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## EXPERIMENTAL EVIDENCE ON THE VALUE OF TIME AND STRUCTURE IN MARKET NEGOTIATIONS

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KARINE LAMIRAUD, JULIEN PATRIS, RADU VRANCEANU

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# Experimental evidence on the value of time and structure in market negotiations

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## Abstract

This paper reports the results from a multi-attribute market negotiation experiment to study how the structure of the negotiation process influences its efficiency. We found that, conditional on the success of the negotiation, the total value created increased with the time spent negotiating; by working one more minute, negotiators created on average 37 additional value units (1% of the maximal value). However, most of the gains were obtained in the early moments of the negotiation. Using a between-subject design, we analyzed the consequences of (1) guiding negotiations towards early wins, and (2) inviting negotiators to share information about their priority goals. In both treatments, the total value created exceeded the control value by approximately 9% of the maximal value. However, it was essentially the buyer who captured the additional value. Negotiator gender had an impact on the negotiation outcome, with women underperforming compared to men.

*Keywords:* Structured negotiation; communication; information sharing; trust.

*JEL Classification:* C71, C91, I11.

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## 1. Introduction

Negotiation, defined as “back and forth communication designed to reach an agreement” (Fisher and Ury, 1981, p. 6), is a social interaction as old as humankind. People negotiate on almost everything, from the sharing of household burdens to resolving wars and armed conflicts between nations. Negotiations differ in many ways, including their objective, their complexity, the level and distribution of information among parties, the stakes, and the best alternative to the negotiation outcome.

Negotiations also hold an important place in the market economy, which fundamentally relies on voluntary agreed contracts between market participants that set the rules for exchanging claims (Hermalin et al., 2006). While the typical trade in competitive markets is a spot transaction that involves no negotiation, situations in which a buyer and a seller must agree on the terms of an exchange contract are ubiquitous. Following a meaningful typology introduced by Fisher and Ury (1981), negotiations can be *integrative*, whereby they aim to create value (win-win), or *distributive*, whereby they aim to capture value (win-lose). Most market negotiations are of the integrative type, as a successful trade creates a surplus to be shared between the seller and buyer.

Starting with Stigler (1961) and his famous statement “knowledge is a valuable resource”, economists have long acknowledged that removing uncertainty by searching, questioning, and communicating, creates value. In this perspective, bilateral market negotiation can be seen as a useful economic activity through which two parties work to discover a mutually beneficial solution, as neither of the two has perfect information (Prietula and Weingart, 2007).

In the past, game theorists who studied the negotiation process built their reasoning on standard axioms used to define rationality. Important advances to the normative theory of negotiation were the cooperative bargaining solution by Nash (1950) and the solution to the non-cooperative bargaining problem as studied by Rubinstein (1982) for a single good, or Freshtman (1990) for multiple goods. In this normative framework, when they have perfect information, rational persons should agree to a solution where no gain from trade is wasted, referred to as a Pareto efficient outcome.

However, in real-world situations, negotiations with a strong welfare-improving potential often fail outright, or parties agree on a suboptimal outcome (e.g., Pruitt and Rubin, 1986; Samuelson and Bazerman, 1984; Thompson, 1991; Thompson et al., 2010). A substantial amount of literature in psychology, marketing and behavioral economics focuses on explaining these documented failures (see surveys by Bazerman, 2000; Thompson et al., 2010; Brett and Thompson, 2016). One common result in this literature is that failures are, in general, rooted in players’ lack of understanding of their opponents’ priorities and the best strategies the latter can use. These failures are sometimes amplified by a shortage of information specific to complex negotiations, cognitive biases, stereotypes (e.g., a fixed-pie perception), and detrimental emotional dynamics (Samuelson and Bazerman, 1985; Bazerman and Neale, 1992).

Poorly structured negotiation processes can generate two types of inefficiencies. The first is the inability of negotiators to reach an agreement even if the integrative solution exists. The second is that when an agreement is reached, the outcome of the negotiation can fall short of the best possible outcome. Although the first type can be documented and analyzed

in the field, this is not the case for the second type, as missed opportunities in successful negotiations cannot easily be detected using field data, since most of the time it is impossible to observe the maximal value. In this context, laboratory-based experiments can provide useful insights.

This paper contributes to the analysis of negotiation by implementing a laboratory-based experiment to study how two parties can negotiate the acquisition of a complex, multi-attribute good. Our experiment presents several novel features compared with the large number of previous studies. It develops an original scenario, both in terms of sector of activity (pharmaceutical market) and payoff choices. It brings new evidence on the role of structure, of gender, and of trust on the efficiency of the negotiation process. It investigates the question of the negotiation time and provides an original estimate of the negotiation ‘production function’.

The experiment described here belongs to the category of integrative, bilateral, multi-attribute negotiations. In other words, there are several outcomes of the game where *both* negotiators can end up with a positive value. Several contracts are Pareto efficient: a higher payoff for one negotiator necessarily decreases the payoff for the other negotiator. By design, there is one ‘first best’ contract featuring the highest *total value* created. However, taken one by one, several items in the negotiation are divergent as a larger gain for one party involves a loss for the other party, with alternating asymmetry; accordingly, reaching the most integrative outcome (i.e., the greatest total value) requires a set of tradeoffs that only rational, benevolent and empathetic negotiators can detect and implement (Walton and McKersie, 1965; Froman and Cohen, 1970; Pruitt and Rubin, 1986; Bazerman et al., 2000).

To our knowledge, the first complex integrative experimental negotiation task was introduced by Kelly (1966) and involved bilateral bargaining for the prices of three commodities. Later, Pruitt and Lewis (1975) introduced the “car negotiation task” which became the reference multi-attribute negotiation task in marketing studies. Variants of this task have been extensively used in laboratory experiments involving a buyer and a seller of a complex good (e.g., Campbell, 1988; Croson, 1999; Thompson, 1989; Weingart, 1990).

Our negotiation scenario is inspired by the European organization of the pharmaceutical market for innovative therapies (see Appendix A).<sup>1</sup> Briefly, we have a seller of a new drug working for a biotech firm, and a buyer who represents the National Health Insurance body. This is a salient example of integrative negotiation, since innovative therapies provide cures for severe diseases, and the benefits for patients, in general, exceed the therapy’s development costs. Furthermore, the pharmaceutical market - where prices are regulated and determined by a formalized process – is a relevant real-world setting for a sequential negotiation process. We must highlight however that the large uncertainty surrounding the medical performance of an innovative therapy, the complexity of the contract claims, and the emotional content of a negotiation involving such high stakes

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<sup>1</sup> Advanced treatments cover a complex set of gene-based, cell-based, and tissue-based engineered products. As of April 2022, 14 such treatments had marketing authorization from the European Medicines Agency (Simoens et al., 2022).

sometimes lead to failed negotiations (Simoens et al., 2022; Smyths and Kuchler, 2022; van Overbeeke et al., 2021; Whittal, 2022).<sup>2</sup>

Following the standard design (Pruitt and Lewis, 1975), our instructions to participants defined negotiators' preferences by mapping the negotiation outcome for each item into a value created for their organization. In our scenario, the negotiated contract involved six key clauses (i.e., items); four of these are divergent (win-lose), and two are convergent (win-win). Negotiators had perfect information about their own mapping choice-value (preferences), but did not know the mapping of the other party. They only received hints about the latter's preferences. By design, participants could create a large net value from the negotiation if they mutually agreed to trade low losses on low-priority items against high gains on high-priority items. The structure of payoffs was such that it was in the interest of one party to take the other party's interest into account when negotiating, as recommended by the literature (Bazerman and Neale, 1992). By making alternate offers and eventually communicating, a negotiator could remove uncertainty about the other party's goals and achieve an integrative outcome.

At the beginning of the experiment, participants were matched in dyads, and the roles of buyer and seller were randomly assigned. After reading the scenario and the instructions, participants engaged in the negotiation. Interactions were computerized. Decisions and outcomes were strictly anonymous, and participants could not establish eye contact. We adopted this framework to increase control, limit emotional impact, and contain reciprocation between participants who shared a common educational background.<sup>3</sup>

The negotiation process involved repeated alternated offers, covering the six contract items. When an offer arrived, the negotiator could accept all its terms, or make a counteroffer. The process stopped if agreement was reached on all six items, or when the time for the negotiation elapsed. Limiting the negotiation duration (Arunchalam and Dilla, 1995; Thompson, 1991) reflects real-world negotiations in the pharmaceutical market. Furthermore, negotiators could unilaterally withdraw at any time, even if no agreement had been reached. At the end of the experiment, negotiators received compensation in cash which was proportional to the value created for their organization.<sup>4</sup> Because this study investigated negotiation as an economic activity, this proportionality was important to make sure that participants' incentives were aligned with the objective of value creation for their organizations.

Similar to Exely et al. (2020), our computerized experiment allowed participants to chat in real time. This is an important design feature, not only because verbal/written communication has significant consequences on the dynamics of trust (Srivatava and Chakravarti, 2009), but also because it allows participants to communicate and learn about the preferences of the other.

In brief, the results of our experiment revealed a significant improvement in value creation both when subjects were guided towards early wins, and when they were invited to share information about their priority goals. The buyer benefited the most from the additional

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<sup>2</sup> The use of the drug market scenario links our paper to the growing literature in experimental health economics (for a survey of this literature, see Galizzi et al., 2018).

<sup>3</sup> See Bazerman et al. (2000) for a discussion on the benefits and shortcomings of various types of communication channels used for experimental research on negotiation.

<sup>4</sup> Kelley et al. (1970) showed that monetary compensation leads to a more integrative outcome than point-based or grade-based compensation.

guidance, while there was no negative consequence for the seller. The results also show that that time spent on negotiation created value in bilateral market negotiation. Higher trust at the beginning of the negotiation was not associated with a higher created value in the experiment overall. However, trust impacted benefits differently for buyers and sellers; trustful buyers lost value, while sellers facing trustful buyers saw their gains increase. Finally, compared to men, women underperformed in our game, in particular in the buyer role.

The text is organized as follows. Section 2 reviews the related literature. Section 3 introduces the experimental design. The results are presented in Section 4. Section 5 is our conclusion.

## 2. Related literature and analytical framework

A discussion of the literature will help us to explain how we formulated the hypotheses tested, and to position our findings with respect to existing results.

Building on the multi-attribute, non-cooperative bargaining problem studied by Frehstman (1990), Fatima et al. (2002) developed a realistic model of multi-attribute negotiation with imperfect information. They revealed that a unique equilibrium exists, and that the sequential implementation is superior to the simultaneous implementation of the equilibrium. Our laboratory experiment allowed for direct observation of the interaction between players during the negotiation process. Our first hypothesis was that *the more time negotiators interact, the more uncertainty they remove and the more value they create*.

