Round Off the Bargaining: The Effects of Offer Roundness on Willingness to Accept

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This research shows that making a precise (vs. round) offer in a negotiation may lead to diverging outcomes. On the one hand, past literature has demonstrated a precision advantage wherein offer precision reduces the amount by which offer recipients counter. On the other hand, building on the notion that round numbers symbolize completion and previous findings that individuals tend to set goals at round numbers, we hypothesize a roundness advantage wherein offer roundness increases the bargainer's willingness to accept an offer. Five studies provide convergent evidence for our proposition and reconcile the present results with previous findings. We found that participants receiving a round offer are more (less) likely to accept (counter) than those who receive comparable precise offers. However, if they counter, participants in the precise condition counter by a smaller amount than those in the round condition. Furthermore, in agreement with our explanation, we find that the roundness advantage is more likely to manifest when participants subscribe to the association between round numbers and the feeling of completion.

Keywords: negotiation, numerical cognition, round numbers, psychological closure

Negotiations occur everywhere. For instance, consumers negotiate with dealerships for cars, with realtors for houses, and with sellers on Craigslist for used goods. In addition to marketing, employees negotiate salaries with their employers, firm acquirers negotiate with sellers for prices, and politicians negotiate with each other on a variety of issues. Most negotiations, as illustrated by the preceding examples, involve numbers. The existing literature has demonstrated that a negotiator's response to an offer is determined by not only offer magnitude but also numerical features associated with that offer. In particular, several studies have examined how negotiators respond to precise versus round offers. Interestingly, these studies have converged on the finding that making precise offers is advantageous in that negotiators often counter less to precise offers than round offers (Janiszewski and Uy 2008; Mason et al. 2013; Thomas, Simon, and Kadiyali 2010). Consequently, offer makers are more likely to make a deal that is closer to their expectations.

However, the foregoing findings assumed that negotiators will make counteroffers. In addition to counteroffering, the offer recipient can also accept or reject an offer. To the best of our knowledge, whether and how precise versus round[1] offers influence negotiators' propensity to accept or counter have not been investigated. From a theoretical perspective, examining this issue would provide a more comprehensive picture about how offer

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1 Round numbers refer to natural stopping points such as 30, 31.00, or $35. Both precision and roundness are relative, subjective perceptions and thus may be contextual. They differ from other numerical properties such as parity (even or odd) that are inherent in specific numbers.

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characteristics influence negotiators' decisions. Managerially, a negotiator's willingness to accept (WTA) an offer is closely related to how long the bargaining will take; time is money. In many circumstances, additional rounds of bargaining can bring a better deal, but consumers may be better off closing the deal sooner. For example, the negotiation process is often associated with unpleasant emotions, such as anxiety (Rosette, Kopelman, and Abbott 2014), anger (Adam, Shirako, and Maddux 2010), and fear (Adler, Rosen, and Silverstein 1998). Thus, reducing the number of rounds may improve a negotiator's subjective happiness.

The present work attempts to fill this gap. Building on the notion that round numbers symbolize completion and previous findings that individuals tend to set goals at round numbers, we propose that negotiators are more likely to accept round offers than comparable precise offers. In five studies, we obtained triangulating support for this hypothesis and reconciled our roundness advantage with the previous literature showing the benefit of making precise offers. In the following, we first discuss the past research showing the precise advantage in negotiations and the various mechanisms proposed to explain this effect. Then, we present our hypothesis for why negotiators are more willing to accept round, rather than precise, offers. Next, we present the five studies and conclude with a discussion of the results, theoretical contributions, managerial implications, and opportunities for further research.

THE PRECISION ADVANTAGE

Imagine that Sherry wants to sell her car. She can either set the price at a round number, such as $18,000, or a precise one, such as $17,799. The question then becomes which strategy Sherry should choose. One of the key findings in the recent negotiation literature was that negotiators should make precise offers, because a precise (vs. round) offer reduces the magnitude of counteroffers (Janiszewski and Uy 2008; Mason et al. 2013; Thomas et al. 2010). These findings indicated that Sherry may eventually sell the car at a higher price if she asks for $17,799, rather than $18,000. Several accounts have been proposed to explain this precision advantage.

First, making a precise offer signals confidence, believability, and reasonability. For example, whereas a counteroffer is often based on the previous offers that a negotiator has received, Mason et al. (2013) contended that the potency of such anchoring is stronger when the received offer is more credible. Compared with a round offer, a precise offer suggests that the offer maker is more informed and more confident and that the value seems to be reasonable and valid. Jerez-Fernandez, Angulo, and Oppenheimer (2014) conducted an interesting study in which participants played a game based on the television show *The Price Is Right*. They were asked to estimate the price of three different products with the audience's help. The prices that the audience suggested were either round or precise. In agreement with the authors' reasoning that precision signals confidence, the authors found that the participants preferred receiving advice from people who provided estimates that were not round.

In addition to this confidence-based explanation, Thomas and colleagues (2010) proposed a different mechanism. In reality, when magnitudes are small, they are often expressed in precise numbers. For example, numerical values, such as grade point averages (GPAs) and laptop weights, often contain decimal points. In contrast, round numbers are often used for large quantities. For example, the distance between New York City and San Francisco is approximately 2,500 miles. The authors thus argue that individuals may have learned a "precise = small magnitude" heuristic. Consequently, consumers are likely to judge a precise price (e.g., $364,578) to be smaller than round prices of similar magnitude (e.g., $364,000). In the negotiation context, this magnitude perception causes negotiators to counter less (in magnitude). In addition to showing this effect in the laboratory, the authors also obtained supportive evidence from real housing markets. In particular, they found that the sale price of a house is higher if the listing price contains fewer ending zeros (i.e., a more precise offer). Interestingly, Janiszewski and Uy (2008) also analyzed home sales data and observed the same pattern of more precise listing prices leading to higher sale prices after controlling for the magnitude of the listing price.

ROUND NUMBERS AND THE FEELING OF COMPLETION

The studies discussed above showed that offer precision may signal credibility and small magnitudes. The present research proposes that whether an offer is precise or round can express additional meanings, which, under certain circumstances, can also influence negotiators' decisions. In particular, we propose that round numbers symbolize completion, whereas precise numbers do not. Although this proposition has not previously been examined, several lines of research, which are reviewed below, provide grounds that support a relationship between numerical roundness and the feeling of completion.

First, round numbers are usually the last in a series of numbers. For example, Isaac and Schindler (2014) found that individuals tended to divide a series of numbers into small categories based on round numbers, which is why rankings such as top 10, top 50, and top 100 are so ubiquitous. In each of these rankings, round numbers are last, functioning as the boundaries of numerical categories. Consequently, when counting or measuring, people usually view a rollover to a round number as a milestone (e.g.,

improving from 11th to 10th), whereas movement within the same round-number category appears to be smaller (e.g., improving from 18th to 17th).

The connection between round numbers and completeness is also evident when viewed from a linguistic perspective. In English, the word "round" has several meanings that are closely related to completeness, including (a) brought to satisfactory completion or perfection, (b) from beginning to end, and (c) a unit of action in a contest or game that comprises a stated period. For example, rounding off an activity means ending the activity by doing something that provides a clear or satisfactory conclusion. In the same vein, life is commonly conceptualized as a circle that ends with its completion. In addition, round shapes are associated with concepts such as perfection, wholeness, and completion. For example, in Ancient Greek culture, the circle was considered the perfect shape. In contrast, precise numbers are often associated with incompleteness. Consider one type of precise number: the fraction. The word "fraction" comes from the Latin *fractus*, which means "broken." In contrast with completeness or wholeness, a fraction represents part of a whole.

