Silence is Golden: Extended Silence, Deliberative Mindset, and Value Creation in Negotiation

Jared R. Curhan[1], Jennifer R. Overbeck[2], Yeri Cho[3], Teng Zhang[4], and Yu Yang[5]

[1] Sloan School of Management, Massachusetts Institute of Technology
[2] Melbourne Business School, University of Melbourne
[3] College of Business and Public Management, University of La Verne
[4] School of Business Administration, Penn State Harrisburg
[5] School of Entrepreneurship and Management, ShanghaiTech University

We examine the previously unstudied effects of silent pauses in bilateral negotiations. Two theoretical perspectives are tested—(a) an *internal reflection* perspective, whereby silence leads to a deliberative mindset, which, in turn, prompts value creation, and (b) a *social perception* perspective, whereby silence leads to intimidation and value claiming. Study 1 reveals a direct correlation between naturally occurring silent pauses lasting at least 3 s (extended silence) and value creation behaviors and outcomes. Study 2 shows that instructing one or both parties to use extended silence leads to value creation. Additional studies establish a mechanism for this effect, whereby negotiators who use extended silence show evidence of greater deliberative mindset (Study 3) and a reduction in fixed-pie perceptions (Study 4), both of which are associated with value creation. Taken together, our findings are consistent with the internal reflection perspective, whereby extended silence increases value creation by interrupting default, fixed-pie thinking, and fostering a more deliberative mindset. Findings of Study 3 also suggest a boundary condition whereby when status differences are salient, the use of silence by higher status parties leads to value creation, whereas the use of silence by lower status parties does not. Finally, Study 4 shows that instructing negotiators to use silence is more effective for value creation than instructing them to problem-solve. Challenging the social perception perspective that silence is a form of intimidation, we find no evidence for any associations between extended silence and the proportion of value claimed or subjective value of the counterpart.

Keywords: silence, integrative negotiation, bargaining, value creation, deliberative mindset

What is the role of silence in negotiation? Judging from textbooks and prescriptive literature, many scholars and practitioners propose that silence represents a tool for intimidation, used to extract concessions from others (Lewicki et al., 1996; Thompson, 2012; Volkema, 1999). This is a *social perception* perspective in that it considers the effects of silence used by one negotiator on the perceptions of the counterpart, potentially leading to changes in their performance relative to each other (value claiming). By contrast, the one peer-reviewed, theoretical discussion of silence in negotiation argues that silence can provide an opportunity for one or both parties to engage in *internal reflection* (Brett et al., 1999), which, in turn, may give rise to greater joint performance (value creation).

In light of the discrepancy between these two perspectives, our theoretical and empirical understanding of how silence affects negotiation is incomplete. Not only is it unclear how silence functions in negotiation, but also prior academic theorizing (Brett et al., 1999) has not focused on potential consequences for negotiation outcomes or the specific mechanisms at play. To address these important theoretical and empirical shortcomings, our studies systematically examine the effects of silence in negotiation and how silence produces those effects. Our primary focus is to expand and test the internal reflection perspective because this account, as shown below, has considerable support from extant research in domains related to negotiation, but we also evaluate the social perception perspective because that account has been put forth so broadly in popular literature on negotiation, and is also acknowledged briefly by Brett et al. (1999).

In the sections below, we begin by introducing the concept of silence and providing an operational definition. Then, we discuss the logic and evidence (or lack thereof) for the internal reflection and social perception theories, and derive associated hypotheses. Finally, we consider a potential boundary condition, prompting additional hypotheses.

Defining Silence

Silence refers to "a state of abstaining from speech" (Oxford English Dictionary, n.d.) with "a total lack of audible vocal signals" (Jaworski, 1993, p. 73). Ordinary conversation includes very brief periods of silence between words and slightly longer

periods of silence between speaking turns (Kurzon, 2007; Nakane, 2012), but in this set of studies on bilateral negotiations, silence is defined as periods during which neither party is speaking for a noticeable duration of time. Following communication scholars, we refer to silence of a noticeable duration as an "extended silence" (also known as a "conversation lapse") and we operationalize such pauses as lasting for at least 3 s (McLaughlin & Cody, 1982, p. 301). As these definitions imply, an extended silence can only occur when both parties are silent, regardless of which party initiates it, making silence a dyad-level variable. Furthermore, in the work that follows, we examine dyad-level outcomes (value creation and value claiming). However, we postulate that the mechanism underlying the dyad-level phenomenon can be conceived in terms of internal processes—that is, shifts in the cognitive processing of one or both dyad members.

An Internal Reflection Theory on Silence and Negotiation

In this section, we outline a theory whereby silence in negotiation prompts internal reflection, which, in turn, gives rise to value creation. We discuss each of these associations below.

Silence and Internal Reflection

We are aware of only one peer-reviewed publication in which the topic of silence in negotiation is addressed formally. In their interlocking self-regulation model of negotiation, Brett et al. (1999) theorized, within the context of a compendium of propositions about negotiation in general, that silence might play an important role in negotiation by increasing the probability of internal reflection by the actor (the party who initiates silence), the counterpart, or both parties. Since silence was not the primary focus of their research, Brett et al. do not offer a detailed account for this association, yet we theorize that extended silence during a negotiation can pause the flow of attentional, cognitive, and social demands of the interaction, so that one or both parties can take time to reflect and consider how best to proceed (also see Kopelman et al., 2008). Even just listening to one's counterpart is cognitively demanding (Kolfschoten & Brazier, 2013; Loewenstein & Wang, 2019; Stewart & Arnold, 2018); at best, most people can rehearse what they want to say next while their counterpart is speaking, but most have more difficulty engaging in reflective evaluation or problem-solving (Itzchakov & Kluger, 2017). Moreover, silence reduces physiological arousal (Bernardi et al., 2006), which otherwise interferes with reflective thinking (Strack & Deutsch, 2004). For these reasons, silent pauses should afford greater internal reflection during negotiation.

Although this theoretical perspective is untested in the domain of negotiation, research from other domains suggests that a positive association between silence and internal reflection during interactions is likely. For example, therapists report using silence as a means of facilitating reflection among their patients (Hill et al., 2003; see also Cook, 1964; Tindall & Robinson, 1947). Similarly, research on teaching shows that extended "wait times" (Rowe, 1969) of about 3–5 s between speaking turns of teachers and students are associated with higher levels of cognitive functioning (Doerr, 1984; Fagan et al., 1981), more complex responses among students (DeTure & Miller, 1985; Lake, 1973), and greater flexibility among teachers (Rowe, 1974; for a review, see Tobin, 1987). The

effect of silence on reflection has also been articulated in the communications field, such as when Johannesen (1974) argued that silence "promotes careful inspection of 'life-facts' before communicating" (p. 27).

Internal Reflection and Value Creation

Thus far, we have argued that existing theory in negotiation as well as empirical research in related domains supports a positive association between extended silence and internal reflection. We now extend this theory by postulating that internal reflection, in turn, gives rise to value creation.

The concept of internal reflection relates to dual-process models of cognition. Many scholars have asserted that thinking occurs within two distinct systems: System 1 is intuitive, automatic, heuristic, and impulsive, whereas System 2 is systematic, controlled, reflective, and deliberative (Evans, 2008; Evans & Over, 1996; Kahneman, 2003; Kahneman & Frederick, 2002; Sloman, 1996). Strack and Deutsch (2004) argued that new information in the environment is processed impulsively by default, unless circumstances facilitate deliberation, which is akin to reflection. Extended silence is likely to be one of those circumstances.

Negotiation is a context in which the default, System 1 response tends to be "fixed-pie" thinking, characterized by the assumption that a fixed amount of a given resource must be allocated in a "zero-sum" fashion to the negotiators, such that in a bilateral negotiation one negotiator's gain requires an equal loss to the counterpart (Bazerman & Neale, 1993; Pinkley et al., 1995; Pruitt & Carnevale, 1993; Schelling, 1960; Thompson & Hastie, 1990). Fixed-pie thinking can result in unnecessarily adversarial positions, escalating conflict beyond what the situation demands, or reactively devaluing counterparts' proposals (Bazerman & Neale, 1993; Curhan et al., 2004). By contrast, a more deliberative, System 2 mindset allows for the realization that most negotiations are in fact integrative, mixed-motive situations (Walton & McKersie, 1965), featuring opportunities to "enlarge the pie" by reconceptualizing the resources or trading one issue for another (value creation). Consistent with this logic, negotiation scholars have empirically established that the default fixed-pie mindset is associated with System 1 thinking, whereas the more deliberative System 2 thinking is required to reach integrative agreements (De Dreu et al., 2000; Thompson, 1995). Given these findings, it is reasonable to expect that a deliberative mindset should be associated with more value creation in negotiation. Our focus is on deliberative mindset in particular, within the broader construct of internal reflection, because deliberation involves a task-oriented, problem-solving mode of thinking (Gollwitzer & Kinney, 1989), which is highly applicable to the process of value creation in negotiation.

In summary, extant negotiation theory (Brett et al., 1999) and related empirical research from outside the field of negotiation suggest that silence triggers internal reflection. Drawing on dual-process cognition, we further theorize that deliberative mindset (a particular form of internal reflection) in negotiation leads to greater value creation. In short, we propose that extended silence provides an opportunity for negotiators to shift from their default,

fixed-pie mindset to a deliberative mindset, which, in turn, fosters value creation in negotiation.

Hypothesis 1: Extended silence during a negotiation is positively associated with value creation.

Hypothesis 2: The positive association between extended silence and value creation is mediated by a deliberative mindset.

