness are both conceptually related to negotiations (e.g., Huber & Neale, 1986; Thompson, 1990). We follow Neale and Northcraft (1991), and we treat these characteristics as dynamic variables; these variables also represent control variables in our model.

Machiavellianism is the degree to which a person expresses the tendency to control others through aggressive, manipulative, or even devious means to achieve personal or organizational objectives (Christie & Geis, 1970). In turn,

H12. A higher seller's tendency toward Machiavellianism leads to a higher seller's profit.

The sales rep's persuasiveness reflects his or her willingness and capability to conduct the negotiation effectively. Therefore, it features the ability to steer the negotiation in the right direction, according to the seller's interests (Thompson, 1990). We hypothesize:

H13. A higher seller's persuasiveness leads to a higher seller's profit.

3.4. Link between outcome measures

Two sales reps with equal target prices but different negotiation results should evaluate the outcome differently, such that the higher profit leads to higher satisfaction for the seller. Hence:

H14. A higher seller's profit leads to a higher satisfaction of the seller with the negotiated outcome.

4. Research design

4.1. Sample

In the first step (Study 1), we recruited 254 participants consisting of graduate students in business administration, most in their final year of education. Student samples provide relatively high homogeneity (Petty & Cacioppo, 1996), which helps to isolate the effect(s) of interest. Furthermore, in bargaining games, students regularly do not perform differently than do practitioners or professionals (e.g., Camerer, 2003; Neale & Northcraft, 1986; Northcraft & Neale, 1987; Roth, 1995). Therefore, we consider this sample suitable for our context, and we use laboratory research, which allows for replication (Greenhalgh & Neslin, 1983; Pullins, 2001). However, we also replicate this experimental study with a (smaller) sample consisting of 41 key account managers who have experience in price negotiations (Study 2).

4.2. Study design

To test our hypotheses, we conducted a simulation of a one-to-one industrial price negotiation. Each participant was randomly assigned to one of two roles: a representative of the supplying firm or a representative of its (potential) customer. The object of the negotiation was a special facility that the customer needed to produce highly efficient heating pumps. The special facility would be tailored exactly to the customer's specific needs, implying that the supplier could not easily sell it to other organizations. Hence, we have a project business setting. The participants were to negotiate only the price of the facility (including the possibility of no transaction); all technical features had already been fixed. As is typical of a project business setting, the unit of analysis was a specific transaction, which directed the participants' attention to maximizing profit from the transaction instead of some lifetime value of the entire buyer–seller relationship. This is in line with previous studies (e.g., Hunter, Bunn, & Perreault, 2006).

Participants received basic information (the information was the same for both groups: description of the situation, and problem formulation), as well as confidential, role-specific material. The respondents in the buyer's role received details regarding the arguments to use in the negotiation as well as information about the upper price level and the BATNA (best alternative to a negotiated agreement; Fisher, Ury, & Patton, 1992). Regarding the BATNA, the experimental material told the participants that they had no information about other potential suppliers, though a thorough search might identify other potential suppliers in the long run. Thus, the BATNA was vague enough to encourage but not force participants to come to an agreement (see also Van Poucke & Buelens, 2002). All participants in the customer function received the same information.

The respondents in the seller's role received arguments they could use in the negotiation and information about the BATNA, which again was vague; they had no particular information about other potential customers. In addition, the salespeople obtained cost information regarding the development and manufacturing of the plant facility. We manipulated the cost information as follows: half the respondents received an exact summary of all cost elements, with an explicit split into direct costs and overhead expenses (differentiated cost information), whereas the other half only knew the total amount (undifferentiated cost information), as we show in Table 1. Because the total across all cost elements (direct costs: 3,364,250 €; full costs: 4,500,000 €) is below the reservation price of the buyer (4,947,234 €), a positive bargaining zone exists for both experimental groups (Raiffa, 1982).

To provide the participants with an incentive to maximize their own transaction profits, we offered flight vouchers (50 € value) to the 10 students who achieved the highest profits (other studies have applied a similar mechanism; e.g., Olekalns, Smith, & Walsh, 1996), considering the different experimental roles of the participants. These vouchers likely hold less value to the key account managers in Study 2 than to the students in Study 1, so we provided the managers with an intrinsic motivation, releasing a ranking of all managers' results, followed by a group discussion. We believed that such a public acknowledgement of performance would induce the managers to work to achieve a respectable result. After the experimental negotiations, we asked students and managers to summarize the arguments

Table 1
Cost information provided to two experimental groups, seller's role.

Group 1: Undifferentiated cost information. The participants in group 1 received information about the full costs, but received no information about the direct costs. The confidential case study material contained the following table (including the caption in italics):

Cost type	Amount
Manufacturing costs	3,423,750 €
Financing costs	350,320 €
Handling and shipping costs	252,850 €
Travel costs	54,180 €
Assembly and installation costs	310,800 €
Administration and sales and marketing costs	108,100 €
Sum: net costs	4,500,000 €
Information on costs to BiboTech Ltd. (full costs)	

Group 2: Differentiated cost information. The participants in group 2 received information about the amount of direct costs and overhead costs. The confidential case study material contained the following table (including the caption in italics):

Cost type	Direct costs	Overhead costs
Material costs	1,335,000 €	
Indirect material costs		133,500 €
Direct labor	685,000 €	
Indirect production costs		590,000 €
Engineering	470,000 €	
R&D overhead		210,250 €
Sum: manufacturing costs	2,490,000 €	933,750 €
Financing costs	350,320 €	
Handling and shipping costs	252,850 €	
Travel costs	54,180 €	
Assembly and installation costs: material	36,200 €	
Assembly and installation costs: labor	180,700 €	
Assembly and installation costs: overhead		93,900 €
Administration and sales and marketing costs		108,100 €
Sum: net costs	3,364,250 €	1,135,750 €
Information on costs to BiboTech Ltd.		