Moreover, if something—especially a negotiation—is complete or closed, it should be perceived to be static and peaceful. Conversely, an incomplete or ongoing negotiation may be considered dynamic and full of aggression or conflict. For example, one indicator of psychological closure is decreased emotional detail in the constructed representation in autobiographical memory (Beike and Wirth-Beaumont 2005). Consistent with this notion, recent research has shown that people perceive round numbers as feminine (Yan 2016) and therefore as possessing typical feminine attributes, such as peacefulness and harmony. In contrast, precise numbers are judged to be more masculine and are likely to be associated with aggression, toughness, and other stereotypically manly properties. Thus, this line of reasoning lends additional support to our notion that round numbers symbolize completion.

Collectively, therefore, these different strands of thought yield suggestive support for our proposition that round numbers express completion. Below, we elaborate on how this symbolic meaning of round numbers influences negotiators' decisions.

THE ROUNDNESS ADVANTAGE

Given that numerical precision or roundness can convey multiple meanings, the question arises of the conditions under which negotiators will infer credibility from precision and when they will infer completion from roundness. Existing research suggests that when the same information carries multiple meanings, the particular inference that people make may be simply determined by the judgment task itself, which presumably recruits a relevant subset of knowledge that can serve as an applicable inference rule (Schwarz 2004). Considering ease of retrieval as an example, a person who finds it easy (difficult) to recall examples of an event infers (a) that there are (are not) many such events when asked about frequency (Aarts and Dijksterhuis 1999), (b) that the relevant events occurred very recently (a long time ago) when asked about temporal distance (Schwarz 2003), or (c) that his or her memory for this information is good (poor) when asked about memory quality (Winkielman, Schwarz, and Belli 1998).

Applying these findings to the current research, we suggest that when bargainers think about the counteroffers they should make, as shown in previous studies, they are likely to infer credibility and magnitude from offer roundness or other characteristics, because such inferences will help them to decide how much they should counter. However, we propose that when negotiators decide whether to continue negotiations or to accept an offer—that is, when the concept of closure is made salient—such inferences are less likely. Instead, the meaning of round numbers as representing completion is more likely to be activated. Previous research has shown that by expressing a specific meaning, psychological markers can play an important role in influencing individuals' behavioral decisions. For instance, Dai, Milkman, and Riis (2014) found that people are more likely to initiate their goal pursuit at the beginning of a week, month, or year, because the first day in a temporal period symbolizes a "fresh start." By the same reasoning, we propose a roundness advantage whereby bargainers are more likely to close a negotiation (i.e., accept an offer) when the offer they receive is round rather than precise, because the meanings signaled by round numbers create a sense of goal achievement and psychological closure.

In line with our reasoning, previous research has shown that individuals prefer setting goals at round numbers. Therefore, the goal pursuit process will be completed when they reach that round number. For example, when running on treadmills, people often stop at round numbers, such as 10 miles, 30 minutes, or 500 calories. Empirically, Pope and Simonsohn (2011) found that professional baseball players were approximately four times as likely to end the season with a .300 batting average as they were to end the season with a .299 average. Similarly, high school juniors were much more likely to retake the SAT if their total score ended in 90 (e.g., 1190) than if it ended in the most proximate 00 (e.g., 1200).

In summary, we propose that, because round numbers signal completion and are associated with goal achievement, when bargainers think about closing a deal, round numbers create a sense of goal completion that increases their willingness to accept an offer.

OVERVIEW OF STUDIES

In this article, we report five studies. The first three studies focused on testing our predictions and reconciling our

findings with the previous literature. Specifically, in study 1, we observed the roundness advantage when participants were asked to indicate their willingness to accept (WTA) an offer. In contrast, the precision advantage emerged when the participants were asked to make counteroffers. Study 2 replicated these findings using a more natural setting. The results showed that participants receiving a round offer were more likely to accept than those who received comparable precise offers. In contrast, precise (vs. round) offers increased the likelihood of counteroffering. Furthermore, we found that, conditional on countering, participants in precise conditions countered less than those in round conditions. Study 3 further replicated previous findings using a negotiation simulation with monetary incentives. The last two studies investigated the psychological mechanism underlying the roundness advantage. Study 4 demonstrated the mediating role of completion in the effect of offer roundness on WTA. In addition, this study also assessed several alternative interpretations. Study 5 demonstrated the existence of an association between round numbers and completion and the moderating role of this association on the roundness advantage.

STUDY 1: THE ADVANTAGES OF ROUND AND PRECISE OFFERS

Study 1 attempted to provide an initial demonstration of the proposed roundness advantage that negotiators are more likely to accept round, rather than precise, offers. In this and subsequent studies, we manipulated offer roundness using different numbers, such as \$9.87 versus \$10.00, which was a widely used method in earlier research (Janiszewski and Uy 2008; Mason et al. 2013). However, this operationalization may introduce magnitude as a potential confounder. We addressed this issue by including two precise conditions: precise-below (e.g., \$9.87) and precise-above (\$10.13). Our second goal with this study was to reconcile our prediction with the precision advantage that has been robustly documented in previous research. For this purpose, participants were explicitly asked either to indicate their willingness to accept the offer or to make a counteroffer.

Methods

Participants and Design. We recruited 605 participants (274 women; $M_{age} = 33.64$, SD = 10.30) from Amazon's Mechanical Turk and randomly assigned them to cells using a 3 (Offer Roundness: Round vs. Precise-Below vs. Precise-Above) × 2 (Dependent Measures: Acceptance vs. Counteroffer) × 3 (Replicate) mixed factorial design. The first two factors were manipulated between subjects, while the replicate was a within-subjects factor.

Procedure. We informed all of the participants that the purpose of this study was to understand home purchase decisions (The stimuli used in this and subsequent studies are presented in the web appendix). They were instructed to imagine being a buyer in the real estate market. They had narrowed down their choices to three homes that met all of their expectations. Thus, they were negotiating with the seller for the best possible prices. For each home, we provided the participants with the list price and the most recent offer that the seller had proposed after some bargaining. For each home, depending on conditions, the participants were asked to indicate their willingness to accept and close the deal (acceptance condition) or to make a counteroffer as if they had decided to continue the negotiation (counteroffer condition). For each house, we kept the list price constant across conditions and manipulated the precision of the most recent offer that may be most salient, diagnostic, and influential. These houses were listed at \$339,999, \$375,900, and \$390,000. We varied the precision level of these list prices to evaluate the generalizability of our prediction. As reported later, our results were not dependent upon this feature. In the Round (Precise-Below, Precise-Above) condition, the most recent offers were \$325,000 (\$324,599, \$325,499), \$365,000 (\$364,599, \$365,399), and \$377,000 (\$376,579, \$377,429), respectively.

Results and Discussion

How Much to Counter. Because the two dependent variables were qualitatively different, we analyzed them separately. Two hundred ninety-six participants were asked to make counteroffers, with the expectation of 888 responses. However, only 865 observations were used in the analyses. First, we observed nine values missing from the dataset. Second, 14 responses that deviated from the mean by more than three standard deviations were removed. To test our predictions, we first computed the amount of countering by subtracting the counteroffers made by participants from the most recent offers. Table 1 summarizes all of the information.