A Social Perception Theory on Silence and Negotiation

Although the main focus of this program of research is on the internal reflection perspective, we also consider the possibility of a social perception effect whereby silence that is initiated by a negotiator is perceived negatively by the counterpart. As we have discussed, the prescriptive literature on negotiation has traditionally treated silence as an intimidation tactic for eliciting concessions from counterparts (Lewicki et al., 1996; Thompson, 2012; Volkema, 1999).

Despite the common practitioner assumption, the negotiation literature has not empirically tested associations between silence and intimidation. However, consistent evidence can be found in related literatures. For example, the "silent treatment" is identified as a form of ostracism (Sommer et al., 2001; Williams, 2002). Furthermore, in one of the few studies to empirically examine the effect of silence on groups (not in a negotiation context), Koudenburg et al. (2011) found that even brief silence can trigger negative emotions or feelings of rejection if it disrupts an otherwise flowing conversation.[1]

In our research, we tested the social perception theory in two different ways. First, in addition to measuring value creation, we also measured value claiming (how resources are divided) to explore whether silent pauses are associated with an increase in value for one negotiator at the expense of the counterpart, suggesting that extended silence could have been used as a form of intimidation. Second, in Studies 3 and 4, we measured the effect of extended silence on the negotiators' subjective value (Curhan et al., 2006) to determine whether extended silence was associated with negative social perceptions.[2] Thus, based on claims made in the prescriptive literature on negotiation as well as results of empirical research on groups (outside of the negotiation context), we hypothesized as follows:

Hypothesis 3: Extended silence during a negotiation is positively associated with value claiming.

Hypothesis 4: Extended silence during a negotiation is negatively associated with subjective value.

A Boundary Condition Involving Status Differences

We further explored an important boundary condition involving salient status differences between negotiators. Multiple findings in the negotiation literature suggest that status differentials moderate negotiation processes and outcomes (e.g., Curhan & Overbeck, 2008; Greer & Bendersky, 2013). For example, Curhan and Pentland (2007) found that some conversational dynamics (such as a higher proportion of speaking time) are associated with better outcomes for high-status parties, whereas others (such as vocal mirroring) are associated with better outcomes for low-status parties.

Status effects have also been demonstrated in research on silence outside the negotiation context. As noted above, Koudenburg et al. (2011) showed that brief silences disrupted conversational flow,

leading to reduced feelings of belonging, esteem, and social acceptance among conversation partners. However, in subsequent research, the same authors found that these effects were moderated when status differences were made salient, such that low-status parties were uncomfortable with silence, whereas high-status parties were not (Koudenburg et al., 2013). We theorize that a negotiator who is uncomfortable with silence due to status differences would find it hard to engage in reflection during a silent pause. Moreover, such discomfort could make the negotiator more vulnerable to exploitation. To explore these possibilities, in Study 3 we tested salient status differences as a boundary condition for effects of extended silence. Based on past research on the importance of status differences in negotiation coupled with the findings of Koudenburg et al. (2013), we hypothesized as follows:

Hypothesis 5: The positive association between extended silence and value creation occurs for high-status parties, but not for low-status parties.

Hypothesis 6: The positive association between extended silence and value claiming occurs for high-status parties, but not for low-status parties.

Hypothesis 7: The negative association between extended silence and subjective value occurs for low-status parties, but not for high-status parties.

If the internal reflection theory governs the effects of extended silence on negotiation, we would expect support for Hypotheses 1, 2, and 5. If the social perception theory holds true, we would expect support for Hypotheses 3, 4, 6 and 7. Of course, these two theories are not mutually exclusive, in that support for one does not necessarily imply lack of support for the other.

Overview of Studies

We conducted four studies to test our predictions. In Study 1, we used a computer algorithm to identify periods of silence from audio-recorded negotiations and measured their association with value creation and value claiming. This was an observational study, designed to document associations with naturally occurring periods of silence. We also used a natural language processing algorithm to code the transcripts for multi-issue utterances, an indicator of integrative negotiation and a behavioral antecedent of value creation (Weingart et al., 1993). We then applied time-lagged regressions to test sequential effects of extended silence on these value creation behaviors. This time-lag analysis suggests but does not prove a causal relationship.

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[1] To test the prevalence of the belief that silence leads to intimidation, we surveyed 151 participants (30.5% female) from Amazon's Mechanical Turk about how they interpreted the use of silence in negotiation, and found that roughly 50% considered silence to be a form of intimidation or an effort to elicit concessions from their counterpart (see details in our online supplement at https://osf.io/mr7ba/?view_only=1586c037264148249ccd7896d6a64797). Note that our survey provided a neutral context for the silence, with no cues (such as staring) that might increase the likelihood of a negative attribution. Yet half of the participants assumed that silence was a form of intimidation, suggesting that this perception is relatively common among lay people.

[2] Note that there was no rationale for testing deliberative mindset as a mediator of these potential associations because intimidation has no theoretical link to reflective, System 2 thinking.

In Study 2, we examined silence as a negotiation strategy, measuring value creation and value claiming when silent pauses were experimentally manipulated to be initiated by one, both, or neither dyad member. In addition to providing a better test of a causal relationship through random assignment, this study enabled us to examine the effects of extended silence when used intentionally.

In Studies 3 and 4, we tested for mediating effects of deliberative mindset as a potential mechanism for the association between extended silence and value creation. In Study 3, we measured deliberative mindset via retrospective self-report on a postnegotiation survey, whereas in Study 4 we examined evidence of changes in deliberative mindset based on pre–post measures of fixed-pie perceptions. In addition, in Study 3 we tested salient status differences as a potential boundary condition and in Study 4 we crossed our silence manipulation with a manipulation of motivational orientation (instructing some negotiators to problem-solve and seek out joint gains) to examine the effects of silence above and beyond those of a commonly used prompt to foster value creation (vs. value claiming) by influencing negotiators' goals. Finally, in Studies 3 and 4 we included postnegotiation measures of subjective value (Curhan et al., 2006) to assess negative social perceptions, as a potential indicator that some intimidation had taken place.

In the studies that follow, we report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study (Simmons et al., 2012).

Study 1: Naturally Occurring Silence and Value Creation

In Study 1, we explored naturally occurring silence in the context of simulated bilateral negotiations to examine the prevalence of silent pauses of various lengths and whether pauses predicted value creation and/or value claiming. All negotiations were audio recorded, transcribed, and analyzed with machine learning and natural language processing.

We have defined an extended silence as a period in which neither party is talking for a noticeable duration of time (as opposed to ordinary pauses, such as those resulting from taking a breath before speaking). As noted earlier, we follow the prescriptions of McLaughlin and Cody (1982), who defined extended silence as any period of silence lasting for at least 3 s.

Method

Participants

A sample of 124 participants (44.4% female; $M_{age} = 27.15$, $SD_{age} = 5.50$) was recruited at a large, private university in the northeastern United States. Of these participants, 72 (58.1%) spoke English as their native language. The sample size was determined by participant yield rather than being planned in advance. Therefore, using G*Power (Faul et al., 2007), we conducted a post hoc sensitivity power analysis and determined that our research design and sample size had 80% power to detect effects of size $f = .33$ ($r = .31$) and above. Each participant was paid $15, plus a chance to win cash prizes based on their performance in the negotiation. This study was approved by the institutional review board (IRB) of the Massachusetts Institute of Technology (Protocol ID: 403000325, Study Title: "Research on Interpersonal Negotiation").

Procedure

Participants arrived at the laboratory 2 at a time and were randomly assigned to one of two roles—candidate or recruiter—in a negotiation simulation. The negotiation simulation was modeled after the classic New Recruit exercise (Neale, 1997; Pinkley et al., 1994), which involves a candidate and a recruiter negotiating over multiple issues concerning the candidate's employment compensation package. The simulation consisted of five scored issues to be negotiated, with point totals reflecting the preferences and priorities attached to each issue. Two issues were distributive ("fixed-sum"), such that the two parties had diametrically opposed interests. One issue was compatible, such that both parties would earn the most points for the same settlement option (Thompson & Hrebec, 1996). The two remaining issues were integrative, such that the parties could make potential trade-offs that would maximize both individual and joint gains (Froman & Cohen, 1970; Pruitt, 1983). Thus, the negotiation was structured such that high scores were likely to result from a combination of value creation and value claiming (Lax & Sebenius, 1986; Walton & McKersie, 1965).

All participants learned that the goal was to earn as many points as possible for themselves; each point earned provided one lottery ticket toward three $100 cash prizes. Participants had up to 20 min to negotiate. Afterward, they reported outcomes and answered demographic questions.

Negotiation Outcomes

Our main dependent measures were value creation and value claiming. *Value creation* was measured by the sum of the two parties' points (cf., Galinsky et al., 2008), whereas *value claiming* was measured by the number of points earned by the recruiter divided by the sum of the two participants' points (cf., Sinaceur & Tiedens, 2006). Since both of these outcome variables are dyadic, we treated the dyad as the unit of analysis.

Identifying Periods of Silence

Each negotiation was digitally recorded. Subsequently, we used a computer algorithm to identify all incidences of silence within each recording. Specifically, we used a MATLAB implementation of the G.729 Voice Activity Detector, which considers speech in 25 ms frames and detects whether each frame contains speech or silence.[3]

Identifying Multi-Issue Utterances

Discussion of more than one issue at a time in a single utterance is a behavioral indicator of value creation (Weingart et al., 1993, 2004). To identify multi-issue utterances, we first transcribed all

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[3] Our speech detection algorithm used long-term averaging to detect energy and frequency content of background noise, which served as a baseline for speech detection based on the audio signal's total energy level, spectral distortion, zero crossings, and frequency content. Spurious detections of speech were mitigated by adaptive tuning of the speech detection criteria. For example, frames immediately following frames which were detected as speech were more likely to be denoted as speech. Median filtering was also applied to the speech detection signal. This approach, commonly used in signal processing for noise mitigation, considers the "speech or no speech" output a signal, and outputs a signal corresponding to the median over a progressively moving window across the input signal.

