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Negotiation and Conflict Management Research

Does Justice Need to be in the Eyes of Both Beholders? Examining Face-to-Face and Virtual Negotiators' Interactional Justice Congruence

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Abstract

We build from justice and negotiation scholars' historical interest in interpersonal interactions and reciprocity to develop the notion of interactional justice congruence, which refers to the degree of reciprocity in negotiation dyad members' respectful and truthful treatment of one another. Yet, media richness theory holds that communication media differ in their provision of social cues and ability to interpret subjective information such as justice perceptions. Integrating social exchange theory tenets with media richness theory, we examine how communication medium influences the effects of negotiators' interactional justice congruence on their dyadic economic and social-psychological outcomes. Moderated polynomial regression and response surface analyses of data from 199 face-to-face and virtual negotiation dyads revealed that face to-face dyads' relationship conflict and outcome inequality were minimized when negotiators' interpersonal and informational justice perceptions were congruent—even if both negotiators perceived one another be disrespectful or deceptive. Virtual negotiation dyads did not experience this benefit. This suggests justice functions differently at the dyadic level in negotiations, such that justice needs to be similarly perceived by both face-to-face negotiators in order to produce dyadic benefits.

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Negotiation is an interpersonal process between two or more interdependent individuals who conduct exchanges and make decisions (Jang et al., 2018; Lewicki et al., 2020; Thompson et al., 2010). Because negotiation outcomes can be consequential (e.g., for individual and joint gain, Thompson, 1990; Thompson et al., 2010), concerns about fairness are well-documented in the popular press, textbooks, and lay books on negotiation (e.g., Fisher et al., 2011; Lewicki et al., 2020; Voss, 2016). Yet, the negotiation and organizational justice literatures have rarely substantively referenced each other and largely evolved independently (Conlon, 2012). Despite their different origins, a persistent commonality between them is that both have been studied using theories of social interaction and reciprocity (Rubin & Brown, 1975; Rupp et al., 2017; Thompson et al., 2010). In recent decades, their shared interest in interpersonal exchanges has manifested as research on communication medium (i.e., channel of social interaction, such as computer-mediated or virtual and face-to-face; Purdy et al., 2000; Thompson et al., 2010). Given the overlapping interests between the negotiation and justice literatures, it is surprising that integration between them has remained limited, despite recent calls that "negotiation analyses need to take justice…into account" (Druckman & Wagner, 2017, p. 16).

Integrating these two literatures is important because conclusions regarding the effects of justice may differ in dyadic negotiation contexts and when justice is perceived from a counterpart versus an authority (Rupp et al., 2017). For example, Bies and Moag (1986) suggested that "it may be relatively 'fair' to bluff or 'shade the truth' in a negotiation setting," p. 52). This stands in contrast to the justice literature, which has concluded a lack of justice is unilaterally harmful and has almost exclusively focused on perceptions of authorities (vs. peers or counterparts) (Colquitt et al., 2013). Prior studies have overlooked the possibility that in some social contexts, high justice might not necessarily be beneficial and low justice might not be detrimental. Indeed, research has suggested that information is processed differently by dyads than by individuals (Daft & Lengel, 1986; Emerson, 1976). Both negotiation and communication have been characterized as "fundamentally dyadic" phenomena (Krasikova & LeBreton, 2012, p. 740). Together, these ideas call into question whether prior conclusions about the effects of justice generalize to negotiation dyads.

Justice perceptions have been considered to be subjective and "in the eye of the beholder" (Colquitt et al., 2018, p. 159). We examine whether justice needs to be in the eyes of both beholders—that is, whether two negotiators' perceptions need to be reciprocated (i.e., similarly perceived) by both negotiators. To investigate justice in negotiations at the dyadic level, we first build from theory on reciprocity (e.g., Gouldner, 1960) to develop the notion of *justice congruence*, defined as the degree of reciprocity in dyad members' perceptions of each other's justice (i.e., when negotiator A's perceptions of B are equivalent to negotiator B's perceptions of A). We focus on congruence in justice perceptions corresponding to respect and truthfulness (i.e., interpersonal and informational justice dimensions; Bies & Moag, 1986; Colquitt, 2001; Greenberg, 1993) given their relevance to "dyadic communication" (Scott et al., 2014, p. 1515) that occurs during the negotiation process. Overall, we theorize that relationship conflict and outcome inequality will be minimized in dyads with interactional justice congruence.