These difference scores were submitted to a 3 × 3 ANOVA with repeated measures, where offer roundness was the between-subjects factor, and replicate was the within-subjects factor. This analysis revealed two significant effects. First, the main effect of offer roundness was significant ($F(2, 277) = 4.34$, $p = .01$). Replicating the past literature, we found that compared with those in the Round condition ($M = \$16{,}427$, SD = \$17,265), participants in the Precise-Below ($M = \$11{,}346$, SD = \$9,888; $p = .02$) and Precise-Above ($M = \$11{,}042$, SD = \$11,463; $p = .01$) conditions countered less. The difference between the Precise-Below and Precise-Above groups was not significant ($p > .80$).

TABLE 1

ACCEPTANCE RATES AND MEAN COUNTEROFFERS IN STUDY 1

Number manipulation				DV manipulation			
				DV = Counteroffer			DV = Acceptance
		List price	Last offer	Mean	Difference	SD	
House 1	*Precise-Below*	$339,999	$324,599	$316,191	$8,408	$9,581	42% (42/100)
	Precise-Above	$339,999	$325,499	$316,615	$8,884	$9,674	40% (40/101)
	Round	$339,999	$325,000	$311,594	$13,406	$14,126	58% (63/108)
House 2	*Precise-Below*	$375,900	$364,599	$351,775	$12,824	$12,701	37% (37/100)
	Precise-Above	$375,900	$365,399	$352,929	$12,470	$16,859	38% (38/101)
	Round	$375,900	$365,000	$348,624	$16,376	$13,957	54% (58/108)
House 3	*Precise-Below*	$390,000	$376,579	$363,591	$12,989	$12,196	40% (40/100)
	Precise-Above	$390,000	$377,429	$365,401	$12,028	$12,652	39% (39/101)
	Round	$390,000	$377,000	$360,407	$16,593	$13,463	56% (60/108)

The fact that the offer roundness × replicate interaction ($F < 1$, $p > .80$) was nonsignificant suggests that the precision advantage did not vary across scenarios. For each house, the differences between the Round and Precise-Below conditions (House 1: $t(285) = 3.11$, $p = .002$; House 2: $t(286) = 2.01$, $p = .05$; House 3: $t(285) = 2.13$, $p = .03$) and the Round and Precise-Above conditions (House 1: $t(285) = 2.75$, $p = .006$; House 2: $t(286) = 2.08$, $p = .04$; House 3: $t(285) = 2.73$, $p = .007$) were significant. Additionally, there was no significant difference between the two precise conditions ($ps > .50$). Finally, in addition to this anticipated effect of offer roundness, we also observed a significant within-subjects difference ($F(2, 554) = 23.66$, $p < .001$). We speculate that this difference was due to different price levels associated with different houses.

WTA. To examine our predicted roundness advantage, we conducted a random-effects logistic regression, in which participants' decisions (acceptance or not) were regressed on offer roundness, replicate, and their interaction. This analysis yielded a significant effect of offer roundness ($z = 1.93$, $p = .05$) only. The within-subject factor and its interaction with offer roundness was not significant ($ps > .80$). We first report the results collapsed across three houses. Specifically, consistent with our predictions, we found that participants in the Round condition (158/324 or 49%) indicated stronger willingness to accept the offer than those in the Precise-Below (119/300 or 40%; χ^2 (1) = 5.22, $p = .02$) and Precise-Above (117/303 or 39%; χ^2 (1) = 6.55, $p = .01$) conditions. The difference between the latter two conditions was not significant ($p > .70$). It is worth mentioning that the difference between the Round and Precise-Above conditions may be explained by magnitude because buyers should exhibit greater acceptance intentions when the price is lower. However, this alternative explanation is excluded by the exact same pattern between the Round and Precise-Below conditions.

Furthermore, we found that this pattern held for all three houses. For each house, the differences between the Round and Precise-Below conditions (House 1: χ^2 (1) = 5.54, $p = .02$; House 2: χ^2 (1) = 5.84, $p = .02$; House 3: χ^2 (1) = 5.03, $p = .02$) and the Round and Precise-Above conditions (House 1: χ^2 (1) = 7.33, $p = .007$; House 2: χ^2 (1) = 5.43, $p = .02$; House 3: χ^2 (1) = 6.01, $p = .01$) were significant. Additionally, there was no significant difference between the two precise conditions ($ps > .70$).

Discussion. To the best of our knowledge, study 1 is among the first to show the advantage of making round offers in negotiations because they are more likely to be accepted than precise offers, even though the precise offers are better. At the same time, this study also reconciles our findings with the previous literature. We show that making round offers is advantageous when acceptance rate is the primary objective. However, if the goal is to obtain the best possible offer, negotiators are advised to make precise offers because precision has been found to signal a number of factors (Janiszewski and Uy 2008; Mason et al. 2013; Thomas et al. 2010), all of which cause offer recipients to counter less.

STUDY 2: REPLICATION

In study 2, we first sought to replicate the findings of study 1 in a controlled lab setting using different scenarios. Second, this study addressed one limitation of study 1, in which we explicitly instructed participants to either indicate their willingness to accept or make a counteroffer. Bargainers in real situations, however, do not receive such instructions. Thus, study 2 used a more natural paradigm, in which the participants were provided with three options: to accept, reject, or make a counteroffer. Participants who chose to counter were then asked to indicate their counteroffers. The participants' decisions and counteroffers were

TABLE 2

DECISIONS AND MEAN COUNTEROFFERS IN STUDY 2

Number manipulation				Dependent measures: Decision			Dependent measures: Counteroffer (if counter)		
		List price	Last offer	Accept	Reject	Counter	Mean	Difference	SD
Coffee	*Precise-Below*	$4.29	$3.87	51%	5%	44%	$3.59	$0.28	$0.23
	Round	$4.29	$4.00	63%	4%	33%	$3.59	$0.41	$0.37
	Precise-Above	$4.29	$4.13	51%	6%	43%	$3.94	$0.19	$0.32
Jewelry	*Precise-Below*	$25	$19.3	21%	19%	60%	$15.85	$3.45	$3.12
	Round	$25	$20.0	33%	21%	46%	$14.68	$5.32	$3.26
	Precise-Above	$25	$20.7	23%	21%	54%	$16.34	$4.36	$3.55

used to evaluate our predictions and the precision advantage.

Methods

Design and Participants. This study was a 3 (Offer Roundness: Round vs. Precise-Below vs. Precise-Above) $\times$ 2 (Replicate) mixed design. Similar to study 1, we varied price roundness between subjects, and each participant responded to two different scenarios. Four hundred seventy-two undergraduates (250 females; M_{age} = 22.66, SD = 5.49) who participated in a 45-minute study session the focal study is the first in exchange for additional course credit, were randomly assigned to the three between-subjects cells.

Procedure. All of the participants were told that the study was about negotiations. On this pretense, they were asked to imagine being involved in two negotiation scenarios, which were adopted from Mason et al. (2013). The first scenario was about buying coffee for a hotel. The participants were asked to imagine being a hotel director negotiating the coffee price with a potential vendor. The vendor representative, who initially asked for $4.29 per pound, offered a price of $3.87 ($4.00, or $4.13) after some bargaining. In the second scenario, participants imagined bargaining with a shopkeeper over jewelry in Istanbul. Some bargaining had brought the initial asking price of $25.00 down to $19.30 ($20, or $20.70). For each scenario, the participants were asked to indicate whether they would accept or decline the offer or make a counteroffer. Participants who chose to counter were asked to indicate the counteroffer they intended to make.

