

Concession Patterns in Dyadic Negotiations: Empirically Contrasting Sunk Cost, Loss Aversion, and Rationality Predictions

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Abstract

To understand the far-reaching effects of offers on negotiation outcomes, researchers have predominantly focused on first offers, while largely neglecting the subsequent negotiation process with its offer exchanges and concession patterns. We argue that this first-offer supremacy leaves a crucial element of the negotiation process largely unobserved. To address this gap, the present registered report examines key questions regarding the intrapersonal effects of concession patterns and the impact of one's prior concessions on subsequent behavior. Drawing on different literatures, we developed three competing hypotheses: (1) the loss-aversion hypothesis (larger prior concessions leading to *smaller* future concessions and to less integrative behavior), versus (2) the sunk-cost hypothesis (larger prior concessions leading to *larger* future concessions and to more integrative behavior), versus (3) the rationality hypothesis (prior concessions leaving future behavior unaffected). Pilot study data in a distributive setting ($N = 166$) show promising effects for our paradigm and research question, corroborating that prior concessions indeed impact negotiators' subsequent behavior. Building on these data, we outlined two additional preregistered experiments to replicate and extend our pilot findings by examining the underlying psychological mechanisms and generalizing from a distributive negotiation (Study 1) to a multi-issue integrative setting (Study 2). Preregistered analyses show evidence for different processes: In the distributive Study 1, larger concessions made later negotiation behavior more assertive (loss-aversion hypothesis). In the integrative Study 2, however, negotiation behavior was unaffected by prior concessions (rationality hypothesis). Finally, exploratory analyses in both studies reveal empirical support for the sunk-cost hypothesis in the predominant subset of negotiators who decided to continue their concessionary behavior. We discuss and integrate these findings.

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Concession Patterns in Dyadic Negotiations: Empirically Contrasting Sunk Cost, Loss Aversion, and Rationality Predictions

Negotiations are a ubiquitous social endeavor characterized by elements of competition, cooperation, and joint decision-making (Brett & Thompson, 2016; Lax & Sebenius, 1986; Raiffa, 2007; Zartman, 1977). This process of joint decision-making is fueled by the exchange of offers and counteroffers between different parties, which ultimately ends in a deal (i.e., parties agree to a proposed offer; Fisher et al., 1981) or with an impasse (i.e., at least one party disagrees with a proposal and terminates the negotiation process; Petrowsky et al., 2023; Schweinsberg et al., 2012, 2022, 2023a). While a multitude of studies, $n > 100$ articles, has highlighted the substantial role of the first offer for predicting subsequent negotiation processes and results (e.g., Galinsky & Mussweiler, 2001; see Petrowsky et al., 2025, for literature search on first-offer effects; see Schweinsberg et al., 2023b, for transparency in quantifying prior research), remarkably few studies, $n = 13$ articles, have investigated the role of offer exchanges and concession patterns for predicting intrapersonal cognitions and negotiation outcomes (e.g., Tey et al., 2021; Yukl, 1974a, 1974b; see Table 1). Although concessions are a fundamental part of nearly every negotiation across various contexts, negotiation research is lacking a systematic investigation of concession patterns and their accompanying psychological mechanisms. In short: We know a lot about *when* and *how* to set first offers and which *outcome effects* these might elicit (i.e., the start and end of a negotiation; e.g., Jäger et al., 2015; Loschelder et al., 2016a), but we know little about what happens in between first offers and final outcomes (i.e., negotiators' *concession patterns* and how they shape psychological processes and negotiation behavior).

The present registered report addresses this gap by systematically examining whether, how, and why prior concessions systematically impact negotiators' willingness to engage in further concessions. We derive three competing predictions from the literature, suggesting that larger prior concessions (1) reduce further concessions and hinder integrative solutions (loss aversion), (2) facilitate further concessions and ease integrative solutions (sunk cost), or (3) do not systematically impact further concession making and integrative solutions (rationality). A pilot study with $N = 166$ participants empirically tests these predictions in a distributive setting and finds tentative support for one of them. Two subsequent preregistered experiments seek (a) to conceptually replicate the preliminary findings from the pilot study, (b) to examine the underlying psychological mechanisms (Study 1 and 2), and (c) to generalize the effect and extend our understanding from distributive (Study 1) to integrative negotiations (Study 2).

Prior Research on Concession Making in Negotiations

As mentioned above, research on concessions in negotiations remains scarce (see Table 1). 50 years ago, early negotiation research (e.g., Yukl, 1974a, 1974b) suggested that one's own concessions are mainly driven by the opponent's concessions (e.g., magnitude, frequency, speed), shaping a reactive and interpersonal perspective on concession effects (see also Benton et al., 1972;

Chertkoff & Conley, 1967). More recent findings further illuminated this interpersonal perspective: Concession patterns signal diagnostic information about the conceding negotiator's limit (i.e., decreasing concession steps signal that the limit is approaching) and elicit less ambitious counteroffers by the counterpart (Tey et al., 2021). Distributive concession strategies (i.e., high demands, low concessions; Hüffmeier et al., 2014) further lead to a reduction of conceded value and eventually to impeded deal-making and higher impasse rates (Maxwell et al., 2003; Mertes et al., 2023). In sum, all these papers investigated the effect of concession patterns as a *situational* process variable (i.e., formal part of the negotiation) and their *interpersonal* impact on negotiation outcomes (e.g., Tey et al., 2021; Yukl, 1974a), impasse rates (e.g., Mertes et al., 2023), or feelings of (violated) reciprocity or inequity (e.g., Gouldner, 1960; Maxwell et al., 2003; Pruitt & Syna, 1984).

In contrast, the intrapersonal perspective on concessions—which mental processes and decision rules are at play while negotiators concede and how these mental processes affect negotiators' concession making (Caputo, 2013)—has not been thoroughly investigated. This is surprising and potentially problematic given that the vast majority of first-offer effects on outcomes are substantially driven and explained by such *intrapersonal* processes and cognitive biases (e.g., anchoring, framing, fixed-pie perceptions, insufficient adjustment, selective accessibility, or self-serving biases; Babcock & Loewenstein, 1997; Galinsky & Mussweiler, 2001; Kriss et al., 2011; Liu et al., 2016; Loschelder et al., 2014, 2016a; Majer et al., 2020; O'Connor & Adams, 1999; Thompson & Hastie, 1990; Thompson et al., 1999; Tversky & Kahneman, 1974). We hence propose that *intrapersonal* concession effects also influence negotiations: (1) prior concession patterns impact further concession making (i.e., the behavioral, functional level), and (2) this concession making is influenced by cognitive biases and heuristics (i.e., the cognitive level; De Houwer, 2011). Drawing on prior literature, competing (and directionally different) predictions can be derived for these research questions—we outline three competing hypotheses and perspectives for how (and why) one's prior concessions will (or will not) influence one's future behavior and concession making. In short, our research aims to answer two important questions: Do negotiators concede more versus less after having made prior concessions, or are they unaffected by the negotiation's concession history? And which perceptions and motivations can explain this behavior?

Three Competing Predictions for the Influence of Prior Concessions on Future Behavior

Based on prior empirical evidence and theorizing, we outline three competing perspectives to predict the intrapersonal effects of prior concessions on future negotiation behavior. As there are only few papers on concession patterns and their effects in negotiations (see Table 1), it proved insufficient to draw solely on findings from psychological negotiation research for theorizing and hypothesis development. We therefore turned to the broader literature on (ir)rational decision-making. This literature review suggested three (competing) predictions for how and why negotiators' prior concessions influence their future behavior in negotiations. We will outline these three perspectives (1) loss aversion, (2) sunk costs, and (3) rationality consecutively—structuring the respective sections in parallel to present a brief introduction (What is it?), the mechanisms (What are the mechanisms?), as well as their implications for decision-making, negotiations, and the present hypotheses (see Table 2).

Table 1. *Overview of Past Empirical Research on the Effects of Concession Making*

Reference	Finding	Level
Chertkoff & Conley (1967)	Extreme initial offers with infrequent concessions yielded the best outcomes, while frequent concessions prompted reciprocity.	Interpersonal
Komorita & Brenner (1968)	Concessions by negotiators are inversely related; firm strategies may increase advantageous agreements but decrease fairness, while starting with a fair offer and remaining firm elicits least yielding.	Interpersonal
Pruitt & Drews (1969)	Time pressure and opponent's concessions did not influence the negotiators' concessions, but over time, concession size decreased from large to small concessions.	Interpersonal
Benton et al. (1972)	Following a flexible concession-making schedule (as opposed to an intransigent, that is, no-concession schedule) was more effective in achieving monetary gain, and counterparties were more satisfied with their outcomes.	Interpersonal
Yukl (1974a)	Small (compared to large) concessions by the opponent led to more favorable final offers, lower aspirations, and the opponent was perceived as tougher.	Interpersonal
Yukl (1974b)	Small (compared to large) concessions by the opponent led to lower negotiators' aspirations, more concessions, and the opponent was perceived as stronger.	Interpersonal
Esser & Komorita (1975)	Incompletely reciprocated concessions led to smaller concessions in the last offer, with this effect of violated reciprocity being stronger for competitive negotiators.	Interpersonal
Komorita & Esser (1975)	Reciprocity of concessions induced further concession making, but reciprocity of non-concessions induced concessions only if concessions were also fully reciprocated.	Interpersonal
Turnbull et al. (1976)	Face-to-face communication and higher power were most effective for joint outcomes, while prior concession strategies had little influence on negotiation outcomes.	Inter- and intrapersonal
Wall (1981)	Negotiators did not reciprocate concessions, but rather they repeated concessions that were reinforced by large opponent concessions.	Interpersonal
Kwon & Weingart (2004)	Gradual and delayed (compared to immediate) opponent's concessions increased the negotiator's object valuation and satisfaction with the negotiated outcome.	Interpersonal
Azmi & Voon (2016)	Gradual (compared to delayed) opponent's concessions elicited smaller concessions, but experience did not moderate the relationship between concession timing and the final offer.	Interpersonal
Tey et al. (2021)	Decreasing concessions led to less ambitious counteroffers due to recipients' inflated expectations of subsequent offers, particularly when concessions decreased moderately over more rounds.	Interpersonal

Note. Articles are ordered along their publication date. The column finding denotes the most important finding on concession making (i.e., other results are not depicted). Cited articles were identified using the following search terms: TI (conced* OR concession*) AND AB (negotiat* OR bargain*) in the databases “APA PsycInfo”, “APA PsycArticles”, “Psychology and Behavioral Sciences Collection”, and “PSYINDEX”. From $n = 35$ peer-reviewed articles identified, we removed articles that were not experimental ($n = 7$), deviated too far from our research focus of dyadic negotiations (e.g., political standoffs; $n = 9$), or assessed concessions as a dependent variable, rather than as an independent variable ($n = 6$). In total, we identified $n = 13$ articles. The full list of all identified articles is available on OSF.