Figure 1

Percentage of Dyads With at Least One Pause as a Function of Pause Duration (Study 1). No Pause Lasted Longer Than 25.5 s
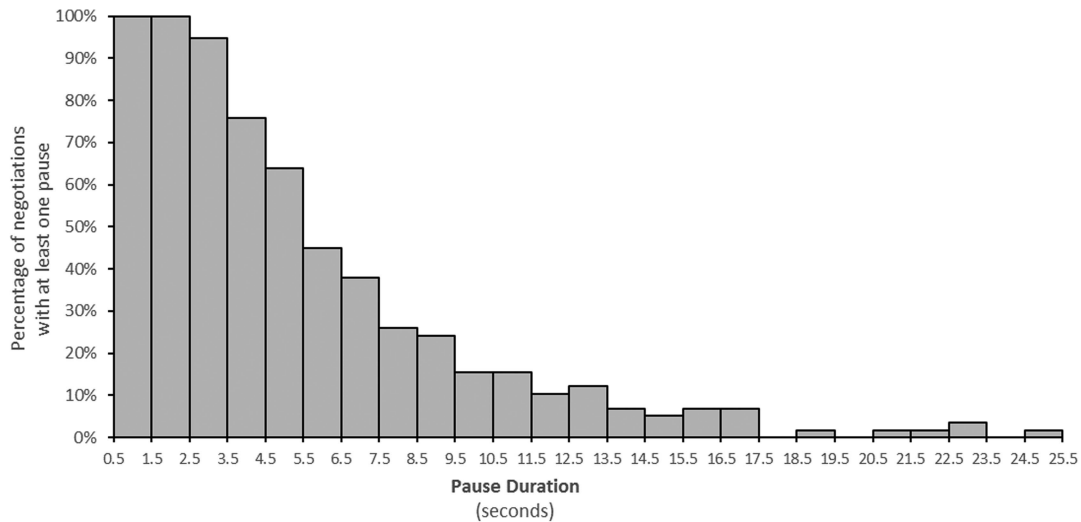
negotiations and parsed them into utterances, defined as a segment of the negotiation in which one negotiator was talking without interruption from the other negotiator. This yielded 6,766 utterances. Next, we examined a random subsample of 414 utterances and indicated in each case whether the utterance included mention of more than one issue with an apparent intention to logroll or trade across those issues (Froman & Cohen, 1970; Pruitt, 1983). For example, one such utterance was, "I'm willing to work with you. How about $50 per hour, 120 hours, discretionary budget $4,000, and secretarial assistance 50 percent." Of these 414 coded utterances, 331 (80%) were fed into a computer program to "train" an algorithm to code for multi-issue utterances. The remaining 83 (20%) utterances were used to test the reliability between human-made and computer-made categorizations. Almost all (97.6%) of the computer categorizations matched the human categorizations. Cohen's Kappa was .793, considered to be in the "substantial" range (Landis & Koch, 1977).

Results

The Association Between Extended Silence and Value Creation

We first considered the distribution of pause lengths in the data (see Figure 1). Examining a series of 1-s intervals beginning at 500 ms, we determined that pause lengths greater than 17.5 s were extremely rare; only 5.2% of dyads had even one pause longer than 17.5 s. Thus, to test Hypothesis 1 (regarding the association between extended silence and value creation), we examined any pause lasting from 3.0 to 17.5 s. Supporting Hypothesis 1, the correlation between extended silence frequency and value creation was positive and significant, $r(53) = .32$, $p = .018$, 95% CI [.06, .54].[4]

To explore whether pause length affects outcomes, we tested the correlation between pause frequency and value creation for pauses of different lengths, testing correlations at each 1-s interval between 0.5 and 17.5 s. As shown in Figure 2, the correlation between silent pause frequency and value creation was positive for any pause length greater than 1.5 s in duration. The pause lengths with the strongest associations ranged from 3.5 to 9.5 s and from 11.5 to 12.5 s in duration, all rs .29–.41. All associations within these ranges were statistically significant, all p .002–.036. Notably, these results corroborate McLaughlin and Cody's 3-s lower-bound for extended silence as a meaningful criterion for value creation.

Controlling for the Length of the Negotiation

An alternative explanation for the association between extended silence and value creation is that value creation takes time, and longer negotiations afford more opportunities for pauses to occur. To test this idea, we conducted a series of OLS regressions with length of the negotiation as a control variable. As shown in Table 1 (Models 1a and 1b), controlling for the length of the negotiation did not diminish the effect of extended silence on value creation. The effect of negotiation length on value creation was not significant on its own, $b = .09$, $t(52) = 0.66$, $p = .510$, 95% CI [−.05, .09]; and when controlling for negotiation length, the effect of extended silence frequency remained significant, $b = .33$, $t(51) = 2.29$, $p = .026$, 95% CI [.01, .14] (while the effect of negotiation length remained nonsignificant, $p = .871$).

The Associations Between Extended Silence, Multi-Issue Utterances, and Value Creation

Another alternative explanation is that silent pauses were a byproduct, not a precursor, i.e., that value creation behaviors gave rise to pauses because value creation is mentally taxing, as opposed to pauses giving rise to value creation. To test this idea, we used our behavioral

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[4] Four dyads failed to reach agreement and therefore are not included in any analyses involving negotiated outcomes. Also, four negotiations were not recorded due to a malfunction in the recording device.

Figure 2

Correlations Between Pause Frequency and Value Creation as a Function of Pause Duration (Study 1). Each Bar Represents a Correlation Coefficient, Indicating the Association Between Value Creation and the Frequency of Pauses of a Particular Duration. Value Creation = Sum of the Two Participants' Points. Darker Shaded Bars Indicate Statistically Significant Correlations (p < .05)
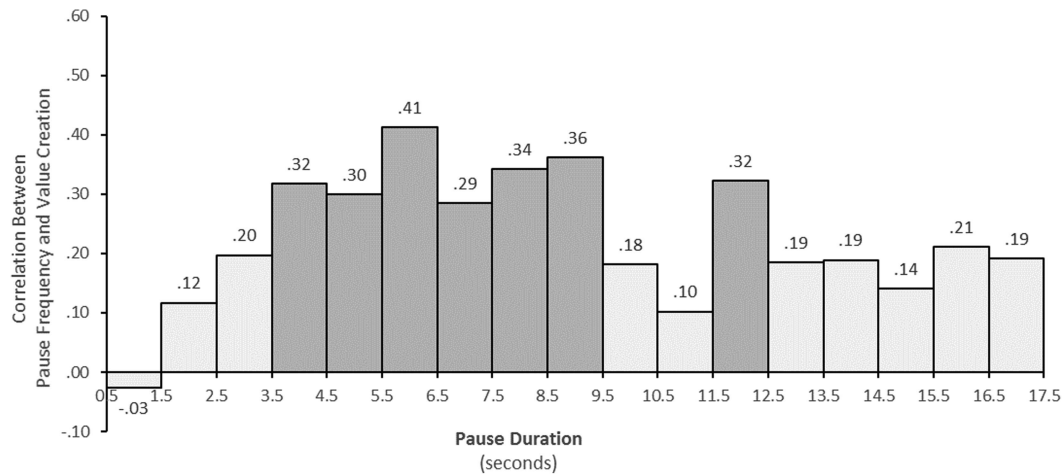
measure of value creation (multi-issue utterances) to examine temporal ordering between pauses and value creation.

First, to validate our behavioral measure, we tested the association between multi-issue utterances and value creation outcomes (joint points). Corroborating prior research (Weingart et al., 1993, 2004), the correlation was positive and significant, $r(53) = .36$, $p = .007$, 95% CI [.10, .57], suggesting that multi-issue utterances indeed gave rise to value creation outcomes.

To investigate the association between extended silence and multi-issue utterances, we first ran a zero-order correlation without considering their timing. Results showed a positive association between the frequency of extended silence and the frequency of multi-issue utterances, $r(53) = .35$, $p = .009$, 95% CI [.09, .57].

Table 1

Regression Models Predicting Value Created and Value Claimed (Study 1)

	Value created		Value claimed	
	Model 1a	Model 1b	Model 2a	Model 2b
Control variable				
Length of negotiation (s)	.09	−.02	−.16	−.14
Number of pauses (≥3 s)		.33*		−.05
Model diagnostics				
F test of model	$F(1, 52)$	$F(2, 51)$	$F(1, 52)$	$F(2, 51)$
Value of F	.44	2.87*	1.39	.74
R^2	.01	.10	.03	.03
Adjusted R^2	−.01	.07	−.01	−.01
Change in R^2		.09		.12
F test of change		$F(1, 51)$		$F(1, 51)$
Value of F		5.25*		.12

Note. All terms other than model diagnostics are standardized regression coefficients. $N = 54$. Value creation = sum of the two participants' points. Value claiming = number of points earned by the recruiter divided by the sum of the two participants' points.
† $p < .10$. * $p < .05$. ** $p < .01$.