Results: Coffee Scenario

WTA. The participants' responses in each cell are summarized in table 2. We report our analyses for each scenario separately. Replicating previous results, the participants in the Round condition (99/156 or 63%) indicated greater willingness to accept the offer than those in the Precise-Below (84/165 or 51%; χ^2 (1) = 5.16, p = .02) and Precise-Above conditions (77/151 or 51%; χ^2 (1) = 4.88, p = .03). The participants' accepting and countering likelihood did not differ significantly between the two precise conditions (ps > .90).

In contrast, our theorizing predicted that negotiators were more likely to counter precise versus round offers. Consistent with this reasoning, we found that participants' countering likelihood in the Round condition (51/156 or 33%) was significantly less than that in the Precise-Below condition (72/165 or 44%; χ^2 (1) = 4.06, p = .04); it was also lower than that in the Precise-Above condition (65/151 or 43%; χ^2 (1) = 3.50, p = .06), although the difference was only marginally significant.

How Much to Counter. Next, we analyzed whether and how the roundness of the last offer influenced the magnitude of counteroffers. Similar to study 1, we calculated the amount of adjustment by subtracting the counteroffer from the most recent offer. A one-way ANOVA on this measurement yielded a significant difference (F(2, 183) = 7.42, p = .001). Replicating the precision advantage documented in the prior research, we found that, compared with participants in the Round condition (M = \$.41, SD = \$.37), those in the Precise-Below (M = \$.28, SD = \$.23; t(183) = 2.34, p = .02) and Precise-Above conditions (M = \$.19, SD = \$.32; t(183) = 3.85, p < .001) countered less. The difference between the two precise conditions, although not predicted, was marginally significant (t(183) = 1.68, p = .095).

Results: Jewelry Scenario

WTA. The results of the jewelry scenario paralleled the coffee scenario. Specifically, the acceptance rate was higher in the Round condition (53/159 or 33%) than in the Precise-Below (35/167 or 21%; χ^2 (1) = 6.33, p = .01) and Precise-Above (33/146 or 23%; χ^2 (1) = 4.33, p = .04) conditions. The participants' accepting and countering likelihoods did not differ significantly between the two precise conditions (ps > .70). The participants' likelihood

of countering, in contrast, was less in the Round condition (73/159 or 46%) than in the Precise-Below condition (100/167 or 60%; χ^2 (1) = 6.38, p = .01). However, although the direction was consistent with our prediction, the difference between the Round and Precise-Above conditions was not significant (79/146 or 54%; χ^2 (1) = 2.05, p = .15).

How Much to Counter. When the participants chose to counter, the amount they countered was affected by offer roundness as well. In agreement with past research and replicating the previous results, we found that, compared with participants in the Round condition (M = \$5.32, SD = \$3.26), those in the Precise-Below (M = \$3.45, SD = \$3.12; $t(249) = 3.70$, $p < .001$) and Precise-Above conditions (M = \$4.36, SD = \$3.55; $t(249) = 1.80$, $p = .07$) countered less. Again, although not anticipated, the difference between the two precise conditions was marginally significant ($t(249) = 1.82$, $p = .07$).

Discussion

Thus, using an experimental setting that mimics negotiation in the real business world, study 2 replicated study 1's findings in two different scenarios. We found that, consistent with our theorizing, participants receiving a round offer were more likely to accept than those who received comparable precise offers. In contrast, precise (vs. round) offers increased the likelihood of continuing the bargaining process (i.e., making a counteroffer). Furthermore, replicating the prior literature (Mason et al. 2013; Thomas et al. 2010), we found that, conditional on countering, participants in precise conditions countered less than those in round conditions. Finally, it is worth mentioning that by yielding the same results in both the Precise-Below and Precise-Above conditions, the first two studies suggest that the effects we observed were not due to the small magnitude difference.

STUDY 3: NEGOTIATION SIMULATION

While the first two studies provided converging evidence for our hypotheses, they were based on hypothetical scenarios. Therefore, whether our findings could be observed in real negotiations remained unclear. In particular, real negotiations occur through a sequence of offers and counteroffers. Under these circumstances, negotiators' WTA may be influenced by many factors, one of which is the depth of counteroffers. It is important to assess whether and to what extent numerical roundness can still have an effect in these more complex settings. In addition, participants' motivation in scenario-based studies is presumably lower than it is in real negotiations. It is unclear whether negotiators will be willing to accept round offers that actually lower their surplus when the outcome is consequential. Combining these goals, we conducted study 3, which was a negotiation simulation in the laboratory with monetary incentives. In addition to addressing these two limitations, this study also tested the generalizability of our effects using a different product category: used cars. In reality, consumers often buy and sell used vehicles through bargaining.

Methods

Participants. Two hundred forty-six undergraduate students (102 women; M_{age} = 22.72, SD = 5.50) participated in exchange for course credit.

Procedure. The negotiations were conducted via a website created by the researchers. Participants were randomly paired and assigned to the role of buyers or sellers, according to the sequence in which they entered their participant IDs. They were informed that they would be negotiating two used cars with another participant anonymously. They had a chance to win \$20 cash on a lottery basis. Following Anthony and Cowley (2012), we told the participants that the number of lottery tickets they would receive was proportionate to their performance in the negotiations. Specifically, we provided a price range for each car. The seller participants' rewards would be determined by how much higher the final price was than the lower range. For example, if the suggested price range was \$9,000 to \$10,000, they received more lottery tickets if they made a deal at \$9,800 rather than \$9,500. Participants playing buyers were informed that the number of lottery tickets they would receive was determined by how much they could lower the price.

The negotiation commenced with the seller making an initial offer. All participants could make any offer as they wanted. In each round, the offer recipient made his or her decision by clicking one of three buttons: (a) Accept, (b) Reject, or (c) Counteroffer. If participants chose to counter, they were asked to indicate their offer. The process continued until a deal was made or broken. Subsequently, the participants moved to the second car.

Results and Discussion

The data contained 865 observations, including 195 acceptances, 619 counteroffers, and 51 rejections. The rejected offers were excluded from the main analysis, leaving 814 observations. We followed Thomas et al. (2010) to code offer roundness by counting the number of ending zeros. In our dataset, the numbers of offers with 0, 1, 2, 3, or 4 trailing zeros were 86 (10.6%), 153 (18.8%), 350 (43.0%), 206 (25.3%), and 19 (2.3%), respectively. In addition, we standardized offer and counteroffer depth such that the coefficients would not have an excess of zero decimals.

WTA. Because the data included multiple observations (i.e., several rounds of decisions) from the same participant, we considered this within-subjects variance by running a pseudopanel model with random effects. In this binary logistic regression, negotiators' decisions (1 = accept; 0 = counteroffer) were regressed on offer roundness and counteroffer depth. Counteroffer depth is the absolute difference between offer recipients' last offers and the counteroffers they just received from another party. For example, if we suppose that the offer recipient is a seller who made an offer of $18,000 in the previous round, he or she should be more likely to accept a counteroffer of $17,500 rather than $16,000, as the latter deviates too far from his or her offer. Because we need to include counteroffer depth as a predictor in the model, buyers' first decisions were excluded from the analysis (577 observations were used).