The Loss-Aversion Perspective – Conceding Impedes Further Concessions

What is it? The seminal prospect theory (Kahneman & Tversky, 1979) postulates that people evaluate outcomes relative to a reference point. Outcomes below the reference point are coded as losses and outcomes above the reference point are coded as gains. Prospect theory further posits that losses loom larger than equivalent gains (i.e., loss aversion). People dislike incurring losses and try to prevent them. To illustrate, the discomfort experienced from losing \$100 surpasses the pleasure derived from gaining an equivalent amount. Loss aversion has received considerable empirical support in social sciences (for a meta-analysis, see Brown et al., 2024; Neumann & Böckenholt, 2014; for a critical discussion, see Gal & Rucker, 2018).

What are the mechanisms? While the prospect theory does not propose a specific psychological mechanism underlying loss aversion (Gal, 2006; Gal & Rucker, 2018), numerous studies have endeavored to unravel its potential causes. Loss aversion has been attributed to variations in the attention drawn to gains and losses (Carmon & Ariely, 2000), the way they are retrieved from memory (Johnson et al., 2007), individuals' affective forecasting (Kermer et al., 2006), or the processing of affective stimuli in the brain (De Martino et al., 2006).

Implications for decision-making? Loss aversion significantly impacts decision-making in both risky and non-risky choices, as individuals actively seek to avoid losses (e.g., Gächter et al., 2022; Kahneman & Tversky, 1979). For instance, individuals reject gambles with positive expected values that involve potential losses (Rabin, 2000). Loss aversion also impacts decisions involving others, as seen in more selfish and aggressive behavior in dictator or ultimatum games framed in terms of losses rather than gains (Fiedler & Hillenbrand, 2020; Neumann et al., 2018; cf. Leliveld et al., 2009).

Implications for negotiations? Loss aversion also plays an important role in negotiations. Viewed through the lens of mental accounting, concessions can be conceptualized as ongoing mental expenses incurred throughout the negotiation process. These concessions are perceived as losses, subtracted from the mental account established at the negotiation's outset (Thaler, 1980). Consistent with this perspective, research indicates that negotiators are more concession averse when proposals are framed to highlight their own resources (i.e., 'offers' vs. 'requests'; Majer et al., 2020; Trötschel et al., 2015) or framed in terms of losses rather than gains (De Dreu et al., 1994; Neale & Bazerman, 1985).

What do we hypothesize? Building on prior research, one can argue that larger prior concessions induce a sense of loss in negotiators and thus lead to smaller future concessions in an attempt to minimize further losses. We therefore derive the following hypotheses:

H1a. Negotiators who have previously made larger (smaller) concessions to the counterpart make smaller (larger) concessions, i.e., more (less) ambitious counteroffers with their next move.

H1b. Negotiators who have previously made larger (smaller) concessions to the counterpart report a lower (higher) willingness to accept the next offer by their counterpart.

The Sunk-Cost Perspective – Conceding Facilitates Further Concessions

While the loss-aversion perspective conceptualizes prior concessions as losses to a mental account, a different phenomenon from decision-making research lends itself to operationalize concessions more akin to investments (of time, effort, and money)—the concept of *sunk costs*.

What is it? Sunk costs represent investments or efforts incurred in the past (Arkes & Blumer, 1985; Thaler, 1980). From a micro-economical perspective, individuals should not be influenced by prior investments made in a project (Heath, 1995), which should therefore no longer be considered in current or future decision-making processes (Arkes & Blumer, 1985). However, decision-makers systematically overestimate prior investments, leading them to make larger future investments into a project or object when they have already invested in them in the past—a phenomenon widely known as the “sunk-cost fallacy” (e.g., Garland & Newport, 1991).¹

What are the mechanisms? The sunk-cost fallacy has been explained by at least two mechanisms. First, individuals tend to mentally justify previous decisions to reduce their cognitive dissonance (Festinger, 1954), leading them to invest more in the future instead of withdrawing from irrational options (i.e., justification of prior investments; proposed by Rubin & Brockner, 1975; Ku et al., 2005; Teger, 1980). Second, stemming from research on auctions, individuals ascribe higher values to items throughout the bidding process (compared to their true value, i.e., overestimation), leading to an (over)appreciation of the product (Bazerman & Samuelson, 1983).

Implications for decision-making? Findings of sunk-cost fallacies are widely distributed across different domains with far-reaching effects—in psychology (e.g., Astebro et al. 2007; Strough et al. 2008), management (e.g., Garland, 1990; Negrini et al., 2022), marketing (e.g., Soman & Cheema, 2001), auctions (Bazerman & Samuelson, 1983; Galinsky et al., 2009; Ku et al., 2005), sports (Keefer, 2015; Staw & Hoang, 1995), and various other fields (e.g., Guler, 2007; Máñez et al., 2009; see Roth et al., 2015, for a review). Contrary to this broad application in various decision-making contexts, the application of sunk-cost effects in negotiation research is rare.

Implications for negotiations? To our knowledge, there is only one exception to this neglect of sunk cost in negotiations. Diekmann et al. (1996) focused on the transmission of sunk costs between two negotiating parties in the housing market (i.e., buyers making larger concessions to sellers who previously paid more for a negotiation good). As pointed out earlier for general concession research (e.g., Tey et al., 2021; Yukl, 1974b), this research again focused on *interpersonal* processes (see also Olivola, 2018). In an *intrapersonal* perspective, little is known about the effects of sunk costs on negotiators’ perception, behavior, or outcomes.

This neglect is surprising for at least two reasons: First, negotiations, by nature, unfold over time, making negotiators susceptible to the overestimation of earlier investments (i.e., concessions; Navarro & Fantino, 2009; Tey et al., 2021). Second, negotiations represent dynamic situations wherein parties are continually forced to make decisions (i.e., accept or decline an offer) and allocate and monitor resources mentally (Thaler, 1985; Tsay & Bazerman, 2009), which makes them a suitable domain for expecting sunk-cost effects.

In the context of negotiations, parties’ own prior concessions could be mentally processed as investments made, therefore triggering a justification of prior investments and the emergence of the sunk-cost fallacy. In a similar vein, improved evaluation (i.e., product appreciation) of the

¹ The concept of sunk costs shares similarities with the phenomenon of escalation of commitment (Staw, 1976; Staw & Ross, 1987; see also Sleesman et al., 2012)—with the sunk cost effect being considered an important driver of escalation of commitment (Sleesman et al., 2012). As an important conceptual distinction, sunk costs primarily involve the strictly economical attachment to past investments, while escalation of commitment is broader and includes the tendency to persist with failing endeavors due to the emotional or psychological need to validate prior decisions (Brockner, 1992; Moon, 2001; Rubin & Brockner, 1975).

negotiated issue would lead to higher concessions (i.e., “If I concede this much, I must really like this object”). Hence, larger prior concessions would lead to larger future concessions in the same negotiation.²

What do we hypothesize? Building on the sunk-cost fallacy, one can thus derive the following hypotheses—diametrically opposed to H1a/H1b:

H2a. Negotiators who have previously made larger (smaller) concessions to the counterpart also make larger (smaller) concessions, i.e., less (more) ambitious counteroffers with their next move.

H2b. Negotiators who have previously made larger (smaller) concessions to the counterpart report a higher (lower) willingness to accept the next offer by their counterpart.

The Rationality Perspective – Conceding Does Not Affect Further Concessions

What is it? Besides these two perspectives driven by cognitive biases, there is a third standpoint in this debate—the rationality perspective (Davis & Holt, 1993; Kahneman & Tversky, 1979; Smith, 1962; Tversky & Kahneman, 1974). Within a strictly rational-economic framework, the magnitude of negotiators’ next concession should logically and rationally be influenced solely by considerations about the their target or limit—but certainly not by any prior concessions. This stance aligns with micro-economic principles and normative cost-benefit analyses (Heath, 1995) which both assume that present decisions should remain unaffected by prior investments in a given project (Arkes & Ayton, 1999). In line with the *homo economicus* concept, rational individuals should not consider prior costs or hypothetical investments in their subsequent decision-making (Kahneman & Tversky, 1976). Finally, normative rational choice theory (Boudon, 2003) points out that individuals should opt for the maximum benefit, evaluating alternatives exclusively in terms of *concurrent* costs and benefits.

Implications for decision-making? Empirical findings across various fields, such as economics, psychology, or sociology, show evidence for rational decision-making. Behavioral economists even argue that, while individuals do apply heuristics in their daily lives, these strategies are typically well-adapted and might be referred to as “ecologically rational” (Camerer & Loewenstein, 2004, p. 11) as they lead to reasonable, and thus, rational decisions (see also Coleman, 1990; Fehr & Schmidt, 2006). Finally, other streams of research showed that human biases are reduced under certain circumstances (e.g., Kahneman, 2011; Nemeth & Kwan, 1987; Stanovich & West, 2000; Svenson & Benson, 1993), further supporting the argument that individuals *can* decide rationally.

Implications for negotiations? Applying this rationality perspective to negotiations, prior concessions should primarily stem from considerations about negotiators’ target or limit rather than being affected by their prior concessions. Through a decision-analytic lens, concessions can be conceptualized as stand-alone, individual decisions (Tsay & Bazerman, 2009); each concession,

² Beyond sunk costs, other psychological mechanisms predict that larger prior concessions could lead to higher future concessions. For instance, one could argue that prior concessions act as an aggregated numerical anchor for future concessions (Schaerer et al., 2016). Also, one’s individual need for consistency over time (Festinger, 1954; Lecky, 1945), Gestalt theory (Koffka, 1935), and self-perception theory (Bem, 1967, 1972; see also Goldstein & Cialdini, 2007) could trigger higher future concessions to be consistent with prior behavioral patterns.

