

Anchoring in Simulated Competitive Market Negotiation

ILANA RITOV

Ben-Gurion University, Be'er Sheva, Israel

The competitive market simulation (Bazerman, Magliozzi, & Neale, 1985) was used to explore anchoring effects in negotiation. Two possible anchoring effects were examined in the present study. One effect involved the profit schedule format; although individual profit schedules for buyers and sellers were normatively equivalent, in most previous studies the buyer's schedule was presented in decreasing order, whereas the seller's schedule was increasing. Anchoring on the first number in the profit list would contribute to the buyer's advantage, often found in this research. The effect of schedule format was tested here by running a separate simulation with inverted formats. As predicted, the relative advantage of buyers over sellers reversed with the change in profit schedule format. The second anchoring effect involved the initial offers. In running the simulated market, initial offers were recorded as well the initiator's assigned role. Initial offer values, for both the initiator and the non-initiator significantly affected final profit. The impact of schedule format on final agreement appeared mostly due to its effect on initial offers. Finally, the role of experience was examined. As in Bazerman *et al.* (1985), joint profit increased with learning. The increase stemmed from improved value of the initial offer from the perspective of the non-initiator. The results provided no indication of a decline in format schedule effect or in the major impact of initial offers, as negotiators gain experience. The implications of results concerning the role of anchoring in negotiation are discussed. © 1996

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Negotiation is a continual process of decision making. Participants in negotiation perceive and interpret the information available to them and proceed to act on these perceptions. Not surprisingly, negotiators are susceptible to judgmental biases documented in numerous studies of individual decision making. Indeed, negotiation research (Neale & Bazerman, 1992) uncovered systematic departures from rationality. Thus, for

Address reprint requests to Ilana Ritov, Department of Industrial Engineering and Management, Ben-Gurion University, POB 653, Be'er-Sheva, Israel. E-mail: ritov@bgumail.bgu.ac.il.

example, framing of outcomes in positive or negative terms has been shown to affect negotiators performance and total profit (Bazerman, Magliozzi, & Neale, 1985; Neale & Northcraft, 1986). Other biases, such as undue reliance on readily available information, and overconfidence in judgment have also been shown to affect negotiators (Neale, 1984; Neale & Bazerman, 1985).

One of the cognitive heuristics which extensively affects individual decision making (Tversky & Kahneman, 1974; Kahneman, 1992) is termed Anchoring. This heuristic is employed in various cases in which one needs to estimate an unknown value. To generate the required estimate, one begins by anchoring on a salient available point and continues by making adjustment away from that anchor. The adjustment is typically insufficient, thus yielding a final estimate which is overly affected by the anchor. Anchoring number estimates on irrelevant information has been shown to affect experienced negotiators as well as novices (Northcraft & Neale, 1987).

A novel methodology, first developed by Kelley (1966) and later extensively used by Bazerman and his associates (Bazerman, Magliozzi, & Neale, 1985; Neale & Bazerman, 1991) enabled researchers to study the impact of judgmental biases on integrative bargaining in laboratory setting. In the setting employed by Bazerman *et al.* (1985) subjects, randomly assigned roles as buyers or sellers, engage in a simulated negotiation with as many partners as possible in a fixed period of time. Agreements negotiated in this market involve a combination of three different attributes, varying in relative importance for buyers and sellers. While individual profit schedules place all participants in normatively equivalent power positions, different variables related to judgmental heuristics are manipulated between subjects, to test for their effect on negotiation outcomes.

One variable extensively studied using the integrative bargaining paradigm is the impact of predetermined goals. Negotiators with specified difficult goals were generally more profitable than negotiators with less difficult goals (Bazerman *et al.*, 1985; Neale &

Northcraft, 1986; Huber & Neale, 1986, Neale, 1987). These findings reaffirm earlier results concerning the impact of goal setting in negotiation (Pruitt 1981, 1983). While earlier research attributed the impact of preset goals to increased utilization of problem solving strategies by negotiators under difficult constraints (Pruitt, 1981), later studies raised the hypothesis that the assigned goals provide anchors which affect potential outcome evaluation (Huber & Neale, 1986).

While anchoring negotiation on the initial offer or a preassigned goal may be a consciously motivated process, anchoring could on other occasions be automatic and unintended. For example, in a study of willingness to pay (WTP) for environmental cause Kahneman and Knetsch (1993) showed that the amount mentioned in the initial question had a large effect on respondents' estimate of the average WTP in the population, but it had no effect on their estimate of the proportion of households that would pay a given amount. Thus, the anchor's impact appears to be controlled by surface matching of the anchor and the required response. Such format effect indicates that anchoring, in this case, is caused by a relatively primitive cognitive operation. Similarly automatic anchoring may also occur in the integrative bargaining studies.