This analysis revealed two significant effects. First, consistent with our intuition, counteroffer depth had a negative impact ($B = –.8186$, SE $= .2081$; $z = –3.93$, $p < .001$) on participants' WTAs such that offer recipients were more likely to accept offers that did not deviate much from the offer they made in the previous round. More importantly, replicating previous studies, we found that offer roundness had a significant impact ($B = .2653$, SE $= .1361$; $z = 1.95$, $p = .05$), indicating that participants' WTAs increased when offers had more ending zeros.

How Much to Counter. Among 814 observations, 619 were about counteroffers. Participants' countering amounts (difference between two offers) were regressed on the most recent offer and offer roundness. This analysis yielded two significant effects. First, the effect of offer magnitude was positive ($B = .3165$, SE $= .0377$; $z = 8.39$, $p < .001$), indicating that participants countered more to a larger (e.g., $20,000) than a smaller offer (e.g., $7,000). More importantly, in line with the previous literature and replicating the previous findings, the effect of offer roundness was significant ($B = .1656$, SE $= .0387$; $z = 4.28$, $p < .001$), suggesting that participants adjusted more based on rounder offers.

Discussion. The main contribution of study 3 was the replication of the findings in studies 1 and 2 in a more realistic sequential negotiation setting, in which the participants were also motivated to obtain the best possible outcomes. On the one hand, by controlling the counteroffer amount, which is more salient and diagnostic, we found that offer roundness still influenced participants' WTAs, indicating that our findings are robust. On the other hand, we also replicated the precision advantage such that participants countered less to offers with fewer ending zeros.

Although in the foregoing analyses we treated offer roundness as a continuous variable, it merits mention that our findings still held if we coded offer roundness as a dichotomous variable (round = 1; precise = 0). Specifically, in addition to the significant effect of counteroffer depth ($B = –.7541$, SE $= .2044$; $z = –3.69$, $p < .001$), offer roundness also had an impact on participants' WTAs, although the effect was only marginally significant ($B = .8084$, SE $= .4508$; $z = 1.79$, $p = .07$). However, the effect of offer roundness on how much to counter became nonsignificant ($B = .1306$, SE $= .1197$; $z = 1.09$, $p = .275$), whereas the effect of offer magnitude remained significant ($B = .3137$, SE $= .0386$; $z = 8.14$, $p < .001$).

STUDY 4: TESTING UNDERLYING MECHANISM

Combined, the first three studies provided supportive evidence for our proposed roundness effect and reconciled our findings with the precision advantage. We attempted to test the underlying mechanism in the last two studies, where we focused on WTA only. The purpose of study 4 was to measure and assess the intervening role of feeling of completion. We predicted that participants in the round condition would have a stronger feeling of completion than those in the nonround condition and that this difference would mediate the effect of offer roundness on WTA. In addition to testing this mediation model, we also reported two post studies (studies 4A and 4B) that evaluated a few alternative explanations.

Methods

Participants and Design. We recruited 71 participants (25 females) from MTurk. Their ages ranged from 19 to 63, with an average of 28.14 years. The study had a two-cell between-subjects design with participants being randomly assigned to either the round or nonround condition.

Procedure. Participants imagined selling a textbook (original price: $50) at the end of the semester. Depending on conditions, participants were told that one potential buyer was willing to pay $30 ($31) for the book. After they read the scenario, participants indicated how likely they would accept the offer using a seven-point scale ranging from 1 (very unlikely) to 7 (very likely). To measure feeling of completion, we asked participants to indicate the extent to which they agreed or disagreed with several statements using seven-point scales anchored by 1 (strongly disagree) and 7 (strongly agree). These items included "This price brought me a sense of completeness," "This price brought me a sense of closure," "This price brought me a sense of perfection," and "I think the buyer wanted to close the deal."

Results

WTA. The results of a one-way ANOVA on WTA yielded a significant difference ($F(1, 69) = 6.20$, $p = .02$). Replicating previous findings, participants' WTA was

higher in the \$30 ($M = 5.58$, SD = 1.06) than \$31 ($M = 4.87$, SD = 1.30) condition.

Feeling of Completion. We averaged the four items to form a single feeling of completion index ($\alpha = .84$). A one-way ANOVA on this index revealed a significant effect ($F(1, 69) = 10.12$, $p = .002$). Consistent with our prediction, participants indicated that the price \$30 ($M = 4.75$, SD = 1.14) gave them a stronger feeling of completeness than did \$31 ($M = 3.89$, SD = 1.13).

Mediation Analyses. Next, we conducted a mediation analysis using the PROCESS macro (Hayes 2013) to examine our hypothesis that the effect of offer roundness on WTA is in part driven by the feeling of completion. First, as mentioned earlier, the direct effect of offer roundness on WTA was significant. In addition, the effect of offer roundness on feeling of completion was also significant. However, when both offer roundness and feeling of completion were included in the model, the direct path from offer roundness to WTA disappeared ($B = .09$, SE = .22; $t(68) = .41$, $p = .69$), while the effect of feeling of completion was significant ($B = .72$, SE = .09; $t(68) = 7.69$, $p < .001$). Bootstrapping results involving generating 5,000 resamples suggest that the indirect effect is significant with a 95% confidence interval excluding zero [.25, 1.09]. Thus, as hypothesized, the effect of offer roundness on WTA was mediated by the extent to which the offer created a sense of completion.

Alternative Mediation Analyses. It is arguable that the mediation results discussed previously do not conclusively support the underlying process. Specifically, it is possible that the effect of offer roundness on WTA was driven by other mechanisms, which subsequently influences the feeling of completion. To examine such a possibility, we evaluated an alternative mediation model in which the effect of offer roundness on completion is mediated by WTA. If the effect of offer roundness on WTA is indeed attributed to other drivers, this alternative mediation model should work better than our proposed one. However, a test of this mediation model (again using the PROCESS macro) showed that our proposed model outperformed this alternate. Specifically, while the indirect effect is significant (95% CI: 0.11, 0.84), when offer roundness and WTA were included in the model to predict feeling of completion, the effect of offer roundness remained marginally significant ($t(68) = 1.93$, $p = .06$). Thus, this suggests that feeling of completion as the mediator of the roundness-WTA effect is a more accurate representation of the results. Next we report two post studies that further examined a few specific alternative accounts.

Study 4A

In previous studies, our manipulation of offer roundness was often confounded by numerical parity. Specifically, round offers were all even numbers, whereas precise offers were odd. The existing research has shown that individuals assign different qualities to even and odd numbers, which may have partially contributed to our results. For example, Wilkie and Bodenhausen (2012) found that people associated odd (even) numbers with maleness (femaleness). Thus, individuals may be more likely to extract masculine attributes—such as aggression and competitiveness—from odd, rather than even, offers, decreasing their intention to continue bargaining. Study 4A was designed to examine this possibility using both odd and even offers. Specifically, in this study, we included six conditions in which the prices ranged from \$30 to \$35. If the roundness advantage were indeed driven by parity, we should observe a similar difference between pairs, such as \$32 and \$33, while this design also allowed us to test the strength of the roundness advantage.

Methods. The method used in this study was similar to that of study 4. Undergraduate students ($N = 186$) were randomly assigned to conditions according to a six-cell between-subjects design. They were told that the original price was \$50 and that one potential buyer was willing to pay \$30 (\$31, \$32, \$33, \$34, or \$35). After reading the scenario, all participants indicated how likely they were to accept the offer and how likely they were to make a counteroffer, both on seven-point scales ranging from 1 (very unlikely) to 7 (very likely).

