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# Towards an interdisciplinary perspective of training intervention for negotiations: Developing strategic negotiation support contents

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ABSTRACT

This paper presents a prototype negotiation support system (NSS) intended to help the user to analyze the economic underpinnings of the negotiation, and to construct an initial offer. We also present the results of a behavioral test of the system using techniques from the field of experimental economics. In the test, negotiators have private, asymmetric information about the value of the negotiated item. In one treatment both negotiators operate without an NSS, and in a second treatment the seller has an NSS. The data shows that the NSS assisted negotiators make offers that lead to better price outcomes for themselves. The NSS is web-based and the system might have particular relevance for e-negotiating.



## 1. Introduction

This paper presents a prototype negotiation support system (NSS) that takes the bargainer through the analysis of the economic underpinnings of the negotiation, and the formulation of initial offers. The principles underlying the NSS are culled from negotiation findings in the decision science, economics and psychology literatures. The principles are general, befitting an NSS that aims at broad application. An important question is whether users can successfully apply an NSS of this kind to *specific* negotiations. As a first step towards answering this question, we present a behavioral validation test of the system using techniques from experimental economics, involving human subjects who are given material incentives to perform the best they can. The test case negotiation is patterned after an actual negotiation, and features the private, asymmetric information that makes evaluating the other party's economic circumstance a challenge.

The NSS prototype has three components: A content component provides the negotiator with concepts and information culled from the negotiation analysis literature. The content component is nested in a process component that provides a framework to help the negotiator begin to organize his or her thoughts. A communication component provides an electronic 'negotiation table.'

The content component guides the user in estimating the opportunity costs for each bargainer, and in constructing a zone of potential negotiated agreements (ZOPA). Given the ZOPA, the NSS then provides guidelines on how to formulate a good opening offer. Research shows that focusing the negotiator's attention on the ZOPA — what is potentially in the deal for the other person as well as oneself — helps the negotiator avoid being "anchored" by aggressive demands made by the other side [2,21]. In addition, it is well established that the opening offers of each negotiator are good predictors of the eventual settlement [33]. In essence, the NSS aims to get the user off to a good start, guiding through what are, strategically speaking, the critical first steps [5,10,21].

The present work builds on work done by Galinsky and Mussweiler [10]. They provide experimental evidence on the positive influence that perspective taking (e.g., thinking about the other party's options) has on a negotiator. The design of Galinsky and Mussweiler's experiment reflects their objective of isolating particular behavioral effects, and they control aspects of the negotiation, such as who makes the first offer. We extend their work to a more free-form environment, more akin to one in which a negotiator normally operates. The NSS walks the negotiator through a perspective taking exercise prior to the negotiation, and independent of who makes the first offer. Another difference is that the NSS provides the negotiator with information on crafting an initial offer (each negotiator can make an *initial offer*, but only one initial offer can be the *first offer* in the negotiation).

The validation test focuses on a case study that captures some of the richness of a buyer–seller price negotiation. The parties have private, asymmetric information about the value of the item. That is, each party knows the value of the item to themselves but has only a partial understanding of what the value is to the other party. There are, of course, clues in the environment as to what the value to the

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other party might be. The clues in the test case reflect the kind of information that one could find in the public domain (in fact, the clues in the case were found on the Internet).

The validation test is web-based and has two treatments. In the baseline treatment, both negotiators operate without the NSS. In the negotiation support treatment, the seller has an NSS. We then compare the results of the two treatments to see whether the NSS can assist seller decision making.

Our research has particular relevance to electronic negotiation (e-negotiation). Electronic environments are particularly amenable to the implementation of a system of the kind presented here, and the system could eventually be integrated with e-negotiation media and complementary support systems (potential complements to be elaborated on in a moment). At the same time, there is evidence that the medium the negotiation takes place in can influence the outcome [29], so it may turn out to be important that we test the behavioral response to an NSS in a specific e-negotiation environment.

Negotiation is a complex social activity, and we intend our prototype as a complement to NSS's that address other important aspects of the negotiation problem. There are a number of existing NSS's that rely on template-based and artificial intelligence techniques [4]. Template-based NSS focuses on informing parties of past and present preferences, and on the progress made within the negotiation. Examples include Negotiator Pro, the Art Of Negotiating [7] and DEUS [34]. Web-enabled NSS include Smartsettle [26], INSPIRE [13] and CBSS [32]. Early decision-support negotiation systems primarily used artificial intelligence techniques to model negotiation such as case-based reasoning, rule-based reasoning and hybrid reasoning. These systems are considered to be intelligent systems since they can generate solutions using the system's internal knowledge as well as users' input. Examples include LDS [20], SAL [31], NEGOPLAN [17], Mediator [14], PERSUADER [25] and Family_Negotiator [3].