Notes: The case and the role descriptions are available at http://www.marketing-centrum.de/ias/de/forschung/downloads/index.php (password: BiboTech).

they used in the negotiation and to justify why they did not achieve better results. This step was believed to increase the simulation's realism by making the participants responsible to an outside constituency (see also Alexander et al., 1991).

We analyze electronically mediated negotiations; specifically, the negotiations took place during Internet chats (Bryant, Hunton, & Stone, 2004). This method also helped us guarantee anonymity, as no participant could identify his or her negotiating counterpart.

Before the negotiation started, the participants answered an online questionnaire that contained measures of their Machiavellianism and persuasiveness, as well as their reservation and target price. After the negotiation, we collected their satisfaction with the outcome and justification of their performance as well as data for the manipulation checks (supplying firm only) through another online questionnaire.

4.3. Measures

We report the items in Appendix A. The seller's cognitions reflect their responses to either the first questionnaire (reservation price, and target price) or the Internet protocols from the negotiations (first bids). We capture the personality traits with reflective multi-item measures. To measure Machiavellianism, we draw on four items offered by Christie and Geis (1970). Persuasiveness is a three-item measure, comparable to that of Huber and Neale (1986) and Evans and Beltramini (1987). All scale validation measures appear in Appendix B. Regarding the outcomes, we measure profit as the difference between the final agreement price and the direct costs. Overall satisfaction with the agreed price uses a single-item measure.

To assess negotiation behavior, we use a content analytic approach instead of a post-hoc collection of participants' self-reports, as the latter is prone to response bias that would threaten the validity of the data (Campbell et al., 1988). To code the negotiation protocols, we first identify the unit of analysis to be coded (i.e., unitizing) and then assign the units to prespecified negotiation tactics (i.e., content coding; Weingart, Olekalns, & Smith, 2004). We unitize at the thought unit level, which refers to single identifiable ideas (Bales, 1950). Overall, we identify 13,159 units in all negotiations. We adapt the coding scheme described by Donohue (1981) and modified by Alexander et al. (1991), who distinguish among attacking, defending, and integrating. We instead label the last category "coordinating" to achieve a clear distinction from integrative (i.e., multi-issue; Pruitt, 1981) negotiations. Each strategy consists of specific tactics, each of which reflects the realization of a strategy. In total, our classificatory scheme assigns the units to one of 16 tactics. Unlike Alexander et al. (1991), we do not include tactics typical of integrative bargaining (e.g., change the issue under negotiation), but we add tactics from other studies about bargaining behavior that appear relevant to price negotiations (e.g., commanding the other party to make a concession). In Table 2, we display our final coding scheme.

Two coders, blind to the research hypotheses, performed the coding procedure (e.g., Angelmar & Stern, 1978). To determine the reliability of the coding scheme, both raters coded approximately 10% of the total data (1487 units, 16 dyads). As we report in Table 3 and Appendix C, we confirm the intercoder reliability of our taxonomy.

Table 2
Coding scheme for the content analysis of the negotiation log files.

Negotiation strategy	Negotiation tactic	Operational definition
Attacking	Nonconcessional offer	Refers to initial offers and repeats of prior offers.
	Charge fault, derogation	Contains a disparaging remark or questions something regarding the opponent or his/her offer(s).
	Threat, promise	A self-prediction that the sender will provide reward or punishment in the near future.
	Assert wants	Pertains to the speaker's wants, requirements, rights, or needs as related to the topic under discussion.
	Command	A statement in which the source suggests that the target should perform a certain behavior.
Defending	Position support	Provides information supporting one's own position or provides reasoning for rejecting the opponent's position.
	Deny or question information	Relevance or accuracy of the opponent's statement is either questioned or denied.
	Offer rejection	Rejects, disagrees with, or challenges the opponent's offer.
	Support and rejection	Represents an attempt to reject, disagree with, or challenge something in an opponent's utterance and is accompanied by some form of support or cooperation.
Coordinating	Offer concession	Contains an offer that is less than the sender's immediate previous offer.
	Flexibility	Indicates at least some degree of flexibility in the speaker's position.
	Approve offer	Indicates agreement, acceptance, or approval of the opponent's offer.
	Other support	Indicates agreement, acceptance, or approval of something about the opponent that is not a direct response to an offer.
	Additional information	Offers information about the speaker's situation.
	Question	A request for additional information.
	Opening	A statement that leaves the upcoming response choice open for the opponent.

Notes: Each negotiation log file was divided into units of analysis; each unit was assigned to one of the 16 negotiation tactics. Units that did not belong to an actual negotiation tactic (e.g., technical advice from the administrator) fell into the "other" category.

Table 3
Number of units and Cohen's kappa for each negotiation tactic.

Negotiation strategy	Negotiation tactic	Analysis of reliability (16 dyads)		Counts (absolute number of units assigned to tactic; 160 dyads)
		Counts (absolute number of units assigned to tactic)	Cohen's kappa	
Attacking	Nonconcessional offer	59	1.00	597
	Charge fault, derogation	84	.82	450
	Threat, promise	87	.82	692
	Assert wants	22	.60	250
	Command	110	.75	752
Defending	Position support	329	.65	2760
	Deny information, question information	48	.71	414
	Offer rejection	150	.84	1404
	Support and rejection	28	.75	162
Coordinating	Offer concession	143	1.00	1532
	Flexibility	25	.67	325
	Approve offer	16	1.00	160
	Other support	69	.72	723
	Additional information	17	.56	204
	Question	40	.68	401
	Opening	13	.59	127
	Other	247	.85	2206
	Sum	1487		13,159

Notes: Columns 3 and 4 refer to the 16 dyads that were double-coded and analyzed for intercoder reliability; column 5 refers to the coding of all 160 dyads. Following Bakeman and Gottman (1986), the Cohen's kappas of "additional information" and "opening" reach only fair levels because they are below .6 but exceed .4. A possible reason may be the comparatively low frequency with which these tactics were used.