Table 2. *Summary of Three Competing Perspectives on Intrapersonal Concession Effects*

Perspective	What is it?	What Are the Mechanisms?	Implications for Decision-Making	Implications for Negotiations	Hypotheses
Loss Aversion	- Prospect theory (Kahneman & Tversky, 1979) posits that losses loom larger than equivalent gains - People dislike incurring losses and try to prevent them - Concessions are mental expenses (i.e., losses) on negotiators' mental account	- Attention (Carmon & Ariely, 2000) - Retrieval from memory (Johnson et al., 2007) - Affective forecasting (Kermer et al., 2006) - Processing of affective stimuli in the brain (De Martino et al., 2006)	- Gambles that involve potential losses (Rabin, 2000) - Economic games (e.g., dictator or ultimatum games) framed in terms of losses vs. gains (Neumann et al., 2018)	- Individuals are more concession averse when offers highlight the individual's resources (Trötschel et al., 2015) - Individuals concede less when offers are framed as losses rather than gains (De Dreu et al., 1994) - Individuals are more self-oriented in loss-negotiations (Sondak et al., 1995)	Larger prior concessions induce a sense of loss and thus lead to <i>smaller</i> future concessions, <i>lower</i> acceptance rates, <i>less</i> integrative behavior, and <i>lower</i> joint outcomes, all to minimize further losses.
Sunk Cost	- Sunk costs represent investments incurred in the past (Arkes & Blumer, 1985; Thaler, 1980). - Concessions are prior investments (i.e., sunk cost) on a mental account - People overestimate prior investments, leading them to make larger future investments into this project (Garland & Newport, 1991)	- Justification of prior investments (Rubin & Brockner, 1975) and cognitive dissonance reduction (Festinger, 1954) - Attribution of higher value throughout bidding or negotiating processes (Bazerman & Samuelson, 1983)	- Investment decisions in management (Negrini et al., 2022) - Marketing choices (Soman & Cheema, 2001) - Decision-making in sports (Staw & Hoang, 1995) - Various other fields (see Roth et al., 2015, for a review)	- Sunk costs are transmitted between two negotiating parties (Diekmann et al., 1996) - Negotiations are susceptible to the overestimation of earlier investments (i.e., concessions; Tey et al., 2021), as they require continuous allocation of resources (Tsay & Bazerman, 2009)	Larger prior concessions induce a sense of having made large investments already and thus lead to <i>larger</i> future concessions, <i>higher</i> acceptance rates, <i>more</i> integrative behavior, and <i>higher</i> joint outcomes, all to reduce cognitive dissonance and justify prior investments.
Rationality	- Traditional economics assume that human beings generally act in rational ways (Smith, 1962) - Individuals <i>should</i> not consider prior costs or hypothetical investments in their subsequent decision-making - Concessions are stand-alone, individual decisions	- Homo economicus (Kahneman & Tversky, 1976) - Normative rational choice theory (Boudon, 2003) - Normative cost-benefit analyses (Heath, 1995)	- Individuals apply heuristics in their daily lives, but the strategies are well-adapted (i.e., "ecologically rational"; Camerer & Loewenstein, 2004, p. 11) as they lead to reasonable/rational decisions - Human biases are reduced under certain circumstances (Kahneman, 2011) showing that individuals <i>can</i> behave rationally	- Each concession, viewed independently, should be evaluated and decided upon in an independent manner—irrespective of prior concessions - Future concessional patterns remain unaffected by prior concessions	Larger prior concessions <i>do not</i> affect future concessions, acceptance rates, integrative behavior, and joint outcomes (i.e., null effects emerge).

viewed independently, would then be evaluated and decided upon in an independent manner. Consequently, current decisions (i.e., next concession) should remain unaffected by prior decisions (i.e., prior concessions).

What do we hypothesize? Building on the rationality of economic agents, one can derive a third, competing set of hypotheses:

H3a. Negotiators' prior concessions do not affect their future concessions, i.e., the magnitude of their counteroffer with their next move.

H3b. Negotiators' prior concessions do not affect their willingness to accept the next offer by their counterpart.

Interim Conclusion and Contribution of the Present Research

Building on three different streams of literature, we developed three competing predictions for how negotiators' prior concession patterns affect their willingness to concede further. Does a sense of loss aversion accumulate over time, thereby impeding further concessions (i.e., loss aversion)? Do the sunk-cost fallacy and inherent involvement make it more likely to invest more, thereby facilitating further concessions (i.e., sunk-cost perspective)? Or are negotiators rational enough to base their willingness to concede solely on their own target or limit, ultimately neglecting prior concessions (i.e., rationality perspective)? We gathered first evidence to illuminate these competing perspectives in a pilot study.

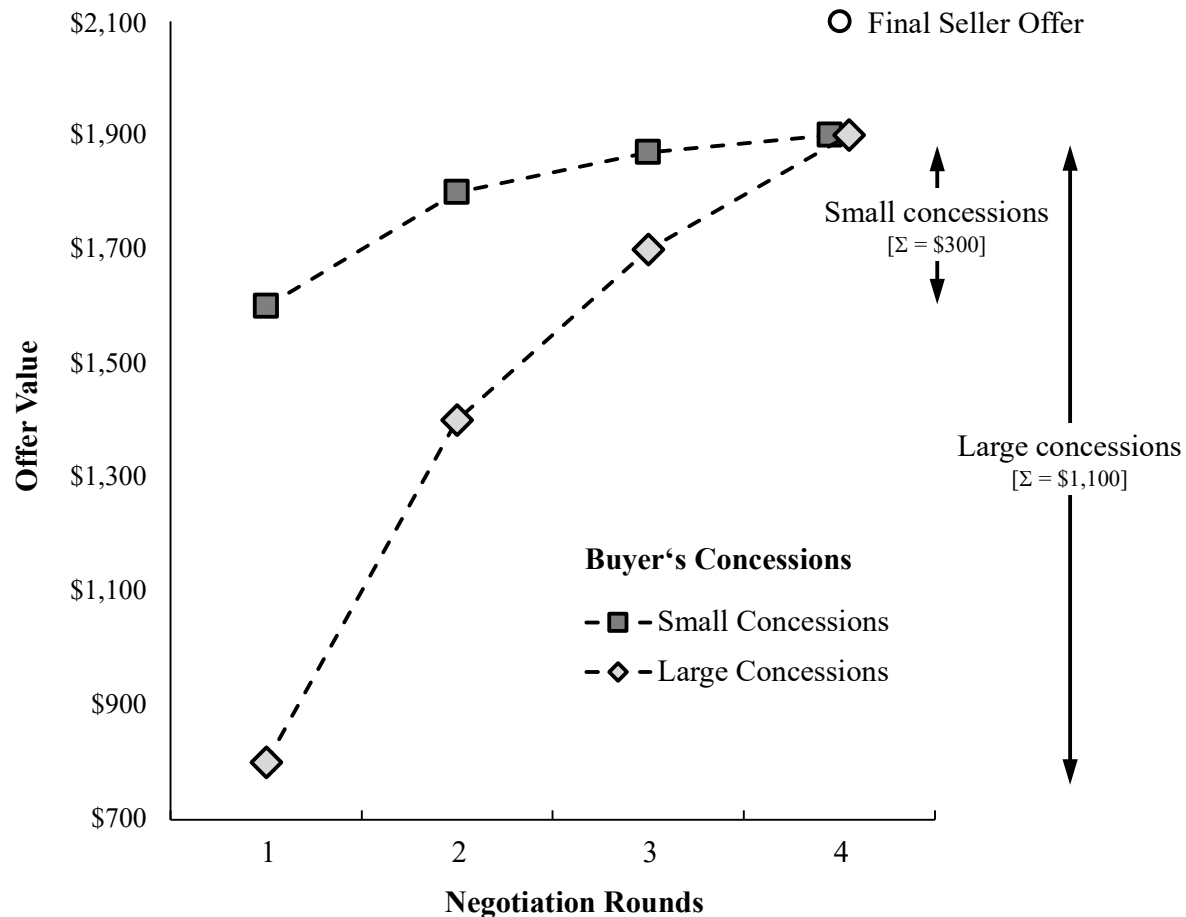
Pilot Study – Buyers Concede to Sellers

We conducted a pilot study to test our basic experimental paradigm for investigating intrapersonal concession effects in distributive negotiations ($N = 166$ from *MTurk*). Participants assumed the role of buyers and were presented with an online negotiation scenario for the sale of a bike in an animated chat interface. In this chat interface, participants were guided through four consecutive negotiation rounds, with an offer having been made by them and by the seller in each round (note that the participants did not actively make offers but were asked to imagine that they had made the predefined offers themselves). Throughout this simulated back-and-forth concession process, the seller's offers were left unclear to rule out possible effects of reciprocity, anchors, or the assumed zone of possible agreement. Participants were told that the seller made "another concession to their latest offer", but no monetary value for the seller's offer was displayed in the chat interface (see OSF). Therefore, participants only knew the value of their own (predefined) concessions. With this manipulation we made sure to measure the pure intrapersonal, rather than the interpersonal, effect of negotiators' own concessions. Eventually, participants (i.e., buyers) were presented with the seller's latest offer (this time with a monetary value) in the same chat interface and asked to indicate their willingness-to-accept (WTA) the offer (in %) and to make another counteroffer (in \$).

The experiment featured two conditions (see Figure 1): (1) a large concession condition, in which participants imagined to have already made large concessions to the seller (i.e., from a first offer of \$800 to the most recent offer of \$1,900), and (2) a small concession condition, in which participants imagined to have made small(er) prior concessions (i.e., from a first offer of \$1,600 to the most recent offer of \$1,900). Again, note that the simulated seller also made concessions, but no monetary values were displayed to the participants before the seller's final offer. Importantly, the two conditions solely differed in the magnitude of own total concessions

made ($\Sigma = \$1,100$ vs. $\Sigma = \$300$), but not in the number of concessions made ($n = 3$) or in the magnitude of the latest offer made by the buyer (i.e., \$1,900) or the seller (i.e., \$2,100). All experimental materials, the video simulation of the concession manipulation, all data, and analysis code are available at <https://osf.io/u8grv/>.

Figure 1. Operationalization of Small vs. Large Concessions



Note. To rule out unintended interpersonal effects, participants (i.e., buyers) were told that seller made “another concession to their latest offer” after each counteroffer, but the value of this counteroffer was not displayed in the chat interface. Participants were assigned to either a small concession condition (i.e., having made small prior concessions of $\Sigma = \$300$, with an initial offer of \$1,600; dark gray squares) or a large concession condition (i.e., having made large prior concessions of $\Sigma = \$1,100$, with an initial offer of \$800; light gray rhombs). The number of prior concessions ($n = 3$) was held constant between conditions. After negotiation round 4, participants were informed about the monetary value of the seller’s final offer (\$2,100 in both conditions)

Results

Data analysis revealed a significant difference in counteroffers between the large concession ($M = \$2,000.75$, $SD = \$61.39$) and the small concession condition ($M = \$1,985.09$,

$SD = \$50.08$)—a conventionally ‘small’ effect ($d = 0.283$). This descriptive difference ($M_{\text{Diff}} = \$15.66$; i.e., 7.83% of the ZOPA) was nonsignificant according to common significance thresholds, $t(164) = 1.811, p = .072$. Nonetheless, the direction of this difference points towards H2a: larger prior concessions leading to larger future concessions (sunk-cost perspective). The direction of the effect speaks against H1a (larger prior concessions impeding future concessions; loss-aversion perspective) and H3a (prior concessions *not* affecting future concessions; rationality perspective).

For buyers’ WTA, we found no significant differences, $t(164) = 0.857, p = .393, d = 0.134$, between the large concession ($M = 55.53\%, SD = 28.69\%$) and small concession condition ($M = 51.90\%, SD = 25.81\%$). This cautiously speaks against both H1b (loss-aversion perspective) and H2b (sunk-cost perspective). A Bayesian analysis with a default Cauchy prior of 0.707 resulted in a $BF_{01} = 4.219$ —that is, ‘substantial’ evidence for a true null effect (H3b; rationality perspective) according to common Bayesian conventions (Wagenmakers et al., 2011). The fact that negotiators’ own concession making did not impact their willingness-to-accept was somewhat surprising, especially considering that the bivariate correlation between counteroffer and willingness-to-accept was highly significant ($r = .514, p < .001$). One possible explanation would be that people are less familiar with statements or decisions in percent rather than with absolute numbers (Hoffrage et al., 2000). In addition, in real-life negotiations and other decisions in daily-life, people are typically forced to make binary choices (i.e., accept vs. decline). We have thus added another measure based on absolute values to our subsequent Study 1.