We then integrate theory on reciprocity and media richness to argue that the beneficial effects of justice congruence will be stronger in face-to-face than in virtual negotiations. This is because it is easier for the two negotiators, or "beholders," to process justice cues from each other using more information-rich media. According to media richness theory (Daft & Lengel, 1986), communication media differ in their capability to transmit information and support mutual understanding. Face-to-face communication has been proposed to be the richest medium because it offers numerous forms of social information, including cues via vocal tone and body language (Daft & Lengel, 1986). As such, the theory has suggested that face-to-face communicators can process subjective and complex

information—such as each other's justice—more easily (Daft & Lengel, 1986). Accordingly, the theory has indicated that leaner media, such as instant messaging, dulls communicators' ability to process such information. Given that subjective and complex information is more easily interpreted by face-to-face than virtual communicators, we theorize that face-to-face negotiators are more likely than virtual negotiators to benefit from interactional justice congruence. We test our hypotheses with data from face-to-face and virtual negotiation dyads using moderated polynomial regression and response surface methodology (Edwards, 1996, 2002; see also Vogel et al., 2016).

Our work makes several contributions. First, we contribute to social exchange theory by extending Gouldner's (1960) work on reciprocity to consider negotiators' dyadic congruence in interactional justice. While prior research on social exchange has largely focused on perceived reciprocity in exchanges from the perspective of one member of the dyad, we operationalize reciprocity as the degree of congruence in justice perceptions from both members. In doing so, our study reveals novel findings about the social and economic implications of two individuals' treatment of each other that would not be evident from individual perceptual operationalizations of reciprocity. Second, we offer contributions to the justice literature by challenging prevailing assumptions that the greater respect and truthfulness an individual perceives, the better their outcomes (e.g., Colquitt et al., 2013). We theorize that negotiation dyads' relationship conflict and outcome inequality are minimized when their interpersonal and informational justice perceptions are congruent (i.e., reciprocated), even when both perceive one another to show low justice. We also theorize that relationship conflict and outcome inequality are maximized in dyads in which negotiators demonstrate incongruent justice toward one another (i.e., one negotiator perceives low justice, and the other negotiator perceives high justice). Together, this theorizing suggests that low justice is not always harmful, and that high justice is not always beneficial. Our findings broaden the understanding of justice sources beyond authorities (Rupp et al., 2017) such as counterpart peers (e.g., Bendersky & Brockner, 2020). Third, we contribute to the communication medium literature. We integrate reciprocity arguments with media richness theory to argue that the effects of justice congruence will be stronger in face-to-face negotiation dyads and weaker in virtual dyads, due to differences in cues transmitted by face-to-face and virtual mediums. Focusing on the dyadic level in both our theorizing and methodology using moderated polynomial regression and response surface methodology (Edwards, 2002; see also Vogel et al., 2016), we pinpoint which communication medium (face-to-face or virtual) is most likely to generate joint benefits of the congruence between two negotiators' justice perceptions.

Theoretical Background

Dyadic Justice Congruence as a Form of Reciprocity

Social exchange theory has revolved around the idea that two interdependent actors, or dyad members, provide and receive resources from each other (Cropanzano & Mitchell, 2005; Emerson, 1976; Gouldner, 1960). Resources refer to "anything transacted in an interpersonal context" (Colquitt et al., 2013, p. 200) that allow dyad members to "reward (or punish)" one other (Emerson, 1976, p. 347). Justice has been characterized as a "valuable resource" (Zapata et al., 2013, p. 5) and as such, can be exchanged between dyad members. Gouldner (1960) argued that "the *degree* of mutuality or…symmetry of reciprocity" varies, such that dyadic reciprocity in exchange may be low (i.e., unequal) or high (i.e., equal) (emphasis in original) (p. 168).

The theory has argued that dyadic reciprocity in exchange can vary according to "the return

of benefits," which reflects positive reciprocity, or "the return of injuries," which reflects negative reciprocity or retaliation (Gouldner, 1960, p. 172; see also Cropanzano et al., 2017; Greco et al., 2019). We apply these seminal theoretical tenets to dyadic negotiations, which are interdependent, as settlements reached depend on both negotiators' actions. The negotiation literature has operationalized positive reciprocity as the dyadic exchange of cooperative actions and negative reciprocity as the dyadic exchange of punitive actions (e.g., Fehr & Gächter, 2000). Research has shown that although it may appear harmful, negative reciprocity can often help protect negotiators from being exploited by their counterpart (Murnighan, 1991; Olekalns & Smith, 2009; Putnam & Jones, 1982).