With regard to our level of analysis, we investigate the frequencies of the tactics used (and strategies, on a higher level of aggregation) because "analyzing frequencies helps us to answer questions such as: Does the negotiation context affect the kind of strategies that are used? Are specific strategies linked to different kinds of outcomes?" (Weingart et al., 2004, p. 452). These questions summarize our aim. The dominance of a specific bargaining strategy depends on the extent to which other bargaining strategies are also used; therefore, we analyze the relative frequencies. In our model, only attacking and coordinating strategies appear (in line with our hypotheses), and the defending strategy is implicitly included as the remaining proportion. We measure both attacking and coordinating strategies with a single item, namely, the relative frequency of the related tactics, using the sum of attacking, defending, and coordinating behaviors as the basis. That is, we employ a formative measure of the strategies, with equal weights for all related tactics, so that an aggregation is admissible and meaningful. This approach matches prior studies that apply a comparable coding scheme (Alexander et al., 1991; Weingart, Hyder, & Prietula, 1996).

5. Empirical results

5.1. Study 1—student sample

The final survey data consist of 119 dyads after having excluded 8 dyads from the analysis: 4 that suffered from missing data from at least one party and 4 that ended in an impasse (2 from each cost information condition). Because the impasse rate is very low and affects both cost information conditions equally, we believe these exclusions are acceptable. In Table 4, we display the means and standard deviations of the sellers' cognitive references, negotiation strategies, and outcome measures, as well as the results of the Mann–Whitney *U*-test we conducted to analyze differences across the cost information conditions.

Table 4
Means and standard deviations of key constructs for both cost information conditions, Study 1 ($N=119$).

	Undifferentiated cost information ($N=58$)	Differentiated cost information ($N=61$)	Mann–Whitney *U*-test (*Z*-statistic)
Seller's cognitions			
Reservation price[a]	4033 (460.39)	3608 (672.96)	−4.158*
Target price[a]	4872 (427.39)	4570 (669.08)	−2.509*
First bid[a]	5902 (786.59)	5581 (955.86)	−2.590*
Seller's behavior (*relative measures*)			
Attacking	.244 (.131)	.131 (.062)	−5.068**
Defending	.499 (.100)	.477 (.104)	−.931
Coordinating	.259 (.111)	.392 (.104)	−5.944**
Buyer's behavior (*relative measures*)			
Attacking	.299 (.118)	.199 (.104)	−4.780**
Defending	.449 (.112)	.441 (.106)	−.335
Coordinating	.252 (.092)	.362 (.105)	−5.753**
Outcome measures			
Sales price[a]	4538 (315.40)	4293 (410.85)	−3.169**
Seller's profit[a]	1174 (315.40)	929 (410.85)	−3.169**
Seller's satisfaction[b]	4.741 (1.345)	4.885 (1.318)	−.494

Notes: Standard deviations are in brackets. Significance of difference between samples: * $p<.05$, ** $p<.01$.
[a] In 1000 euros.
[b] 1 = totally dissatisfied, 7 = totally satisfied.

Three questions in the second questionnaire determine whether the manipulation of the cost information succeeded (see Appendix A). As expected, all items show significantly higher values among the group with differentiated cost information (Mann–Whitney *U*-test; $p<.05$ in each case).

The correlation matrix also reveals relatively high correlations between the negotiation strategies of the seller and the buyer, and we explicitly account for these correlations in the model estimation. Furthermore, we find a considerable correlation between cost information and reservation price (initial support for H1), as well as relatively high correlations between cost information and attacking and between cost information and coordinating (initial support for H2a and b). All other correlations appear in Table 5.

To test our hypotheses, we apply structural equation modeling (SEM), as both latent and manifest variables appear in the study. We use the partial least squares (PLS) algorithm to estimate the proposed model (Wold, 1974). The PLS path model indicates whether the hypothetical relationships match the empirical correlations (Wold, 1974). A key advantage of PLS is that it can handle a relatively small sample size (Chin, 1998). This condition applies in our case; the sample size is approximately 60 in each of the two experimental groups, and the model originally contained a total of 17 items.

In Table 6, we provide the estimated path coefficients of the model, as well as their levels of significance (derived through a bootstrapping procedure with $N=119$ cases and 200 subsamples), as well as the R^2 as a goodness-of-fit index for any endogenous variable. Regarding the influence of cost information on the dynamic variables, we find support for H1, H2a, and b: Undifferentiated cost information leads to higher reservation prices ($\beta=.347$, $p<.01$), and a salesperson with undifferentiated cost information is more likely to employ an attacking negotiation strategy ($\beta=.279$, $p<.01$) and less likely to use a coordinating strategy ($\beta=-.232$, $p<.01$).

With regard to the relationships between the dynamic negotiation variables, we first find that the significant effect of H1 translates into higher target prices, because higher reservation prices yield higher target

Table 5
Correlations of all constructs used in the SEM model, Study 1.