The way a negotiation is organized, or its structure, can have substantial consequences on its outcome. The famous American diplomat Henri Kissinger once stated “... the way negotiations are carried out is almost as important as what is negotiated. The choreography of how one enters negotiation, what is settled first and in what manner, is inseparable from the substance of the issues” (Kissinger, 1969, p.111). In the past, scholars and consultants in negotiation strove to develop structured negotiation processes using objective items in order to determine the best negotiation sequence, with a view to increasing the likelihood that an integrative agreement would emerge (e.g., Donohue, 1981, Fisher, 1986, and Lewicki et al., 2003 in applied psychology; Lai and Sycara, 2006 and Gettinger et al., 2012 in decision science).

Experimental research has revealed that recommended play can act as a coordination device inducing players to choose dominated strategies (e.g., Brandts and McLeod, 1995, Van Huyck et al., 1992, Croson and Marks, 2001, and Chauduri and Paichayontvijit, 2010). Building on this result, we analyzed whether two types of pre-negotiation advice can create value, and if so, how much. The first type is *specific* and based on the superior information of the administrator of the negotiation game (the equivalent of an external consultant in a real-world situation). The second type is *general* and would apply regardless of the negotiation context (such a mandatory requirement could be imposed by law).

With regard to specific advice, Bazerman et al. (2000), building on Thompson and Hastie (1990), argued that a very short initial interaction “solidifies the mental models of the negotiators, resulting in either a trusting or competitive script that carries through the negotiation”. Favorable outcomes at the beginning of a negotiation sequence play an

important role in building trust and a spirit of compromise (Mitchel, 1981, and Lewicky and Polin, 2013).

Our second hypothesis was based on the arguments in the previous paragraphs as follows: *early agreement on some items should increase the chances of reaching a final integrative agreement*. Therefore, in a specific treatment, instructions guide participants toward (small) gains early in the negotiation process, by recommending them to negotiate first on the two integrative criteria (in our case, information that the game administrator had but which participants did not have explicitly). In real-world settings, such external benevolent advice might be provided by an independent mediator.

The third hypothesis was that *the exchange of information should have a positive effect during the negotiation process*. Specifically, in a pioneering theoretical analysis, Walton and McKersie (1965) argued that information exchange helps negotiators make more accurate judgements, and should therefore increase the chances of reaching an integrative outcome. Although this hypothesis is quite compelling, experimental research to date has provided contrasting evidence. In particular, studies by Pruitt and Lewis (1975) and Schulz and Pruitt (1978) could not corroborate it, probably because negotiators in their studies were subject to strong stereotypes (e.g. fixed-pie bias). Using a design to contain the fixed-pie stereotype, Thompson (1991) and Brett and Thompson (2016) found supporting evidence for the positive effect of information exchange.

Besides these three hypotheses, our study also investigated the role of trust in the negotiation process. In general, trust can be defined as “an intention to accept vulnerability based upon positive expectations of the counterpart’s behavior and intentions” (Rousseau et al. 1998, p.395). The focus on trust in our experiment is justified by the large amount of literature in negotiation which highlights its instrumental role in reaching better outcomes (as surveyed in Lewicky and Polin, 2013; Thompson et al., 2010; Brett and Thompson, 2016). Negotiators who trust each other exchange more information about priorities and preferences, and therefore reach more integrative outcomes (e.g., Butler, 1995; Kimel et al., 1980; Weingart et al., 1993). However, it has also been shown that excessive candor and trust by a negotiator can result in greater concession-making, and poorer outcomes for him/her (Lewicky and Polin, 2013; DeRue et al., 2009) and that trust cannot be easily generated with the purpose of improving a negotiation outcome (Brañas-Garza et al., 2023).

Finally, we also examined the effect of gender on the outcome of the negotiation. A substantial proportion of the literature in psychology and behavioral economics concludes that women try to avoid wage negotiations, and when they enter into such negotiations, they fare worse than men (see Stuhlmacher and Walters, 1999; Azmat and Petrongolo, 2014; Exley et al., 2020 and Reclade and Vesterlund, 2020 for reviews of this literature).<sup>5</sup> In the literature, the gender of the partner is known to the ‘employer’, therefore this poor outcome for women may suggest that some form of discrimination is present in a labor market context. Exley et al. (2020) conducted a wage negotiation experiment with anonymous subjects (participants were not informed about the gender of the other party).

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<sup>5</sup> In a study by Lamiraud and Vranceanu (2018), the gender composition of teams of students mimicking the functioning of a board of directors in a mass attendance business game had an impact on the performance of the different teams during the game.



By contrast with the other studies, they found no difference between wages negotiated by men and by women.

### 3. Experimental design

#### 3.1 Implementation

Our experiment was conducted in May, June and September 2022 at the Experimental Laboratory at the University of Montpellier (LEEM). Twenty-two sessions were organized with a total of 238 subjects recruited from the laboratory's subject pool. Participants made their decisions on a computer screen and could not establish eye contact with the other party. Instructions and data collection were computerized using an O-Tree program (Chen 2016).<sup>6</sup> Details of the instructions are provided in Appendix A.

On average, participants spent 50 minutes in the laboratory (i.e., instructions and negotiation game combined), and earned a median of 12 euros (including a 6-euro participation fee).

#### 3.2 Scenario and preferences

The negotiation game involved two fictitious agents, a representative of a biotech company in the role of the seller, and a representative of the National Health Insurance (NHI) body in the role of the buyer. The scenario was as follows: the biotech company has developed an advanced genetic therapy for a severe disease and negotiates a contract with the NHI body that will allow the latter to offer this new therapy to a pool of patients.

Participants were told that their mission was to succeed in the negotiation and obtain the highest possible value for their respective employer. Their cash payment at the end of the experiment was proportional to the total value they created. If an agent terminated the negotiation before an agreement was reached, or if the time allowed for the negotiation (30 minutes) ended without agreement, neither party earned anything. All participants received a 6-euro participation fee, but did not learn about this until after the experiment concluded.

On arrival at the laboratory, participants had 25 minutes to read the instructions, including a general (i.e., common to all) section and a role-specific (i.e., buyer or seller) section. The general section described the scenario and market context, as well as the terms of the contract under negotiation. While the company, the disease and the therapy were fictive, in terms of context they were realistic, as they replicated standard characteristics of gene therapy. Furthermore, the context of bilateral negotiation between a buyer and a seller reflects the negotiation setting prevalent in developed countries for drugs.

The object of the negotiation was a transfer contract which included six distinct items (or clauses): (1) the price (cost) per patient, (2) the maximum number of patients for which the NHI body would pay for the therapy, (3) the location of therapy production units and R&D, (4) how the clinical risk would be shared, (5) the time required to bring the product to the market, and (6) the quality of the data generation system (i.e., statistical evidence on the medical outcome of the treatment). Each of these contract terms had a discrete set of choices, as indicated in Table 1 (the number of choices ranging from 3 to 5). An offer

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<sup>6</sup> The program was developed by Dimitri Dubois at the *Laboratoire d'Economie Expérimentale de Montpellier* (LEEM).

involved a six-tuple of choices, for example [1a, 2b, 3a, 4b, 5b, 6a]. An ‘offer’ included all the six clauses simultaneously. The negotiation was deemed a success if both parties agreed on all the six terms of the contract, and a failure if there was disagreement on at least one item.

In the second (i.e., role-specific) section of the instructions, negotiators received private information about their preferences, and some basic indications about the preferences of the other agent. This allowed them to perceive convergence on some items, and to observe that the level of divergence on other items varied depending on the individual item (see Instructions in the Appendix). Careful negotiators are expected to realize that an integrative global outcome is within their reach. Following a now standard methodology (Pruitt and Lewis, 1975) a table of values indicated - separately for the buyer and for the seller - the ‘value created’, measured in ECU (experimental currency units), for each possible choice for each negotiation item. Preferences for all buyers were identical for all participants playing this role, as were preferences for the sellers.

Table 1 presents these values in a two-column format, one column describing the values for the seller and one for the buyer. These payoffs define, in an exogenous manner, the preferences of the players in our experiment-. The role-specific instructions provide some indications about their real-world context (See Appendix A). In the experiment, each negotiator was informed only about his/her own values, but not about the specific values of the other negotiator.

Note that items 5 and 6 are of the convergent type: in a context of perfect information, rational individuals are expected to agree on the same choice. However, items 1 to 4 are clearly of the divergent type: on each of these items, more value for one party involves less value for the other, and vice-versa. However, there are many advantageous tradeoffs: one party might sacrifice some of his/her gain on a low-priority item, to induce reciprocal behavior by the opponent; this simultaneous tradeoff entails a win-win outcome. Consequently, negotiators can rank their priorities. Obviously, for a buyer, it is more beneficial to obtain a good deal on ‘risk sharing’, while for the seller it is better to have a good deal on the ‘price per patient’. Pruitt and Rubin (1986) defined “logrolling” as the strategy of making tradeoffs on issues that differ in importance to negotiators with the aim of reaching a win-win outcome.

		BUYER (ECU)	SELLER (ECU)
Item 1. COST PER PATIENT	<i>KEuros</i>		
	a/ 1900	-200	<b>1200</b>
	b/ 1700	-100	500
	c/ 1500	100	100
	d/ 1300	200	-500
	e/ 1100	300	-1000
Item 2. THRESHOLD NUMBER OF PATIENTS THAT COULD BE TREATED	<i>Number of patients</i>		
	a/ 30	<b>200</b>	-100
	b/ 40	100	100
	c/ 50	-100	<b>400</b>
Item 3. LOCATION OF PRODUCTION	<i>% Share of production in France</i>		
	a/ 0	-100	<b>200</b>
	b/ 15	100	100
	c/ 30	<b>400</b>	-100
Item 4. CLINICAL RISK SHARING	<i>% Coverage of inefficient therapies</i>		
	a / 100 seller	<b>1200</b>	-200
	b/ 75 seller	500	-100
	c/ 50-50	100	100
	d/ 75 buyer	-500	200
	e/ 100 buyer	-1000	300
Item 5. TIME TO MARKET	<i>Months</i>		
	a/ 6	<b>300</b>	<b>400</b>
	b/ 12	200	300
	c/ 18	100	100
	d/ 24	-100	-100
Item 6. DATA GENERATION (Registry)	<i>Range</i>		
	a/ Narrow	100	100
	b/ Normal	200	200
	c/ Comprehensive	<b>400</b>	<b>300</b>

Table 1: Buyers' and sellers' preferences: the values created depended on contract items (in ECU).

In two-player bargaining games with continuous payoffs, the *highest* payoff one party can obtain can be represented as a function of the gain of the other party. This decreasing, concave curve is referred to as the *Pareto efficient frontier*. At any point on the frontier, participants do not waste opportunities to trade; contracts below the frontier are inefficient, in that a better negotiation could increase the payoff of one party without deteriorating the payoff of the other party. In our experiment, choices were discrete; thus, instead of a continuous frontier, there was a set of Pareto efficient contracts.

In Figure 1, we represent several Pareto efficient contracts. The line that connects these contracts is a proxy for the Pareto efficient frontier.