Next, to investigate order effects, we conducted a time-lagged multilevel binary logistic regression (nesting utterances within dyads) to examine the likelihood of multi-issue utterances occurring within five speaking turns following an instance of silence. The results were positive and significant, OR = 1.73, 95% CI [1.39, 2.15], indicating that multi-issue utterances were 1.73 times more likely to occur within five speaking turns following a pause than at any other time in the negotiation. By contrast, multi-issue utterances were no more likely to occur within five speaking turns *preceding* a pause, OR = 0.89, 95% CI [0.71, 1.13].[5]

The Association Between Extended Silence and Value Claiming

To test whether extended silence was associated with increased value for one negotiator at the expense of the counterpart (Hypothesis 3), which might suggest intimidation, we regressed value claiming on extended silence, again using dyad as the unit of analysis. As shown in Table 1 (Model 2b), the effect of extended silence frequency on value claiming was not significant, $b = −.05$, $t(51) = −0.34$, $p = .733$, 95% CI [−.35, .25], suggesting that extended silence was not used as a form of intimidation.[6]

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[5] We have focused on the likelihood of multi-issue offers occurring within five turns following a pause, but as a robustness check, we also confirmed that the odds ratio was significantly greater than 1.0 for three turns (OR = 1.55, 95% CI [1.22, 1.96]), four turns (OR = 1.65, 95% CI [1.32, 2.07]), six turns (OR = 1.71, 95% CI [1.38, 2.12]), and seven turns (OR = 1.65, 95% CI [1.33, 2.04]) following a pause.

[6] Because this study was observational (neither party was told to use silence), we could not identify which party initiated silence or even whether silence was being used intentionally. Therefore, it is possible that silence affected value claiming in both directions and those effects canceled each other out. To test this, we repeated our analysis using inequality (the absolute value of value claiming minus 0.5) as the DV. The effect of silence on inequality was not significant, $b = −.10$, $t(51) = −0.66$, $p = .515$, 95% CI [−.40, .20], suggesting that silence did not affect the inequality of outcomes.

Discussion

Study 1 supports Hypothesis 1 by showing that extended silence—specifically, the frequency of silent pauses lasting between 3.0 and 17.5 s—was positively associated with value creation. Although this study was observational, and thus causality cannot be established, we did control for the length of the negotiation and used time-lagged regressions that revealed order effects suggestive of a causal relationship. Specifically, the use of multi-issue utterances (akin to logrolling) was more likely to occur shortly after extended silence than at any other point in the negotiation.

We examined whether silence might be a tool for intimidation by testing differences in how resources were divided between negotiators (value claiming), yet our results did not yield significant differences. Thus, Hypothesis 3 and the associated social perception theory were not supported.

The observational design of Study 1 precluded any conclusions about which party was responsible for initiating extended silence or whether silence was initiated intentionally, which prevented us from testing directional effects of one party's use of silence on the other party's outcome. We address this issue in our remaining studies, which feature experimental manipulations of silence applied to one or both parties in the negotiation and their effects on value creation and value claiming. This experimental design enabled us to evaluate the intentional use of silence as a negotiation strategy, as well as to explore the locus and mechanism for these effects.

Study 2: Silence as a Negotiation Strategy

In a lab setting, we instructed some individuals to use extended silence in their negotiations, whereas others did not receive this instruction. In the silence condition, we told participants to pause for 20 s. Pilot testing showed that actual pause duration tends to be considerably shorter than target pause duration; thus, the instruction was intended to produce actual pauses in the range of 3.0–17.5 s, in accord with Study 1 and the McLaughlin and Cody (1982) threshold.

Method

Participants

We collected parallel samples at two large universities in the western United States. A total of 206 students—70 (32.8% female; $M_{age} = 25.16$, $SD_{age} = 3.06$) from a public university and 136 (38.2% female; $M_{age} = 20.65$, $SD_{age} = 1.21$) from a private university—participated in partial fulfillment of a course requirement.[7] All participants spoke English as their native language. Sample size was determined by rule-of-thumb estimates and course enrollment. Using G*Power (Faul et al., 2007) we ran a post hoc sensitivity power analysis and found that our research design and sample size had 80% power to detect effects of size $f = 0.24$ ($r = .22$) and above. This study was approved by the IRBs of the University of Utah (Protocol ID: 00060114, Study Title: "Negotiation Study") and the University of Southern California (Protocol ID: 00007099, Study Title: "Negotiation Study").

Procedure

The structure and process of the negotiation followed Study 1 except that in Study 2, the New Recruit simulation included six issues (1 distributive, 1 compatible, 4 integrative). Participants were randomly assigned to condition. In the Silence condition, the instructions read: "Your job today is to use a lot of silence. Whenever you want to interact with your counterpart (e.g., ask a question or respond to an offer), count 20 s in your head before you speak." Participants in the No Silence condition received no instruction about the use of silence.

Random assignment yielded a 2 (Recruiter Silence: yes vs. no) × 2 (Candidate Silence: yes vs. no) design, but we expected no effects of role. A test of distinguishability using actor–partner interaction models (Kenny et al., 2006) showed no meaningful distinctions between roles. Thus, we collapsed the two conditions in which one party was silent to create a three-level design: both parties silent ($N = 21$ dyads), one party silent ($N = 62$ dyads), and neither party silent ($N = 20$ dyads).

After negotiating, participants reported their outcomes and responded to a manipulation check and demographic questions. The manipulation check consisted of two items, asking participants to rate the extent to which they used silence during the negotiation and the extent to which the counterpart used silence, both using seven-point scales (1 = very little, 7 = very much).

Negotiation Outcomes

As in Study 1, our dependent variables were value creation (the sum of the two parties' points) and value claiming (the proportion of total points earned by the recruiter). We again treated the dyad as the unit of analysis.

Results

Manipulation Check

Participants in the Silence condition reported using silence significantly more ($M = 4.44$, $SD = 1.36$) than did those in the No Silence condition ($M = 2.99$, $SD = 1.44$), $F(1, 204) = 55.29$, $p < .001$, $\eta_p^2 = .213$, 95% CI [.122, .305]. Also, the measure of counterpart silence showed higher scores for Silence condition counterparts ($M = 3.73$, $SD = 1.55$) than for No Silence counterparts ($M = 2.43$, $SD = 1.27$), $F(1, 204) = 43.32$, $p < .001$, $\eta_p^2 = .176$, 95% CI [.090, .266], suggesting our silence manipulation was effective.[8]

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[7] We tested and found no effects of sample or gender (all p .12–.95).

[8] We confirmed these analyses with a multilevel test that found an actor effect for the "own silence" manipulation check (Silence condition participants reported using silence more than No Silence participants, $t(101) = 7.43$, $p < .001$, whereas their partners did not report using more silence, $p = .23$); and a partner effect for the "counterpart silence" manipulation check (participants with counterparts in the Silence condition reported encountering more silence than did those with counterparts in the No Silence condition, $t(101) = 6.48$, $p < .001$, though they themselves were not more silent, $p = .80$).

Table 2
Individual and Joint Outcome Means and Standard Deviations by Condition (Study 2)

Variable	Control		One party silent		Both silent		All conditions	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Candidate	3,520.00	1,858.01	4,261.29	1,943.32	3,614.29	1,801.75	3,985.44	1,911.85
Recruiter	3,470.00	1,417.60	3,901.61	2,069.96	4,480.95	1,844.35	3,935.92	1,925.67
Value creation	6,990.00	1,920.22	8,162.90	1,592.73	8,095.24	1,360.32	7,921.36	1,666.90
Value claiming	.51	.20	.47	.26	.55	.21	.49	.24

Note. We did not treat role (candidate vs. recruiter) as a factor of analysis because roles are theoretically and empirically nondistinguishable. Value creation = sum of the two participants' points. Value claiming = number of points earned by the recruiter divided by the sum of the two participants' points.

The Association Between Silence and Value Creation

A one-way ANOVA using value creation as the dependent variable confirmed a significant effect of condition, $F(2, 100) = 4.13$, $p = .019$, $\eta_p^2 = .076$, 95% CI [.002, .179] (see means and standard deviations by condition in Table 2). Supporting Hypothesis 1, a planned contrast showed that, compared with No Silence dyads ($M = 6,990.00$, $SD = 1,920.22$), dyads with at least one party using silence created significantly higher value ($M = 8,145.78$, $SD = 1,529.49$), $t(100) = 2.74$, $p = .007$. A second planned contrast showed no significant difference in value creation between dyads with one silent party ($M = 8,162.90$, $SD = 1,592.73$) and dyads with both parties using silence ($M = 8,095.24$, $SD = 1,360.32$), $t(100) = .17$, $p = .869$. This suggests that one party's use of silence is essentially equivalent to both parties' use of silence in terms of the positive effect on value creation.

The Association Between Silence and Value Claiming

To test for intimidation effects, we subjected value claiming to a one-way ANOVA. Consistent with Study 1, we found no significant effect of the Silence condition on value claiming, $F(2, 100) = .95$, $p = .389$, $\eta_p^2 = .008$, 95% CI [.000, .056], confirming that intentional silent pauses did not affect the division of resources between the parties in the negotiation. Once again, Hypothesis 3 was not supported.

Discussion

Study 2 confirmed and extended Study 1, showing that negotiation outcomes were more integrative (i.e., more value creation occurred) in dyads when at least one party was instructed to use silent pauses during negotiation (again supporting Hypothesis 1). Furthermore, we found this effect with a very simple experimental manipulation in which negotiators were instructed to intentionally remain silent for an extended period of time. As in Study 1, we found no asymmetries in value claiming as a function of the instruction to use silence, suggesting that silent pauses did not serve as a form of intimidation (again failing to support Hypothesis 3). We next turned to tests of a potential mechanism (deliberative mindset) and boundary condition (salient status differences).