In sum, we find tentative evidence for a sunk-cost effect of prior concessions on future counteroffers (albeit small in size and nonsignificant, i.e., $p = .072$), as well as empirical evidence for prior concessions *not* affecting negotiators’ willingness to accept the seller’s next offer (a ‘substantial’ Bayesian null effect). In all, the pilot study (1) offers an in-principle confirmation of the viability of the experimental paradigm, (2) suggests that previously neglected biases might indeed play a role in negotiation research, and (3) leads us to believe that there is more to uncover in further studies with larger sample sizes. Specifically, future research should (a) attempt to replicate the sunk-cost effect on future concessions, (b) examine competing mediators derived from the different theoretical accounts, and (c) substantiate the Bayesian absence of evidence for concession effects on WTA. Based on this assessment, we preregistered and subsequently conducted two additional experiments to gain deeper insights into intrapersonal concession effects in distributive (Study 1) and integrative (Study 2) negotiations.

Overview of the Preregistered Experiments

We sought to build on the pilot study findings with two additional preregistered experiments in a threefold way: First, we sought to replicate the results of the pilot study with a larger sample (Study 1) that is sufficiently powered to detect conventionally small effect sizes. Second, we planned to generalize the present empirical findings across negotiation settings and to extend our results to an integrative negotiation setting with potential win-win agreements (Study 2). Third, we intended to investigate and empirically test competing psychological mediators—derived from the different theoretical accounts—to explain the emergence of the effect in distributive, but also integrative negotiations (Study 1 and 2). The approved stage-1 protocol for this registered report is publicly available on OSF (<https://osf.io/74s3d/>).

Study 1 – Psychological Mechanisms in a Distributive Setting

Study 1 sought to replicate the concession effect from the pilot study with a larger sample while additionally assessing competing psychological mediators.

Method

Sample

An a priori power analysis with the conventionally ‘small’ effect size from the pilot study ($d = 0.283$) and a power of 90% revealed a necessary total sample size of $N = 528$ (Faul et al., 2007). We conservatively estimated that around 10% of participants might fail attention checks (Douglas et al., 2023), thus aspiring to recruit a total of $N = 581$ participants. We recruited participants via Prolific, an online research platform with higher data quality than MTurk (see Peer et al., 2022). We sampled U.S. residents and used \$ as negotiation currency. As preregistered, we excluded participants who failed the attention check ($n = 62$; slightly more than the estimated 10%-attrition of $n = 53$). Our final sample consisted of $N = 519$ participants ($M_{\text{age}} = 37.20$ years, $SD_{\text{age}} = 13.05$ years; 47.98% female, 51.45% male, 0.58% other), yielding a high statistical power of 89.57% (*pwr* package in R; Champely et al., 2022).

Procedure and Design

We applied a procedure and experimental design very similar to our pilot study. Participants assumed the role of buyers and responded to an online negotiation scenario in which a seller is offering them a laptop for sale. Participants were assigned to either a large concession condition (i.e., imagining to have made large prior concessions of $\Sigma = \$1,100$) or a small concession condition (i.e., imagining to have made small prior concessions of $\Sigma = \$300$; see Figure 1). Importantly, participants were told that the other party made “another concession to their latest offer”, but there was no monetary value displayed in the chat interface (see OSF for experimental material). Participants therefore only knew the monetary value of their own predefined concessions. With this manipulation we made sure to measure the pure intrapersonal, rather than the interpersonal, effect of one’s own concessions. Only the seller’s last offer (i.e., \$2,100) was displayed as a numeric value. The number of prior concessions and monetary value of the seller’s last offer were again held constant between conditions.

Dependent Variables

As in the pilot study, we assessed participants’ willingness-to-accept (WTA) the seller’s latest offer (in % and in absolute numbers) and participants’ last counteroffer (in \$) as key dependent variables. We further assessed four different psychological mechanisms derived from the literature to test for mediator effects (with 3 items each): (1) loss aversion (e.g., “I feel like I have already lost a lot of money in this negotiation”; $\alpha = .87$), (2) justification of prior investments (e.g., “Given my prior investments, I really wanted to reach a deal”; sunk-cost perspective; $\alpha = .72$), (3) product appreciation (e.g., “I really valued the product offered by the seller”; sunk-cost perspective; $\alpha = .81$), and (4) rational decision-making (e.g., “I feel that my prior concessions in the negotiation process did *not* affect my final offer and WTA”; $\alpha = .59$). All items were measured

on 7-point Likert scales (1 = *not at all*, 7 = *very much*; see Appendix for all verbatim items). We randomized the order in which mediators are measured to control for unintended order effects. All materials and data are publicly available on OSF (<https://osf.io/u8grv/>).

Results

Negotiation Differences Between Large and Small Prior Concessions

As preregistered, we conducted two-tailed *t*-tests to examine group differences in our main dependent variables: participants' last counteroffer, their WTA (individual WTA in %), and their WTA in absolute numbers (global WTA; i.e., "Out of 100 negotiations like this, how many buyers would accept the seller's final offer?"). Data analyses revealed a significant difference in counteroffers between the large concession ($M = \$1,926.55$, $SD = \$229.01$) and the small concession condition ($M = \$1,964.86$, $SD = \$70.82$), $t(303.66) = -2.564$, $p = .011$, $d = 0.227$. The size of prior concessions indeed influenced buyers' final counteroffers: with larger prior concessions leading to smaller final counteroffers. This pattern supports the loss-aversion account, as buyers made markedly lower (i.e., more assertive) counteroffers after having made larger prior concessions (H1a). For buyers' individual WTA (in %), we found no significant difference between the large concession ($M = 42.44\%$, $SD = 33.30\%$) and the small concession condition ($M = 43.81\%$, $SD = 29.76\%$), $t(508.26) = -0.494$, $p = .622$, $d = 0.043$. As this result was non-significant, we also conducted a Bayesian *t*-test, $BF_{01} = 9.096$, which revealed conventionally 'moderate' evidence for the null hypothesis (H3a; Lee & Wagenmakers, 2013). For buyers' global WTA, results corroborated the findings for the final counteroffer: Participants in the large concession condition reported a significantly lower willingness to accept the seller's last offer ($M = 45.01$, $SD = 25.68$), compared to participants in the small concession condition ($M = 49.58$, $SD = 24.14$), $t(513.63) = -2.086$, $p = .038$, $d = 0.183$. This again supports the loss-aversion perspective and its predictions for negotiators' willingness-to-accept (H1b).

Psychological Mechanisms in a Distributive Setting

In the next preregistered step, we conducted parallel mediation analyses to simultaneously test the four theoretically proposed mechanisms explaining the effect of prior concessions on following concession patterns. In all mediation models, we included size of prior concessions as the independent variable (0 = small vs. 1 = large) and entered (1) perceived loss aversion, (2) justification of prior investments, (3) product appreciation, and (4) rational decision-making as parallel mediators (see Table 3 for descriptive results). We used the PROCESS macro in *R* (Model 4; Hayes, 2013), full information maximum likelihood estimation, and bootstrapped 95% confidence intervals (CI) with 5,000 bootstrapped resamples for all effects (see SOM for complete results).

Table 3. Descriptive Results for the Psychological and Behavioral Mechanisms in Study 1 and 2

Mechanism	Study 1				Study 2			
	Small Concessions		Large Concessions		Small Concessions		Large Concessions	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Psychological Mechanisms								
Loss Aversion	4.96 _a	1.58	5.33 _b	1.56	4.42 _a	1.30	4.63 _b	1.35
Justification of Prior Investments	4.97 _a	1.19	4.74 _b	1.34	5.34	1.04	5.24	0.96
Product Appreciation	5.15	1.23	5.07	1.25	5.40	1.04	5.33	1.10
Rational Decision-Making	4.26	1.15	4.15	1.23	4.22	1.21	4.18	1.17
Behavioral Mechanisms								
Time ^c					35.97	49.50	33.86	40.28
Switches ^d					6.82	5.66	7.36	6.18

Note. Psychological mechanisms were measured on 7-point scales (1 = *not at all*, 7 = *very much so*) and in randomized order after the dependent variables. ^{a,b} Mean values with different subscripts differed significantly in the respective study ($p < .05$). The behavioral mechanisms were measured implicitly in Study 2 only. ^c Time was measured as the total time participants spent inspecting their counterpart's payoff table (in seconds). ^d Switches captured the number of times participants switched between their own and the counterpart's payoff table (only one table was visible at a time).

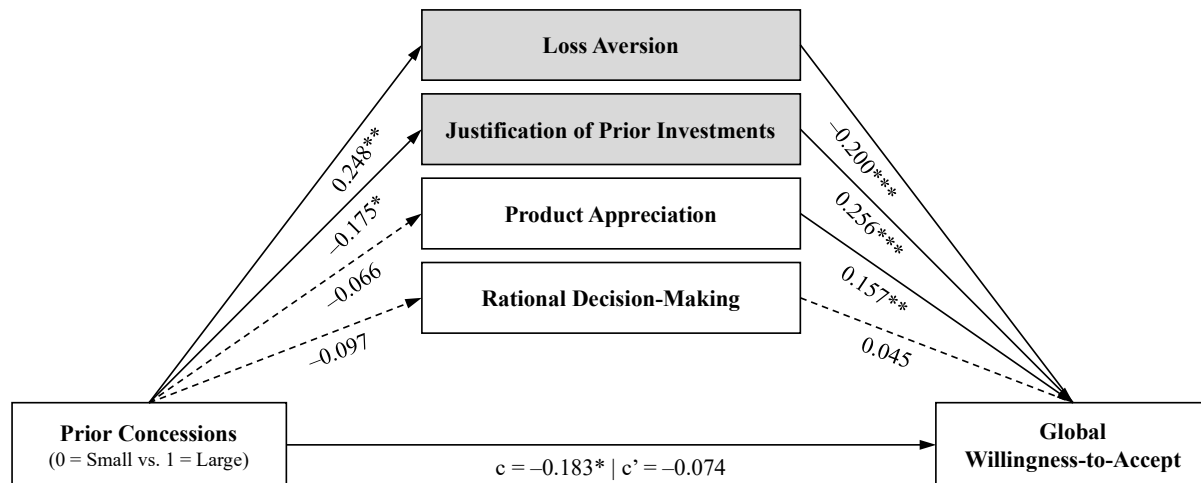
The first mediation model with the final counteroffer as the dependent variable revealed that larger prior concessions predicted higher perceived loss aversion ($\beta = 0.238$, $p = .006$) and less justification of prior investments ($\beta = -0.182$, $p = .038$; see Table 3). The other two mediators, rational decision-making ($\beta = -0.094$, $p = .286$) and product appreciation ($\beta = -0.068$, $p = .442$), remained unaffected by the size of prior concessions. Furthermore, the mediation analysis revealed a total effect of prior concessions on final counteroffer ($b = -38.306$, $SE = 14.822$, 95% CI $[-67.424, -9.188]$), corroborating the significant t -test result showing that larger concessions led to markedly lower final counteroffers. This direct effect remained significant after including all mediators ($b = -38.158$, $SE = 14.325$, 95% CI $[-66.300, -10.016]$). Despite the two significant a -paths for loss aversion and prior investments, no indirect effects emerged—the total indirect effect was also not significant ($b = -0.148$, $SE = 5.337$, 95% CI $[-11.361, +10.242]$).