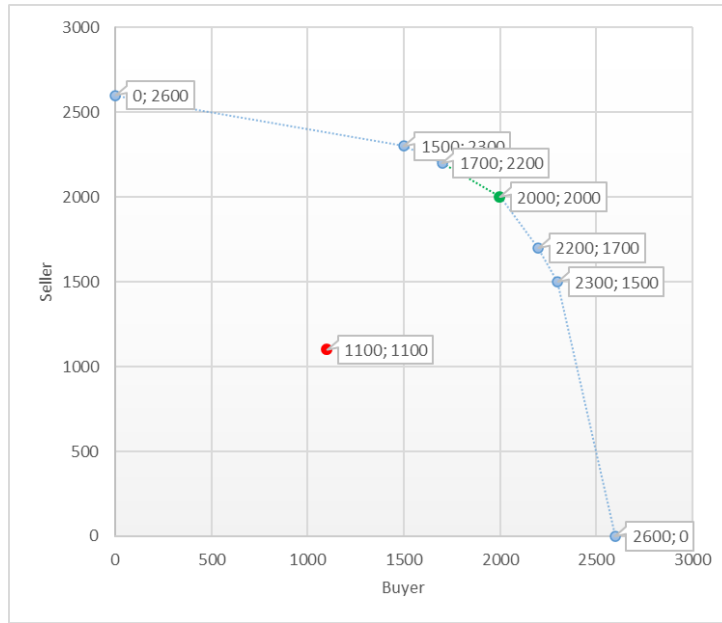


Figure 1. Pareto efficient contracts

In our game, the highest value that could be created was 4000 ECU (2000 for the buyer; 2000 for the seller), with the six-tuple item choice: [1a, 2c, 3c, 4a, 5a, 6c]. This was the 'best' of all Pareto-efficient contracts, as it presented the maximum total value. The connected vector of ECU values was [-200,-100,400,1200,300,400] for the buyer, and [1200,400,-100,-200,400,300] for the seller.

In the neighborhood of this contract, we see two other Pareto efficient contracts, where the value created was (1700; 2200) and (2200; 1700).

The maximum gain a person could obtain in this game was 2800 ECU, if the other party accepted a loss of 700 ECU.<sup>7</sup> This is obviously an impossible outcome in the presence of rational agents, since no negotiator would accept a deal that makes him/her worse off compared to his/her best alternative to a negotiated agreement (BATNA). A negotiator who voluntarily quit the negotiation obtained a zero payoff. The maximum gain one negotiator could obtain when the opponent agreed to leave empty handed was 2600 ECU, as obtained from the contract [1b,2b,3a,4a,5a,6c]. Therefore contracts (2600;0) and (0;2600) define the limit of the Pareto efficient frontier.

However, reaching an efficient outcome is difficult when traders' preferences are private information. What we can refer to as the 'intuitive' or perceived fair contract [1c, 2b, 3b, 4c, 5a, 6c] delivered a smaller positive value (1100 ECUs for both parties) with no tradeoffs between items. More precisely, in this contract, the buyer and seller sets included only positive values ([100, 100, 100, 100, 300, 400] and [100, 100, 100, 100, 400, 300], respectively). The total value created in this negotiation was 2200 ECU, which is significantly lower than the total value in the best contract (4000 ECU).

<sup>7</sup> The buyer would obtain this maximal and unrealistic gain if the agreed contract were [1d,2a,3a,4a,5a,6c].

### 3.3 The negotiation process

The roles of buyer or seller were assigned at random at the beginning of each session.

After the participants read the instructions (general and role-specific), the experiment continued with the negotiation stage which had a fixed duration of 30 minutes and which was automatically terminated by the computer (similar to Arunchalam and Dilla, 1995; Thompson, 1991). Negotiators ideally had to reach an agreement before the 30 minutes ended. They could also decide to terminate the negotiation unilaterally at any moment, a strategy that could also serve as a threat.

The negotiation mechanism involved alternated offers. The seller moved first and submitted his/her initial offer. The buyer received this offer and could accept it or make a counteroffer. The process repeated itself as long as necessary. Participants had one minute to make each offer. A timer was displayed on the decision screen, but was not binding. When the one minute elapsed, they were reminded that they should make their decision. On average, participants negotiated for 15 minutes.

Figure 2 displays the main decision screen. When the active player made his/her offer, he/she saw the partner's pending offer. Buttons at the top of the screen allowed the participant to quickly access the instructions and the values table in the first part of the session. Each participant selected his/her choice for all the six items from a multiple-item list. The software automatically calculated and displayed the total value of the offer at the bottom of the screen. Any change in choice modified the total instantaneously.

Remaining time for the negotiation: 27:04

Round 1  
Remaining time to make an offer: 00:00

General Instructions   Negotiation context   Confidential instructions   Confidential values

You		The seller	Agreement
1. Cost per patient	1300 k€	1300 k€	✓
2. Number of patients to be treated	40	40	✓
3. Percentage of global production and research in France	30%	15%	✗
4. Breakdown of treatment cost for patients on whom treatment does not work	75% seller - 25% buyer	25% for the seller	✗
5. Time between the negotiation and the commercialization of the product	18 months	18 months	✓
6. Database	étroite	normale	✗
<b>Total value of your offer</b>	<b>1400</b>		

Vous : hello, please find out my values  
Le vendeur : hello

The text written below will be sent to the other player

Send offers   Exit negotiation

Figure 2. Main decision screen

To narrow the gap between real-world negotiations and our experimental context, participants were allowed to communicate through a chat box displayed on the decision screen. At each offer, the sender could write a short message to the receiver. The latter received the message at the same time as the sender’s offer. Previous messages were also visible in the chat box. There was no obligation for the parties to communicate.

### 3.4 Treatments and individual characteristics

Three treatments were implemented in a standard between-subject design with the aim of testing hypotheses 2 and 3 as described in Section 2. Participants were allocated at random to one of the three treatment groups. A participant who took part in one treatment could not be invited to participate in another session.

1. Treatment 1 (T1 – *baseline*) with 44 pairs is our control group: this comprised negotiations with no external influence (i.e., advice).
2. Treatment 2 (T2 – *convergence*) with 36 pairs; participants were guided toward first negotiating on the two convergent items, which normally should entail prompt and mutually beneficial agreement (see hypothesis 2 in Section 2).

Specifically, after reading the initial instructions, and before moving on to the negotiation, the following message from the experiment's administrator was displayed on participants' screens, "*We strongly recommend you negotiate first on items 5 and 6*". Note that while players did not know the other party's values, the scenario provided them with a hint that these two items might be convergent.

3. Treatment 3 (T3 – *priority*) with 39 pairs: participants were guided toward voluntarily disclosing information relative to their priority items (see hypothesis 3 in Section 2).

Specifically, after reading the instructions, and before moving on to the negotiation, the following message was displayed: "*We strongly recommend you inform the other negotiator about your priority items, by using qualitative sentences. Your private values cannot be disclosed*".

We used the following four questions to measure participant's level of trust in the other party at three stages: before the negotiation (but after reading the instructions), during the negotiation (after four interactions), and after the negotiation:

- *Do you think that your partner will try to take/is trying to take/took advantage of you, or will be/is/was fair?* [Certain about taking advantage =0; about being fair=10]
- *Do you think your partner will just look out/is just looking out/just looked out for himself/herself or for mutual benefit?* [Certain about looking out for himself/herself = 0; about mutual benefit =10]
- *Do you think your partner will send/is sending/sent misleading information or will communicate/is communicating/communicated honestly?* [Certain about sending misleading information 0; honest communication = 10]
- *Would you say that that you must be careful/had to be careful when dealing with your partner, or that your partner can be/could be trusted?* [Must be careful = 0; partner can/could be trusted = 10]

An individual *index of trust in the other* was calculated by summing the scores for each item (in the range 0 to 10) and normalizing the maximal level to 10. In our pool of 238 subjects, the average pre-negotiation score was 4.7. It would appear that while all items were related to trust, each captured a different dimension since correlation coefficients between the four items lay between 0.38 and 0.67 (see Appendix B, Table B4). This trust scale was internally consistent, as indicated by a satisfactory Cronbach alpha of 0.81.

At the end of the experiment, participants had to provide information about their gender, age, and highest education level obtained.

Tolerance to risk was elicited using the self-reported measure introduced by Dohmen et al. (2011): “How do you see yourself? Are you generally a person who is fully prepared to take risks, or do you try to avoid taking risks? [Avoid taking risks =0; Fully prepared to take risks=10].

It is a standard result in experimental research that subjects’ social preferences can shape the result of a negotiation. We chose to address this issue while taking advantage of the context of the negotiation. To elicit contextual-based social preferences we asked participants (1) how they felt regarding patients having open/restricted access to extremely expensive drugs [All patients should have access =0; Budgets are limited, and choices should be made = 10], and (2) their attitude with respect to pharmaceutical firms making large profits [Very uncomfortable =0; Very comfortable = 10].

At the final stage of the experiment, each player’s computer displayed the status of the negotiation (success/failure) and the gains he/she made. A payment of 5 euros was given per 1000 ECU of new value created, to which was added the 6-euro participation fee (see above). To avoid any wealth effect, participants were not informed about the participation fee until after the experiment ended.

Finally, the computer displayed an open question which allowed participants to share any feelings and remarks they may have had about the experiment with the administrator.

## 4. Results

### 4.1 Key sample statistics

The sample included 238 subjects, 50.21% of whom were women. Average age was 24.7 years. One quarter (24.89 %) of the participants had at least a Master’s degree. Additional data on personal characteristics are presented in Appendix B, according to the treatment (Table B1) and to the role in the negotiation (buyer or seller, Table B2). Socio-demographic characteristics were not significantly different across the three treatment groups, or between sellers and buyers. This confirms the good quality of the randomization process.

There were no significant differences between treatment groups or between buyers and sellers in terms of self-reported tolerance to the profits made by big pharma, their stance on very expensive drugs, or their tolerance to risk (self-reported). In contrast, there was a difference in the level of trust in the other party before the negotiation stage, with buyers (trust index = 4.39) being more distrustful than sellers (trust index = 5.01) ( $p$ -value =0.03,  $n=119$ ).<sup>8</sup> This result suggests that participants were well aware of the stereotypes associated with their roles (e.g., the general public’s distrust of private companies).

Subjects were randomly assigned to 119 buyer-seller pairs. Table B3 in Appendix B presents the gender composition of these pairs according to the treatment. There were 27 female / female dyads, 27 male / male dyads, and 65 mixed dyads. The gender composition of pairs was homogeneously distributed across all three treatments.

A large majority of the pairs reached an agreement during the allotted negotiation time. Table 1 presents the final negotiation status (success / failure) according to treatment.

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<sup>8</sup> The trust in the other measure was elicited before the negotiation, but after reading the scenario.