Study 3: A Mechanism and a Boundary Condition

In addition to replicating our core finding, the primary aim of Study 3 was to test Hypothesis 2—the assertion that a deliberative mindset serves as a psychological mechanism underlying the positive association between extended silence and value creation. Thus, a key component of the study design was to ask participants immediately after the negotiation how much they experienced a deliberative mindset during the negotiation. Brett et al. (1999) theorized that in bilateral negotiation, silence could prompt a cognitive shift for the actor (the party who initiates silence), the counterpart, or both. Thus, in Studies 3 and 4 we measured the mindsets of the actor and the counterpart, and tested each as a potential mediator of the association between silence and value creation in order to shed light on the locus of observed effects.

As noted earlier, Koudenburg et al. (2013) found that when status differences were made salient during discussions, silence was experienced negatively only by those with lower status. Accordingly—and given frequent suggestions in the negotiation literature that status differences moderate processes and outcomes (e.g., Curhan & Overbeck, 2008; Curhan & Pentland, 2007; Greer & Bendersky, 2013)—we also explored salient status differences as a potential boundary condition.

Finally, Study 3 included two design features not present in Study 2. First, because Study 2's design compared a treatment condition in which negotiators were given a specific task—to initiate silent pauses—with a control condition in which negotiators had no particular task, it was important to rule out the possibility that our effects were due to asymmetry in task demands. Thus, in Study 3 we used a control condition in which negotiators were given task-focused instructions not relevant to silence. Second, to more directly examine social perceptions of silence, participants reported their subjective value (Curhan et al., 2006)—i.e., their impressions of the outcome, themselves, the process, and their relationship with the other party. If silence was regarded as intimidating, we would expect to see lower scores on the process and relationship subscales in particular.

Method

Participants

A sample of 254 students (45.7% female) from a large, private university in the northeastern United States participated in partial fulfillment of a course requirement.[9] Participants were randomly formed into 127 dyads. All spoke English as their native language. Sample size was determined by course enrollment; again using G*Power (Faul et al., 2007), we ran a sensitivity power analysis that

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[9] We tested and found no effects of gender (all *p* .24–.29).

indicated 80% power to detect effects of size $f = .10$ ($r = .10$) and above. This study was approved by the IRB of the Massachusetts Institute of Technology (Protocol ID: 403000325, Study Title: "Research on Interpersonal Negotiation").

Procedure

As in Studies 1 and 2, participants were randomly assigned to one of two roles in a negotiation simulation based on the New Recruit (Neale, 1997; Pinkley et al., 1994) exercise. The instructions were adapted to make status differences between the recruiter and the candidate substantially more salient: the recruiter was described as a seasoned, high-ranking executive, and referred to as the "Chief Operating Officer," whereas the candidate was just finishing an MBA program after some start-up work, and was referred to as a "freelance consultant" (similar descriptions were used by Curhan & Overbeck, 2008). The effectiveness of this manipulation was measured in a separate pretest in which 151 participants (30.5% female) from Amazon's Mechanical Turk read the role description for both roles, and reported the perceived status of each. On a forced-choice question, 73.5% of participants reported that the recruiter had the higher status role. A paired t test on separate status ratings for each role confirmed that participants also rated the recruiter ($M = 4.23$, $SD = 0.81$) higher than the candidate ($M = 3.44$, $SD = 0.82$) in status, $t(150) = 7.88$, $p < .001$. Details on this validation study appear in our online supplement at https://osf.io/mr7ba/?view_only=1586c037264148249ccd7896d6a64797.

The negotiation included eight scored issues (2 distributive, 2 compatible, 4 integrative) and used a lottery-based financial incentive like the one in Study 1. Silence was manipulated through a short message embedded in confidential instructions. In the silence condition, participants read:

> Prior research shows that some negotiation strategies will improve negotiated outcomes. Adding silent pauses into a negotiation is one such strategy. In the upcoming negotiation, please pause and be silent for 10–20 s before you respond. I recommend you try doing this whenever you can.

In the control condition, participants received a neutral message (conceptually a placebo condition):

> Prior research shows that some negotiation strategies will improve negotiated outcomes. Focusing on the information in your confidential instructions is one such strategy. In the upcoming negotiation, please try and keep this information in the back of your mind. I recommend you try doing this whenever you can.

These instructions were applied to the high- and low-status parties using a 2 (High-Status Silence: yes vs. no) × 2 (Low-Status Silence: yes vs. no) design.

Right after negotiating, participants reported their outcome and responded to a manipulation check and questions assessing deliberative mindset and subjective value. As a manipulation check, participants rated the extent to which they used silence during the negotiation, and the extent to which their counterpart used silence, on seven-point scales (1 = not at all, 7 = a great deal).

To measure deliberative mindset, we used dimensions from Magee (2009), asking "To what extent did you engage in each of the following during the negotiation?" Three items, "Deliberate about potential offers/counteroffers"; "Think things over before

making offers/counteroffers"; and "Consider your options and alternatives in the negotiation," each using a seven-point scale (1 = not at all, 7 = a great deal), were averaged into one scale (α = .74, $M = 5.02$, $SD = 1.02$).

Subjective value was measured using the 16-item Subjective Value Inventory (SVI; Curhan et al., 2006), which contains four separate four-item subscales measuring feelings about the instrumental outcome (α = .74, $M = 5.52$, $SD = 0.26$), the self (α = .65, $M = 5.28$, $SD = 0.73$), the process (α = .83, $M = 5.71$, $SD = 0.13$), and the relationship (α = .91, $M = 5.70$, $SD = 0.17$). Response scales for the SVI ranged from 1 (not at all) to 7 (a great deal).

Negotiation Outcomes

As in Studies 1 and 2, our main dependent variables were value creation (the sum of the parties' points) and value claiming (the high-status party's points divided by the sum of the parties' points). As in our prior studies, the primary unit of analysis was the dyad.[10]

Results

Manipulation Check

Participants in the silence condition reported using more silence ($M = 4.08$, $SD = 1.60$) than did those in the control condition ($M = 3.02$, $SD = 1.60$), $F(1, 247) = 27.15$, $p < .001$, $\eta_p^2 = .099$, 95% CI [.039, .173]. Also, the measure of counterpart silence was significantly higher for counterparts of those in the silence condition ($M = 3.35$, $SD = 1.58$) than for counterparts of those in the control condition ($M = 2.75$, $SD = 1.49$), $F(1, 246) = 9.64$, $p = .002$, $\eta_p^2 = .038$, 95% CI [.005, .094].[11] These results suggest that the silence manipulation was effective.

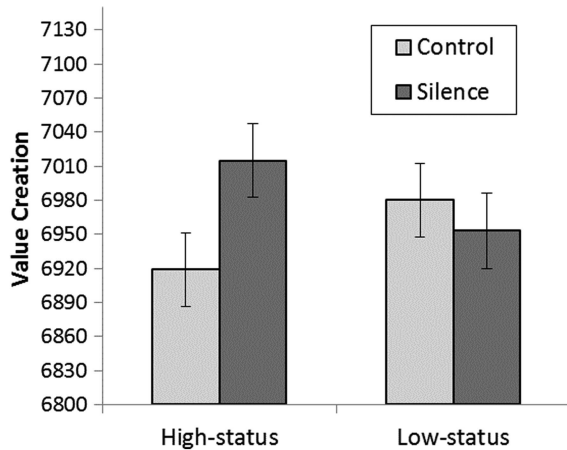### The Association Between Silence and Value Creation

We applied a two-way ANOVA to value creation, with high-status party silence and low-status party silence as independent factors. The main effect of high-status party silence was significant, $F(1, 119) = 4.34$, $p = .039$, $\eta_p^2 = .035$, 95% CI [.001, .120]. As shown in Figure 3, joint points were greater for the high-status party with silence ($M = 7,014$, $SD = 224$) versus control instructions ($M = 6,920$, $SD = 277$). Neither the main effect of the low-status party's silence nor the interaction was significant ($p > .33$). This pattern of results is consistent with Hypothesis 5, which predicted an effect of silence on value creation when silence was initiated by high-status parties, but not when inititiated by low-status parties.

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[10] Two dyads failed to reach agreement and are not included in analyses involving outcomes. Five individuals were excluded because they failed attention checks or did not complete their postnegotiation surveys.

[11] We confirmed these analyses with a multilevel test, which showed an actor effect for the "own silence" manipulation check (Silence condition participants reported using silence more than Nonsilence participants, $t(122) = 5.69$, $p < .001$, whereas their partners did not report using more silence, $p = .62$); and a partner effect for the "counterpart silence" check (participants with counterparts in the silence condition reported encountering more silence than did those with counterparts in the nonsilence condition, $t(122) = 3.12$, $p < .001$, but they themselves were not more silent, $p = .49$).