INITIATOR ADVANTAGE

In most reported research employing this paradigm buyers outperformed sellers. This result was unpredictable, since the profit schedules for buyers and sellers in this market simulation were completely symmetrical. According to the rational model, the subject's randomly assigned role as buyer or seller should have no effect on her gained profit. Neale and her associates (Neale, Huber, & Northcraft, 1987; Neale & Bazerman, 1991) offer an explanation involving the notion of natural differences in framing, due to social influences. By this argument, sellers conceptualize their role as one which initiates action, in order to gain resources. Buyers, on the other hand, tend to frame transactions in terms of loss. Consequently, sellers are more risk averse and more willing to reach a compromise than buyers. This asymmetry in framing yields the robust finding of buyers' advantage. Neale *et al.* (1987) provided indirect support for their account, by showing that the buyer's advantage was eliminated when assigned roles were described by non-words rather than "buyers" and "sellers". The present study will directly examine the impact of role assignment on the tendency to initiate action. In particular the following hypotheses will be tested:

Hypothesis 1. The proportion of initiators is higher among sellers than among buyers.

Hypothesis 2. Initiators achieve higher outcomes than non-initiators.

PROFIT SCHEDULE FORMAT

While framing induced by social context may be involved in producing the asymmetry between buyers and sellers, a closer examination of participants' profit schedule formats suggests the possible influence of task characteristics as well. In the Bazerman *et al.* (1985) competitive market simulation, profit levels are presented either in descending or in ascending order. If the buyer's list typically starts at the highest profit level and the seller's list starts at the lowest profit level, then the task characteristics of the two participants are not cognitively identical. To the extent that the top of the list provides an automatic anchor for further processing, anchoring bias implies that high starting point will eventually generate higher profit. Hence, a buyer's advantage would be predicted merely on the basis of this superficial difference in schedule formats. Although Neale *et al.* (1987) showed that the buyers' advantage can be eliminated if the role titles are changed, their study does not preclude the possibility that the difference between buyers' and sellers' profit is affected by the profit schedule format, as well as by social role perception. If buyers outperform sellers at least partly due to format differences in profit schedules, the effect should diminish or even reverse for inverted format schedules. In the present study profit schedule formats are experimentally manipulated, thus providing an opportunity to test the following hypothesis:

Hypothesis 3. Schedule format affects final agreement, so that participants with decreasing schedule achieve higher profits than participants with increasing schedules. In particular, the advantage of buyers over sellers will be reduced if the sellers' schedule is decreasing, and the buyers' schedule increasing.

INITIAL OFFERS

The factors pertaining to negotiation outcomes, namely the asymmetry between initiators and non-initiators and the impact of profit schedule format, are apt to shape initial offers as well as final outcomes. First, it seems reasonable to assume that initiators' edge over their opponents would be even more pronounced in the comparison of initial offer values than in final profits: initiators would tend to propose initial offers which are highly valuable from their perspective. Second, anchoring on the top of the profit schedule list is also expected to affect initial offer values: initiators whose schedule starts at the lower end of the profit scale would propose lower initial offers than initiators whose schedule is

formatted in descending order. This would result in a difference between initial offer values for buyers and sellers in the two market versions. Hypotheses 4 and 5 sum up the preceding predictions:

Hypothesis 4. Initial offer value for initiators is higher than for non-initiators.

Hypothesis 5. Presentation format affects initial offers, in the same way it affects final agreements.

INITIAL OFFERS AS MEDIATORS

The initial offer itself may serve as an anchor in the proceeding stages of the negotiation process. Earlier research, employing mostly programmed opponents in non-integrative settings, consistently uncovered a positive correlation between opening demands and final agreements (Chertkoff & Conley, 1967; Liebert, Smith, & Hill, 1968; Benton, Kelley, & Liebling, 1972). The great impact of initial offer on subsequent negotiation (Rubin & Brown, 1975) has been attributed to the major role it plays in conveying one's positions and sending implicit messages to the opposite party. It may, however, be also at least partly related to the anchoring heuristic. Indeed, initial offer is likely to serve as an even more powerful anchor than a preassigned goal. The present study examines the role of initial offers as anchors, using the integrative negotiation paradigm developed by Bazerman *et al.* (1985).

Although, as mentioned earlier, previous research has demonstrated correlation between initial offer and final profit, this has not yet been shown in integrative negotiation of this type. The question of a possible correlation between initial offer and final outcome in this type of simulation is more complex. The cognitive effort required for constructing offers, which consist of a combination of factors may generally reduce the impact of anchors. Furthermore, the fact that the initial offer values for the two parties are not completely correlated gives rise to two separate questions regarding the relation between initial offers and final outcomes for initiators and non-initiators. In the earlier studies, the initial offer was typically made by the programmed opponent. Extending the findings of these studies to the integrative market simulation would imply a correlation between initial offer and final profit for the non-initiator. Based on anchoring studies, however, it is reasonable to assume that for the initiator too, the value of the initial offer from her perspective would affect her final outcome. Thus, the following hypothesis will be tested, in the context of the present study:

Hypothesis 6. For initiators and non-initiator alike, initial offers affect final agreement, so that higher initial offer value leads to higher final gain.