Only 13 of the 119 pairs failed to reach an agreement. In four of these cases, a negotiator decided to exit unilaterally. In the other nine, the parties could not reach an agreement before the end of the allotted negotiation time. Of course, explaining the causes of these failures constitutes an important research question. Unfortunately, the small number of data points makes any statistical inference tenuous. With this in mind, we note that five failures were observed in the first treatment (i.e., no advice given), and only two in each of the other two treatments. Perhaps, with some additional time, agreement could have been reached in some of these cases. However, for other cases, our post-experiment analysis of the chat box messages and comments revealed that deception and anger took over the rational process of value creation, leading to failure.

In the following sections, most of our analyses will consider only successful negotiations ( $n=106$ ).

	<b>All</b>	<b>Success</b>	<b>Failure</b> (value = 0 for each negotiator)	
	nb. dyads	nb. dyads	30-min deadline was reached	Unilateral termination before 30-min deadline
All treatments	119	106	9	4
T1 – <i>Baseline</i>	44	38	5	1
T2 – <i>Convergence</i>	36	32	2	2
T3 – <i>Priority</i>	39	36	2	1

Table 1. Status of negotiation by treatment

The average time spent in successful negotiations was 1034 seconds (17 minutes and 14 seconds), 952 seconds (15 minutes and 52 seconds) and 965 seconds (16 minutes and 5 seconds), respectively, in the Baseline, Convergence, and Priority treatments (Table B2). The duration of successful negotiations did not significantly differ between treatment groups ( $p = 0.757$ ).

Figure 3 presents the histogram of the total value added by the pairs of negotiators in all three treatments. At the left of the distribution are the 19 pairs that did not reach an agreement. Eight pairs agreed on the ‘intuitive’ contract (1100;1100) (see above). Remember this contract allowed negotiators to obtain a positive value without agreeing on any loss, on any item. Negotiators in 64 pairs accepted some sacrifices and managed to generate a joint value greater than 2200 ECU. Two dyads agreed on the best contract, providing a maximum of 4000 ECU (see above).

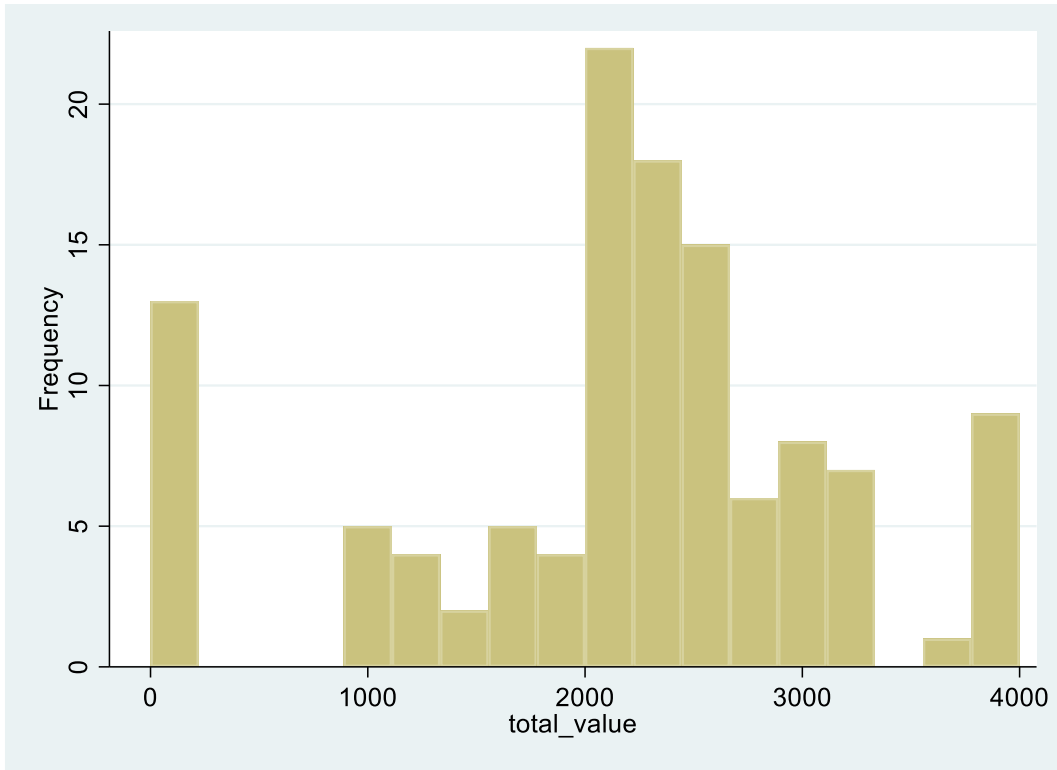


Figure 3: The distribution of total value created at the dyad level ( $n=119$ )

On average, the more time parties spent on negotiating, the higher was the value created. Figure 4 displays the scatter diagram of the negotiation time and total value by dyads, as well as a nonlinear, weighted fitted curve, using the Stata 'lowess' command. The concavity of the curve suggests that most of the gains were obtained in the early moments of the negotiation.

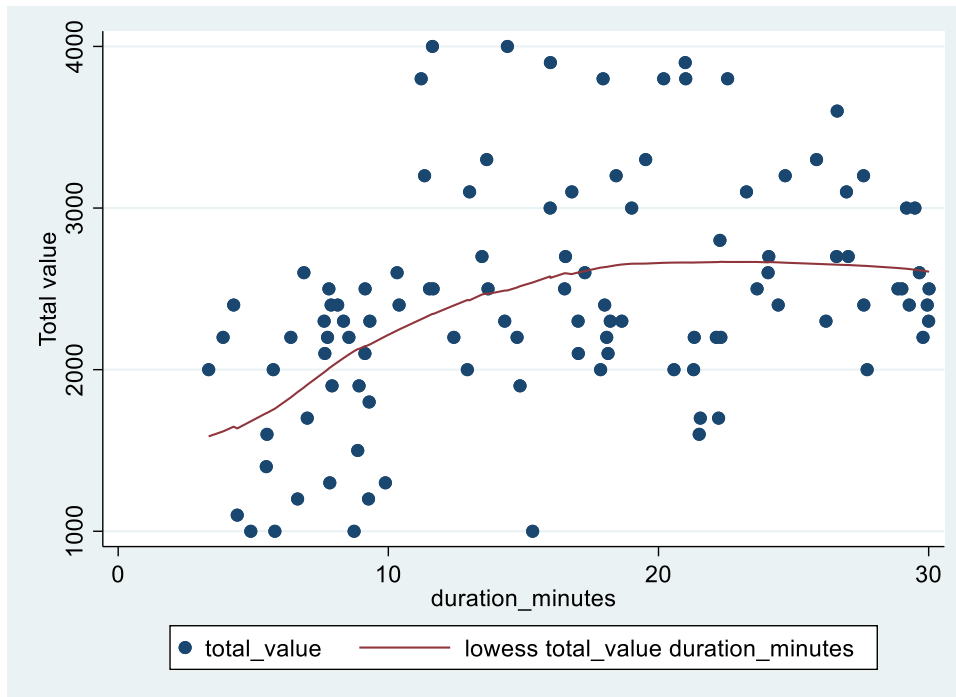


Figure 4. Total value and Negotiation time ( $n = 106$ )

Figure 5 presents the scatter plot of the value created by a dyad, separately for buyers and sellers, for the full sample (i.e., all three treatments), and by treatment.

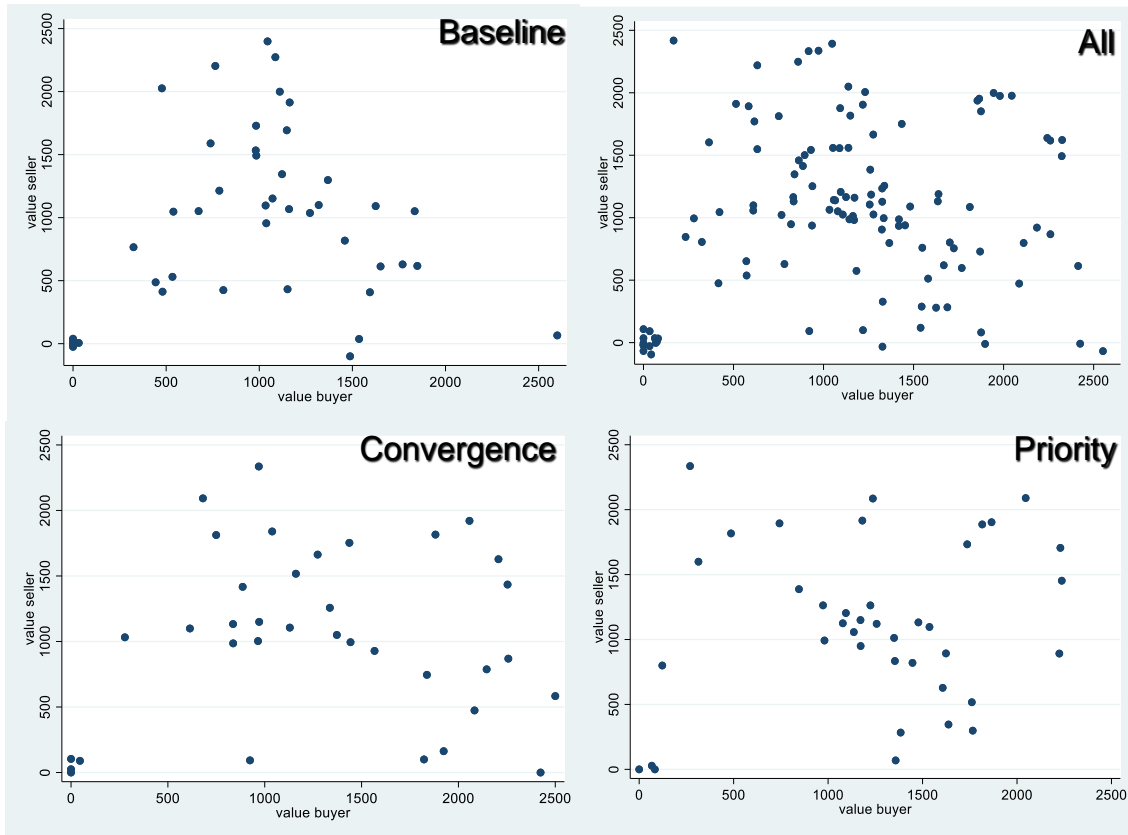


Figure 5: Structure and value. Value created by a dyad, for sellers and buyers, by treatment.

In Figure 5, most of the dots are located below the (theoretical) Pareto frontier (not represented, see Figure 1). These agreements are inefficient, showing that negotiators missed opportunities to cooperate for a better solution, that is to say, a solution in which at least one party would have gained more, without reducing the payoff for the other party. However, Figure 3 also reveals that in the two treatments where participants were provided some advice about how to engage in the negotiation, a larger number of dots are close to the frontier. We shall analyze this result in detail later.