Figure 3

Value Creation as a Function of Instructions to Use Silence Given to the High-Status or Low-Status Party (Study 3). Value Creation = Sum of the Two Participants' Points. Error Bars Represent the Standard Error

Figure 4

Deliberative Mindset as a Mediator of the Effect of Silence on Value Creation (Study 3). Value Creation = Sum of the Two Participants' Points

Indirect effect: B = 20.1**

$^\dagger p < .10.$ * $p < .05.$ ** $p < .01.$

The Association Between Silence and Value Claiming

We applied a two-way ANOVA to value claiming (proportion of points earned by the high-status party), with high-status party silence and low-status party silence as predictors. Neither the main effects nor the interaction was significant, all $p > .40$, corroborating the results from Studies 1 and 2 that silent pauses did not affect division of resources between the parties. Thus Hypotheses 3 and 6 were not supported.
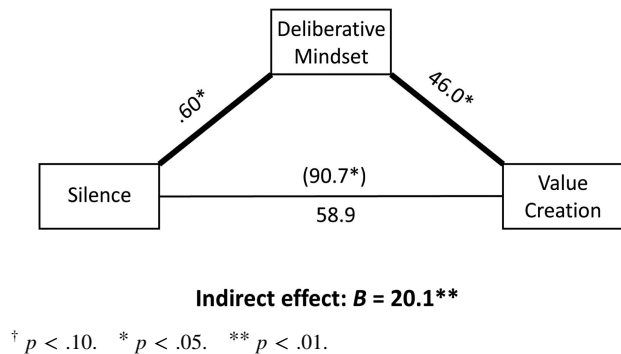
Deliberative Mindset as a Mediator

To test Hypothesis 2 regarding the mediating role of a deliberative mindset, we used Hayes' (2013) PROCESS macro (Model 4). In a model with value creation as the outcome variable, we used high-status silence as the predictor, deliberative mindset as the mediator, and low-status silence and the interaction between high-status and low-status silence as covariates. As expected, high-status silence predicted the high-status party's deliberative mindset, $a = 0.60$, 95% CI [0.09, 1.11]. Deliberative mindset, in turn, predicted value creation, $b = 46.00$, 95% CI [0.94, 91.05]. Supporting Hypothesis 2, the indirect effect of high-status silence on value creation via deliberative mindset was significant, $ab = 27.75$, 95% CI [2.03, 86.02]. As shown in Figure. 4, the instruction to use silence was associated with greater deliberative mindset, which, in turn, was associated with more value creation. In summary, the anticipated mediating role of deliberative mindset for the association between silence and value creation was clearly evident for high-status negotiators, further supporting our argument that silence prompts internal reflection.

We applied the same mediation analysis with the low-status party as the focal negotiator. Deliberative mindset again predicted value creation, $b = 45.9$, 95% CI [1.25, 90.58]. However, low-status silence did not predict the low-status party's deliberative mindset, $a = -0.02$, 95% CI [-0.53, 0.50], and the indirect effect of low-status silence on value creation via deliberative mindset was not significant, $ab = -0.71$, 95% CI [-29.9, 28.6].

To further investigate the locus of effects, we examined whether silence initiated by either party provided an opportunity for deliberative mindset by the other party, but our results did not support those counterpart effects. We found no significant correlations between high-status party silence and low-status party deliberative mindset, $r(122) = .04$, $p = .695$, or between low-status party silence and high-status party deliberative mindset, $r(121) = -.03$, $p = .766$. Taken together, these results suggest that silence brings about value creation by affecting the deliberate mindset of the actor who initiates the silence, as opposed to the counterpart.

The Association Between Silence and Subjective Value

To test Hypotheses 4 and 7, we used multilevel actor–partner interaction models (Kenny et al., 2006) to examine responses to four separate subscales of the SVI (Curhan et al., 2006) as a function of condition for each focal negotiator (actor) and their counterpart (partner). We found no actor or partner effects for either high- or low-status negotiators on the instrumental, self, or relationship subscales, contrary to Hypothesis 4. However, supporting Hypothesis 7, the process subscale showed a significant actor effect for the low-status party only: When low-status parties were instructed to use silence, they reported less satisfaction with the negotiation process, $b = -.15$, $t(122) = -2.05$, $p = .040$. This result suggests a potential reason why silence led to value creation only when the high-status negotiator initiated it. Low-status negotiators may have been less comfortable using silent pauses, apparently to such a degree that they were prevented from developing a deliberative mindset. Consistent with this interpretation, a follow-up analysis showed a marginally significant association between process subjective value and deliberative mindset, $b = .15$, $t(120) = 1.73$, $p = .087$.

Discussion

Study 3 replicated the direct association between extended silence and value creation, while also demonstrating a psychological mechanism and a boundary condition. When status was made salient, high-status negotiators instructed to use silence were more likely to

report a deliberative mindset, which, in turn, was associated with value creation (higher joint value) for the dyad.

Notably, a deliberative mindset by low-status negotiators also predicted value creation, though low-status negotiators instructed to use silence were no more likely to report experiencing a deliberative mindset. Rather, echoing Koudenburg et al. (2013) and consistent with Hypothesis 7, low-status negotiators reported less satisfaction with the process when using silent pauses, and (perhaps as a result) we observed no increase in either their deliberative mindset or value creation (consistent with Hypothesis 5). The reason for this subjective value effect awaits future research. However, we speculate that low-status negotiators were uncomfortable due to the violation of a cultural expectation that lower status parties provide direct and quick responses to those with higher status. By contrast, higher status parties tend to have more latitude in how they respond to those with lower status (Fragale, 2006; Morand, 2000), and high-status negotiators may therefore be comfortable enough while using extended silence to develop a deliberative mindset.

Notably, we found no evidence that the actor's use of silence affects the counterpart's likelihood of engaging in a deliberative mindset. Rather, the intentional use of extended silence appears to work primarily via a deliberative mindset for the initiator of the silence.

Finally, Study 3 again challenged the practitioner view that the use of silence is a form of intimidation. First, we found no difference in value claiming between conditions, suggesting that silence was not associated with greater concessions by either side. Thus, Hypothesis 3 was not supported; nor was Hypothesis 6. Second, though low-status negotiators felt worse about the process when they attempted to use silence, neither party reported negative perceptions based on the *counterpart's* use of silence. Thus, these findings did not support Hypothesis 4, but supported Hypothesis 7.

Taken together, Study 3 provides consistent support for the internal reflection perspective that silence benefits negotiators primarily through an intrapersonal pathway (operationalized here as deliberative mindset). Even when examining subjective value, the negative perceptions of the process by low-status negotiators when they tried to use silence was an intrapersonal effect, not a reaction to their counterpart's silence or some other form of social perception.

Study 4: Fixed-Pie Perceptions and motivational Orientation

Together, Studies 1 through 3 offer convergent evidence to support our prediction that extended silence is positively associated with value creation, and Study 3 suggests this relationship is mediated by an increase in deliberative mindset. Study 4 replicates and extends the findings of Study 3 in two main ways. First, we have argued that extended silence prompts an increase in deliberative mindset, but Study 3 measured only post-negotiation differences— not *changes*—in deliberative mindset. Thus, in Study 4 a primary goal was to measure a shift in mindset over time as a function of using silence. Because the Study 3 deliberative mindset measure was not suited to prenegotiation use (it asked participants to reflect on behaviors that occurred *during* negotiation), we replaced it in Study 4 with a well-validated measure of fixed-pie perceptions. This measure is often used in negotiation research and relies on participants' estimates of their counterpart's negotiation payoffs rather than on self-reported feelings or behaviors. As such, it is well

suited for pre- and postnegotiation measurement (cf., Thompson & Hastie, 1990). Furthermore, it is generally accepted that System 1 and System 2 thinking are inversely related (Alter et al., 2007; Böckenholt, 2012; Evans, 2008; Evans & Stanovich, 2013; Thompson, 2009); thus, decreases in fixed-pie mindset (System 1 thinking) suggest increases in deliberative mindset (System 2 thinking).

Second, though our findings suggest the use of extended silence may be a good strategy for creating value, we have not compared silence with a more commonly used means to enhance joint gains— namely, urging negotiators to adopt a more integrative motivational orientation (De Dreu & Boles, 1998; De Dreu et al., 2000). Thus, a second aim of Study 4 was to determine whether extended silence was any more helpful in creating value than simply instructing negotiators to problem-solve and seek out joint gains. To this end, we crossed our silence manipulation with an established manipulation of motivational orientation, enabling a comparison of the two effects.

This fully crossed design also allowed us to test motivational orientation as a potential moderator. We have argued that extended silence disrupts default, zero-sum thinking in negotiation. As such, negotiators induced to focus only on their own outcomes, which is consistent with the default, competitive orientation, might benefit more from a deliberative mindset (prompted by extended silence); whereas negotiators induced to have an explicit problem-solving orientation might show weaker effects because they already have an orientation toward value creation. Alternatively, pairing an individualistic motivational orientation with silence might encourage the use of silence as a tool for intimidation, possibly crowding out any thoughts about value creation. Thus, we treated the moderation test as strictly exploratory.

Method

Participants

Participants came from two negotiation classes at a private university in the northeastern United States. We set an a priori goal to recruit at least 600 participants and thus 300 dyads, following prior large-sample negotiation studies (e.g., Schaerer et al., 2018). One class, conducted online, included 520 students (36.4% female; $M_{age} = 41.62$, $SD_{age} = 8.86$). The other class, in person, included 98 students (44.0% female; $M_{age} = 24.38$, $SD_{age} = 4.03$). The online enrollment was not high enough to meet the sample size goal, so we added the in-person course. Both courses had the same pedagogy, exercise, content, and instructor. However, since negotiation behavior has been shown to differ across communication media (Bazerman et al., 2000), we controlled for class in all analyses. A sensitivity analysis using G*Power (Faul et al., 2007) showed that our design and sample size had 80% power to detect effects of size $f = 0.11$ ($r = .11$) and above. This study was approved by the IRB of the Massachusetts Institute of Technology (Protocol ID: 403000325, Study Title: "Research on Interpersonal Negotiation").