For the second mediation model with buyers' individual WTA as the dependent variable, a complementary result pattern emerged. As expected, given the non-significant t -test, we found no total effect ($b = -1.370$, $SE = 2.771$, 95% CI $[-6.813, +4.074]$) and observed no direct effect after including all mediators ($b = 2.695$, $SE = 2.192$, 95% CI $[-1.611, +7.001]$). However, the indirect effects via loss aversion ($b = -2.176$, $SE = 0.856$, 95% CI $[-3.931, -0.623]$) and justification of prior investments ($b = -1.205$, $SE = 0.662$, 95% CI $[-2.684, -0.090]$) were significant, suggesting that these perceptions play a significant role in shaping individual WTA.

Lower WTA coincided with higher levels of perceived loss aversion ($\beta = -0.297, p < .001$) and less justification of prior investments ($\beta = 0.210, p < .001$).

The third mediation analysis with global WTA as the dependent variable revealed a full mediation via loss aversion and justification of prior investments (Figure 2): The significant total effect ($b = -4.565, SE = 2.187, 95\% \text{ CI } [-8.862, -0.267]$) disappeared after including all mediators ($b = -1.814, SE = 1.918, 95\% \text{ CI } [-5.581, +1.954]$; zero included in the CI). The indirect effects via loss aversion ($b = -1.241, SE = 0.531, 95\% \text{ CI } [-2.424, -0.352]$) and justification of prior investments ($b = -1.119, SE = 0.636, 95\% \text{ CI } [-2.517, -0.012]$) were both significant. Again, higher perceived loss aversion ($\beta = -0.200, p < .001$) and less justification of prior investments ($\beta = 0.256, p < .001$) coincided with lower global WTA (see b-paths in Figure 2). These results suggest that the negative relationship between negotiators' own prior concessions and WTA is mediated by a higher perceived loss aversion and less justification of prior investments following larger prior concessions (see Figure 2).

Figure 2. Mediation Model of Prior Concessions on Global WTA in Study 1



Note. The mediation model shows the effects of prior concessions (0 = small vs. 1 = large) on global willingness-to-accept were mediated by loss aversion, justification of prior investments, product appreciation, and rational decision-making in Study 1. Gray boxes indicate significant indirect effects, continuous lines indicate significant regression weights. Estimates for indirect effects are based on a bootstrapping procedure with 5,000 bootstrap samples. Path coefficients display standardized β regression weights.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Exploratory Analyses for Participants' Counteroffers

Whilst these results broadly point in the direction of the loss-aversion reasoning, we sought to gain a more precise understanding of the underlying patterns in the data. When carefully examining the distribution of counteroffers, it was surprising that some buyers decided not to make any more concessions—in stark contrast, they even ‘reversed’ their previous standing offer of \$1,900. To better understand this pattern and how it influences the overall pattern of results, we

divided the buyers into two subsets: the majority of buyers continued to negotiate *within* the zone-of-possible agreements (ZOPA, i.e., between \$1,900 and \$2,100; $n = 482$; 92.87%) and thus moved farther *towards* their counterpart with the final counteroffer. In contrast, a select subsample of buyers, unexpectedly, decided to make their final counteroffer outside of the ZOPA (i.e., below their last standing offer \$1,900; $n = 37$; 7.13%). This latter subsample decided to move *away* from their counterpart again and to rescind an offer that they had already made (i.e., \$1,900).

These exploratory subset analyses are interesting for at least two reasons: First, in the, arguably small, subsample of participants (7.13%) who moved *away* from their counterpart (i.e., counteroffers below \$1,900), the loss-aversion effect described in the preregistered analyses was markedly amplified. Specifically, in this subset, participants in the large concession condition made significantly smaller (more assertive) final counteroffers ($M = \$1,306.59$, $SD = \$429.12$) than participants in the small prior concession condition ($M = \$1,734.67$, $SD = \$95.76$). That is, negotiators undercut their ‘own’ standing offer of \$1,900 significantly stronger, $t(23.987) = -4.517$, $p < .001$, $d = 1.267$.

Second, in the larger subsample of participants (92.87%) who moved *toward* their counterpart (as initially expected), the loss-aversion effect was reversed and trended toward the sunk-cost effect described in the pilot study. Participants in the large concession condition made descriptively *higher* final counteroffers ($M = \$1,984.59$, $SD = \$36.49$) than participants in the small concession condition ($M = \$1,978.84$, $SD = \$37.04$), $t(479.41) = 1.718$, $p = .087$, $d = 0.156$. This latter pattern of results closely resembles the one from the pilot study and trends in the direction of a sunk-cost effect. We return to this explorative finding in the general discussion.

Interim Discussion

Study 1 sought to investigate the intrapersonal effects of prior concessions on subsequent negotiation behavior in a distributive negotiation setting. Preregistered analyses with all participants supported a loss-aversion reasoning for counteroffers (in line with H1a) and global WTA (in line with H1b): Larger prior concessions made negotiators loss averse and led to lower, that is, more assertive final counteroffers and also lower WTA rates. This effect for WTA was fully mediated by higher loss aversion and less justification after larger concessions—buyers felt they had already *lost* a large amount of money by their own concessions, *justified* their prior concessions less, and were thus ultimately *less willing* to accept the seller’s offer to prevent further losses.

This overall result pattern stands at odds with the results of our pilot study, which found (1) no effect on individual WTA and (2) tentative evidence for the sunk-cost rather than the loss-aversion perspective. Interestingly, exploratory analyses revealed that the loss-aversion effect on counteroffers was particularly strong in a subsample of 7% of participants who decided to rescind their prior offer. Amongst the vast majority of buyers (93%) who decided to proceed with concessions toward the seller, however, this effect reversed and—at least descriptively—supported the findings from the pilot study and the sunk-cost reasoning.

Study 2 – Perspective-Taking and Creating Value in an Integrative Setting

Study 2 sought to replicate and extend the findings from the prior studies in an integrative negotiation setting with the potential for tradeoffs and win-win agreements. We move away from a single-issue price negotiation and instead test our hypotheses in a three-issue negotiation (Pruitt

& Lewis, 1975; see also Loschelder et al., 2016b). Unlike distributive negotiations that revolve around the zero-sum division of resources and require concessions on all negotiation issues (Craver, 2010; Thompson, 2006), integrative negotiations are characterized by (a) the opportunity for mutually beneficial outcomes (Fisher et al., 1991; Weingart et al., 1999) and (b) parties conceding on less important issues in return for gains on more important issues (i.e., “logrolling”; Froman & Cohen, 1970). While the hypothesized effects for the distributive outcome (i.e., claiming value with the counteroffer) of the negotiation remain the same for Study 2, the competing mechanisms (i.e., loss aversion, sunk cost, and rationality) additionally suggest markedly different outcomes for negotiation behavior within an *integrative* setting.

Further advancing the loss-aversion perspective, previous research has shown that people make more self-serving mistakes in individual decision-making tasks (Leib et al., 2019) and act more individualistically in loss contexts compared to gain contexts (Poppe & Valkenberg, 2003). Also in negotiations, this more individualistic social value orientation predicted less attentional focus on the other party’s (vs. one’s own) payoffs (Fiedler et al., 2013; Trötschel et al., 2013). Finally, negotiated agreements have been found to be less integrative for loss (compared to gain) negotiations (Sondak et al., 1995). Based on this research, and additional to the prior hypotheses from Study 1, we derived the following hypotheses for the integrative setting of Study 2:

H1c. Negotiators who have previously made larger (smaller) prior concessions invest less (more) effort and perspective-taking into finding integrative solutions.

H1d. Negotiators who have previously made larger (smaller) prior concessions create less (more) integrative value.

Further advancing the *sunk-cost perspective*, negotiators’ own prior concessions should be mentally processed as investments made, therefore evoking self-justification processes (Brockner, 1992), improved evaluations of the negotiated issues (Festinger, 1954), and an overestimated probability of a successful conclusion of the negotiation (Arkes & Hutzler, 2000). In an integrative setting where negotiators potentially (and typically) concede on several issues (Vetschera et al., 2012), the feeling of sunk costs could be more pronounced. This could ultimately lead to investing even more (i.e., making larger concessions) in order to successfully complete the project (i.e., to successfully reach an agreement). Participants with sunk-cost perceptions should therefore put more effort into perspective-taking and the identification of integrative potential. Additional support for the sunk-cost perspective lies in the nature of integrative negotiations: While distributive negotiations are more similar to individual decision-making processes (and heuristically-driven failures thereof), integrative negotiations share more similarities with joint decision-making (Fisher et al., 1981; Zartman, 1977). Previous research has shown that groups are even more susceptible to the sunk cost fallacy (Seibert & Goltz, 2001), again supporting the idea that the risk of falling prey to the sunk-cost fallacy seems to be increased in mutually interdependent settings. From a sunk-cost perspective, we therefore derive the following hypotheses:

H2c. Negotiators who have previously made larger (smaller) prior concessions invest more (less) effort and perspective-taking into finding integrative solutions.

H2d. Negotiators who have previously made larger (smaller) prior concessions create more (less) integrative value.

Finally, in line with our theorizing in the introduction and building on the *rationality* perspective of economic agents, we derive the following set of hypotheses:

H3c. Negotiators’ prior concessions will not affect their effort and perspective-taking into finding integrative solutions.

H3d. Negotiators' prior concessions will not affect the integrative value they create.

Method

In Study 2, we applied our experimental paradigm to an integrative setting in a three-issue negotiation (Pruitt & Lewis, 1975; see also Loschelder et al., 2016). The negotiation revolved around the sale of a café and featured three issues: transfer fee, coffee beans, and furniture. The payoff structure was slightly adjusted from the seminal task developed by Pruitt and Lewis (1975; see Loschelder et al., 2016b) to (1) include more options for larger variance in potential counteroffers and (2) increase the maximum value on each issue to preserve the initial distances between the different options. Each issue featured 21 options (A–U) with a maximum value of 13,000 individual points (see Appendix for details).

Sample

An a priori power analysis with the same parameters and considerations as in Study 1 again led to an aspired sample size of $N = 581$. We again recruited U.S. residents via Prolific (participants from Study 1 were not able to enter Study 2). As we did not implement attention checks in the integrative setting and no outcome-related attention checks are possible, we report the results from the full sample of $N = 581$ participants ($M_{\text{age}} = 39.12$ years, $SD_{\text{age}} = 13.12$ years; 48.36% female, 49.57% male, 2.07% other). This sample yields a statistical power of 92.42% for detecting an effect size as found in the pilot study (i.e., $d = 0.283$; Champely et al., 2022).

Procedure and Design

As in Study 1, we used a vignette study in a chat interface and participants again assumed the role of buyers. Participants were guided through three consecutive negotiation rounds (see Study 1). However, as this was an integrative negotiation setting, participants made package offers on all three issues simultaneously (e.g., I-I-K; see Appendix). Similar to Study 1, participants were asked to imagine having made several predefined package offers and were told that the other party had made “another concession to their latest offer” (i.e., without revealing the concession value of their counteroffer).