	CI	RP	TP	FB	FB _CP	ATT	ATT _CP	CO	CO _CP	MV	PERS	PR	SAT
Cost information (CI)[a]	1.000												
Reservation price (RP)	.347	1.000											
Target price (TP)	.261	.592	1.000										
First bid (FB)	.122	.193	.560	1.000									
First bid of counterpart (FB_CP)	.181	.094	.035	.029	1.000								
Attacking strategy (ATT)	.487	.205	.141	.036	.170	1.000							
Attacking strategy of counterpart (ATT_CP)	.418	.202	.238	.024	.180	.608	1.000						
Coordinating strategy (CO)	−.528	−.212	−.145	.091	−.124	−.649	−.482	1.000					
Coordinating strategy of counterpart (CO_CP)	−.489	−.150	−.234	.004	−.214	−.445	−.575	.693	1.000				
Machiavellianism (MV)	.183	−.038	−.074	.082	−.017	.044	.165	−.120	−.099	1.000			
Persuasiveness (PERS)	.028	.084	−.014	−.034	−.051	.002	−.011	.053	.149	−.012	1.000		
Profit (PR)	.319	.447	.332	.252	.524	.252	.113	−.105	.012	−.057	.097	1.000	
Satisfaction (SAT)	−.054	.078	−.222	−.317	.310	.046	−.043	.160	.222	−.069	.033	.379	1.000

[a] Coding of cost information: differentiated = 0, undifferentiated = 1.

prices (H3; $\beta = .592$, $p < .01$). Furthermore, this impulse carries forward through the chain of cognitive references, indicating a significant effect of the target price on the first bid (H4; $\beta = .686$, $p < .01$) and of the reservation price on the first bid (H5; $\beta = -.213$, $p < .05$). However, contrary to H5, we find that the latter effect is negative. Therefore, the total effect of the reservation price on the first bid is positive and decomposes into a largely positive, indirect effect through the target price and a negative direct effect. The total positive effect finds support in the positive correlation between the reservation price and the first bid (.193).

However, other than these points, we find no support for H6a and b: the reservation price does not significantly influence the negotiation strategy. The correlation between reservation price and attacking (coordinating) behavior is only .205 (−.212), which indicates that cognition and behavior are related to some degree but also offer a substantial amount of autonomy in the model.

Turning to the relationship between cognitions and behavior for the outcome measures, we establish that from the seller's perspective, a high first bid leads to a high profit ($\beta = .19$, $p < .05$), in line with H7a. In addition, the higher the buyer's first bid, the more convenient it is for the seller, which results in higher profits for the latter ($\beta = .496$, $p < .01$), in line with H7b. In accordance with H8, we find a significant direct link between the reservation price and the profit ($\beta = .334$, $p < .01$), which emphasizes the prominent role of the reservation price during negotiations. For the behavioral measures, we find evidence of the positive influence of an attacking strategy by the seller on his or her profit ($\beta = .168$, $p < .05$), but coordinating behavior does not significantly diminish profit. Thus, H9a receives support, whereas H9b does not. However, the buyer cannot minimize the seller's profit by using an attacking strategy (we must reject H10a), though a stronger use of a coordinating strategy is beneficial to the seller ($\beta = .242$, $p < .05$, in support of H10b). We conclude that sales reps with undifferentiated cost information achieve systematically higher profits because of their greater attacking behavior.

This result is even more interesting, considering the highly significant correlation between the uses of an attacking strategy by both negotiating parties (about .49). Sales reps with undifferentiated cost information set a more aggressive tone for the negotiation, which is reciprocated by the buyer; this finding is in line with previous studies that provide evidence of reciprocity in negotiations (e.g., Campbell, Graham, Jolibert, & Meissner, 1988; Weingart, Thompson, Bazerman,

Table 6
Results of the SEM model (path coefficients [standardized betas] and *p*-values), Study 1.

	Endogenous variables						
Exogenous variables	Reservation price	Target price	First bid	Attacking strategy	Coordinating strategy	Profit	Satisfaction
Structural variables							
Cost information[a]	.347**			.279**	−.232**		
Cognitions							
Reservation price		.592**	−.213*	.010	−.045	.334**	
Target price			.686**				−.391**
First bid						.190*	
First bid of counterpart						.496**	
Behavior							
Attacking strategy						.168*	
Attacking strategy of counterpart				.489[b],**		−.018	
Coordinating strategy						−.133	
Coordinating strategy of counterpart					.573[b],**	.242*	
Personality							
Machiavellianism						−.047	
Persuasiveness						.071	
Outcome measures							
Profit							.509**
R^2	12.0%	35.0%	34.3%	43.5%	52.9%	52.4%	28.0%

Notes: Significance of path coefficients according to the bootstrapping procedure with 119 cases and 200 samples: * $p < .05$, ** $p < .01$.
[a] Coding of cost information: differentiated = 0, undifferentiated = 1.
[b] Correlation.

& Carroll, 1990; Westbrook, 1996). Despite this reciprocation, these sales reps achieve higher prices. It may be that not only does the attacking negotiation strategy lead to a higher profit, but the greater references also play a crucial role. In particular, the reservation price induces sales reps with undifferentiated cost information to assume a position of strength. Considering both cognitions and behavior simultaneously thus seems promising not only from a conceptual perspective, but also for the empirical analysis. The results obtained thus far establish that undifferentiated cost information leads to higher sales prices, through two different routes: the first route is through the various cognitions, and the second route is through the greater use of the attacking negotiation strategy. We substantiate this observation in our assessments of some alternative models.

We also find support for H11, as higher target prices lead to lower satisfaction levels ($\beta = -.391$, $p < .01$). Therefore, when profit remains constant, satisfaction with the economic measure of the negotiated agreement decreases when the target price is higher. In contrast, we reject the two remaining hypotheses (H12 and H13) regarding the effects of sales reps' personal traits on the negotiated price, as we detect no significant influences. That is, in our distributive bargaining game through electronic media, only the "hard facts" (i.e., cognitive references: reservation price, target price, first bids) and the use of an attacking strategy determine the negotiated outcomes, whereas the characteristics of the negotiators have virtually no effect, perhaps because of the weaker role of personal cues in electronically mediated negotiations. The link between the two outcome measures ($\beta = .509$, $p < .01$) is again substantive and supports H14, but it also shows that the two measures are not exactly the same, which is an ex post justification for treating them separately. We summarize the results with respect to these hypotheses in Table 7.