Two candidates for anchoring the negotiation process have been proposed above: the starting level of the profit schedule and the initial offer put forward by the negotiation initiator. The question whether the former anchor (the starting level of the profit schedule) affects the negotiation outcome beyond its role in determining the latter anchor (initial offer) is not conclusively resolved, even if all the hypotheses proposed earlier are supported by the data. Although possibly mediated through initial offers, the effect of format may go beyond its impact on initial offers, indicating the use of more than a single anchor. The preceding discussion suggests the following hypothesis:

Hypothesis 7. Schedule format affects final agreement, even when initial offer value is controlled.

Similarly, the initiator's advantage may go beyond initial offers. As pointed out earlier, Hypotheses 4 and 6 imply the advantage of taking the initiative. In a simulation which allows for self initiated matching of negotiators, initiators are predicted to be more profitable than non-initiators, simply by virtue of their making the initial offer. Initiators may, however, also possess personal characteristics which help them handle the negotiation process, beyond its initial stage, more successfully than other negotiators. Indeed, Huber and Neale (1986) found that Machiavellianism has a powerful effect on negotiators' performance. In their study, negotiators who expressed higher degree of belief in their ability to influence other people achieved higher average profit.

It is conceivable that in a competitive market situation people high in self perceived social influence ability would also tend to initiate negotiations more than other people. Do personal characteristics, such as Machiavellianism, influence negotiation beyond the impact of initial offers? As the present study did not involve collection of individual differences data, only indirect evidence concerning this question can be provided. In that context, only the following limited hypothesis can be tested:

Hypothesis 8. Initiators' final gain is higher than non-initiators' gain, even when initial offer value is controlled.

THE ROLE OF EXPERIENCE

Although the competitive market simulation, as it is normally run, does not allow for close examination of the course of a single negotiation, it offers the opportunity of studying changes in negotiation patterns over repeated negotiations. Past research documented increase in joint profit over time, reflecting a move toward more integrative agreements (Bazerman *et al.*, 1985).

This finding is expected to replicate in the present study.

A natural question in the context of the present study concerns the effect of experience on the initiator's advantage. Bazerman *et al.* (1985) show that the increase in joint profit is mostly due to increase in the profit of the less successful negotiator, while the profit of the more successful negotiator remains relatively stable across trading periods. If initiators are generally the more successful negotiators, then one could infer from the above results the hypothesis that non-initiators benefit from experience more than initiators. A more precise formulation of the hypothesis would be:

Hypothesis 9. Non-initiators' profit increases, with experience, more than initiators' profit. In other words, initiator factor interacts with experience in predicting final agreement.

If, indeed, non-initiators appear to benefit from experience more than initiators, this could be due to changes in the initial offers submitted to them. Initiators may become geared toward presenting their party with more attractive offers. This suggests the last hypothesis to be tested in the present study, which is:

Hypothesis 10. The value of the initial offers for the non-initiator increases with experience more than their value for the initiator.

The present study employed the simulated market exercise, introducing two variations: (a) profit schedule format was manipulated between market runs, so that buyers' schedule was either increasing or decreasing (with corresponding changes in the sellers' format); and (b) initial offers were recorded as well as final agreements. These two methodological variations allow for testing of the hypotheses detailed above.

METHOD

Subjects

One hundred forty-eight Management and Industrial Engineering students at Ben-Gurion University participated in the study, run as a class exercise.

Design

Subjects were randomly assigned to (1) one of two versions of the market or (2) the role of buyer or seller. The two versions of the market differed only in the profit schedule format. In the version denoted BISS the buyer's schedule was presented in increasing order, whereas the seller's schedule was decreasing. The order was reversed in the second version, denoted BDSI (buyer decreasing seller increasing). The two version

were run at separate locations. Thus, no interaction between participants in different versions of the market occurred. The number of sellers and buyers in each run of the market was equal. Due to logistic difficulties, the total number of participants in each version of the market did not come out equal. Three runs of both versions were performed. Altogether 68 subjects participated in version 1, and 80 subjects participated in version 2 of the market.

Task

Bazerman *et al.* (1985) competitive market simulation was used. Following the assignment of roles, subjects were given a packet including instructions and their "individual" profit schedule. The profit schedules for Buyers and Sellers in each version of the market are given in Table 1. The instructions specified that a deal requires agreement with respect to each of the three factors: delivery terms, discount level, and financial terms. The profit incurred by each participant is the sum of the amounts corresponding to the agreed level of each factor, as specified in the participant's profit schedule. As the profit schedules of buyers and sellers are completely symmetrical, "A-A-A" and "E-E-E" agreements yield the highest profit (\$8000) to one of the negotiators and the lowest profit (\$0) to the other. A simple compromise solution yields a profit of \$4000 to each. Integrative agreements can yield higher profits for both parties. In particular "A-E-I" agreement yields a profit of \$5200 to negotiator.