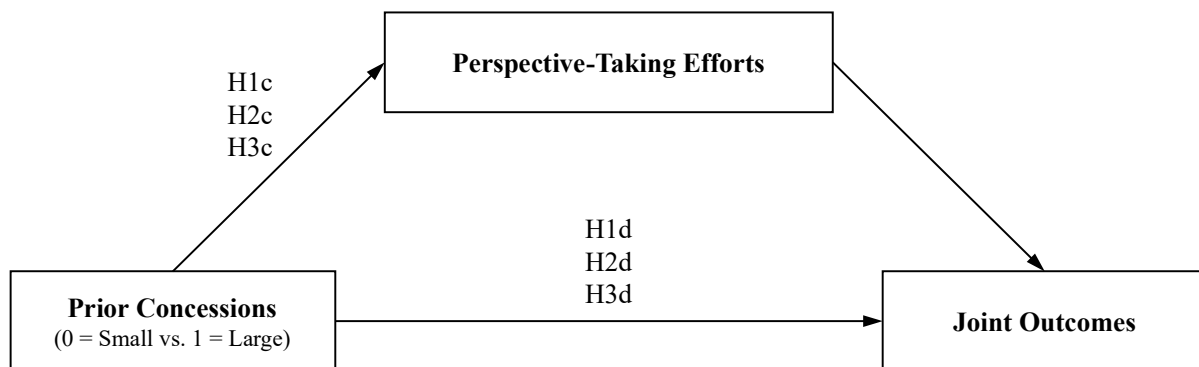
Again, Study 2 featured two conditions. Participants were assigned to either a large concession condition (i.e., imagining to have made large prior concessions; $\Sigma = 4,650$ individual points; from 12,250 to 7,600) or a small concession condition (i.e., imagining to have made small prior concessions; $\Sigma = 1,700$ individual points; from 9,300 to 7,600). Again, the two conditions did not differ in the number of concessions made, nor in the last offer made by the buyer (i.e., worth 7,600 individual points for the participant); they solely differed in magnitude of negotiators' own concessions to isolate the *intrapersonal* concession effects (i.e., 4,650 points vs. 1,700 points). As this was an integrative negotiation and package counteroffers would have been informative of the underlying priorities (see Loschelder et al., 2016b), the participants were not presented with a last offer by the seller (see Study 1) and were therefore not asked to indicate their willingness-to-accept. At all times throughout the negotiation, participants had access to their own payoff table (see OSF and Appendix).

Dependent Variables

We assessed two key dependent variables. First, to measure claiming value (see Study 1), we calculated the individual points participants would earn with their final offer. Second, to measure creating value, we calculated the integrativeness of participants' final offer (i.e., the joint points both parties would achieve with the participant's final offer).

As in Study 1, we assessed four different psychological mechanisms derived from the literature to test for mediator effects (i.e., loss aversion, justification of prior investments, product appreciation, and rationality; see Study 1 and Appendix). Additionally, we assessed two behavioral mediators, for which we drew inspiration from research by Giacomantonio and colleagues (2010, Study 1): After seeing their own concessions and offers, participants were given access to their counterpart's payoff table (i.e., their underlying interests and priorities; see Giacomantonio et al., 2010). In this phase, two buttons appeared on participants' screens—one leading to their own payoff table and one leading to their counterpart's payoff table. Clicking on either of these buttons displayed the corresponding table while simultaneously hiding the unselected table. This allowed us to capture (a) the total *time* participants spend viewing their counterpart's table (i.e., perspective-taking efforts in trying to understand the counterpart's priorities) as well as (b) the *number of switches* between tables (i.e., deliberate comparisons of own vs. the other party's priorities; see also Fiedler et al., 2013). Both measures of perspective-taking behavior serve as mediating mechanisms that should facilitate the identification of integrative potential and increase joint outcomes. After a maximum of three minutes, participants were asked to indicate their final package offer, including all three issues. After the assessment of our dependent variables, we measured the verbatim mediators in randomized order (see Appendix; loss aversion, $\alpha = .81$; justification of prior investments, $\alpha = .71$; product appreciation, $\alpha = .83$; rational decision-making, $\alpha = .54$). All materials and data are publicly available on OSF (<https://osf.io/u8grv/>).

Figure 3. Overview of Additional Hypotheses in Study 2 and Theoretical Model for Creating Value



Note. We ran a parallel mediation model with multiple mediators estimated simultaneously. Here, only the hypotheses H1c–H3c and H1d–H3d are displayed. Perspective-taking efforts were measured as (1) time spent on the counterpart's payoff table and (2) number of switches between one's own payoff table and the counterpart's payoff table.

Results

Negotiation Differences Between Large and Small Prior Concessions

As preregistered, we conducted two-tailed *t*-tests to examine group differences in our main dependent variables: participants' claimed value and participants' created value. We did so by calculating the individual points (for claimed value) and joint points (for created value) that negotiators would make with their final counteroffer.

Frequentist data analyses revealed no significant difference in claimed value between the large concession ($M = 7,707.01$, $SD = 1,821.97$) and the small concession condition ($M = 7,656.55$, $SD = 1,349.65$), $t(568.66) = 0.383$, $p = .702$, $d = 0.031$. Bayesian analyses showed 'strong' evidence for the null hypothesis (i.e., $BF_{01} = 10.078$; Lee & Wagenmakers, 2013). This is in line with the rationality perspective (H3a), suggesting that the size of prior concessions does not affect later counteroffers.

Similarly, for created value—the integrativeness of the final offer—we found no significant difference, $t(491.64) = -0.555$, $p = .579$, $d = 0.047$ (i.e., 'moderate' Bayesian evidence for the null hypothesis, $BF_{01} = 9.220$; Lee & Wagenmakers, 2013) between the large ($M = 13,153.34$, $SD = 392.11$) and the small concession condition ($M = 13,174.72$, $SD = 514.61$). In all, the preregistered analyses suggest that participants' prior concessions did not influence their own claimed value, nor did it increase the value created at the joint level (thus supporting the rationality perspective; H3d).

Psychological Mechanisms in the Integrative Setting

As in Study 1, we followed our registered analysis protocol and conducted parallel mediation analyses of the four underlying mechanisms. We again included size of prior concessions as the independent variable (0 = small vs. 1 = large) and considered the same four parallel mediators (see Table 3 for descriptive results on the mediators in Study 2). We used the PROCESS macro in *R* (Model 4; Hayes, 2013), full information maximum likelihood estimation, and bootstrapped 95% CI with 5,000 resamples for all effects (see SOM for complete results).

The first mediation model with claimed value as the dependent variable revealed that larger prior concessions predicted higher perceived loss aversion ($\beta = 0.165$, $p = .048$), but did not affect justification of prior investments ($\beta = -0.107$, $p = .199$), product appreciation ($\beta = -.080$, $p = .339$), and rational decision-making ($\beta = -.033$, $p = .688$). The mediation analysis corroborated the non-significant total effect of prior concessions on claimed value ($b = 50.452$, $SE = 135.039$, 95% CI $[-214.773, +315.678]$). After including all mediators, neither the direct effect ($b = 75.462$, $SE = 134.777$, 95% CI $[-189.252, +340.176]$), nor the total indirect effect were significant ($b = -25.010$, $SE = 26.843$, 95% CI $[-82.099, +24.134]$).

The second mediation model with created value as the dependent variable corroborated the *t*-test's null finding. The total effect ($b = -21.375$, $SE = 37.671$, 95% CI $[-95.364, +52.614]$), the direct effect after including all mediators ($b = -18.179$, $SE = 37.916$, 95% CI $[-92.649, +56.292]$), and the total indirect effect ($b = -3.197$, $SE = 5.539$, 95% CI $[-15.144, +7.287]$) were not significant.

Behavioral Mechanisms in an Integrative Setting

To extend our understanding of how prior concessions might affect integrative behavior, we additionally preregistered two behavioral mechanisms: (1) the time participants spent inspecting the counterpart's payoff table and (2) the number of switches between their own and the counterpart's payoff table (see Table 3 for descriptive statistics).

For the time spent examining the other's table, no significant difference emerged between the large ($M = 33.86s$, $SD = 40.28$) and the small concession condition ($M = 35.97s$, $SD = 49.50$), $t(511.94) = -0.558$, $p = .577$, $d = 0.047$ ('moderate' Bayesian evidence for the null hypothesis, $BF_{01} = 9.223$; Lee & Wagenmakers, 2013). Similarly, we found no significant difference for how often negotiators switched between payoff tables in the large ($M = 7.36$, $SD = 6.82$) and the small concession condition ($M = 6.82$, $SD = 5.66$), $t(575.83) = 1.099$, $p = .272$, $d = 0.091$ (with 'moderate' Bayesian evidence for the null hypothesis, $BF_{01} = 6.037$; Lee & Wagenmakers, 2013). This moderately supports H3c (rationality perspective).

Finally, we repeated the mediation analysis with the behavioral mediators. In line with the non-significant group differences reported above, larger prior concessions did not coincide with more time spent with the other's payoff table ($\beta = -0.047$, $p = .571$) or the number of switches between payoff tables ($\beta = 0.091$, $p = .276$). Furthermore, no direct effect ($b = -22.915$, $SE = 37.733$, 95% CI $[-97.026, +51.196]$) and no total indirect effect emerged ($b = 1.540$, $SE = 5.330$, 95% CI $[-8.184, +13.460]$).