In our experiment, negotiators' preferences were symmetric (see Table 1). There was nothing in the study design to induce a significant gap in bargaining power; although the seller made the first offer, the interaction was repeated until an agreement was reached. When fairness is a major goal of negotiators, the surplus (whatever its size) is expected to be equally split between the two participants, and the contract should be located on the 45° line. However, as Figure 3 shows, this was not the case in our experiment, as negotiated contracts were scattered above and below the 45° line. In the sample of successful negotiations ( $n=106$ ), the mean absolute difference between the gains of the seller and of the buyer was 673 ECU in the baseline treatment (i.e., no advice provided), 790 ECU in the convergence treatment, and 600 ECU in the priority treatment. The difference across the treatments was not statistically significant.

## 4.2 Specific results – analysis by dyads (joint output)

This subsection analyses the total value generated at the pair level, i.e., the sum of the total value created by the buyer and the seller (Table 2).

Taking account of the full sample data, which include the zero values ( $n=119$ ), Table 2 suggests that the two treatments where advice was provided significantly contributed to increase the value created. Specifically, the total value was significantly larger for the convergence treatment (2291 ECU) (versus baseline (1909 ECU)) ( $p = 0.04$ ) and for the priority treatment (2333 ECU) (versus baseline ( $p = 0.02$ )). Furthermore, Table 2 shows that both treatments led to almost the same increase in net value, as there was no significant difference in total values between them ( $p = 0.43$ ).

Table 2 also displays the mean total value by treatment, conditional on success ( $n = 106$ ). Excluding the zero values (i.e., failed negotiations), mean total values were larger for all three treatments. The comparison of the value created in the three treatments is consistent with the results obtained in the full sample. The total value was significantly larger for the convergence treatment (2578 ECU) (versus baseline (2210 ECU)) ( $p = 0.01$ ) and for the priority treatment (2527 ECU) (versus baseline) ( $p = 0.02$ ). There was no significant difference between the convergence and priority treatments ( $p = 0.61$ ).

	Full sample (n= 119)					
	T1 baseline	T2 convergence	T3 priority	p (baseline vs convergence)	p (baseline vs priority)	p (convergence vs priority)
Mean total value (std)	1909.10 (972.84)	2291.67 (1064.60)	2333.33 (973.15)	0.04	0.02	0.43
Mean seller's value (std)	940.91 (692.93)	1027.78 (689.77)	1117.95 (626.55)	0.29	0.11	0.27
Mean buyer's value (std)	968.19 (585.00)	1263.89 (733.35)	1215.39 (619.23)	0.02	0.03	0.62

	Success (n= 106)					
	T1 baseline	T2 convergence	T3 priority	p (baseline vs convergence)	p (baseline vs priority)	p (convergence vs priority)
Mean total value (std)	2210.53 (644.64)	2578.13 (719.20)	2527.78 (722.94)	0.01	0.02	0.61
Mean seller's value (std)	1089.47 (625.92)	1156.25 (619.54)	1211.11 (556.92)	0.33	0.19	0.35
Mean buyer's value (std)	1121.06 (470.86)	1421.88 (612.63)	1316.67 (528.34)	0.01	0.04	0.22

Table 2: Mean total value at the dyad level according to treatment and role (seller/ buyer)

We also analyzed the exchange of information via the chat box tool. Six, eight and five pairs had no two-way exchange of messages in the baseline, convergence, and priority treatments, respectively. In the subsample of successful negotiations ( $n = 106$ ), these numbers were six, seven and four. Pairs who used the chat box obtained significantly higher total values (2495 ECU versus 2082 ECU,  $p = 0.02$ ) in successful negotiations.

We implemented a regression model to provide additional insights. Table 3 presents the output of several ordinary least squares (OLS) regressions, using the total value created at the pair level as a main dependent variable for successful negotiations ( $n = 106$ ).

The baseline treatment was our reference. A dummy variable took the value 1 for the convergence treatment and 0 otherwise, and another dummy variable took the value 1 for the priority treatment and 0 otherwise.

We introduced two main explanatory variables at the dyad level: the time spent negotiating and the gender composition of the dyads.

The production of information as the activity to discover the preferences of the other, and to reach a compromise may have neoclassical properties; in other words, the value created should increase with the time spent on negotiating (where the latter is a proxy for effort), yet the marginal contribution of time should decrease. We studied the effect of the variable ‘time’ measured in minutes (average time spent negotiating at the pair level), and of the square of this variable. A negative coefficient on the latter is indicative of a concave production function.

To analyze how the gender composition of the buyer/seller pair influences value creation in the negotiation, we introduced gender composition dummy variables, in the order (Buyer; Seller). With the notation M for a male subject and F for a female subject, the dyads were MM, MF, FM and FF. In the regressions, FF pairs served as the reference.

	Dependent Variable: total value				Dependent Variable: log total value			
	model1	model2	model3	model4	model5	model6	model7	model8
	b/t	b/t	b/t	b/t	b/t	b/t	b/t	b/t
T2 – convergence	374.719** (2.45)	380.782** (2.58)	389.431** (2.57)	395.378** (2.60)	0.164** (2.46)	0.167** (2.58)	0.170** (2.55)	0.173** (2.60)
T3 – priority	368.612** (2.49)	323.436** (2.25)	325.280** (2.25)	333.679** (2.28)	0.170*** (2.63)	0.151** (2.40)	0.152** (2.40)	0.156** (2.43)
Time spent negotiating (min)	37.596*** (4.70)	146.265*** (3.79)	147.196*** (3.79)	147.159*** (3.80)	0.018*** (5.29)	0.063*** (3.74)	0.063*** (3.72)	0.063*** (3.74)
(Time spent negotiating) <sup>2</sup>		-3.191*** (-2.88)	-3.210*** (-2.87)	-3.217*** (-2.88)		-0.001*** (-2.70)	-0.001*** (-2.69)	-0.001*** (-2.71)
Buyer M Seller M	324.571* (1.81)	272.886* (1.86)	264.963* (1.89)	290.260* (1.82)	0.161** (2.06)	0.140** (2.03)	0.138** (1.99)	0.148** (2.08)
Buyer M Seller F	342.495* (1.87)	268.421* (1.81)	259.364* (1.83)	275.635* (1.83)	0.184** (2.32)	0.154** (2.07)	0.151** (2.06)	0.157** (2.00)
Buyer F Seller M	200.505 (1.14)	183.229 (1.08)	174.363 (1.00)	193.215 (1.12)	0.095 (1.24)	0.088 (1.18)	0.085 (1.12)	0.092 (1.23)
Average risk taking behavior			10.438 (0.29)				0.003 (0.21)	
Average trust index (before negotiation)				20.528 (0.46)				0.008 (0.46)
Constant	1351.425*** (6.38)	673.080** (2.16)	607.476 (1.57)	554.658 (1.36)	7.226*** (78.28)	6.948*** (50.84)	6.926*** (40.75)	6.895*** (38.66)
r2	0.250	0.308	0.309	0.310	0.291	0.340	0.340	0.341
N	106	106	106	106	106	106	106	106

Table 3: Ordinary Least Squares estimates of the value equation; Dyad data

Model 1 was our benchmark. In models 1-4, the dependent variable was the total value in ECU created by the pair. To test for a decreasing marginal contribution of time, Model 2 added the square of the time variable. As additional controls, Model 3 added the dyad average tolerance to risk of the pair, and Model 4 added the dyad average trust index at the beginning of the negotiation.<sup>9</sup> To check for robustness, Models 5-8 used the log of the total value as the dependent variable, including the same explanatory variables as in Models 1-4. This log transformation brought the data closer to the normal distribution.

<sup>9</sup> This is the dyad average of self-reported tolerance to risk, and of self-reported trust in the other player.

We found the following results:

**Result 1:** *Total value created at the dyad level was an increasing, concave function in relation to the time spent negotiating.*

Model 1 suggested that for each additional minute of negotiation, the average value created increased by 37.6 ECU. However, as shown in Models 2-4, the coefficient of the quadratic term on time was negative, significant and relatively large here. The marginal gain of time decreased over time, fully vanishing after approximately 24 minutes. We infer that the larger gains were obtained early in the negotiation process. This might explain why many participants stopped the negotiation before reaching the best contract, and before the 30-minute deadline.

**Result 2:** *The additional negotiation structure, established by guiding negotiators towards early small wins (convergence) or additional transparency (priority), created value.*

In all eight regressions, the ‘advice’ treatment (i.e., convergence and priority treatments) variables were consistently positive and significant at a 5% level, and even at a 1% level in some of the log specifications. As shown in Model 1, the better negotiation structure (thanks to advice being provided) increased the value created by 374 ECU in the convergence treatment, and by 368 ECU in the priority treatment.

Our results corroborate the early-wins anchoring effect hypothesis (Thompson and Hastie, 1990; Bazerman et al., 2000). They also support the information exchange hypothesis (see above) by Walton and McKersie (1965), which received empirical confirmation by Thompson (1991) and Brett and Thompson (2016).

**Result 3.** *In the experiment, the capital of trust at the outset of the negotiation - as estimated by mean value at the dyad level - was not associated with a higher created value.*

This result suggests some form of excessive candor, which worked against the negotiator, as pointed out by DeRue et al. (2009). As we will show in the next section, the analysis of individual data sheds additional light on this rather surprising result.

A gender effect was also observed, as male-only teams (i.e., MM dyads) and teams where the buyer was male performed better than our benchmark (female-only dyads). The MM and MF dummy variables were significant at the 5% level in four specifications, and at the 10% level in four specifications.

#### 4.3 Specific effects for buyers and for sellers

We now analyze the determining factors of value creation using individual data.

Based on raw data displayed in Table 2, Figure 6 shows the net gain associated with the two more structured ‘advice’-based treatments compared to the baseline treatment, separately for buyers and sellers. While both types of negotiators seemed to benefit from the additional structure, most of the net gain accrued to the buyer in both treatments.<sup>10</sup> We will comment on this result in the next sub-section.

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<sup>10</sup> The increase in the total value created was statistically significant for the buyer in both treatments (Table 2). The increase was not statistically significant for the seller.

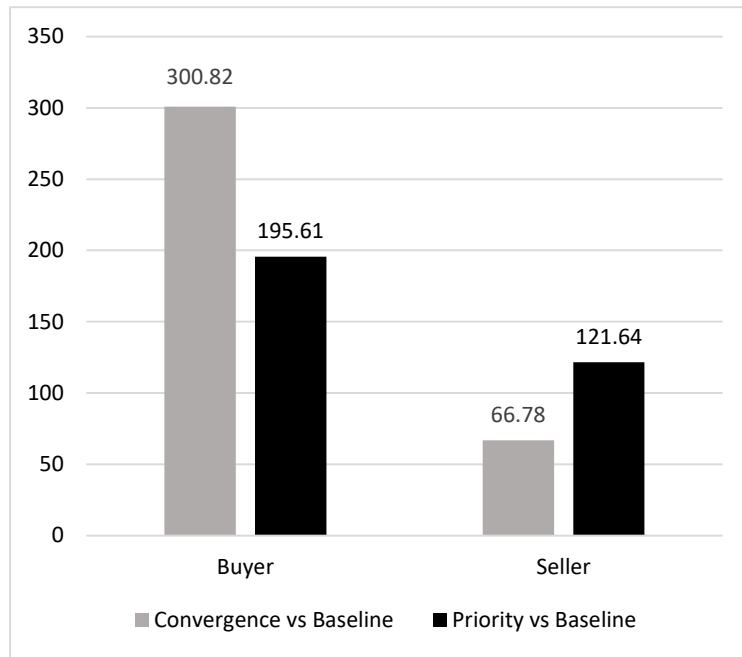


Figure 6. Change in value created, by role and treatment.