After having studied the material, subjects were instructed to wear the attached badge indicating whether they were buyers or sellers. They were then asked to find themselves partners, and commence negotiation. As in the original simulation, subjects were allowed to negotiate only one deal with the same partner. Having completed a deal, subjects restarted the search for a new partner. Subjects recorded the deals using prepared forms. For each deal they specified the three dimensions of both the initial offer and the final agreement. In addition they were asked to record which of the two parties initiated the negotiation.

RESULTS

Three hundred twenty negotiations were recorded. All but 14 of these attempts concluded with agreements. The computed profit for buyer and seller in each agreement record served as the primary mea-

TABLE 1
Buyer and Seller Profit Schedules in the Two Markets

	Buyer			Seller			
	Del.	Dis.	Fin.	Del.	Dis.	Fin.	
BISD Market							
A	000	000	000	A	4000	2400	1600
B	200	300	500	B	3500	2100	1400
C	400	600	1000	C	3000	1800	1200
D	600	900	1500	D	2500	1500	1000
E	800	1200	2000	E	2000	1200	800
F	1000	1500	2500	F	1500	900	600
G	1200	1800	3000	G	1000	600	400
H	1400	2100	3500	H	500	300	200
I	1600	2400	4000	I	000	000	000
BDSI Market							
A	4000	2400	1600	A	000	000	000
B	3500	2100	1400	B	200	300	500
C	3000	1800	1200	C	400	600	1000
D	2500	1500	1000	D	600	900	1500
E	2000	1200	800	E	800	1200	2000
F	1500	900	600	F	1000	1500	2500
G	1000	600	400	G	1200	1800	3000
H	500	300	200	H	1400	2100	3500
I	000	000	000	I	1600	2400	4000

asures for analysis.¹ Each agreement naturally involved a pair of negotiators. Hence, in all analyses, the role of the individual member within each pair (buyer vs seller, or initiator vs non-initiator) was treated as a within-subject factor. In order to avoid confusion, these factors are referred to as the “within-pair” factors, whereas the other factors are “between-pair.”

¹ In all the analyses reported here, deals were assumed to be independent observations. Since subjects participated in more than one deal each, the above assumption is not strictly correct. A rough estimate of the ratio between the true standard deviation and the estimated one was computed to be 1.4. This ratio implies that all effects found to be significant with p value below .005 would still have been found significant in more conservative (and more complex) analyses including the subject factor in addition to the other relevant factors. Most of the significant effects in the present study are significant at this level. Other effects should be interpreted with care. Notice that using the individual subject as a unit of analysis (as, for example in Bazerman *et al.*, 1985) does not avoid the problem of non-independence (besides being unsuitable for testing some of the hypotheses of the present study): although the sellers, for instance, are independent, their averaged profit across deals are not independent, since the same buyer contributed to the outcomes of several sellers. Thus, using the average profit of an individual negotiator as the basic unit of analysis ignores the correlation between the outcomes of the two participants in each deal. It can be shown that the two methods of analysis (assuming independence of deals and assuming independence of average profit per negotiator) involve errors of the same order.

Initiator Advantage

Of the 306 completed deal records, 38 either did not specify the initiator, or had clearly erroneous initiator registration. These records were omitted from further analysis. In the analyses reported henceforth only the 268 remaining records were considered.

Hypothesis 1 proposed that the proportion of sellers who initiate negotiation should be higher than the proportion of buyer initiators. This hypothesis was supported by the data. In both markets the proportion of initiators among buyers was remarkably lower than their proportion among sellers (34% vs 66% in BISD; 40% vs 60% in BDSI). This finding supports Neale *et al.*'s (1987) hypothesis that sellers are naturally conceptualized as initiators.

Hypothesis 2, extending Neale *et al.*'s argument, proposed that initiators' final profit would be higher than non-initiators'. Table 2 displays the mean final profit for initiators and non-initiators in the two markets. Indeed, as predicted, initiators obtained higher profits than non-initiators ($F(1,264) = 13.82, p < .001$, in an ANOVA with buyers' and sellers' profit as dependent within-pair measures, and “market version” and “initiator”—buyer or seller—as between-pair factors). No significant interaction between ‘market version’ and ‘initiator’ was observed ($F(1,264) = .04, p = .84$).