Results: WTA and WTC. The results of a one-way ANOVA with WTA as the dependent variable revealed a significant main effect ($F(5, 180) = 3.36$, $p = .006$). The planned contrasts revealed that participants' WTA in the \$30 condition ($M = 5.82$, SD = .94) was significantly higher than that in the \$31 condition ($M = 4.58$, SD = 1.77; $t(180) = 3.16$, $p = .002$) and marginally significantly higher than that in the \$32 condition ($M = 5.16$, SD = 1.90; $t(180) = 1.68$, $p = .09$). In addition, we did not observe significant differences when comparing WTA in the \$30, \$33 ($M = 5.27$, SD = 1.73; $t(180) = 1.37$, $p = .17$), \$34 ($M = 5.41$, SD = 1.46; $t(180) = 1.06$, $p = .29$), and \$35 conditions ($M = 5.97$, SD = .93; $t(180) = .38$, $p = .71$), suggesting that the roundness effect in this study might be as strong as a 16% price difference.

The exact opposite pattern was found for willingness to counteroffer (WTC). The results of a one-way ANOVA revealed a marginally significant main effect ($F(5, 180) = 2.14$, $p = .06$). Follow-up contrast analyses showed that when the buyer was willing to pay \$30, the participants were less likely to counteroffer ($M = 3.53$, SD = 1.89) than when the price was \$31 ($M = 4.84$, SD = 1.93; $t(180) = 2.45$, $p = .02$) or \$32 ($M = 4.51$, SD = 2.36; $t(180) = 1.85$, $p = .07$). The difference became smaller when the price increased, yet no significant difference was observed among the \$30, \$33 ($M = 4.21$, SD = 2.09; $t(180) = 1.11$, $p = .27$), \$34 ($M = 3.82$, SD = 2.02; $t(180) = .48$, $p = .64$),

and \$35 ($M = 3.50$, SD = 2.13; $t(180) = 0.06$, $p = .95$) conditions.

Results: Effects of Parity. If the roundness advantage were due to parity, then the participants should be more likely to accept even offers than odd offers, but this was not the case. Specifically, in analyses treating parity as a factor, we did not observe significant differences between odd and even numbers for either WTA or WTC (*p*s > .59).

Study 4B

Study 4B was designed to examine two additional alternative accounts. The first one suggested that negotiators may be more inclined to close the bargaining at a number that they preferred. In the present context, it seems reasonable to assume that individuals may like round numbers more than precise numbers. To control for this account, we kept the numbers constant, while manipulating their roundness. Specifically, depending on the conditions, participants were told that after some bargaining, a potential buyer was willing to offer \$31 or \$31.00 for the book. Compared to 31, 31.00 is rounder, having two ending zeros. This manipulation of roundness also helped assess another alternative interpretation. Specifically, past research has shown that the offer recipient tended to counter a smaller amount if he or she received a precise, rather than round, offer. For example, in study 4, participants in the \$30 (\$31) condition might have thought about making a counteroffer of \$35 (\$32). Because intuitively \$32 will be more likely to be accepted by the other party than \$35, participants' intention to make another counteroffer should be higher in the \$31 (vs. \$30) condition. Consequently, participants in the round condition are more likely to accept. In study 4B, \$31.00 was more precise than \$31, implying that when thinking of countering, participants in the \$31.00 condition should counter even less than those in the \$31 condition. If the alternative explanation we just discussed were true, then participants in the \$31.00 condition should be less likely to accept the offer compared with those in the \$31 condition. However, our completion-based theorizing predicted the opposite: participants in the \$31.00 condition would indicate higher WTA than those in the \$31 condition.

Methods. This study had a two-cell (\$31 vs. \$31.00) between-subjects design. The basic setting of this study was similar to that of study 4. After reading the scenario, 100 online participants (58 females, mean age = 36 years) indicated their WTA. In addition, to examine the alternative hypothesis, we also asked all participants to indicate their counteroffer, assuming they have decided to counter.

Results: WTA. A one-way ANOVA on WTA yielded a significant effect ($F(1, 98) = 7.63$, $p = .007$). Replicating previous findings, participants in the \$31.00 condition ($M = 6.23$, SD = .79) indicated higher WTA than those in the \$31 condition ($M = 5.60$, SD = 1.38).

Results: Counteroffer. Consistent with prior findings, the results demonstrate that participants in the \$31.00 condition countered less ($M = 36.74$, SD = 2.86) than those in the \$31 condition ($M = 37.79$, SD = 4.29). Although the difference was not significant ($F(1, 98) = 2.01$, $p = .16$), the results are inconsistent with the alternative interpretation. If negotiators indeed base their WTA on their projected likelihood of their counteroffer being accepted, participants in the \$31.00 condition should be less willing to accept the offer, because their counteroffer is smaller and, thus, should be more likely to be accepted.

Discussion

Taken together, the results of study 4 and two post studies provide convergent support to our proposed psychological mechanism. Specifically, the results of study 4 show that the effects of offer roundness on WTA were mediated by feeling of completion. In addition, in the two post studies, we have shown that the observed effects are unlikely to be attributed to other factors, such as parity, likability, and size of the counteroffer.

STUDY 5: TESTING THE ROUND-COMPLETION ASSOCIATION

We have argued that the roundness advantage is attributed to individuals' associating round numbers with the feeling of completeness. To test whether such an association exists, study 5 employed the Implicit Association Test (Greenwald, McGhee, and Schwartz 1998; Greenwald, Nosek, and Banaji 2003), a technique that has been commonly used to assess the existence and strength of associations. For example, Raghunathan, Naylor, and Hoyer (2006) employed this approach to show that consumers associated unhealthiness with tastiness.

Moreover, if our hypothesis were true, then our previous findings should be moderated by the strength and direction of the association. Specifically, our effect would most likely be observed for participants who strongly associated round numbers with completion. In contrast, this effect should be mitigated when this association is weaker. Furthermore, although we have suggested that many individuals associate round numbers with completion, it is possible that some individuals may not link round numbers with completion or may even subscribe to the opposite association. For participants who subscribe to the inverse association, we speculated that our effect may even be reversed. We assessed these predictions in study 5.

Methods

Participants and Design. The participants were 122 MTurkers (60 women; $M_{age} = 36.23$, SD = 11.91) who completed this study in exchange for a small monetary reward. They were randomly assigned to either round or precise conditions.

Procedure. The study was divided into two ostensibly unrelated parts. In the first part, the participants imagined purchasing a house. The scenario was adapted from study 1. Specifically, in the round (precise) condition, the seller initially asked for $390,000 and made an offer of $377,000 ($376,579) after some bargaining. In this case, the precise offer was less than the round offer; hence, it should be more likely to be accepted. However, our theorizing predicted the opposite. Instead of using choice, we employed a continuous measurement in this study, asking the participants to indicate their likelihood of accepting the offer (1 = very unlikely; 7 = very likely).