Regression analyses using observations at the individual level can provide additional insights. Because a seller and a buyer are tied within a dyad, the estimation errors are not independent. A Seemingly Unrelated Regressions (SUR) model allows us to correct for this bias. Table 4 presents the output of our SUR estimates, using observations from successful negotiations ( $n=106$ ).<sup>11</sup>

The dependent variable is the value created by a seller and respectively by a buyer. All explanatory variables are specific to either the seller or the buyer (including the time variable). Treatment dummies are the same as used previously. One dummy variable allows us to identify the gender of the negotiator (1 for male), and another allows us to identify the gender of the partner.

Model 1 is the main model, including treatment dummies, time and gender dummies. Model 2 adds the square of the time variable. Specifications 3 to 7 include, successively, the participants' attitude towards high big-pharma profits, their attitude toward access to expensive therapies, their tolerance to risk, the self-reported trust they have in the partner before the negotiation started, and the partner's self-reported trust in them before the negotiation started.

Our SUR results corroborate the key findings in Table 2:

**Result 4:** *The surplus from a better negotiation structure – i.e., ‘advice-based treatments – essentially accrued to the buyer. The payoff for the seller also increased, but the change was not statistically significant. The seller was not worse off.*

This result suggests that the additional structure, leading to a more fluid exchange of information or more confidence after early wins, benefited the more distrustful agent most, i.e., the buyer. An initial imbalance in trust, possibly grounded in stereotypes about the

<sup>11</sup> Results from simple OLS models lead to similar conclusions.

other party, was in some cases offset by better communication, or an early agreement on some items.

The value created increased with the time spent negotiating; the marginal contribution of time decreased, as we saw previously (see above). Although the seller obtained the largest early gains, over time, it was the buyer who obtained the largest gain.

With regard to the gender analysis, male buyers obtained better deals on behalf of their employer (the NIH body), regardless of the gender of the seller. With a weak statistical significance, it seems that male sellers also tended to create additional value for their company.

The individual data analysis also provides additional insights into the effect of trust in one's partner on the negotiation outcome. We remind the reader that this measure of trust was evaluated at the outset of the experiment using a set of four questions (see above).

**Result 5.** *In this experiment, a buyer who put his/her trust in the seller lost value (low significance); accordingly, a seller who faced a trustful buyer saw his/her gain increase.*

We did not find an equivalent effect in terms of the seller's level of trust in their partner.

Context-based social preferences (tolerance toward profits and access to therapies) did not appear to be a major determinant of the negotiation outcome, except for the tolerance toward profits, which had a negative influence on sellers' gain. This seemingly counterintuitive outcome can be explained by the importance of taking into account the interest of the other party in reaching an integrative agreement (Bazerman and Neale, 1992).



	model1	model2	model3	model4	model5	model6	model7
	b/t	b/t	b/t	b/t	b/t	b/t	b/t
<b>Total value Seller</b>							
T2 – convergence	73.545 (0.52)	87.647 (0.63)	109.229 (0.81)	106.651 (0.78)	69.541 (0.50)	72.765 (0.52)	131.206 (0.98)
T3 – priority	125.648 (0.92)	106.791 (0.80)	109.764 (0.84)	116.206 (0.88)	105.469 (0.79)	108.071 (0.81)	172.859 (1.31)
Time spent negotiating (min)	9.738 (1.33)	78.483** (2.16)	80.768** (2.28)	78.277** (2.19)	78.271** (2.17)	77.147** (2.13)	79.998** (2.29)
(Time spent negotiating) <sup>2</sup>		-2.012* (-1.93)	-2.132** (-2.09)	-2.035** (-1.98)	-2.022* (-1.95)	-1.955* (-1.88)	-1.993** (-1.99)
male_seller	182.724 (1.61)	177.878 (1.59)	215.477* (1.96)	200.687* (1.81)	192.691* (1.71)	160.821 (1.42)	185.617* (1.73)
male_buyer	25.407 (0.22)	-13.559 (-0.12)	-20.420 (-0.18)	-14.206 (-0.13)	-8.434 (-0.07)	-14.375 (-0.13)	27.209 (0.25)
Tolerance toward profits made by big pharma (high value = high tolerance)			-45.841** (-2.19)				
Position toward very expensive drugs (low value: all patients must have access to very expensive drugs)				-29.273 (-1.53)			
Risk taking behavior (high value = risk taker)					-19.039 (-0.77)		
Trust index (before negotiation)						-20.324 (-0.77)	
Trust index of the buyer (before negotiation)							60.932** (2.42)
Constant	816.413*** (4.60)	375.199 (1.30)	535.664* (1.85)	441.830 (1.54)	484.073 (1.52)	492.917 (1.52)	19.047 (0.06)
<b>Total value Buyer</b>							
T2 – convergence	330.657*** (2.77)	333.397*** (2.80)	326.518*** (2.77)	329.376*** (2.78)	325.382*** (2.73)	305.137*** (2.61)	347.632*** (2.91)
T3 – priority	253.075** (2.19)	244.792** (2.12)	207.251* (1.76)	227.206** (1.96)	239.804** (2.08)	202.065* (1.76)	243.840** (2.13)
Time spent negotiating (min)	21.489*** (3.47)	48.577 (1.56)	54.868* (1.76)	54.783* (1.75)	46.282 (1.48)	47.828 (1.58)	49.080 (1.59)
(Time spent negotiating) <sup>2</sup>		-0.788 (-0.89)	-0.952 (-1.07)	-0.951 (-1.06)	-0.728 (-0.82)	-0.810 (-0.94)	-0.819 (-0.93)
male_buyer	198.451** (2.06)	183.567* (1.88)	209.701** (2.12)	183.035* (1.88)	189.464* (1.94)	157.367 (1.64)	184.932* (1.91)
male_seller	-106.411 (-1.10)	-107.583 (-1.12)	-87.906 (-0.91)	-111.051 (-1.16)	-107.664 (-1.13)	-112.203 (-1.20)	-90.989 (-0.93)
Tolerance toward profits made by big pharma (high value = high tolerance)			-24.465 (-1.27)				
Position toward very expensive drugs (low value: all patients must have access to very expensive drugs)				-17.702 (-1.25)			
Risk taking behavior (high value = risk taker)					-12.403 (-0.62)		
Trust index (before negotiation)						-38.924* (-1.78)	
Trust index of the seller (before negotiation)							19.708 (0.88)
Constant	687.911*** (4.56)	513.476** (2.08)	545.551** (2.22)	523.819** (2.13)	606.362** (2.09)	740.915*** (2.71)	403.595 (1.47)
r2	0.050	0.080	0.127	0.110	0.091	0.088	0.148
N	106	106	106	106	106	106	106

Table 4. SUR estimates of the value creation equation; individual data

Finally, Table 5 shows the evolution of trust in one’s partner before, during (after 4 iterations) and after the negotiation, according to treatment.

In general, trust increased between the beginning of the experiment and the end of the experiment; this is not surprising given the large number of successful negotiations.<sup>12</sup> This positive change in the level of trust was statistically significant for both buyers and sellers in the convergence and priority treatments. It was significant only for buyers in the baseline treatment. The production of trust is an important non-monetary benefit of structured negotiations. In repeated negotiations, an increase in trust might bring about positive material consequences. Our study design did not allow us to investigate this hypothesis.

	Full sample (n= 119)						
	Buyer			Seller			
	T1 baseline	T2 convergence	T3 priority	T1 baseline	T2 convergence	T3 priority	
Trust index before negotiation		5.08	4.15	3.84	5.16	4.51	5.31
Trust index during negotiation <sup>(a)</sup>		4.82	4.74	4.33	5.84	4.73	5.46
Trust index at the end of negociation		6.13	5.58	5.65	5.60	6.09	6.39
$p$ (trust before versus at the end)		0.005	<0.001	<0.001	0.17	<0.001	<0.001

	Success (n= 106)						
	Buyer			Seller			
	T1 baseline	T2 convergence	T3 priority	T1 baseline	T2 convergence	T3 priority	
Trust index before negotiation		4.90	4.17	3.90	5.28	4.45	5.19
Trust index during negociation <sup>(a)</sup>		4.79	4.76	4.28	6.04	5.04	5.39
Trust index at the end of negociation		6.36	5.48	5.92	6.00	6.43	6.45
$p$ (trust before versus at the end)		<0.001	0.001	<0.001	0.09	<0.001	<0.001

(a) : after 4 iterations

Table 5. The evolution of trust during the experiment

## 5. Conclusion

This paper reports the results from a laboratory experiment designed to observe and analyze how two players negotiate a relatively complex, advance therapy-transfer contract. Participants negotiated subject to a realistic system of incentives that, in a frictionless world, should have driven them toward maximum value creation. We used our experimental data to unveil the production function of negotiators who spent time and effort to find as efficient an agreement as possible. Our analysis revealed several factors that drive value creation in negotiations.

Our analysis and interpretation of results was only based on successful negotiations. This is one major limitation of our analysis. A small number of negotiators unilaterally withdrew from the negotiation (4 out of 119 pairs) or could not reach even the simple intuitive outcome before the time allowed for the negotiation had elapsed (9 out of 119 pairs). A reading of the chat box exchanges for these 13 pairs suggests that these extensive

<sup>12</sup> A qualitative survey at the end of the experiment also confirmed that participants enjoyed the experience.

margin failures were grounded in negative emotional dynamics. Further research could attempt to examine and explain this hypothesis.

Our results show that spending more time negotiating, or to put it simply ‘doing more work’, creates value. In successful negotiations, the new value created in one minutes of negotiation was 37 ECU on average, or approximately 1% of the maximum value that could be created in this experiment. However, the value production function was concave: the marginal productivity of time was highest at the beginning of the negotiation and fell to zero after approximately 24 minutes. This validates our calibration of the total time of the experiment at 30 minutes. In this context, it is likely that failures to reach an agreement cannot simply be explained by a ‘lack of time’.

Two treatments allowed us to study whether improvements in the structure - through providing advice to participants - of the negotiation process led to improved efficiency. Several authors have argued that guiding negotiators toward small wins early in the negotiation process should increase the likelihood of reaching an integrative outcome by setting a “favorable script” for the rest of the negotiation (Thompson and Hastie, 1990; Bazerman, 2000) and increasing trust (Mitchel, 1981). Other authors have debated on whether disclosing information about one’s priority goals can increase the likelihood of the integrative outcome, without reaching a definitive conclusion (Walton and McKersie, 1965; Pruitt and Lewis, 1975; Schultz and Pruitt, 1978; Thompson, 1991; Brett and Thompson, 2016). Our results confirmed that a more integrative outcome can be achieved by recommending to negotiators that they start the negotiation process with convergent criteria (early wins), or that they communicate their priorities to the other party. The effects of the advice-based treatments we explored were large, amounting to approximately 9% of the maximum value which could be created in our experiment.