TABLE 2

Average Profit of Initiator and Non-Initiator in Each Market

	Market		Mean
	BISD	BDSI	
Initiator	4862	4392	4592
Non-initiator	4261	4049	4139
<i>n</i>	114	154	

Profit Schedule Format

Hypothesis 3 stated that the profit schedule format affects the participant's final profit. Profit schedules in BISD market were presented in increasing order for buyers, and decreasing order for sellers, and the orders were reversed in BDSI market. Hence, Hypothesis 3 implies an interaction between market and participant's role. Table 3 displays the average profits for buyers and sellers in the two markets. As predicted, sellers' profit was higher than buyers' in BISD market, and the order was reversed in BDSI. ($F(1,264) = 9.30$, $p = .003$ for the interaction between market version and the within-pair factor of "assigned role", in the same ANOVA used for testing Hypothesis 2). The average profit of buyers and sellers across the two markets were not significantly different ($F(1,264) = .22$, $p = .64$). Hence, the schedule format effect seems present even when the initiator factor is controlled for.

Two unpredicted effects were also found significant. First, participants in BISD earned on the average more than participants in BDSI ($F(1,264) = 53.81$, $p < .001$). Second, the mean profit for participants was higher when the buyer initiated negotiation ($F(1,264) = 16.85$, $p < .001$, for the effect "initiator", across the within-pair factor), although this effect occurred mostly in the BDSI market ($F(1,264) = 16.86$, $p < .001$ for the interaction of market version and initiator across the within-pair factor).

Initial Offers

Hypothesis 4 focused on the self-serving nature of initial offers. Namely, it suggested that the initial offer

TABLE 3

Average Profit of Buyers and Sellers in Each Market

	Market		Mean
	BISD	BDSI	
Buyer	4275	4329	4306
Seller	4848	4112	4425
<i>n</i>	114	154	

TABLE 4

Average Initial Offer Values for Buyers and Sellers, by Market and Initiator

	Market BISD		Market BDSI		Mean
	Buyer	Seller	Buyer	Seller	
Initiator	5563	6182	5702	5393	5719
Non-initiator	2323	3834	2721	2545	2708

value for the initiator would be higher than its value for the non-initiator. Average initial offer values are presented in Table 4. The table clearly shows that, as predicted, initial offers are substantially more advantageous for the initiator than for her partner to the negotiation ($F(1,264) = 139.90$, $p < .001$, in an analysis of variance of initial offers with assigned role as a within-pair factor and market version and initiator as between-pair factors). Thus, Hypothesis 4 is clearly supported by the data. The above analysis also provided support for Hypothesis 5, which predicted that initial offer values for buyers and sellers would be affected by the profit schedule presentation format. As expected, seller's initial offer values were higher in BISD than in BDSI, whereas the buyer's initial offer value was lower in the former than in the latter market ($F(1,264) = 7.34$, $p = .007$).

Initial Offers as Mediators

Hypothesis 6 proposed that higher values of initial offer yield higher values of final agreement. Figure 1 displays the distribution of final agreement by initial offer value, separately for initiators (left panel) and non-initiators (right panel). As can be seen in the graph, final profit is correlated with initial offer value for both initiators and non-initiators (the computed correlation between the participant's initial offer value and her final profit was .45 for initiators and .53 for non-initiators; $p < .001$ in both cases).²

² The reported analysis included only the data from negotiations in which a deal was reported. Thus, the conclusion that higher initial offer values lead to higher profit should be conditioned to the cases in which agreement is eventually reached. Initial offers which are highly valued from the perspective of the initiator may, however, decrease the chances of reaching agreement. In the present simulation only 14 negotiations were broken off without agreement, and 2 of these did not specify the initiator. Comparing the mean initial offer values for these 12 cases to the mean values of the other 268 negotiations, we find that the offer's value for the initiator, in the former group was in fact lower than in the latter one (5492 vs 5719). More predictable, perhaps is the finding that the offer's value from the perspective of the non-initiator was lower in the negotiations which were broken off than in the successful negotiations (2633 vs 2708). None of these differences were significant, however.