In assessing the different goodness-of-fit measures of the structural (inner) model, we observe a strong explanation of negotiation outcomes ($R^2 = 54.2\%$ for profit; $R^2 = 28.0\%$ for satisfaction; for the R^2 of the intermediate constructs, see Table 6). In addition to the R^2 values, the effect size (of a particular path coefficient) refers to the change in R^2 when we omit an exogenous construct; according to this measure, all significant effects can be classified as being substantive (Chin, 1998).

We also assess the predictive validity of our model by first reestimating it with a randomly selected subsample of 75% of the respondents. We employ the resulting path coefficients to predict both profit and satisfaction with the outcome for the remaining 25% of respondents, then compare the predicted measures with the actual outcome measures and test for differences using a Wilcoxon test in a within-subject design. For both outcome measures, the test does not indicate any significant differences (profit: $Z = -.442$; $p = .658$; satisfaction: $Z = -.401$; $p = .688$); thus, we can assume predictive validity.

To assess the robustness of our proposed model, we analyze whether some potential relations between constructs are insignificant by assessing the fit of competing (richer) models. Specifically, we consider:

- Model 1, which analyzes the influence of cost information on the target price, the first bid, profit, and satisfaction. This analysis determines whether undifferentiated cost information leverages only the reservation price as a cognitive reference and not the two other downstream cognitions or the outcome measures. We consider this assessment necessary, as cost information correlates with the first bid at .122 and with target price at .261 (see Table 5). The other two links, however, would counteract our conceptual model.
- Model 2, in which the target price influences the use of negotiation strategies and resulting profit. Intuitively, we might expect more attacking and less coordinating negotiation strategies with a higher target price, as well as a higher profit with higher aspirations. The correlation between target price and attacking (coordinating; profit) is .141 (−.145; .332) (see Table 5).

To assess the richer models, we apply a partial F test (e.g., Kirk, 1982) to determine whether any endogenous construct might be

Table 7
Hypotheses results of SEM model, Study 1.

Hypothesis	Description	Result
Link between context variable and dynamic variables		
H1	Compared with differentiated cost information, undifferentiated cost information possessed by a salesperson leads to higher reservation prices of the salesperson.	Supported
H2a	Compared with differentiated cost information, undifferentiated cost information possessed by a salesperson leads to an increase in the use of an attacking negotiation strategy.	Supported
H2b	Compared with differentiated cost information, undifferentiated cost information possessed by a salesperson leads to a decrease in the use of a coordinating negotiation strategy.	Supported
Link within dynamic variables (*cognitions and behavior*)		
H3	A higher reservation price set by the seller leads to a higher target price set by the seller.	Supported
H4	A higher target price set by the seller leads to a higher first bid set by the seller.	Supported
H5	A higher reservation price set by the seller leads to a higher first bid set by the seller.	Not supported
H6a	A higher reservation price set by the seller leads to an increase in the seller's use of an attacking negotiation strategy.	Not supported
H6b	A higher reservation price set by the seller leads to a decrease in the seller's use of a coordinating negotiation strategy.	Not supported
Link between dynamic variables (*cognitions and behavior*) *and outcome* (*profit and satisfaction*)		
H7a	A higher first bid set by the seller leads to a higher seller's profit.	Supported
H7b	A higher first bid set by the buyer leads to a higher seller's profit.	Supported
H8	A higher reservation price set by the seller leads to a higher seller's profit.	Supported
H9a	An increase in the seller's use of an attacking negotiation strategy leads to a higher seller's profit.	Supported
H9b	An increase in the seller's use of a coordinating negotiation strategy leads to a lower seller's profit.	Not supported
H10a	An increase in the buyer's use of an attacking negotiation strategy leads to a lower seller's profit.	Not supported
H10b	An increase in the buyer's use of a coordinating negotiation strategy leads to a higher seller's profit.	Supported
H11	A higher target price set by the seller leads to a lower satisfaction of the seller with the negotiated outcome.	Supported
H12	A higher seller's tendency toward Machiavellianism leads to a higher seller's profit.	Not supported
H13	A higher seller's persuasiveness leads to a higher seller's profit.	Not supported
Link within outcome measures		
H14	A higher seller's profit leads to a higher satisfaction of the seller with the negotiated outcome.	Supported

better explained. The results (all tests using a 95% significance level) indicate that in model 1, $F=.54$ for the target price, 1.06 for the first bid, 3.30 for profit, and 2.40 for satisfaction. Thus, with degrees of freedom (df) equal to 1/116, 1/115, 1/109, and 1/115 for the target price, the first bid, for profit, and for satisfaction, respectively, model 1 does not significantly outperform our original model. The same result emerges for model 2, in which $F=1.02$ for attacking ($df=1/114$), 2.22 for coordinating ($df=1/114$), and .46 for profit ($df=1/109$). Consequently, our original model cannot be significantly improved; it should remain the same for our replication study.

5.2. Study 2—professional sample (key account managers)

To validate the results, we replicate Study 1 with a sample of key account managers from selling organizations who were participants in an MBA program at a Swiss university. Again, we use students on the buyer's side, as we only manipulate the variable of interest (cost information) for the sales reps. We obtain 41 dyads. For completeness, we provide a correlation matrix in Table 8.

Applying the PLS algorithm to the new data, we find further support for our hypotheses; namely, undifferentiated cost information leads to higher reservation prices ($\beta=.246$; $p<.05$), the greater use of an attacking strategy ($\beta=.387$; $p<.01$), and the lesser use of a coordinating strategy ($\beta=-.27$; $p<.05$). The postulated hierarchy of the various cognitive references is also apparent: higher reservation prices enhance target prices ($\beta=.718$; $p<.01$), which leads to higher first bids ($\beta=.944$; $p<.01$). Reservation price again has a negative direct effect on the first bid ($\beta=-.405$; $p<.05$). In contrast to the results from the student sample, though, here we find support for H6a: the higher the reservation price, the more likely is the use of an attacking strategy ($\beta=.322$; $p<.01$). This result indicates that, to a certain degree, key account managers align their cognitions and behavior more systematically, perhaps due to their greater negotiation experience.