In this experiment, buyers were relatively more distrustful of sellers than vice-versa, based on the trust index elicited before the negotiations started (but after reading the scenario). This imbalance is in line with usual stereotypes where lay persons tend to trust the public administration more than private corporations. In our data, additional structure in the advice-based treatments helped redress the balance of trust, and brought substantial benefit to the most distrustful party (i.e., the buyer).

The findings of a large body of laboratory experiments in economics and psychology analyzing how men and women negotiate wage increases and other work-benefits highlight that women underperform with respect to men (Stuhlmacher and Walters, 1999). In all those experiments, the gender of the subject in the role of the employee was an observed variable; therefore the poor result could be interpreted as proof of hidden discrimination. On the contrary, the experimental study by Exley et al. (2020) on wage negotiation with anonymous players - gender being a private observation - found no difference between wages negotiated in the lab by men and women. Gender was also a private observation in our experiment, yet we found women fared less well than men. Therefore the poorer performance of women in our sample cannot be related to gender discrimination.

In the present experiment, a majority of dyads reached an integrative outcome. It is no surprise that these successful negotiations were associated with improved trust in the partner as the negotiation continued. In contrast, initial trust did not appear to contribute directly to the success of the negotiation. Indeed, we found suggestive evidence that buyers who were more trustful were penalized than those less trustful. These results reveal the

complex role of trust in bilateral negotiations, as discussed by Lewicki and Polin (2013). Trust appears to be more the product of a successful negotiation than a factor that contributes to its success. In this respect too, our results raise relevant questions for further research.

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## 7. APPENDIX A. Instructions and scenario of the negotiation<sup>13</sup>

### Welcome to the Experimental Lab

The purpose of the experiment is to observe how you negotiate a deal in a predetermined context.

Please read these instructions carefully. Your take-home compensation will depend on the outcome of the negotiation, which in turn depends on the rules presented in these instructions.

All your decisions will be treated anonymously. You will indicate your choices on the computer you are sitting in front of. From this point on we ask you not to speak or use your cellular phone.

If you have a question, please raise your hand and an administrator will come and answer you privately.

### GENERAL INSTRUCTIONS

A scenario will present you with the context of the negotiation. Briefly, there is a negotiation between a biotech company which has discovered a new therapy, and the National Health Insurance (NHI) body which seeks to acquire this therapy.

There are two players: the seller, who is a representative of the Biotech firm, and the buyer, who is a representative of the NHI body. At the beginning of the experiment, the computer will randomly create pairs of anonymous buyers and sellers, selected from the pool of participants for this session. The role of buyer or seller is also assigned at random. The identity of other player in your pair, with whom you will negotiate, will never be revealed to you, and your identity will not be revealed to him/her.

The experiment proceeds in two distinct stages:

**The first stage** lasts 25 minutes and will allow you to become familiar with the negotiation scenario.

The general part of the scenario is identical for both the buyer the seller, and will be displayed on the main screen of the laboratory. As you will see, the negotiation is based on six contract items. For each item, there are several possible choices. The value of each choice for each item is confidential information for you only. Players only know their own values, and do not know the values of their partner. Please make sure you understand the meaning of these values, since your end of experiment compensation is proportional to the total value you obtain for your employer. Potential gains differ from one item of negotiation to another. Please study your priority item or items.

**The second stage** will last 30 minutes at most. It is the negotiation process. The negotiation is sequential: the seller and the buyer submit successive offers by indicating their acceptable choice for all the six items. The seller will play first. When they submit their offer, participants can also send short instantaneous messages to their partner via a chat box.

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<sup>13</sup> Translated from French.



Each player has up to 1 minute to submit a new proposal by pressing the button "Send the offer". If no new offer is submitted, the offer recorded during the previous round is maintained.

The negotiation is successful if agreement is reached on all six items. If there is disagreement on at least one item, the negotiation has failed. If the negotiation fails, both players earn 0 euros. If the negotiation succeeds, the payoff for each player is obtained by multiplying the total value obtained for their employer by 0.005. For example, a value of 1000 leads to a cash payoff of 5 euros.

Negotiators can unilaterally decide to terminate the negotiation by pressing the button 'Exit negotiation', or can negotiate until the time set for the negotiation - 30 minutes - elapses. If one player unilaterally exists, the negotiation is automatically terminated for the other player. We remind you that if the negotiation is terminated before reaching an agreement on all six items, neither player earns anything.

Do you have any questions? If you do, please raise your hand, and wait for an administrator to come to you.

The first stage will begin just after you click on the button "Next". You will have 25 minutes to read the scenario.

## **THE SCENARIO**

### **Part I – Common to seller and buyer**

#### *The general context of the negotiation*

In France, drug prices are regulated. Pharmaceutical firms negotiate conditions of access to market with the National Health Insurance body (more specifically, its Public Committee). The health sector is a major sector of the French economy (11.1% of GDP). Drugs represent 14% of total health care spending. AdvancedBiotech obtained a Marketing Authorization for its new drug Tamiolas, which provides a potential cure for Appold Disease. Tamiolas is the only therapy for Appold disease, and therefore there is no competing technology or process. The negotiation for access to market for Tamiolas includes six essential negotiation items that will be explained later. The negotiation is carried out by two key negotiators, one on behalf of the firm and the other on behalf of the NHI body, respectively. Pat Seller is the Market Access Director with the company AdvancedBiotech and its main negotiator. Chris Buyer is a Senior Civil Officer and serves as the main negotiator on behalf of the NHI body's Public Committee.

#### *Goals of negotiating parties*

AdvancedBiotech is a young international biotech company based outside France. Its main goals are to bring value to patients, generate revenue, achieve sustainable innovation by investing in R&D, and ensure commercial expansion in Europe.

The NHI body's Public Committee has a longstanding tradition of public service. Its main goals are to maximize value for patients and bring clinically meaningful products to patients at a sustainable cost for the NHI body. It supports therapeutic innovation.

In general, the Public Committee manages its budget under tight constraints. However, if authorized, the expense of providing Tamiolas to patients should represent a very small share of the total budget. It should be kept in mind that by agreeing on a price for Tamiolas, the Public Committee also sets up a reference price for future drugs for this kind of disease and future drugs based on similar technology.

For this kind of innovative drug, patients are fully covered for expenses by the NHI (i.e., 100% of the cost of treatment is reimbursed).

#### *The disease (Appold Disease)*

Appold Disease (ApD) is a rare, fatal, neurodegenerative disease that affects motor neurons. It is a genetic hereditary disease.

1. Clinical description: The most common and recognizable symptoms are a weakening of limbs, and of the ability to hold and use objects and to walk. Disease progression in fast-progressing patients ultimately leads to death, generally caused by respiratory failure, within 3-5 years.
2. Diagnosis: Confirmatory diagnosis is obtained by means of genetic testing. However, a physician needs to first suspect Appold disease in order to prescribe testing.
3. Epidemiology. ApD symptoms typically present at around 40 years of age. According to AdvancedBiotech, there are 40 diagnosed patients in France today (out of an estimated total of 200 people affected by the disease). This means that a maximum number of 40 patients could be treated today according to the company.
4. Management and treatment: there is no available cure for ApD today. Current available options alleviate symptoms, but cannot stop disease progression or death.

#### *The product – Tamiolas*

Tamiolas is based on gene therapy. Gene therapy is a technique that modifies a person's genes to treat or cure disease. Tamiolas prevents disease progression by targeting the specific gene (the APLD gene) that causes ApD. The treatment is one-off and therefore this cost is expected to be the only cost over the patient's lifetime. The company does not communicate on the production cost, yet independent experts have estimated it at least half a million euros per patient. The cost of other gene therapy ranges between one and two million euros per patient.

#### *The negotiation process*

In the negotiation, both AdvancedBiotech and the Public Committee stand to gain from a successful negotiation, defined as reaching an agreement on all the six essential items of the negotiation (which are the terms of the contract). Both the seller and the buyer try to maximize the value generated for their respective employers from the negotiation.

Both parties stand to lose in case of a failure to reach an agreement. Failure would be the source of major delays and the potential death of untreated patients. It would also represent a major financial loss for the company.

The negotiation involves a set of six contractual clauses or items. For each item, there are several possible choices on which negotiators should bargain. The value of each choice will be explained later, in a confidential instruction to each negotiator. The contract clauses are:

1. Price per patient

Description: This is the treatment price per patient on which the Public Committee and AdvancedBiotech can agree.

Options: [1100 k€, 1300 k€, 1500 k€, 1700 k€, 1900 k€]

2. Threshold number of patients to be treated

Description: This threshold is the maximum number of patients which the Public Committee would pay for during the first year of treatment. Beyond that number, patients would be treated for free (i.e., the company would not receive any extra money for treating extra patients) regardless of the cost per patient agreed.

Options: [30, 40, 50] number of patients

3. Location : percentage of global production and research in France

Description: This represents an investment that AdvancedBiotech (as a foreign-based company) could make in France, expressed as a percentage of global production. The larger the percentage, the larger the investment for Tamiolas in France.

Options: [0%; 15%, 30%] production in France

#### 4. Clinical risk-sharing

Description: This is an innovative payment scheme that acts as an insurance policy for the buyer in the special case when the therapy does not work for some patients. The negotiation indicates who will bear the cost of the treatment for these patients.

Options: [100% seller, 75% seller, 50% seller - 50% buyer, 75% buyer, 100% buyer]

#### 5. Speed to reach the market

Description: this is the time between when the agreement is reached and when the product is commercialized under the terms agreed.

The faster the negotiation/agreement, the earlier the product can be commercialized, the earlier the seller will obtain revenue, the earlier the buyer will spend funds, and therefore the earlier patients will benefit from the therapy.

Options about the speed: [6 months, 12 months, 18 months, 24 months]

#### 6. Monitoring and data generation (Registry)

Description: Because of the uncertainty on the therapy's real-world effectiveness, as well as the relatively high estimated rate of non-diagnosed patients, the seller and the buyer could jointly invest in a public-private partnership which would create a database infrastructure that would help both to identify new patients and follow the real-world performance of the therapy. The seller and the buyer can decide how comprehensive this database could be.

Options about the database: [comprehensive, standard, narrow]

### *The experimental design*

At the beginning of the experiment, you will be matched in a negotiation pair with an anonymous player selected at random among the participants in the experiment. Your identity will not be revealed to them, and you will not know who your partner is.

The role – a buyer or a seller – is assigned at random by the computer.

The design of the experiment allows for sequential offers between the buyer and the seller. The offers can be accompanied by a short chat message (up to 140 characters).

The seller makes the first move: he/she submits an offer and a message. The buyer responds with his/her own offer. The process continues until an agreement is reached, or until the 30 minutes set for the negotiation elapse.