Next, all of the participants moved to the IAT study, which was conducted using the web edition of Inquisit (version 4.0.6; Millisecond Software 2013). The participants were asked to sort a series of stimuli into two categories as quickly as possible (see table 3A). For each trial, the target stimulus appeared in the center of the screen, and the two category labels appeared in the two upper corners. The participants responded by pressing either the E or I key, representing the desired category. In total, each participant completed 180 trials, which we purposefully divided into seven blocks (see table 3B). In block 1, the participants categorized a series of words as related either to "Incomplete" or to "Complete." Block 2 required the participants to classify a series of numbers as either "Precise" or "Round." Blocks 4 and 7 were the most critical. In these two blocks, the participants viewed one stimulus, which was either a number or a word, one at a time, and they had to choose a disjunctive category for the stimuli. The key difference between these two blocks was how these disjunctive categories were formed. In block 4, the two categories were "Precise or Incomplete" and "Round or Complete," whereas in block 7, the two category labels were "Round or Incomplete" and "Precise or Complete." The rationale underlying these two blocks is that if round numbers are indeed associated with completeness, then participants should respond more rapidly when the two categories are compatible (i.e., block 4) than when they are incompatible (i.e., block 7). Before responding to each of these critical blocks (40 trials in each), the participants completed some practice trials to become familiar with the procedures. It is noteworthy that if the compatible blocks always preceded incompatible ones, then the faster response in compatible trials may be explained by a learning effect or cognitive inertia, in which it is difficult for participants to switch from one categorization rule to another (Messner and Vosgerau 2010). Thus, we counterbalanced the sequence of compatible and incompatible blocks. The results reported here were pooled across conditions and thus were not subject to these alternative explanations.

TABLE 3A

STIMULI USED IN THE IAT STUDY (STUDY 5)

Number list		Word list	
Precise	Round	Incomplete	Complete
121.36	100	Imperfect	Concluded
203.05	200	Fragmental	Perfect
347.93	300	Incomplete	Ending
459.07	400	Partial	Complete
528.71	500	Halfway	Whole
645.12	600	Unfinished	Closure
724.89	700	Fractional	Done
		In Progress	Finish

Results and Discussion

Effects of Offer Roundness on WTA. Replicating the findings of previous studies (study 1 in particular), the results of a one-way ANOVA showed that, compared with those in the precise condition ($M = 4.27$, SD = 1.41), participants in the round condition ($M = 4.76$, SD = 1.24) indicated a greater intention to accept the offer ($F(1, 120) = 4.17$, $p = .04$), even though the precise offer was objectively better. Nevertheless, as we discuss subsequently, this effect was dependent on the extent to which participants associated round numbers with completion.

TABLE 3B

PROCEDURE AND RESPONSE LATENCY (IN MILLISECONDS) IN EACH BLOCK

Block	Function	Trials	Category labels	Mean	SD
1	Practice	20	Incomplete vs. Complete	969.02	2142.94
2	Practice	20	Precise vs. Round	635.32	580.32
3	Practice	20	Incomplete/Precise vs. Complete/Round	938.40	593.24
4	Test	40	Incomplete/Precise vs. Complete/Round	805.84	493.15
5	Practice	20	Complete vs. Incomplete	782.24	470.61
6	Practice	20	Incomplete/Round vs. Complete/Precise	1010.32	696.83
7	Test	40	Incomplete/Round vs. Complete/Precise	856.60	561.74

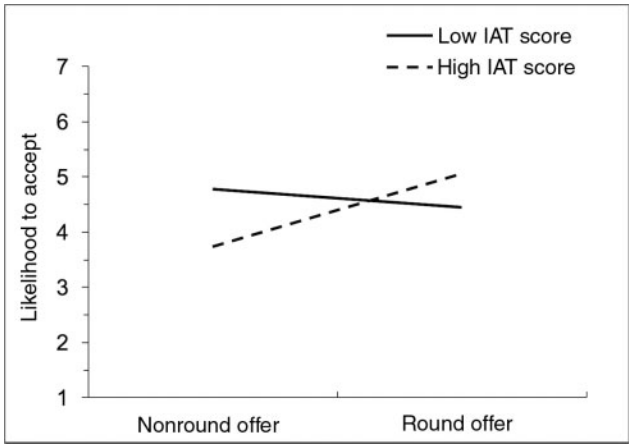
Response Latency. The average response latency across all the trials was 851.13 milliseconds (SD = 894.76). Consistent with our hypothesis, the participants' classification was faster in block 4 (M = 805.84 milliseconds, SD = 493.15), in which the two category labels were grouped in a congruent manner, than in block 7 (M = 856.60 milliseconds, SD = 561.74), in which the two labels were incongruent. Furthermore, to examine the significance of this difference, we calculated the IAT score for each participant following the improved scoring algorithm proposed by Greenwald et al. (2003). This score ranged between –2 and 2, with positive numbers indicating positive associations. In our study the IAT scores ranged between –1.22 and 1.44, with a mean (M = .40, SD = .52) significantly greater than zero ($t(121) = 8.55$, $p < .001$). These results indicated that individuals do subscribe to the association between round numbers and completion.

Moderating Effect of IAT Score on Roundness Advantage. Finally, we examined whether the roundness advantage was contingent upon the participants' IAT scores. Because the IAT score is a continuous variable, we conducted a regression analysis in which offer roundness (0 = precise, 1 = round), IAT score, and their interactions were all included to predict participants' WTA. This analysis revealed two significant effects. Although the unexpected IAT effect was significant (B = –1.02, SE = .34; $t(118) = -3.00$, $p = .003$), it was qualified by its interaction with offer roundness (B = 1.61, SE = .45; $t(118) = 3.59$, $p = .0005$).

To explore the meaning of this interaction effect, we conducted spotlight analyses at one standard deviation greater and less than the mean IAT score (see figure 1). We predicted that the roundness advantage would be more (less) likely to arise when participants have a strong (weak) association between round numbers and completion. In line with our predictions, when the participants' IAT scores were one standard deviation greater than the mean (M = .92), we replicated the previous results such that they were more likely to accept a round offer, rather than a comparable precise offer ($M_{Precise} = 3.73$ vs. $M_{Round} = 5.06$; $t(118) = 4.06$, $p = .0001$). In fact, floodlight analysis showed that the effect was significant when participants' IAT scores were greater than .38 (Johnson-Neyman significance region). The effect, however, was not significant ($M_{Precise} = 4.78$ vs. $M_{Round} = 4.45$; $t(118) = -1.04$, $p > .30$) when participants' IAT scores were one standard deviation less than the mean (M = –.12), which was consistent with our theorizing because an IAT score of –.12 is very close to zero, indicating that participants may not or may only weakly associate round numbers with completion. Thus, the roundness effect was suppressed. Furthermore, our reasoning suggests that the roundness advantage may even be reversed if individuals hold an opposite association. The results of floodlight analysis support this intuition, showing that participants whose IAT scores were –.46 or less (i.e., the bottom 7.38% in the sample) were actually more likely to accept the precise, rather than round, offer (when IAT score = –.46, $t(118) = -1.98$, $p = .05$).

FIGURE 1

THE MODERATING ROLE OF ASSOCIATION STRENGTH ON THE ROUNDNESS EFFECT BASED ON SPOTLIGHT ANALYSIS (STUDY 5)



Discussion. In addition to testifying the robustness of our findings using a continuous, rather than discrete, measurement, study 5 made two main contributions. First, it provided supportive evidence for the key premise that numerical roundness is connected to the feeling of completeness or closure. Second, this study supported our proposed mechanism by showing that the roundness advantage observed in previous studies is contingent on the extent to which individuals hold such associations. Consistent with our reasoning, although we observed the same roundness advantage when participants subscribed to a moderate or stronger connection between round numbers and completion, the effect was mitigated or even reversed when the participants held a weak or opposite association. Collectively, the results of this study supported our proposed underlying mechanism.