Procedure

We used the six-issue (1 distributive, 1 compatible, and 4 integrative) New Recruit exercise (Neale, 1997; Pinkley et al., 1994) with random assignment to dyads and, within dyads, to the role

of recruiter or candidate. A lottery-based financial incentive was again used.

The design was a 2 (Silence: yes vs. no) × 2 (Motivational Orientation: problem-solving vs. individualistic) factorial. Manipulations consisted of short messages embedded within the confidential role instructions of the recruiter, with motivational orientation language copied verbatim from Pruitt and Lewis (1975). In the problem-solving condition, recruiters read:

> In your negotiation, try to view the bargaining situation as a solvable problem. Attempt to play down the conflict nature of the task and view it as a problem situation. Naturally you want to earn as many points as you can, but you are also interested in the needs of the other party.

By contrast, in the individualistic condition, recruiters read:

> In your negotiation, try to earn as many points as possible for yourself. The needs of the other party are not important to you.

Though these instructions have been used and validated in other studies (e.g., O'Connor & Carnevale, 1997; Schei & Rognes, 2005), we ran a validation study with 258 MTurk participants (35.3% female) to confirm that the instructions influenced the motivational orientation of respondents. Using items based on Sorenson et al. (1999), we measured "concern for self" and "concern for other" with seven-point scales, where higher numbers indicated more of the respective motivational orientation. Concern for self was higher among participants who read the individualistic ($M = 6.02$, $SD = 0.93$) rather than problem-solving language ($M = 5.70$, $SD = 1.00$), $t(256) = 2.649$, $p = .009$, $d = 0.331$, 95% CI [0.082, 0.556], and concern for other was higher among those who read problem-solving ($M = 4.47$, $SD = 1.17$) rather than individualistic language ($M = 3.66$, $SD = 1.57$), $t(256) = 4.622$, $p < .001$, $d = 0.577$, 95% CI [0.464, 1.152].

In the Silence condition, participants were further instructed to "try using silence" and to "do your best to pause and be silent for 10–20 s before you respond," as in Study 3. In contrast, those in the No Silence condition did not receive this additional instruction to use extended silence.

Right after negotiating, participants reported their outcomes and responded to a manipulation check and questions about subjective value. As a manipulation check, participants rated the extent to which they used silence during the negotiation, as well as the extent to which their counterpart used silence, on a seven-point scale (1 = *not at all*, 7 = *a great deal*). Subjective value was measured using the same 16-item SVI (Curhan et al., 2006) as in Study 3.

Negotiation Outcomes

As in Studies 1–3, we measured value creation (sum of the parties' points) and value claiming (proportion of points earned by the recruiter). The primary unit of analysis was the dyad.[12]

Fixed-Pie Perceptions

Using the method developed by Thompson and Hastie (1990; see also De Dreu et al., 2000), we measured participants' estimates of their counterparts' points matrices to calculate fixed-pie perceptions. Higher numbers indicated greater fixed-pie perceptions (zero-sum thinking). We administered this measure before and after the negotiation to test how fixed-pie perceptions were changed by

the negotiation.[13] Below, we analyze three variants of this measure. One is taken from the recruiter's perspective, one from the candidate's perspective, and one at the dyadic level (averaging together the recruiter's and candidate's perspectives).

Results

Manipulation Check

Silence-condition recruiters reported using more silence ($M = 3.99$, $SD = 1.74$) than control recruiters ($M = 3.10$, $SD = 1.82$), $F(1, 302) = 18.70$, $p < .001$, $\eta_p^2 = .058$, 95% CI [.018, .116]. Reported counterpart silence was higher for silence-condition ($M = 3.07$, $SD = 1.59$) than for control ($M = 2.45$, $SD = 1.36$) counterparts, $F(1, 306) = 13.52$, $p < .001$, $\eta_p^2 = .042$, 95% CI [.010, .094].[14] These results suggest that our silence manipulation was effective.

The Association Between Silence, Motivational Orientation, and Value Creation

We subjected value creation to a three-way ANOVA with silence (yes vs. no), motivational orientation (problem-solving vs. individualistic), and class (online vs. in-person) as predictors. Consistent with Hypothesis 1, the main effect of silence, $F(1, 265) = 5.58$, $p = .019$, $\eta_p^2 = .021$, 95% CI [.001, .066], showed that value creation was greater when the recruiter was told to use silence ($M = 7,813$, $SD = 1,742$) than when not ($M = 7,646$, $SD = 1,563$). This effect was not moderated by motivational orientation, though a nonsignificant trend showed a greater silence effect in the individualistic than in the problem-solving condition, $F(1, 265) = 2.23$, $p = .137$, $\eta_p^2 = .009$, 95% CI [.000, .043].

A theoretically uninteresting main effect of class showed greater value creation in the in-person class ($M = 8,783$, $SD = 1,412$) than online ($M = 7,511$, $SD = 1,619$), $F(1, 265) = 25.1$, $p < .001$, $\eta_p^2 = .087$, 95% CI [.033, .155], a finding consistent with prior research showing greater value creation when communication media offer more social presence (Nadler, 2003). Likewise, a two-way interaction between silence and class (online vs. in-person) showed that the effect of silence was greater in the in-person class than online, $F(1, 265) = 6.84$, $p = .009$, $\eta_p^2 = .025$, 95% CI [.001, .073].

Neither the main effect of motivational orientation nor the other interactions were significant ($p > .45$). Notably, though instruction

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[12] Two dyads in the in-person class and 34 in the online class failed to reach agreement and are not included in analyses of outcomes. The latter rate is consistent with research showing less agreement in online negotiations (Nadler, 2003).

[13] Premeasures were administered after participants had read their instructions and prior to the start of the negotiation.

[14] We confirmed these analyses with a multilevel test showing an actor effect for the "own silence" manipulation check (more silence use was reported by recruiters in the silence than in the nonsilence condition, $t(301) = 5.92$, $p < .001$, whereas candidates did not differ, $p = .36$); and a partner effect for the "counterpart silence" check (counterparts of silence-condition recruiters reported encountering more silence than those of nonsilence recruiters, $t(301) = 2.51$, $p = .01$). Silence-condition recruiters reported more silence from their candidate counterparts than nonsilence recruiters did, $t(301) = 2.01$, $p = .05$, probably due to heightened sensitivity toward silence due to their own silence condition.

to use extended silence fostered increased value creation, adopting a problem-solving motivational orientation did not. This finding offers further support for the effect of extended silence on value creation, even above and beyond commonly used motivational strategy aimed at promoting problem-solving.

The Association Between Silence and Value Claiming

We subjected value claiming to a three-way ANOVA with silence, motivational orientation, and class. No main effects or interactions were significant, all $p > .30$, refuting Hypothesis 3.

Fixed-Pie Perceptions as a Mediator

To test the mediating role of fixed-pie perceptions, we used Hayes' (2013) PROCESS macro (Model 4). In a model with value creation as the outcome variable, we included recruiter's silence as the predictor, post-negotiation fixed-pie perceptions as the mediator, and prenegotiation fixed-pie perceptions as a covariate. We included all other independent variables from the prior ANOVAs as covariates. We tested separately the mediating role of fixed-pie perceptions by the dyad, the recruiter, and the candidate, respectively.

As expected, recruiter silence predicted dyadic fixed-pie perceptions, $a = -3,289$, 95% CI [$-5,645, -933$] (see pattern of means in Figure. 5). Furthermore, dyadic fixed-pie perceptions predicted value creation, $b = -0.070$, 95% CI [$-0.099, -0.041$]. The indirect effect of recruiter silence on value creation via dyadic fixed-pie perceptions was significant, $ab = 230.48$, 95% CI [$69.99, 431.42$]. Thus, supporting Hypothesis 2, instruction to use silence was associated with decreased dyadic fixed-pie perceptions (suggesting increased deliberative mindset), which, in turn, was associated with more value creation.

Figure 5

Fixed-Pie Perceptions Measured Pre- and Postnegotiation by Silence Condition (Study 4). Fixed-Pie Perceptions is the Sum of Discrepancies Between Imputed Versus Actual Counterpart Point Values, Such That Higher Numbers Indicate Greater Zero-Sum Assumptions. Error Bars Represent the Standard Error
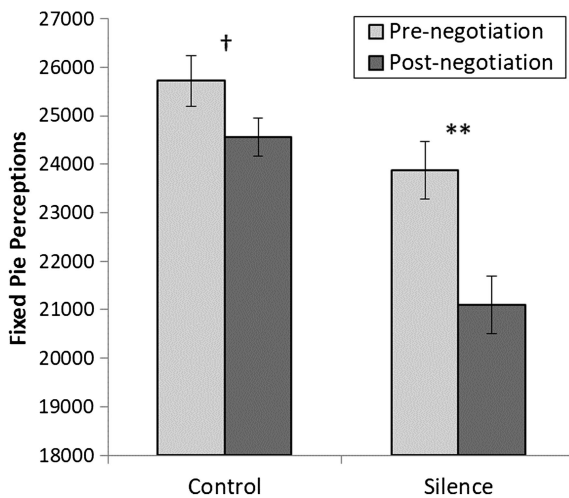
$†$ $p < .10.$ $*$ $p < .05.$ $**$ $p < .01.$

To examine the locus of this effect, we repeated the analysis using the fixed-pie perceptions of the recruiter and the candidate separately. When we examined the recruiter's perspective, recruiter silence again predicted recruiter fixed-pie perceptions, $a = -3,333$, 95% CI [$-6,229, -436$]. Recruiter fixed-pie perceptions, in turn, predicted value creation, $b = -0.047$, 95% CI [$-0.71, -0.022$]. The indirect effect via recruiter's fixed-pie perceptions was significant, $ab = 155.50$, 95% CI [$25.07, 539.19$]. However, when we used the candidate's fixed-pie perceptions, we found a weaker result. Although candidate fixed-pie perceptions predicted value creation, $b = -0.033$, 95% CI [$-0.054, -0.012$], recruiter silence did not significantly predict the candidate's fixed-pie perceptions, $a = -3,021$, 95% CI [$-6,452, 411$]. The indirect effect of recruiter silence on value creation via the candidate's fixed-pie perceptions was not significant, $ab = 99.44$, 95% CI [$-15.48, 247.72$]. Like in Study 3, the effect of silence seems to foster value creation primarily via perceptions of the actor (the silence-user).