The buyer and the seller have their own preferences for each of the possible choices for each of the six negotiation items.

The value generated for each choice for each item is displayed in a confidential table joined to these instructions. These specific values define the priorities of each negotiator; please study them carefully. You will only know your values, not the values of the other party. Please make sure to keep your values strictly confidential.

At each round, the computer displays the total value of your offer (i.e., the sum of the value for all six items).

### *Compensation for the experiment*

If you reach an agreement, your take-home gain in euros is obtained by multiplying the total value obtained for your employer during the negotiation by 0.005. For instance, a 1000 k€ net value will bring you 5 €.

If no agreement is reached (i.e., the negotiation fails), neither party receives any gain (i.e., 0 euros).

## **SCENARIO**

## **Part II - Different for seller and for buyer**

### **Confidential instructions for Pat Seller**

As the main negotiator of AdvancedBiotech, you are reviewing the key issues in the Tamiolas negotiation with Chris Buyer who is the main negotiator on behalf of the NHI's Public Committee.

1. **PRICE PER PATIENT.** The price per patient for drugs using comparable gene therapy varies widely, from 1100 k€ to 1900 k€ per therapy. From the buyer's perspective, the value elasticity to cost is relatively low, as the product would allow the buyer to save on high palliative care costs. Furthermore, the budget impact, while significant, would be less than 1% of the NHI's total annual pharmaceutical expenditure. In terms of your position, given the large investment costs and the fact that AdvancedBiotech currently has no other revenue, obtaining a price as high as possible is a top priority for you Pat.
2. **NUMBER THRESHOLD OF PATIENTS TREATED.** As of today, 40 patients have been diagnosed with the disease in France. However, it has been estimated that as many as 200 patients might suffer from it (i.e., 160 undiagnosed patients). Because the cost of providing therapy to patients above the patient threshold will be at the seller's expenses, you would prefer to agree on a higher threshold number Pat.
3. **LOCATION OF R&D and PRODUCTION UNITS.** Today, the firm's production facilities are located outside France. The number of patients that can benefit from the therapy is limited by the facilities for the therapy, and these facilities are related to the location of laboratories. However, given the specificity of the production (a well-trained workforce, a network effect), it is more cost-efficient for the firm to produce the drugs outside of France. You, Pat, insist that a smaller share of production be based in France.
4. **CLINICAL RISK SHARING.** Tamiolas is an innovative therapy, and there is a risk that some patients will not respond to it. You negotiate on an original risk-sharing scheme which will apply to cases where the therapy does not prove to be effective. This clause indicates how the cost for these unresponsive patients is split between buyer and seller. Along the same lines, there is significant uncertainty on the buyer's side. The seller, who has better knowledge of his product, perceives these risks as limited. The negotiation indicates who will bear the cost of the therapy for these patients. You, Pat, would prefer that a larger share of the burden be covered by the buyer.
5. **SPEED TO MARKET** (speed of bringing the product to market). The average time between a successful negotiation and the first real-world use of a therapy is 18 months. Due to the rapidly progressive nature of the disease, the possibility of a faster agreement and therefore market access would be beneficial for patients. For AdvancedBiotech, as a company with limited revenues which needs to recoup past investment and must finance planned investment, a faster implementation time would be beneficial. Pat, on behalf of the firm, you would push for the rapid commercialization of the first doses of the therapy.
6. **MONITORING AND DATA GENERATION (REGISTRY).** Gene therapy is an innovative and original cure for Appold disease. However, very little is known about the therapy's real-world performance. Accordingly, co-creating a database would be useful. The seller and the buyer can decide how comprehensive that database can be, while equally sharing the cost of the system. In the past, similar public-private partnerships have often proved successful. For your part Pat, you would like to push for the most comprehensive data generation system possible; this would allow you to obtain a higher level of efficacy and would support the company's future research developments.

*Here are displayed the values per choice according to each item (see main text) for the seller.*

### **Confidential instructions for Chris Buyer**

As a buyer for the NHI's Public Committee, you are reviewing the key issues in the negotiation with Pat Seller, the main negotiator with the AdvancedBiotech who is responsible for the company's commercialization of Tamiolas.

1. **PRICE PER PATIENT.** The price per patient for drugs using comparable gene therapy varies widely, from 1100 k€ to 1900 k€ per therapy. For the seller, profit sensitivity to the price is quite high. From your (buyer) perspective, the product would allow you to save on high palliative care costs in the mid to long term (one-off cost vs a yearly cost). In addition, the impact of this cost on the NHI budget, while significant, would be less than 1% of the NHI's total annual pharmaceutical expenditure. Because of this, your net value sensitivity to the price per patient is relatively low. Therefore Chris, you would like to agree on a lower price per patient.

2. **THRESHOLD NUMBER OF PATIENTS TREATED.** Today, 40 patients have been diagnosed with the disease in France. However, it has been estimated that as many as 200 patients might suffer from the disease (i.e., 160 undiagnosed patients). Because the cost of providing therapy to patients above the patient threshold will be at the seller's expenses, you would prefer to agree on a lower threshold number Chris.

3. **LOCATION OF R&D and PRODUCTION UNITS.** Today, the firm's production facilities are located outside of France. Given the specificity of the production (a well-trained workforce, a network effect), it is more cost-efficient for the firm to produce the drugs in the US. However, from experience you know that the number of patients that can benefit of the therapy is limited by the facilities for the therapy, and that these facilities are in turn related to the location of laboratories. You, Chris, insist that a larger share of production be based in France.

4. **CLINICAL RISK SHARING.** Tamiolas is an innovative therapy, and there is a risk that some patients will not respond to it. You negotiate on an original risk-sharing scheme which will apply to cases where the therapy does not prove to be effective. This clause indicates how the cost for these unresponsive patients is split between buyer and seller. Along the same lines, there is significant uncertainty on your - the buyer's - side. The seller, who has a better knowledge of his product, perceives these risks as limited. Given the asymmetry of information, it is your aim Chris to negotiate that a larger share of the burden be covered by the seller.

5. **SPEED TO MARKET** (speed of bringing the product to market). The average time between a successful negotiation and the first real-world use of a therapy is 18 months. Due to the rapidly progressive nature of the disease, the possibility of a faster agreement and therefore market access would be beneficial for patients. For AdvancedBiotech, as a company with limited revenues which needs to recoup past investment and must finance planned investment, a faster implementation time would be beneficial. However, you do not know whether they have the required resources to speed up the production process. On behalf of the NHI's Public Committee, you would push for rapid commercialization of the first doses Chris.

6. **MONITORING AND DATA GENERATION (REGISTRY).** Gene therapy is an innovative and original cure for Appold disease. However, very little is known about the therapy's real-world performance. Accordingly, co-creating a database would be useful. The seller and the buyer can decide how comprehensive that database can be, while equally sharing the cost of the data system. In the past, similar public-private partnerships have often proved successful. For your part Chris, you would like to push for the most comprehensive data generation system possible. This would allow you to obtain a higher level of transparency and accountability.

*Here are displayed the values per choice according to each item (see main text) for the buyer*

## APPENDIX B – Additional Data

	All				p
	All	T1 baseline	T2 convergence	T3 priority	
Female (%)	50.21	52.27	47.22	50.65	0.81
Mean age (std) (years)	24.7 (7.1)	25.6 (7.7)	24.3 (7.1)	24.0 ( 6.4)	0.30
Highest educational qualification: Upper Secondary School certificate (%)	21.94	19.32	26.39	20.78	0.54
Obtained at least a Master's degree (%)	24.89	25.00	27.78	22.08	0.72
Risk taking behavior (mean) (high value = risk taker)	5.70	5.98	5.37	5.68	0.22
Trust index at beginning of negotiation (0 to 10 scale)	4.7	5.12	4.33	4.57	0.06
Tolerance toward profits made by big pharma (mean) (high value = high tolerance)	3.72	3.87	4.04	3.25	0.13
Stance on very expensive drugs (mean) (low value: all patients must have access to very expensive drugs)	2.76	2.90	2.97	2.40	0.45
<b>n</b>	<b>238</b>	<b>88</b>	<b>72</b>	<b>78</b>	<b>238</b>

p-value for the differences between treatment groups (chi-squared for categorical data, one-way anova for continuous variables)

Table B1: Individual characteristics by treatment group (n = 238)

	Buyer				Seller				p
	All	T1 baseline	T2 convergence	T3 priority	All	T1 baseline	T2 convergence	T3 priority	
Female (%)	50.00	52.27	41.67	55.26	50.42	52.27	52.78	46.15	0.95
Mean age (std) (years)	25.18 (8.03)	27.29	22.86	24.94	24.26 (6.07)	24	25.83	23.12	0.32
Highest educational qualification: Upper Secondary School certifi	22.88	20.45	25.00	23.68	21.01	18.18	27.78	17.95	0.73
Obtained at least a Master's degree (%)	26.27	29.55	33.33	15.79	23.53	20.45	22.22	28.21	0.63
Risk taking behavior (mean) (high value = risk taker)	5.87	6.13	5.75	5.68	5.53	5.84	5	5.69	0.24
Trust index at beginning of negotiation (0 to 10 scale)	4.39	5.08	4.15	3.84	5.01	5.16	4.50	5.30	0.03
Tolerance toward profits made by big pharma (mean) (high value = high tolerance)	3.57	4.11	3.91	2.63	3.87	3.63	4.16	3.87	0.36
Stance on very expensive drugs (mean) (low value: all patients must have access to very expensive drugs)	2.79	3.29	2.83	2.18	2.73	2.52	3.11	2.61	0.87
	119	44	36	39	119	44	36	39	238

p-value for the difference between sellers and buyers (chi-squared for categorical data, Student's t-test for continuous variables)

Table B2: Individual characteristics by role, buyer and seller (n total = 238)

	Full sample	Full sample (n=119)			Success (n=106)			p*
		T1 baseline	T2 convergence	T3 priority	T1 baseline	T2 convergence	T3 priority	
<b>Gender match within pair</b>								
Buyer F, Seller F	27	11	6	10	10	4	10	
Buyer M, Seller M	27	9	8	10	8	8	10	
Buyer F, Seller M	32	12	9	11	10	9	10	
Buyer M, Seller F	33	12	13	8	10	11	6	
<b>Average time (seconds) on negotiation</b>					1033.95	952.30	965.21	0.757
(std)					(495.47)	(489.17)	(440.76)	

\*p value for the differences between treatment groups (one-way anova)

Table B3: Gender composition of dyads according to treatment

	Trust before the negotiation started			
	item 1	item 2	item 3	item 4
item 1	1.0000			
item 2	0.6755	1.0000		
item 3	0.3855	0.4462	1.0000	
item 4	0.5175	0.4938	0.5421	1.0000

Average inter-item covariance: 3.655864

Scale reliability coefficient: 0.8071

Table B4. Reliability statistics related to the trust index.  
Data before the negotiation, full sample ( $n=238$ )





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