Exploratory Subset Analyses for Counteroffers

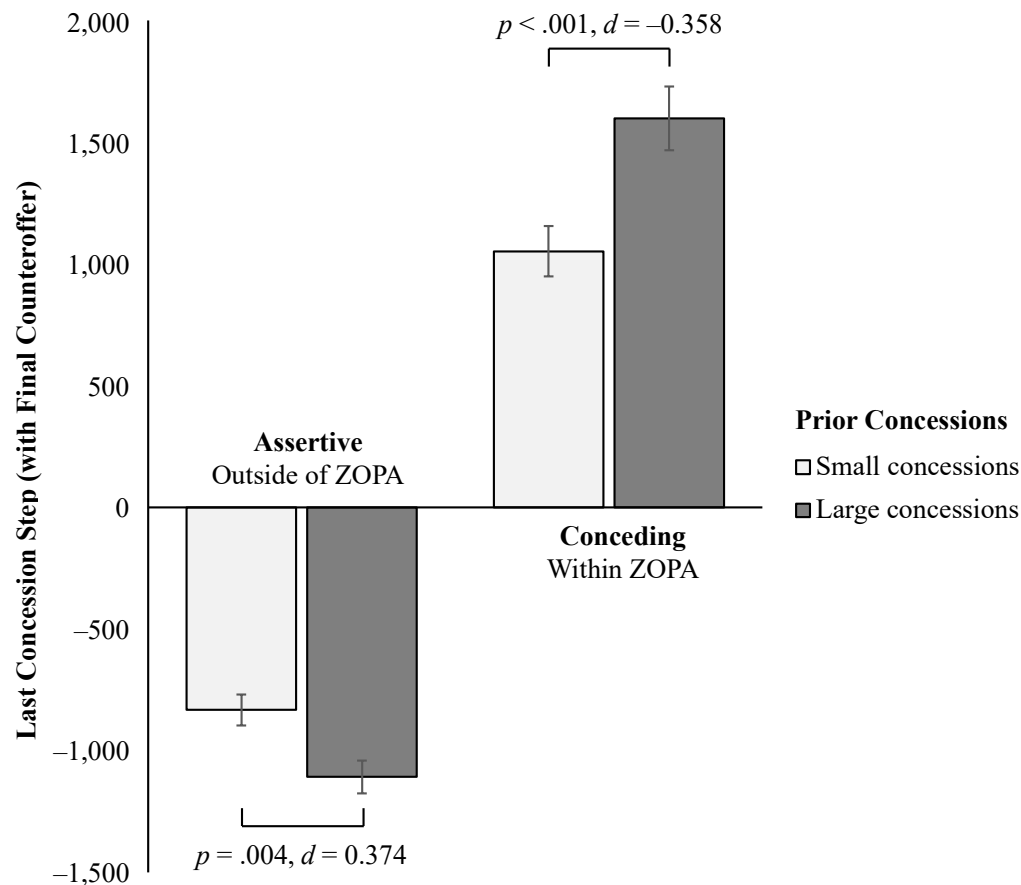
Given Study 1's exploratory findings for participants who decided to concede within vs. outside of the ZOPA, we conducted similar subset analyses in this integrative Study 2. We again split the sample into two subsets: As in Study 1, the majority of buyers made their final counteroffer within the ZOPA (i.e., $\leq 7,600$ points for themselves; $n = 353$, 60.76%). The other, smaller subsample, however, also decided to make their final counteroffer outside of the ZOPA (i.e., $> 7,600$ points for themselves; $n = 228$, 39.24%). Analyses with these subsamples yield a highly similar result pattern as in the distributive Study 1—albeit, participants were more evenly distributed across the two subsamples.

First, in the smaller subsample of participants (approx. 40%), who decided to move *away* from their counterpart in an assertive manner and to rescind their previous offer (i.e., counteroffers *outside* the ZOPA; $N = 228$), a previously obscured loss-aversion effect emerged: Participants in the large concession condition claimed significantly *more* with their final counteroffer ($M = 9,402.40$, $SD = 1,535.07$) than participants in the small concession condition ($M = 8,886.41$, $SD = 1,159.70$), $t(224.39) = 2.889$, $p = .004$, $d = 0.374$. Like the approx. 7% of participants in the distributive Study 1, these negotiators decided to undercut their own final offer and to claim more value—indicating a strong loss-aversion effect in this subsample, and particularly strong in the large concession condition (Figure 4).

In stark contrast and also corroborating Study 1 findings, a highly significant sunk-cost effect emerged in the larger subsample of participants (approx. 60%; $N = 353$), who decided to move *toward* their counterpart with their final counteroffer. They made further concessions *within* the ZOPA and did not rescind their prior offer. In this subsample, participants claimed significantly *less* for themselves in the large concession ($M = 6,585.71$, $SD = 892.96$) than in the small concession condition ($M = 6,884.15$, $SD = 758.24$), $t(341.91) = -3.396$, $p < .001$, $d = -0.358$. Just

as the majority of participants in the distributive Study 1 (approx. 93%), buyers who decided to concede *within* the ZOPA showed a diametrically opposed concession pattern: they conceded *more* after already having made larger (compared to smaller) concessions—indicating a sunk-cost effect in this subsample (see Figure 4). In all, the present interaction effect, together with Study 1 findings, suggests that participants show negotiation behavior that is either highly indicative of loss aversion *or* the sunk-cost effect—whether negotiators opt to remain *within* the ZOPA (or not) appears to be the decisive factor (or indicator) that differentiates the loss-aversion and sunk-cost account, respectively.

Figure 4. *Effect of Prior Concessions on Claimed Value in the Assertive vs. Conceding Subsamples in Study 2*



Note. The average last concessions in points (with Standard Errors as whiskers) are displayed for two subsamples—(1) assertive participants who decided to move *away* from their counterparts with their last concession and to rescind their prior offer (i.e., own points > 7,600, thus outside of ZOPA; $n = 228$, 39.24%; left panel). In contrast, (2) participants who decided to move farther *toward* their counterpart with their last concession and to concede *within* the ZOPA (i.e., own points $\leq 7,600$ points; $n = 353$, 60.76%; right panel). The zero line indicates the last standing own offer of 7,600 points. Positive values thus indicate concessions in favor of the counterpart. Negative values, however, indicate ‘reversed’ concessions and rescinded prior offers, that is, more value claimed by the negotiators. Whereas the two bars on the left support the loss-aversion

reasoning, $t(224.39) = 2.889$, $p = .004$, $d = 0.374$, the two bars on the right support the sunk-cost reasoning, $t(341.91) = -3.396$, $p < .001$, $d = -0.358$.

General Discussion

To our knowledge, the present research is the first to examine the *intrapersonal* effects of negotiators' prior concessions on their future negotiation behavior, as well as the underlying psychological mechanisms. Based on our review of the literature on biases and decision-making, we formulated and tested three competing theoretical predictions: larger prior concessions lead to (i) *smaller* future concession and less integrative behavior ("loss aversion"), vs. (ii) *larger* future concessions and more integrative behavior ("sunk cost"), or (iii) no differences in future concessions and integrative behavior ("rationality"). Findings and preregistered analyses from two high-powered studies reveal a somewhat mixed pattern: While larger concessions generally made negotiators less willing to accept further offers and to make more aggressive counteroffers in the distributive Study 1, preregistered analyses from Study 2 show no significant differences, seemingly supporting the rationality account. Importantly, however, non-preregistered exploratory analyses shed important novel light on these result patterns and allude to a highly influential interpersonal moderation: negotiators differ in whether they decide to continue to concede (within the ZOPA; the majority) or to rescind their prior last offer and claim more value for themselves after having already made concessions (outside the ZOPA). The majority of participants in both studies, who opted to make further concessions, showed a result pattern that supported the sunk-cost perspective. The minority of participants who decided to rescind their previous offer showed empirical support for the loss-aversion reasoning and claimed more value for themselves—particularly in the large-concession condition. It was also this minority of participants (approx. 7%) that drove the overall loss-aversion outcome in the distributive Study 1. We will discuss potential explanations for these differences in reactions to having already made concessions below, as well as potential reasons for the different results in distributive vs. integrative negotiations.

Loss Aversion in Distributive Negotiations

Distributive settings typically revolve around the zero-sum division of resources and require concessions on all negotiation issues (Craver, 2010; Thompson, 2006). Somewhat surprising at first blush, the preliminary findings from our pilot study were generally reversed in Study 1: The pilot study had tentatively supported a sunk-cost reasoning—larger prior concessions increasing later concessions. The high-powered Study 1 did not replicate this pattern; instead, an inverted loss-aversion effect emerged in the full sample (see Heath, 1995; Thaler, 1985). Consistent with the seminal prospect theory account (Kahneman & Tversky, 1979), participants who already made large concessions (and thus mentally accounted for the larger looming losses) were significantly less willing to accept the seller's offer and made more assertive final counteroffers; put differently, they were more focused on their own interests and also more likely to reject the offer to prevent taking further losses (De Dreu et al., 1994; Neale & Bazerman, 1985). Our mediation analyses back the claim that larger prior concessions felt like larger mental expenses (Thaler, 1980). Conceptually, and statistically, this purely intrapersonal concession effect on negotiation behavior was thus (fully) explained by an increased feeling of losses and less justification throughout the negotiation process. As a result, after encountering these larger mental

costs, negotiators were not willing to make further concessions (i.e., at least not in the form of accepting a final offer) and would thus risk an impasse.

Norm Violations After Experienced Loss Aversion

This overall effect pattern supporting the loss-aversion account in the distributive Study 1 was driven by a comparably small minority of participants (see exploratory analyses in Study 1). After having made large concessions, some buyers opted to make a final counteroffer *outside* of the ZOPA and, to that end, decided to rescind their previous offer and to counter more assertively. These buyers were also more likely to *markedly* undercut their own prior limit after making large concessions—that is, after having offered \$1,900 already, they reversed their prior offers more extremely and ultimately went back to an even lower number ($M \approx \$1,300$). Participants who had made smaller concessions went less strongly below their prior limit (i.e., $M \approx \$1,700$). In all, this behavior of going below one's prior offer is at odds with common expectations and social norms in a back-and-forth negotiation process; plausibly it is an expression of reactance after negotiators experienced loss aversion (e.g., Quick et al., 2015). This interpretation is in line with previous findings showing that people who experience loss aversion are generally more motivated to cheat (Schindler & Pfattheicher, 2017) and engage in more unethical behavior (Reinders Folmer & De Cremer, 2012). This pattern paves an avenue for further research to investigate the effects of concessionary behavior on reactive or unethical behavior in negotiations.

The most central question that future research needs to address is which interpersonal characteristics can explain why certain individuals seem to experience loss aversion (and opt to rescind their prior offer), while the majority of negotiators in both studies seem to experience a sunk-cost effect and make more concessions—particularly when they have already conceded more in the prior negotiations. We can only speculate about potential underlying reasons but negotiators' social value orientation (e.g., Loschelder et al., 2014; Murphy & Ackermann, 2014) qualifies as a promising predictor—with prosocial individuals more likely experiencing loss aversion after having conceded, while prosocially motivated individuals could more likely experience sunk cost and concede farther.

Overall Rational Behavior in Integrative Negotiations is Also Moderated

Unlike relatively simple distributive negotiations, integrative negotiations are fueled by the opportunity for mutually beneficial outcomes (Fisher et al., 1991) and parties conceding on less important issues to gain value on more important issues (i.e., “logrolling”; Froman & Cohen, 1970). Integrative negotiations are typically more complex as they involve a larger number of issues and require more cooperation to jointly create value (Fisher et al., 1981). The integrative Study 2 did not replicate the overall loss-aversion effect observed in the distributive Study 1: Buyers who had already made larger concessions were not generally less (or more) conceding in their final counteroffer. Put differently, the size of prior concessions did not affect later negotiation behavior (H3a). Participants also did not create more (or less) value with their counteroffers (H3d). At first sight, this result pattern seems to support a rationality effect.

Admittedly, a more probable explanation for this overall null finding is the co-occurrence of loss aversion *and* sunk costs processes (see our reasoning above; see also Ku et al., 2005): Analyses in both studies showed that a minority of participants (7% in Study 1, approx. 40% in Study 2), experience loss aversion and make extremely assertive counteroffers (i.e., outside of the

ZOPA)—particularly in the high-concession condition. If loss-averse negotiators decide to rescind an offer and to make highly aggressive counteroffers, this likely comes at the cost of higher impasse rates (Petrowsky et al., 2023, 2025) or lower negotiation satisfaction (Curhan et al., 2010). The comparably few participants fully drive the observed loss-aversion main effect in Study 1.