The NSS presented here focuses on fundamental principles associated with the economic strategy of negotiation, having to do with evaluating bargainer opportunity cost and using this information to derive an initial offer. The prototype NSS guides bargainers through a process (as opposed to giving them solutions). The steps in the process are how to prepare for the negotiation, how to derive an initial offer, how to avoid the anchoring effect from the other party's first offer, and how to estimate the final agreement price based on the other party's and the user's initial offers.

## 2. Process framework and description of the NSS content component

### 2.1. Negotiation process framework

We can think of negotiation as having three stages: the preparation phase (what to do before the negotiation begins), the initial offers phase and the reconciliation and outcome phase. A negotiation may not break down cleanly in these phases. Nevertheless, the framework is a useful organizational tool. The NSS uses insights from the literature to assist the negotiator through the first two phases (and points out the direction the third phase is likely to take given what happens in the first two phases).

#### 2.1.1. Preparation for negotiation

During the preparation phase, the NSS draws attention to four critical constructs: interests, best alternative to a negotiated agreement, reservation prices and ZOPA. The basic procedure is to first prompt the user to consider his own circumstance (e.g., his own interests) and then ask him to reflect on what information he has that provides insight into the other party's circumstance (e.g., the other party's interests). The full contents of the NSS are laid out in Appendix B; in this section we discuss the critical features.

*2.1.1.1. Interests.* Misunderstanding the interests of one's negotiation counterpart can lead to erroneous attributions [18], failure to maximize joint gain [28], or impasse [27]. In addition, not understanding the other side's sources of power may lead to unwise strategies that can produce adverse outcomes. So it is important to understand not only one's own interests, but also the other party's interests and alternatives to a negotiated agreement.

The contents of the NSS explain to the user that, "Interests are the underlying reasons that each party has for wanting to reach agreement." The system user (the seller in this case) is reminded of his own interests, and then asked, "From what you know presently, what would you say the buyer's interest is? Give your best guess." This type of debiasing technique is known as "considering the opposite" [16].[1]

*2.1.1.2. Best alternative to a negotiated agreement (BATNA) and reservation price.* The NSS next explains to the user that "A bargainer's interests tell something about the best alternative to a negotiated agreement (BATNA), what will be done if no settlement is reached in the negotiation. In turn BATNA helps understand the walk-away value, the price below or above which a bargainer is no longer interested in an agreement." Determining the BATNA is critical to determining the opportunity cost the negotiator incurs in entering into an agreement [9], which is in turn critical to determining the walk-away value, more formally known in the literature as the reservation price [22]. The system user is reminded of his own BATNA and walk-away value, and then is asked to give a best guess of the buyer's BATNA and walk-away value.

*2.1.1.3. Zone of possible agreement (ZOPA).* The bargaining zone is a fundamental concept in negotiation analysis [22,30]. The NSS explains to the user that, "Together, the buyer and seller walk-aways define the zone of possible agreement (ZOPA). Each point inside the ZOPA represents a settlement at which both parties would find it profitable to make an agreement." The concept is illustrated to the user with a diagram (see Fig. B.1 in Appendix B). The user is further advised that, "During the negotiation, and particularly at the beginning of the negotiation, ask questions to test if your understanding of the buyer's interests is correct. Your goal, as seller, is to obtain a price at the high end of the ZOPA, while the buyer can be expected to work to obtain a price at the lower end."

#### 2.1.2. Initial offers for negotiation

The *anchoring effect* refers to the fact that people tend to make adjustments to their position based on an initial starting position, and often the adjustment process is slow. First offers exhibit a strong anchoring effect in situations of fluidity and uncertainty as is often the case with negotiations [10]. They exercise a strong influence on both counteroffers [12] and final outcomes [5,6,15,19]. More specifically, because of the anchoring effect, initial counteroffers and final outcomes are consistently found to be positively correlated with first offers. In addition, first offers are better predictors of final settlement price than is knowledge of concessionary behavior [33].

Based on the above research [11], the NSS advises the user to make an aggressive initial offer — but one within reason. On the one hand, an aggressive initial offer leverages the positive correlation of

[1] A generalization of the prototype NSS would prompt the user to name their own interests. In the test case we consider (Section 3.1), negotiators are directly told information concerning their own interests, outside alternatives, etc. We do this to avoid the confounding that would otherwise occur in our tests. For example, the test case involves baseball. A subject seller might think season tickets are appropriate compensation depending on the extent to which he or she is personally interested in baseball. We would then have to devise a way to compare the performance of a baseball fan who got tickets as part of a deal to a non-fan who focused soly on monetary compensation. Stating performance measures explicitly and tying these measures to monetary compensation for participating in the experiment avoids this problem.