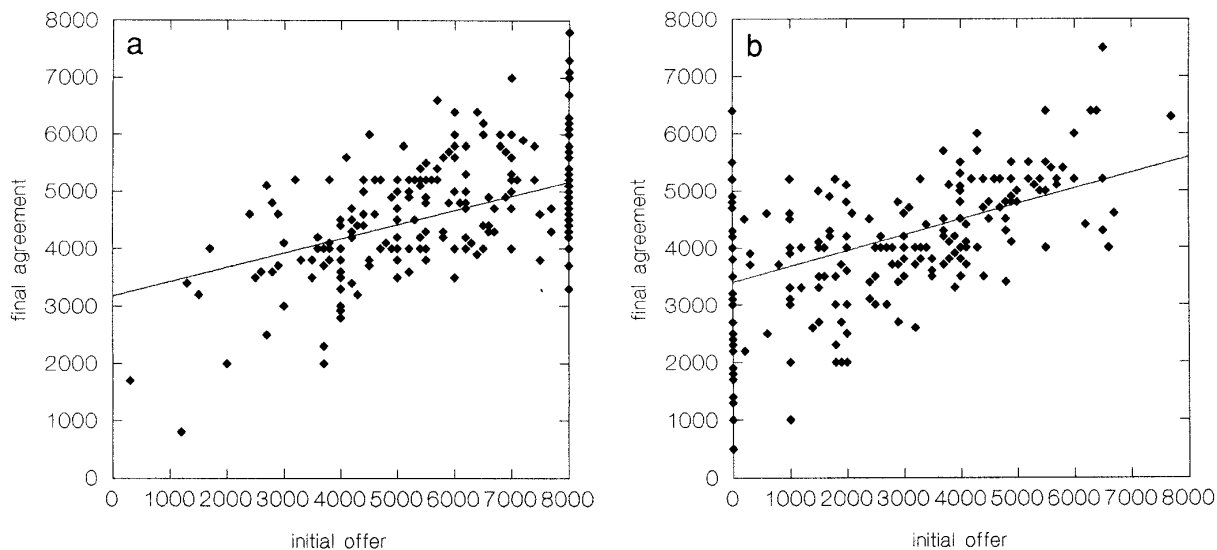


FIG. 1. Distribution of final agreement as a function of initial offer value, plotted separately for initiators (a) and non-initiators (b).

Demonstrating (a) the effect of format on initial offer values and (b) a correlation between initial offer value and final agreement still does not preclude the possibility that the impact of profit schedule format goes beyond its role in determining initial offers. Hypothesis 7 proposed the possibility that format effects are not wholly mediated through initial offers. If presentation format and initiator role significantly interact with the participants' assigned role in predicting final profit, even when initial offer values are controlled, then we may conclude that the impact of these factors goes beyond the opening stage of initial offers. To test this hypothesis a regression analysis was performed, with final profit for buyer and seller as within-pair dependent variables. The independent variables included initial offer values for buyer and seller as well as market version, initiator, and the interaction of market version and initiator (an interaction found significant, across pair, in the previous analysis of final profits). In this analysis, when initiator role as well as initial offer values were controlled, the interaction of market version with the within-pair factor (buyers vs sellers) was only marginally significant ($F(1,262) = 2.89, p = .09$). Thus, Hypothesis 7 received only marginal support.

Hypothesis 8 stated that the initiators' advantage would go beyond the impact of her initial offer. The above analysis offers a test of this hypothesis as well. In this case, too, when presentation format and initial offer values were controlled, the initiator's advantage proved only marginally significant ($F(1,262) = 2.78, p = .09$, for the interaction of initiator with participant's assigned role).

While the above analysis was concerned with relative

advantage of the negotiator over her opponent, it may be of considerable practical importance to determine the impact of the factors examined above for the negotiator's final outcome, regardless of how this outcome compares with the opponent's outcome. For that purpose a separate regression analysis was conducted, with the initiator's final agreement value as the only dependent variable. A similar analysis employed the non-initiator's final agreement value as the dependent variable. The coefficients of the regression equations are presented in Table 5. For the initiator's final profit the only coefficients significantly different from zero are the coefficients of the initial offer value for the initiator and the non-initiator. Interestingly, the initial of-

TABLE 5
Regression Coefficients for Predicting Initiator and Non-Initiator Profit

	Initiator ($R^2 = .32$)		Non-Initiator ($R^2 = .37$)	
	Coef.	<i>p</i> value	Coef.	<i>p</i> value
Constant	800	.411	3799	.000
Market	109	.772	-1178	.005
Initiator role	192	.599	-1056	.010
Market*In.role	-181	.401	674	.005
In.offer-init	.529	.000	.193	.014
In.offer-non	.274	.000	.406	.000

Note. $n = 268$. Variable labels and coding; Market = 1: for BIDS, 2 for BDSI; Initiator role = 1 for buyer, 2 for seller; In.offer-init = initial offer value for initiator; In.offer-non = initial offer value for non-initiator.

fer values for both the initiator and the non-initiator contribute positively to the final profit. Thus, the initiator's profit increased not only as the initial offer value for herself increased, but also as the value of the offer for her partner increased. The non-initiator's profit was also positively related to the initial offer value for both partners, although in this case the other factors had a significant effect as well.

The pragmatic question of what would have been the optimal initial offer in this market simulation can be answered using the above regression model. Given the positive regression coefficients it is easy to see that the optimal initial offer was a combination of the highest levels in the two most important attributes (from the perspective of the initiator), and the lowest level in the least important attribute. Thus, for example, a buyer in the BISSD market had done best, on the average, when she initially proposed an A-I-I agreement.