GENERAL DISCUSSION

Implications for Consumer Research

The present work contains implications for several streams of literature. First, it adds to the numerical cognition literature. Existing research has shown the advantage of making precise (vs. round) offers in negotiations such that a higher level of precision reduces the magnitude of counteroffers (Janiszewski and Uy 2008; Mason et al. 2013; Thomas et al. 2010). In this research, we extend this

literature by examining how precise versus round offers may influence negotiators' willingness to accept offers. Building on previous findings that individuals prefer using round numbers as goals and that round numbers symbolize completion, we hypothesized that negotiators would be more willing to accept round offers than comparable precise offers. Five studies offered triangulating evidence for this prediction and the underlying psychological process. The results appeared robust across different scenarios, seller versus buyer perspectives, and dependent measures. Furthermore, in the first three studies, we also reconciled our findings with the past literature showing the precision advantage. Specifically, when the participants were asked to indicate their willingness to accept or when they spontaneously thought about this decision, we observed our proposed roundness advantage. However, when the participants were asked to make or spontaneously made a counteroffer, the precision advantage emerged. In addition, as demonstrated by Mason et al. (2013) and Zhang and Schwarz (2012), numerical information communicates not only quantitative information but also additional meanings that are often embedded in numerical characteristics. While previous research has shown that people make inferences from preciseness, the present work shows that roundness can also express such qualitative meanings.

Second, not only does our work draw on previous findings that individuals tend to set their goals at round numbers, but it also informs this finding by explaining why it might occur. Further, building on this explanation, we also showed in study 5 that the propensity to use round numbers as goals is contingent upon the extent to which individuals associate round numbers with the feeling of completion. It merits mention that our notion that round numbers signal completion could have other implications in addition to negotiation. For example, consumers often monitor their exercise progress using devices such as treadmills and wristbands. The typical information provided includes running distance and calories burned. This information influences when people stop (Bravata et al. 2007). Our results suggest that people are more likely to stop when they achieve round numbers. For example, people are less likely to stop when they run 5.6 miles than when they run 5.60 miles. Changing how such numerical information is displayed may encourage people to exercise more.

Third, our findings also speak to the research on psychological closure (Beike, Adams, and Wirth-Beaumont 2005). Recent research has shown that several subtle actions generate a sense of closure, which in turn influences individuals' affective status. For example, in one study (experiment 1A), Li, Wei, and Soman (2010) asked participants to recall and write about a recent decision that they regretted. Some of the participants were instructed to place the written recollection of the event into an envelope, whereas others were not. The results showed that participants who sealed their recollections in the envelopes felt less regretful about the events (together with other negative emotions) than those in the control condition. In another study, Gu, Botti, and Faro (2013) demonstrated that other physical acts that are metaphorically associated with the concept of closure—such as putting a lid on or turning the page on the rejected alternatives—created a sense of closure, resulting in greater satisfaction. Our theories and findings add to this body of literature by identifying numerical roundness as another determinant of psychological closure. For example, people may be more likely to open a new chapter in their lives after breaking up with someone after 100 (vs. 98 or 103) days. In addition, from a consequence perspective, our conceptual framework indicates that individuals' needs for psychological closure, either dispositional (Webster and Kruglanski 1994) or situational (Kruglanski and Freund 1983), may influence their preferences for numbers, with high needs increasing preferences for round numbers.

Effects of Numerical Precision: Overview and Future Research

Growing evidence suggests that numerical precision is a cue that may be interpreted very differently in different contexts. For example, prior literature has shown that, compared to round numbers, precise numbers are perceived as more factual (Schindler and Yalch 2006), are more difficult to process (Thomas et al. 2010), signal competence and confidence (Jerez-Fernandez et al. 2014), prime finer mental scales (Janiszewski and Uy 2008; Loschelder, Stuppi, and Trötschel 2014; Zhang and Schwarz 2012), encourage cognitive (vs. affective) processing (Wadhwa and Zhang 2015), and communicate product attributes (Pena-Marin and Bhargave 2016; Yan 2016). Then the question becomes under what conditions each of these inferences is more likely. Understanding this question becomes even more important, because interpreting the same numerical cue differently may lead to different or even opposite predictions. Coulter, Choi, and Monroe (2012), for instance, noticed that two opposing findings have been obtained regarding how numerical precision affects magnitude judgment. On the one hand, Coulter et al. (2012) hypothesized and found that a precise number (e.g., $1599.85) is judged to be much larger than a less precise one (e.g., $1599), as compared to the actual increase in its numerical value. The idea is that a precise number is often visually (having more digits) and auditorily (containing more syllables) longer. On the other hand, from a metacognitive perspective, Thomas et al. (2010) proposed and found that individuals under certain circumstances judged precise prices as being smaller. This effect is attributable to a learned association between processing difficulty and magnitude. Through repeated experiences, individuals have learned that small numbers are more difficult to process than large ones. Thus, once a number is difficult to process, individuals tend to make the reverse inference that it represents a small quantity. While

Coulter et al. (2012) offered some conceptual discussion about such seeming inconsistency, to the best of our knowledge, no research has empirically reconciled these conflicting findings.

Future research that delineates the conditions under which each of these mechanisms is likely to operate has the potential to offer rich theoretical insights and further illuminate our understanding of a developing area. We suggest that the exact meaning that individuals extract from numerical precision may be contingent on a range of factors including the nature of the task, individual attributes, and product characteristics. For example, while previous research has shown that precision signals expertise and credibility and, thereby, influences how much to adjust from the anchor, Loschelder et al. (2016) recently found that this effect is true only for amateurs. For expert negotiators, the effect followed an inverted-U-shaped pattern such that they counter less to a moderately precise offer than to imprecise or too precise offers.

In the present context, even though the results are consistent with our proposed account, we do not argue that this is the only mechanism that is always operating. For example, the effect of offer roundness on WTA is contingent on the premise that the concept of completion becomes salient in negotiators' minds. Thus, the effect is unlikely to manifest at the beginning of bargaining, when negotiators do not usually think of acceptance. Therefore, empirically, participants in some of the studies were explicitly told that some bargaining had already happened. In other studies, showing two prices (starting prices and the most recent offer) might have signaled that some negotiation had already happened. From a practical perspective, the current results, together with previous findings, suggest that negotiators might be better off making precise offers at earlier stages of the bargaining and then making round offers when they want to close.

Finally, future research could also examine whether and when precision and other numerical cues can impact individuals' judgments and decisions in more complex settings. For example, negotiations are sometimes significantly more complicated than was the case in the experimental settings studied here. When negotiation is conducted face-to-face, negotiators can access other cues such as body language, facial expressions, emotions, and so on (Lewicki, Barry, and Saunders 2015). Thus, the probability and extent to which a numerical cue will be used depends on multiple factors, such as the likelihood that negotiators will attend to this cue, their expertise, and processing resources. We leave to future research the task of testing whether and when the present findings will be generalized in other contexts.

DATA COLLECTION INFORMATION

The first author collected data for studies 1 and 5 using Amazon's Mechanical Turk in August 2015 and December 2015, respectively. The first author supervised the collection of data for studies 2, 3, and 4A by the second author and graduate research assistants at the University of Texas at San Antonio behavioral lab in September 2015, November 2015, and November 2013, respectively. The second author collected data for study 4B using Amazon's Mechanical Turk in 2014 and analyzed the data. The first author analyzed data for all other studies.

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