The Association Between Silence and Subjective Value

As in Study 3, we used multilevel actor–partner interaction models (Kenny et al., 2006) to examine responses to the SVI (Curhan et al., 2006) subscales as a function of the silence-user's experimental condition. We found no actor or partner effects on the instrumental, self, process, or relationship subscales (all $p > .23$), failing to support Hypothesis 4.

Discussion

Study 4 replicates and extends the findings of our prior studies. Once again, the use of silence helped dyads achieve greater value creation (supporting Hypothesis 1). This pattern held true regardless of the negotiators' motivational orientation, a finding that supports the effect's generalizability. The mechanism results complement those of Study 3, once again supporting Hypothesis 2. Results suggest that extended silence fosters a shift from a fixed-pie mindset to a deliberative mindset, which, in turn, leads to increased value creation. This pattern can be seen in the mediation analyses of both studies. In Study 3, the mediator was deliberative mindset, whereas in Study 4 the mediator was a decrease in fixed-pie mindset (suggesting an increase in deliberative mindset). Moreover, consistent with findings from Study 3, the results of Study 4 again suggested that the use of silence benefited value creation via the mindset of the initiator of silence to a greater extent than via the mindset of the negotiation counterpart.

Finally, the null findings for value claiming are consistent with Studies 1–3 and the null findings for subjective value are consistent for the most part with Study 3, again failing to support Hypotheses 3 or 4.

General Discussion

Our four studies suggest that extended silence during negotiation fosters a shift from default, fixed-pie thinking to a more deliberative mindset, which, in turn, increases value creation. Study 1 found a direct association between the frequency of naturally occurring extended silence and value creation, as well as a time-lagged

association between naturally occurring silence and value creation behaviors (multi-issue utterances). Study 2 showed that the intentional use of extended silence by one or both parties increased value creation. A mediation analysis conducted in Study 3 provided evidence for the full causal chain from extended silence to deliberative mindset to value creation. Study 4 showed that extended silence is associated with a pre–post negotiation decrease in fixed-pie perceptions (suggesting an increase in deliberative mindset). Taken together, these findings support Hypotheses 1 and 2 as well as the internal reflection theory. By contrast, none of our studies found significant differences in value claiming or counterpart subjective value, refuting Hypotheses 3 and 4, and failing to support social perception theory.

Additional findings from Studies 3 and 4 help to contextualize our results. Supporting Hypothesis 5, Study 3 identified a boundary condition such that when status was made salient to negotiators, silence initiated by high-status negotiators facilitated value creation, whereas silence initiated by low-status negotiators did not. The findings for subjective value offer a possible explanation for this difference. Supporting Hypothesis 7, low-status parties had lower subjective value on the process subscale when attempting to use silence, which may have indicated discomfort with initiating silence and a corresponding inability to engage in a deliberative mindset. This boundary condition was not present for value claiming, failing to support Hypothesis 6.

Theoretical Contributions and Future Directions

Our findings strongly support and extend an internal reflection perspective regarding the effect of silence on negotiation. Specifically, the intentional use of extended silence appears to prompt internal reflection (Brett et al., 1999), replacing fixed-pie, System 1 thinking with reflective, deliberative, System 2 thinking, which, in turn, leads to integrative negotiation behaviors that create value for both parties. Note that, although value-creation benefits occurred (by definition) for the dyad, the shift in mindset that drove the effects was primarily internal to the negotiator who initiated silent pauses, and less so for the counterpart.

Though the prescriptive literature in negotiation suggests a social perception effect whereby silence is used as an intimidation tactic to extract concessions from a counterpart, we found no evidence that the use of extended silence by either party had any effect on value claiming (the division of resources). Moreover, the postnegotiation survey results of Studies 3 and 4 showed that neither party felt any worse as a result of the other party's use of extended silence, suggesting that there were no negative social perceptions associated with silence.

The boundary condition involving salient status differences highlights the importance of context in research on silence. For example, it is quite different for a negotiator to stop speaking and be silent while maintaining a fixed stare at the counterpart than for a negotiator to take a brief, silent pause while looking pensive and not showing body language that conveys intimidation or negative emotion. Those nonverbal cues, as well as what was said immediately prior to a silent pause, may influence negotiators' interpretations of and responses to extended silence. Though we found no evidence of intimidation effects, future research could shed light on particular contexts in which a negotiator's silence is interpreted negatively by the counterpart.

The length of the silent pause may also be an important factor in its effectiveness. In Study 1, very short pauses (less than 3 s) had no significant association with value creation, whereas pauses of at least 3 s were effective. We did not have sufficient data to test for an upper limit on effective pause length because long pauses (greater than 17.5 s) were quite rare in the negotiations we studied. However, earlier research by Harinck and De Dreu (2008) found that taking breaks of 3–5 min actually led negotiators to become more competitive, producing lower joint value relative to a distractor task. The authors found that negotiators tended to ruminate during their breaks—to think obsessively about distressing feelings—which heightened their competitive impulses. Notably, these "breaks" lasted much longer than the silent pauses discussed in this paper, and we reason that the relatively short durations of extended silence in our studies probably precluded the development of rumination (Takano & Tanno, 2009).[15] It would be useful in future work to determine whether very long pauses might become counterproductive.

Future research might also explore the timing of extended silence. Study 1 showed that extended silence frequency predicted value creation, but perhaps extended silence is most effective at particular critical moments in a negotiation, such as when a demand is made, a proposal is offered, or emotions are running high (Druckman & Cutcher-Gershenfeld, 2020). Perhaps timing is a more powerful predictor than frequency of extended silence. Furthermore, our participants were typically told to use silence before responding to the counterpart, but a deliberative mindset could also be fostered by extended silence within a negotiator's speaking turn.

One critical question that lies beyond the scope of the present studies is *how* silence fosters a deliberative mindset. Future research examining physiological activity, focus of attention, and other indicators of cognitive load during a negotiation in which extended silence is used could help to test our theory that extended silence can pause the flow of attentional, cognitive, and social demands of the negotiation, so that the negotiator can take time to reflect and consider how best to proceed.

Future research is also needed to explore how the use of extended silence could be taught. In Studies 2–4, we used rather strong experimental manipulations of extended silence, instructing participants to be silent every time they spoke and for relatively long durations (10–20 s), because pilot testing showed that people tended to resist adding pauses to their negotiations. However, that resistance may stem from conventional wisdom about silence as a tool for intimidation, yet our results suggest silence can be used collaboratively, without damaging relationships. Therefore, one possible technique for making extended silence more palatable would be to give people practice initiating extended silence in a nonthreatening way—for example, by looking to the side, scratching one's head, or even prefacing the pause with a phrase like "just a minute." Pairing nonconfrontational behaviors with extended silence might make silence feel more natural and potentially eliminate the need for strongly worded instructions.

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[15] While outside the scope of this investigation, future research might compare the effects of silent pauses versus breaks. In addition to differing in their duration, breaks typically involve the parties' leaving the negotiating space entirely, whereas silent pauses occur while the parties remain at the table. Moreover, breaks are not necessarily done in silence.

Limitations

These studies provide a solid first step in exploring the effects of extended silence on value creation. Nonetheless, we recognize that some factors may limit the generalizability of our findings. First, our studies were conducted in lab settings or as part of a course curriculum; field research is needed to determine to what extent these results hold in real world contexts.

A particular limitation of Study 1, due to its design, was that we could not ascertain why silence was being used (e.g., for checking notes, using nonverbal communication, or thoughtful deliberation) or whether it was used intentionally. By contrast, in Studies 2–4, random assignment to condition, coupled with manipulation checks in every study, made us confident that those in the silence condition used silence intentionally. Of course, we cannot be certain that the phenomenon in Studies 2–4 (when silence was induced experimentally) is identical to that in Study 1 (when silence could have been unintentional).

In addition, it is not clear that our results would be the same in all cultures. We conducted all studies in the United States among primarily native English speakers. Because silence is a nonverbal cue and the meaning of such cues can be dependent on language and cultural context, it is possible that our results may be unique to English speakers in the United States. Future research is needed on the effects of silence in negotiation in cultural contexts with different assumptions about the practice of negotiation, different behaviors associated with status hierarchies, and different meanings and practices surrounding silence (Albert & Ha, 2004; Graham & Andrews, 1987; Hasegawa & Gudykunst, 1998; Kawabata & Gastaldo, 2015; Kim & Markus, 2002, 2005).

Conclusion

When put on the spot to respond to a difficult question or comment, negotiators often feel as though they must reply immediately so as not to appear weak or interrupt the flow of the negotiation. However, our research suggests that pausing silently for a few seconds or more can be a simple yet very useful tool to help negotiators shift from default, zero-sum thinking to a more reflective, deliberative mindset, which, in turn, is likely to lead to the recognition of golden opportunities to expand the pie.

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