In summary, the above analyses reveal the significant role played by the initial offer values for both participants. The final profit for each participant is positively affected by the initial offer values both for herself and for her partner to negotiation, although not to the same degree. Naturally the participant's own valuation of the initial offer carries more weight than the partner's valuation. Beyond the initial offer effect, we found only marginal indication of an initiator's relative advantage. Similarly, the profit schedule format may have a marginal impact on final outcomes, beyond the role it plays in the process of generating initial offers.

The regression analyses described above uncover one aspect of the interdependence between the parties to negotiation: the final profit for each participant is affected not only by the value of the initial offer for herself but also by the offer's value for the other party. The impact of learning on the participants' profit, to be discussed next, provides further evidence of this interdependence.

The Role of Experience

The present study employed a different measure of experience than the one reported by Bazerman *et al.* (1985). Because exact time of agreement (within each period of trade) was not duly recorded, the number of each deal in the seller's sequence of reported deals was coded and served as a measure approximating experience, instead. In spite of this difference in the coding of experience, the finding that joint profit of participants increases as they gain experience (Bazerman *et al.*, 1985) was replicated in the present study. Regression analysis of joint profit by "deal number" showed a significant contribution of the deal sequential number to predicting the achieved joint profit ($F(1,266) = 29.51, p < .001$).

Hypothesis 9 stated the prediction that the increase in final profit due to experience would be less pronounced for initiators than for non-initiators. The plots of mean final profits against deal number are presented in Fig. 2, separately for initiators and non-initiators (marked by the filled circles and filled stars, respectively). As predicted, joint regression of initiator and non-initiator final profit (as within-pair factor) by deal number revealed a significant interaction of the within-pair factor with deal number ($F(1,266) = 5.033, p = .026$). Indeed, the figure clearly shows that the slope of the regression line for non-initiators' profit is steeper than the one for initiators. Separate tests of the 'deal number' effect on initiator's and non-initiator's profit yield significant results only in the non-initiator's case ($F(1,266) = .42, p = .52$; $F(1,266) = 19.21, p < .001$ for the effect of deal number on the initiator and non-initiator, respectively). This result is compatible with Bazerman *et al.*'s finding (Bazerman *et al.*, 1985) that the increase in joint profit over time stemmed from increase in profit of the less successful rather than the more successful negotiator. As the above analysis indicated, initiators were generally the more successful negotiators. Thus the present finding and Bazerman *et al.*'s finding may reflect the same phenomenon.

Hypothesis 10 posed the possibility that the impact of experience on initial offers is parallel to the effect found in final outcomes. Initial offer values are depicted by the unfilled symbols in Fig. 2. Consistent with the prediction, joint regression of initiator and non-initiator initial offer value (as within-pair factor) by deal number revealed a significant effect of deal number across the within pair factor ($F(1,266) = 25.13, p < .001$). This effect reflects an increase of initial offer values as negotiators gain experience. Furthermore, the analysis also yielded a significant interaction of 'deal number' with the within-pair factor ($F(1,266) = 8.082, p = .005$). As can be seen in the figure, the value of the initial offer from the perspective of the non-initiator clearly increased with deal number. The initial offer value for the initiator herself seems to slightly decrease, but this change is not quite significant ($F(1,266) = 3.659, p < .001$; $F(1,266) = 1.719, p = .088$ for non-initiator and initiator, respectively, in separate regressions of initial offer value by deal number). Thus, while the initiator does not substantially alter the value of her opening offer from her perspective, she learns how to construct an offer that would increase her partner's profit, without significantly reducing her own.

Does Experience Lead to Discount of Anchors?

Beyond the changes in initial offers noted above, it is possible that the role of anchors diminishes as one