Neither personal characteristic, though they both correlate somewhat with profit, exerts a significant influence, which is similar to the finding in the student sample.

With respect to the actual negotiation behavior, the path between attacking (coordinating) and profit again indicates a positive (negative) sign; however, this time, only the influence of the coordinating strategy is significant ($\beta=-.295$; $p<.05$). Therefore, in the student sample, undifferentiated cost information yields higher sales prices through the greater use of an attacking strategy, whereas in the sample of professionals, it results from the decreased use of a coordinating strategy. This finding offers an ex post justification for treating attacking and coordinating strategies separately, even if the respective hypotheses seem symmetric. Thus, whereas the results related to cognitions are similar to those in Study 1, those pertaining to behavioral measures highlight slightly different effects. A possible explanation for this result may be that the cognitions are independent from the negotiating counterpart, whereas the use of a negotiation strategy is not. The negotiating counterpart may determine whether the greater use of an attacking strategy or the decreased use of a coordinating strategy (both consequences of undifferentiated cost information) significantly influences the sales price at the end of the negotiation.

We observe that satisfaction with the outcome is only poorly explained in the executive sample ($R^2=.035$), perhaps because professionals interpret satisfaction more comprehensively (e.g., including evaluations of the actual negotiation process). For example, we observe a considerable negative correlation between attacking and satisfaction with the outcome (−.258), in line with Ganesan's (1993) finding that an attacking strategy deteriorates satisfaction. However, including an additional path in the original model does not significantly enhance the R^2 of satisfaction ($F=1.98$; $df=1/37$; $p>.1$). All other path coefficients appear in Table 9.

To statistically substantiate our observations of the comparisons between both samples, we use the Smith–Satterthwaite test (Miller & Freund, 1965) and investigate whether the estimated path coefficients differ significantly. This test confirms that the influence of reservation price on an attacking strategy is significantly stronger in Study 2 ($S=-2.358$; $p<.05$). The differences regarding the influence of negotiation behavior on profit are significant only with respect to the buyer. In the professional sample, buyers who use the attacking strategy decrease the seller's profit, but in the student sample, this approach is not significant, and the difference is marginally significant ($S=1.773$; $p<.1$). In addition, we uncover a significant (and negative) influence of the buyer's use of a coordinating strategy on the seller's profit (in the student sample, we find a significantly positive influence); again, this difference is significant ($S=3.005$; $p<.01$). However, the influence of the seller's negotiation behavior—which belongs to the negotiation "black box" and is hence the focus of our study—does not differ significantly between the samples. Furthermore, we observe that the insignificant influences of the target price and profit on satisfaction imply significant differences from Study 1 ($S=-2.057$; $p<.05$; $S=3.99$; $p<.01$, respectively).

The comparisons of the samples on all other path coefficients indicate no other significant differences, according to the Smith–Satterthwaite test ($p>.1$) (see Table 10). That is, for the most part (14 of 19 paths), both samples reveal the same results, which indicates that the results from Study 1 largely transfer to professional negotiators.

6. Discussion

Keeping information from salespeople seems to contradict normative theory; more information should empower salespeople to make better decisions. However, with more information salespeople may give in to their myopic tendency to choose the path of least resistance and grant higher discounts rather than expending effort in

Table 8
Correlations of all constructs in the SEM model, Study 2.

	CI	RP	TP	FB	FB _CP	ATT	ATT _CP	CO	CO _CP	MV	PERS	PR	SAT
Cost information (CI)[a]	1.000												
Reservation price (RP)	.246	1.000											
Target price (TP)	.292	.718	1.000										
First bid (FB)	.356	.273	.653	1.000									
First bid of counterpart (FB_CP)	.148	.015	−.006	.090	1.000								
Attacking strategy (ATT)	.473	.453	.528	.182	.269	1.000							
Attacking strategy of counterpart (ATT_CP)	.069	.342	.249	−.180	−.098	.241	1.000						
Coordinating strategy (CO)	−.249	−.385	−.363	.222	−.332	−.525	−.375	1.000					
Coordinating strategy of counterpart (CO_CP)	.190	−.343	−.143	.324	.031	−.011	−.696	.378	1.000				
Machiavellianism (MV)	−.139	−.023	−.130	.006	−.227	−.253	.015	−.089	.058	1.000			
Persuasiveness (PERS)	.085	.374	.209	−.025	.088	.168	.256	.064	−.275	−.207	1.000		
Profit (PR)	.296	.460	.360	.398	.365	.488	.078	−.410	−.226	−.262	.280	1.000	
Satisfaction with outcome (SAT)	−.142	−.242	−.050	.017	−.086	−.258	−.146	.285	.046	−.108	.022	−.187	1.000

[a] Coding of cost information: differentiated = 0, undifferentiated = 1.

Table 9
Results of the SEM model (path coefficients [standardized betas] and *p*-values), Study 2.