Our exploratory findings that dig deeper than the preregistered analyses add important nuance to this conclusion, however: The majority of participants (93% in Study 1, approx. 60% in Study 2) opted to make further concessions *within* the ZOPA and then showed a reversed behavioral pattern that supports the sunk-cost reasoning (Figure 4): They conceded more towards the counterpart—particularly when they had previously already made large concessions. Hence, if a negotiator decides to adhere to common negotiation norms to continue negotiating within the ZOPA—and the majority did—they gave more weight to already committed sunk costs and made *more* generous offers in the interests of the other party (Thaler, 1980).

Sunk-Cost Effect Within the ZOPA – But Also Sunk Cost Processes?

From an economic standpoint, this irrational behavior within the ZOPA is akin to many findings in decision-making behavior or management (e.g., Astebro et al. 2007; Garland, 1990; Negrini et al., 2022; see Roth et al., 2015, for a review). The phenomenon at hand displays the fallacy of giving undue weight to ‘lost’ mental costs and thus making irrational decisions (Thaler, 1980) in an attempt to justify the own previous behavior (Rubin & Brockner, 1975; Ku et al., 2005; Teger, 1980). While the behavioral effect of prior concessions on future concessions is in line with the sunk-cost account, our item-based measure of sunk costs did not statistically mediate the effect. This somewhat surprising null-finding could point to (1) our experimental manipulations not having worked after all, (2) our preregistered items not validly capturing the intended sunk-cost construct or, relatedly, participants not having introspective access to these psychological mechanisms, and/or (3) other theoretical accounts impacting the underlying process.

First, given the consistent pattern of effects across both studies, we deem the option of a null finding—due to experimental manipulations not having worked—unlikely. Second, the self-report items may not have successfully measured the intended constructs: The proposed mechanisms such as sunk-cost perceptions or loss aversion could—just like other cognitive biases in psychology—not be consciously accessible (Greenwald & Banaji, 1995); instead, they might only be discussed phenomenologically. In line with this notion, hardly any research to date has explicitly *measured* these mechanisms (Gal, 2006; Gal & Rucker, 2018). Rather, the unconscious biases are regarded either as objective end products (e.g., as irrational decisions that could be traced back to inaccessible and prior perceptual, procedural, or attentional shortcomings; Sokol-Hessner et al., 2009) or as an individual propensity (e.g., individual differences in susceptibility to loss aversion; Cabedo-Peris et al., 2024). This creates a particular challenge for research that seeks to examine the underlying process with explicit measures. More indirect or implicit measures might be needed to fill this gap in future research (see Nosek et al., 2011, for a similar reasoning); the behavioral measures in this registered report—although more cleanly operationalized—could be considered as a starting point for this future research avenue.

Third, alternative mechanisms that we did not assess here could be at play and account for the observed effects. For instance, an individual’s need for consistency (Festinger, 1954; Lecky, 1945) and self-perception theory (Bem, 1967, 1972; see also Goldstein & Cialdini, 2007) offer plausible explanations: Past behaviors (i.e., larger prior concessions) could be reflected in later behavioral patterns for reasons of consistency (i.e., large future concessions). Also, prior

concessions could influence later concessions primarily because negotiators anchor themselves (Kristensen & Gärling, 1997; Schaerer et al., 2016). While the results pattern in Study 2 suggests this (i.e., larger concessions were followed by equally large concessions in either direction; see Figure 4), Study 1 provides similar indications of this mechanism. For instance, when only investigating last counteroffers that were outside the ZOPA (i.e., below their prior offer of \$1,900), this ‘undercutting’ was more severe in the large compared to the small prior concession condition. Hence, the larger the prior concessions, the larger the ‘undercutting’ tendency in the loss-averse direction. This could point to anchoring or reference point effects of prior concessions influencing later concessions (Schaerer et al., 2016, 2020).

Theoretical Implications

What does this combination of main effects, exploratory in-depth findings, and inconclusive result pattern for the underlying mechanisms mean for the related theorizing? Overall, the experimental results do not provide definitive evidence for one of the three postulated accounts of theorizing. In the light of our preregistered analyses, the distributive Study 1 suggests loss aversion, while the integrative Study 2 indicates a null finding in line with rational decision making. Closer inspection of the data reveals a bimodal reaction patterns by negotiating participants: This pattern suggests that *both* loss aversion and sunk cost may be at play. We wish to highlight two noteworthy results: (1) the stronger loss-aversion effect on negotiation behavior and (2) the differential effects between negotiators within vs. outside the ZOPA. First, markedly fewer participants in Study 1 (and Study 2) experienced loss aversion. Overall, however, this loss aversion likely led participants to refrain from accepting the sellers’ offer and from conceding more; instead, they rescinded their own last offer and countered markedly more assertively. The comparably few participants (7%) were sufficiently loss-averse to evoke an overall result pattern in line with the loss-aversion account. In all, loss aversion is likely a key driver of assertive negotiation behavior and impasses in distributive and potentially also integrative negotiations (see Petrowsky et al., 2025; Schweinsberg et al., 2022). Future research should examine why the ratio of participants who opted to rescind their offer in a distributive task (7%) was much lower than in the integrative setting ($\approx 40\%$). To speculate, it seems plausible that rescinding one’s offer is a stronger violation in a distributive, single-issue negotiation—that is, reversing one’s offer (a single number, i.e., \$1,900) might be a stronger subjective norm violation than across three negotiation issues changing the price so that, overall, there is less value to the counterpart than the previous offer.

Second, we wish to emphasize again that both in simple distributive but also in more complex integrative settings, higher prior concessions differentially influenced future behavior. Whereas those negotiators who decided to stay within the ZOPA seemed to fall prey to the sunk-cost fallacy, negotiators who stepped back from their prior offers, acted even more assertively to avoid incurring further losses. As mentioned above, interpersonal differences could account for these different behavioral patterns: individuals’ social value orientation (De Dreu & Van Lange, 1995), power motivation (Anderson & Thompson, 2004), prior negotiation experience (Loewenstein & Thompson, 2006), or their dark triad (Crossley et al., 2016; see Escher et al., 2025, for a review) could determine why individuals tend to react psychologically very differently to the identical manipulation (having made concessions in a multi-round negotiation).

Conclusion

The present research examined (1) the intrapersonal effects of negotiators' prior concessions on their future negotiation behavior along with (2) the underlying psychological mechanisms (3) in a distributive (Study 1) vs. an integrative negotiation setting (Study 2). A literature review had identified three potential drivers of effects: loss aversion, sunk costs, and rationality. Based on the results of three experiments, we find diverging results that partly support each of the three perspectives. Our preregistered analyses point to the loss-aversion perspective in the distributive Study 1 and to a null-finding in line with the rationality perspective in the integrative Study 2. Exploratory in-depth analyses, however, paint a more nuanced picture and cautiously suggest a different pattern: Negotiators who decided to stay within the ZOPA seemed to fall prey to sunk-cost errors, whereas negotiators who opted to rescind their prior offers, seemed to act particularly assertive to prevent further losses. Our findings hopefully pave the way for future research to illuminate the role of concession patterns in negotiations, the intrapersonal mechanisms behind concession effects, and, most importantly, the reason why some negotiators appear to react loss-averse while others show behavioral reactions in line with the sunk-cost phenomenon.

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David D. Loschelder (Ph.D.) is a professor of business and social psychology at the School of Management and Technology at Leuphana University Lüneburg. His research focuses on human experience and behavior in negotiations, pricing decisions, and conflict, and on success and failure in self-control. In particular, he is fascinated by the effect of entry bids and anchor effects, the influence of precise versus round numbers, procedural framing, ego depletion, self-control and digital skills training, social identity process, smartphone use, the interplay of posture and power, psycho-physiological measures, and meta-analyses.

Appendix

Table S1. *Item List for Assessment of the Mediators in Study 1 and 2*

Construct	Item
Loss Aversion	I feel like I have already lost a lot of money in this negotiation.
	Given my prior concessions, it hurt me to make more concessions with my final offer.
	Accepting the seller's final offer of \$2,100 would have felt like a monetary loss for me. (adapted for Study 2)
Justification of Prior Investments	Given my prior investments, I really wanted to reach a deal.
	Given my prior investments, conceding a bit more with my last offer was easy for me.
	In light of my prior investments, it was important to me to bring this negotiation to a good end.
Product Appreciation	I really valued the product offered by the seller. (adapted for Study 2)
	Given my prior investments, I truly appreciate this product's quality. (adapted for Study 2)

Rational Decision-Making

I feel like this negotiation was worth it (in terms of time, effort, and money).

I feel that my prior concessions in the negotiation process did *not* affect my final offer and willingness-to-accept. (adapted for Study 2)

My final offer and willingness-to-accept were driven by my goal and my limit in this negotiation. (adapted for Study 2)

My final offer and willingness-to-accept was *not* affected by my prior concessions. (adapted for Study 2)

Table S2. *Negotiation Issues Including Options with Individual Points for Buyer and Seller*

Transfer fee					Coffee beans					Furniture				
Price	Buyer	Seller	LC	SC	Price	Buyer	Seller	LC	SC	Price	Buyer	Seller	LC	SC
A	6,000	0			A	5,000	0			A	2,000	0		
B	5,700	300	Offer 1		B	4,750	100	Offer 1		B	1,900	250		
C	5,400	600			C	4,500	200			C	1,800	500	Offer 1	
D	5,100	900			D	4,250	300			D	1,700	750		
E	4,800	1,200			E	4,000	400			E	1,600	1,000		
F	4,500	1,500	Offer 2	Offer 1	F	3,750	500			F	1,500	1,250		
G	4,200	1,800			G	3,500	600	Offer 2	Offer 1	G	1,400	1,500		
H	3,900	2,100		Offer 2	H	3,250	700		Offer 2	H	1,300	1,750	Offer 2	Offer 1
I	3,600	2,400	Offer 3	Offer 3	I	3,000	800	Offer 3	Offer 3	I	1,200	2,000		
J	3,300	2,700			J	2,750	900			J	1,100	2,250		Offer 2
K	3,000	3,000			K	2,500	1,000			K	1,000	2,500	Offer 3	Offer 3
L	2,700	3,300			L	2,250	1,100			L	900	2,750		
M	2,400	3,600			M	2,000	1,200			M	800	3,000		
N	2,100	3,900			N	1,750	1,300			N	700	3,250		
O	1,800	4,200			O	1,500	1,400			O	600	3,500		
P	1,500	4,500			P	1,250	1,500			P	500	3,750		
Q	1,200	4,800			Q	1,000	1,600			Q	400	4,000		
R	900	5,100			R	750	1,700			R	300	4,250		
S	600	5,400			S	500	1,800			S	200	4,500		
T	300	5,700			T	250	1,900			T	100	4,750		
U	0	6,000			U	0	2,000			U	0	5,000		

Note. LC = large concession condition; SC = small concession condition. Columns LC and SC denote the package offer per round by the participants (i.e., buyer). Shaded cells indicate the package offers in both conditions and over the three negotiation rounds (from light to dark gray). Note that the number of prior concessions and offer value of the last offer (i.e., offer “I–I–K” in dark gray) will be held constant between conditions. Transfer fee constitutes a distributive issue, while coffee beans and furniture allow for integrative tradeoffs (adapted from Pruitt & Lewis, 1975).