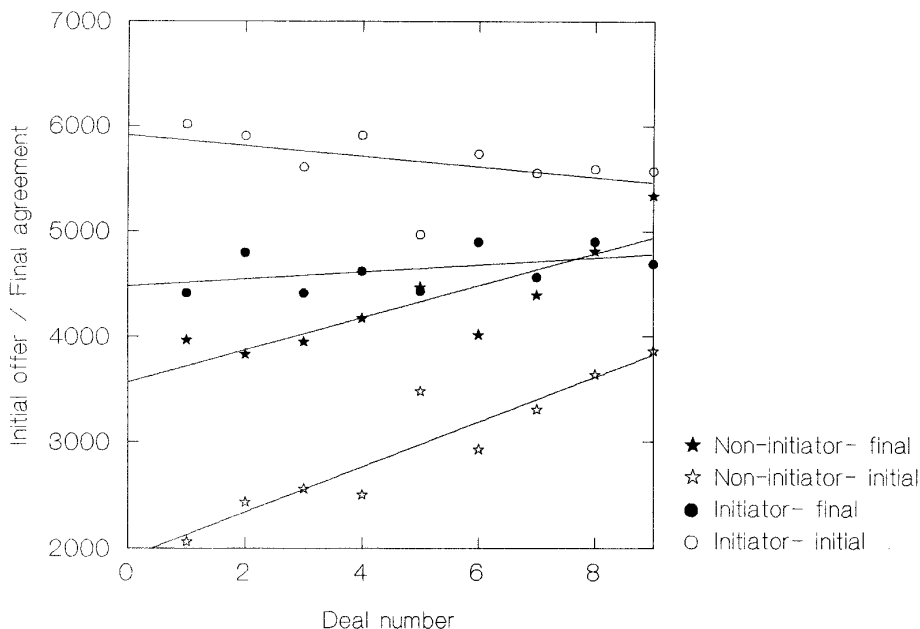


FIG. 2. Mean final profit and initial offer value as a function of deal number.

gains experience with a particular task. To the extent that such a process takes place, non-initiators are likely to benefit from it more than initiators, as their anchors (initial offer value from their perspective) are lower than the initiators'. A decrease in the anchor's impact would imply an interaction of deal number with initial offer values in predicting negotiators' final profit. Regression analysis served to test this prediction. Initiator's and non-initiator's final profits were used as within-pair dependent variables in this regression analysis. The independent factors included deal number, initial offer values (for both participants), and the interaction factors. Only the two initial offer values proved significant across the within-pair factor ($F(1,262) = 29.67, p < .001$; $F(1,262) = 45.83, p < .001$ for the initiator and non-initiator initial offer values, respectively). The interaction of initiator's initial offer value with the within-pair factor was marginally significant ($F(1,262) = 2.96, p = .08$). No other effects approached significance. Hence, the present data provide no indication that the impact of initial offers decreases with experience.

While experience was not found to lessen the anchoring role played by initial offers, other forms of anchoring may be more susceptible to learning. In particular, anchoring the processing of a list of numbers on the top number may become a less salient heuristic as one gains familiarity with the list. In this case, one expects experience and market version to interact in predicting initial offer value as well as final profit. To test this hypothesis the initial offer values for buyer and seller

served as dependent variables in a regression analysis, with market version, initiator, market version * initiator, deal number, and the interaction of market version * deal number as independent factors. While all the effects were significant across buyer and seller ($p < .01$ for each effect), only market version and initiator yielded significant differences between buyer and seller ($F(1,263) = 4.22, p < .05$; $F(1,263) = 147.3, p < .001$ for market version and initiator, respectively). The triple interaction of participant's assigned role, market version, and experience did not approach a significant level ($p = .49$). Thus, the present analysis does not provide any indication that experience moderates the presentation format effect on initial offers.

DISCUSSION

Two anchoring effects have been revealed by the analysis of agreements and initial offers in the simulated competitive market. First, a format effect, attributed to anchoring, has been observed. Presentation of the sequence of profit levels in increasing or decreasing order affected the participant's final profit. The buyer's advantage, often observed in previous studies, reversed when her profit schedule sequence was inverted. The same pattern of results was found for initial offer values as well: Offers made by negotiators with decreasing profit schedules were generally higher than those made by negotiators with increasing schedules.

Next, the role of the initial offer as an anchor in the negotiation has been explored. Previous research has

already demonstrated the impact of initial offer on final outcome in programmed, unidimensional negotiation. The present research examined the role of initial offers in an unprogrammed integrative bargaining situation. In this setting, the value of the initial offer from the participant's perspective affected her final profit, whether the offer was proposed by her or by the other negotiator. Further analysis suggested that the impact of schedule format may be mostly mediated by initial offers.

The gist of the integrative negotiation simulation is that the value of possible outcomes for the two sides to the negotiation are not perfectly correlated. Hence, in assessing the impact of initial offer on final profit, one needs to examine the contribution of both the value of the offer for the initiator and its value for the non-initiator. The present findings suggest that both initial offer values, the initiator's as well as the non-initiator's positively affect the final profit of each participant. Thus, making the opening offer attractive from the viewpoint of the opposite party worked to the benefit of the negotiator making the offer as well. Were participants in the negotiation exercise aware of this reality? The succession of initial offers through the trade period reveals a learning process on the part of the initiators, with respect to this question. While the value of the opening offers for the initiator remained relatively stable throughout the market run, the offers gradually became more attractive from the non-initiator's perspective. These changes in initial offer induced increase in joint profit. Thus it seems that the negotiators have gradually become aware of the advantage in presenting their opponents with an attractive initial offer.

While learning clearly affected the configuration of initial offers, there is no indication that the anchoring effects uncovered in the study significantly changed over the course of the market run: Gaining experience did not appear to reduce the influence exerted by initial offers upon subsequent negotiation, and neither did growing familiarity with the profit schedule diminish the effect of format in initial offers. Thus, in the present setting at least, the use of anchoring may not be susceptible to learning.

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