	Endogenous variables						
Exogenous variables	Reservation price	Target price	First bid	Attacking strategy	Coordinating strategy	Profit	Satisfaction
Structural variables							
Cost information[a]	.246*			.387**	−.270*		
Cognitions							
Reservation price		.718**	−.405*	.322**	−.195*	.138	
Target price			.944**				.020
First bid						.157*	
First bid of counterpart						.415**	
Behavior							
Attacking strategy						.188	
Attacking strategy of counterpart				.104[b]		−.352*	
Coordinating strategy						−.295*	
Coordinating strategy of counterpart					.362[b,**]	−.404*	
Personality							
Machiavellianism						−.085	
Persuasiveness						.145	
Outcome measures							
Profit							−.194
R^2	6.0%	51.5%	50.6%	35.4%	27.9%	61.7%	3.5%

Notes: Significance of path coefficients according to the bootstrapping procedure with 119 cases and 200 samples: * $p<.05$, ** $p<.01$.
[a] Coding of cost information: differentiated = 0, undifferentiated = 1.
[b] Correlation.

the negotiation. In doing so, they also can increase their confidence in closing the deal.

With our model of decentralized price negotiations, we theoretically contribute to existing literature by developing a model that examines the negotiation black box—specifically, the cognitive references used by the seller in the actual negotiation interaction. Empirically, we establish that both cognitive references and bargaining behavior depend on cost information and that they both influence the sales price. On the one hand, our analysis reveals a hierarchical structure of existing reference prices (reservation price, target price, and first offer) that precedes the negotiation outcome. On the other hand, the strategies employed in the negotiation influence profit (more attacking or less coordinating, due to undifferentiated cost information) as well. Here, we comprehensively transform the conceptual behavioral negotiation model offered by Neale and Northcraft (1991) into an empirically testable model for dyadic price negotiations that captures cognitions and negotiators' interactions (as called for by Neale and Northcraft).

Our proposed model holds for both a student sample and a sample of professional salespeople. Therefore, the observed effects do not result from heterogeneity between the two experimental groups (internal validity), or from the experience, or lack thereof, of the negotiators (external validity).

In terms of our methodology, we employ a systematic mixed qualitative–quantitative research design that both includes pure

Table 10
Comparison of both samples using the Smith–Satterthwaite test.

Exogenous variable	Endogenous variable	Path coefficient (Study 1)	Path coefficient (Study 2)	Standard deviation (Study 1, bootstrapping)	Standard deviation (Study 2, bootstrapping)	Smith–Satterthwaite test statistic S ($df = 158$)
Cost information[a]	Attacking strategy	.279	.387	.077	.116	.733
Cost information[a]	Coordinating strategy	−.232	−.270	.080	.129	−.246
Cost information[a]	Reservation price	.347	.246	.086	.141	−.605
Reservation price	Target price	.592	.718	.108	.123	−.640
Reservation price	First bid	−.213	−.405	.119	.230	.790
Reservation price	Attacking strategy	.010	.322	.065	.129	−2.358*
Reservation price	Coordinating strategy	−.045	−.195	.059	.148	1.141
Reservation price	Profit	.334	.138	.071	.175	1.244
Target price	First bid	.686	.944	.117	.170	−1.159
Target price	Satisfaction	−.391	.020	.087	.233	−2.057*
First bid	Profit	.190	.157	.094	.135	.187
First bid of counterpart	Profit	.496	.415	.056	.159	.613
Attacking strategy	Profit	.168	.188	.099	.201	−.097
Attacking strategy of counterpart	Profit	−.018	−.352	.097	.158	1.773
Coordinating strategy	Profit	−.133	−.295	.109	.157	.782
Coordinating strategy of counterpart	Profit	.242	−.404	.109	.188	3.005**
Machiavellianism	Profit	−.047	−.085	.079	.124	−.251
Persuasiveness	Profit	.071	.145	.092	.117	−.435
Profit	Satisfaction	.509	−.194	.081	.192	3.990**

Notes: Significance of difference between both samples: * $p<.05$, ** $p<.01$.
[a] Coding of cost information: differentiated = 0, undifferentiated = 1.

quantitative data (cognitive references, profit, and satisfaction) and transforms qualitative data (negotiation protocols) into meaningful quantitative results. This procedure enables us to perform a comprehensive analysis of the black box of negotiations. In addition, it substantially decreases the potential for common method bias. Beyond the negotiation black box, we confirm that Plinke's (1985) assertion that undifferentiated cost information yields better negotiated outcomes translates to electronically mediated negotiations.

Overall, our work reveals how sales managers, in a situation of delegated pricing authority, can employ information control to steer sales reps' behaviors without explicitly limiting their pricing authority. This finding has great relevance for managers, as few firms provide full pricing authority to their salespeople, even though doing so would allow salespeople to use their superior customer knowledge to exploit customers' willingness to pay, especially when the product and service offering is complex. According to Stephenson et al. (1979), in the hospital supplies industry, only 23% of firms give full pricing authority to salespeople; others allow no (29%) or limited (48%) authority. Hansen, Joseph, and Krafft (2008) report that among their sample of 222 German sales organizations from various industries, only 11% grant their sales reps full pricing authority, whereas 28% give none and 61% allow only limited pricing authority. Our findings should prompt firms that limit pricing authority to think carefully about the indirect ways in which they might guide sales reps' behavior by using insights from behavioral economics, applied to the context of price negotiations.

Of course, there are other ways to influence decentralized price negotiations indirectly, such as training, the recruitment of capable sales reps, and adequate monitoring or incentive systems (e.g., Albers, 2002; Krishnamoorthy, Misra, & Prasad, 2005). However, we hope to draw more attention to another instrument that is simple to understand, easy to implement, and effective. The variation of cost information represents a fairly inexpensive activity and also coincides with the importance of the productivity of sales force investments: "The sales management of a firm is interested in improving overall sales force productivity but has only limited total investment and time budget available for doing so" (Skiera & Albers, 2008, p. 145. Krafft, Albers, and Lal (2004, p. 265) also stress that it is imperative to use the sales force "in the most effective and efficient manner").

Despite these merits of our research, our study suffers from some limitations that suggest avenues for further research. First, we focus on the effects of different levels of cost information, but it would be interesting to vary the incentive system systematically (i.e., sales reps' compensation may be a purely fixed salary or include variable components; see also Segalla, Rouziès, Besson, & Weitz, 2006) and then analyze the combined effect of different incentive systems and different levels of cost information. This analysis might reveal a meaningful combination of the two instruments.

Second, by comparing the student sample with the professional sample, we realize that the buyer's behavior influences which effect of undifferentiated cost information—more attacking or less coordinating—dominates and thus yields a higher profit. Additional research could further analyze the influence of the buyer's negotiation behavior. For example, the buyer's upper price limit might be varied systematically, which could lead to different constellations of the negotiator's power.

Third, in our content analysis, we extend an existing coding scheme (Alexander et al., 1991) to a distributive bargaining setting, in which only price is negotiated. Further research on pricing negotiations should also employ this adaptation. Although such pure price negotiations often occur in business-to-business contexts, negotiations might specify other issues, such as delivery, maintenance, or guarantees. Therefore, it would be interesting to investigate whether the effect of undifferentiated cost information remains the same in more complex, multi-issue, integrative bargaining situations.

Fourth, the negotiation setting for our study centers on the seller's short-term negotiation success within a single transaction, that is, in a one-time sale of a tailor-made special facility. Within this setting, we show that the seller's use of an attacking strategy increases the seller's profit. However, this effect might differ for a negotiation context that reflects a relational setting. Thus, we encourage further research in a repeated-interaction setting that takes into account long-term profit over the entire relationship.

Fifth, we posit that in electronically mediated negotiations, the personal characteristics of the negotiator may be less likely to influence negotiated outcomes than in face-to-face negotiations. Further research should compare the results of our comprehensive model to results obtained in face-to-face situations to confirm or deny this assertion.

Appendix A. Survey items

Likert scales, 1 = totally disagree, 7 = totally agree (unless otherwise noted).

Cognitions

- Reservation price: Which is the minimum price you would just accept for an agreement with the buyer? (amount in euros)
- Target price: What price is a reasonable target for your negotiation? (amount in euros)

Machiavellianism

- When you ask someone to do something for you, it is best to give the real reasons for wanting it, rather than giving reasons that might carry more weight. (r)
- Honesty is the best policy in all cases. (r)
- One should take action only when sure it is morally right. (r)
- It is hard to get ahead without cutting corners here and there.

Persuasiveness

- I perceive myself as being able to easily influence other people with my opinion.
- I perceive myself as being nimble-witted in discussions.
- I perceive myself as being able to influence conversations and steer them in desired directions.

Satisfaction with the outcome

- Overall, how satisfied are you with the result achieved in your negotiation? (1 = totally dissatisfied, 7 = totally satisfied)

Manipulation checks

- The cost data provided were useful in order to come to a pricing decision.
- The kind of cost information provided helped me substantiate my decisions during the negotiation.
- The kind of cost information provided reduced my personal uncertainty in evaluating and accepting particular price offers from my negotiation counterpart.

Appendix B. Scale validation for Machiavellianism and persuasiveness

To analyze the content validity, we conducted an exploratory factor analysis on both constructs. Persuasiveness reveals a one-factor structure; Machiavellianism decomposes into two factors (three items mainly load on the first factor, so we exclude item 4 from further analysis; the remaining three items provide a one-factor structure). At the item level, we measure indicator reliability, which is between .49 and .81 for Machiavellianism and between .75 and .78 for persuasiveness; all item loadings exceed .4. With regard to the internal consistency of the constructs (Fornell & Larcker, 1981), we find satisfactory results for both constructs (.84 for Machiavellianism, .91 for persuasiveness) (Nunnally, 1978). The average variance extracted (AVE) is 63.8% for

Machiavellianism and 76.6% for persuasiveness, both exceeding the critical threshold of .5. In addition, both AVEs are higher than the squared correlations with any other construct (the maximum squared correlation of Machiavellianism with some other construct is .03; persuasiveness .02), which supports discriminant validity.

Furthermore, the results of the SEM reveals the very low loading (.04) of item 1, belonging to the Machiavellianism scale. Because items with loadings lower than .4 should be excluded from the analysis (Hulland, 1999), we restrict our measure of Machiavellianism to items 2 and 3. These items reveal loadings of .808 and .909.

Appendix C. Coding reliability

Each coder independently divided the subset of data into units of analysis. These results were compared to evaluate the unitizing reliability. Guetzkow's *U*, which expresses the difference between the coders in the number of units obtained (Guetzkow, 1950), equals .0196, which indicates a 2% discrepancy in the number of units. In addition, to assess disagreement about the boundaries of each unit, we calculated the index of coterminality (Angelmar & Stern, 1978), which is .83 (i.e., the number of agreements as a percentage of the sum of agreements and disagreements on decomposing the messages). Both indices yield better values than those of comparable studies (e.g., Angelmar & Stern, 1978; Weingart et al., 1996).

The coders then resolved unitizing discrepancies and determined 1487 units. Each coder independently assigned the units to one of the 16 different negotiation tactics (or to the "other" category when an utterance did not belong to an actual negotiation tactic). To compare these coding results, we evaluated the coding reliability according to Cohen's kappa (Cohen, 1960), which determines the level of coding agreement corrected for chance agreement. For the individual categories, the Cohen's kappas range between .56 and 1 (see Table 3); for the entire category scheme, it is .88. Bakeman and Gottman (1986) consider values of Cohen's kappa between .4 and .6 as fair, between .6 and .75 as good, and above .75 as excellent. The values we find are approximately equal to those in comparable studies (e.g., Alexander et al., 1991; Angelmar & Stern, 1978). Nevertheless, both coders discussed coding disagreements and decided how they would handle comparable cases in the remaining data set. Afterward, they coded the remaining data separately.

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