Integrating these tenets of reciprocity (Gouldner, 1960) with the exchange of justice in negotiation dyads, we define *interactional justice (in)congruence* as the degree of dyadic reciprocity in interpersonal or informational justice perceptions. Figure 1 shows illustrative scenarios as follows. Congruence on high interpersonal or informational justice (i.e., positive reciprocity) occurs when Negotiators A and B perceive one another to be respectful or truthful (Quadrant 1 of Figure 1), which reflects an equal exchange of benefits. Congruence on low interpersonal or informational justice (i.e., negative reciprocity) occurs when both A and B perceive the other to be disrespectful or deceptive (Quadrant 2), which reflects an equal exchange of burdens. In both congruence scenarios, negotiators' perceptions of each other are reciprocated. Justice incongruence (i.e., lack of reciprocity), occurs if A perceives B to be respectful or truthful and B perceives A to be disrespectful or deceptive (Quadrant 3) or vice versa (Quadrant 4). Using a continuous measure of justice, we examine the degree of congruence at every level of interactional justice (low to high). Our operationalization of dyadic congruence stands in contrast to prior operationalizations that examine perceptions of reciprocity from only one member of the negotiation dyad.

Gouldner (1960) argued that "reciprocity…is a mutually gratifying pattern" (p. 170) whereas a lack of reciprocity is "socially disruptive" (p. 167) and fosters inequality in benefits between exchange dyad members. Given these consequences of reciprocity and their emphasis on mutual outcomes, we examine the effects of negotiators' interactional justice congruence on their dyadic relationship conflict and outcome inequality. Investigating dyadic outcomes is consistent with how early social exchange theory and media richness theory focused on exchange dyads or communication dyads (Daft & Lengel, 1986; Emerson, 1976). Our focus on these outcomes also aligns with the emphasis on and importance of social-psychological and economic effects in the negotiation literature (e.g., Druckman & Wagner, 2016; Thompson et al., 2010) and social and behavioral outcomes in the justice literature (e.g., Colquitt et al., 2013).

First, relationship conflict refers to interpersonal "tension" that arises due to "real or perceived differences" (De Dreu & Weingart, 2003, p. 741). Relationship conflict is generally considered to be harmful for groups, as meta-analytic research has shown a negative association with group performance, organizational citizenship behavior, group cohesion, and trust (De Dreu & Weingart, 2003; de Wit et al., 2012). At the dyadic level, justice incongruence constitutes a difference in interpersonal behaviors that is expected to generate interpersonal tension (i.e., relationship conflict). This is consistent with the finding that reciprocity between negotiators staved off conflict (Axelrod, 1984; Sheldon, 1999) and with the notion that "conflict emerges to the extent that one party feels deprived… and attributes this state of deprivation to the actions or inactions by the interdependent other" (De Dreu, 2010, p. 984).

Figure 1

Illustrative Scenarios of Dyadic Interactional Justice Congruence in Negotiations

		Negotiator A's Perception of Negotiator B's Interactional Justice Toward A:	
		Negotiator A perceives that Negotiator B's interactional justice is **low**	Negotiator A perceives that Negotiator B's interactional justice is **high**
Negotiator B's Perception of Negotiator A's Interactional Justice Toward B:	Negotiator B perceives that Negotiator A's interactional justice is **high**	**Quadrant 4** *Lack of reciprocity* For justice incongruence scenarios (including this one), relationship conflict and outcome inequality are expected to be *maximized*, compared to justice congruence scenarios (i.e., Quadrants 1 and 2). We expect this effect to be stronger in face-to-face (vs. virtual) negotiations.	**Quadrant 1** *Positive reciprocity: Equal exchange of benefits* For justice congruence scenarios (including this one), relationship conflict and outcome inequality are expected to be *minimized*, compared to justice incongruence scenarios (i.e., Quadrants 3 and 4). We expect this effect to be stronger in face-to-face (vs. virtual) negotiations.
	Negotiator B perceives that Negotiator A's interactional justice is **low**	**Quadrant 2** *Negative reciprocity: Equal exchange of burdens/harms* For justice congruence scenarios (including this one), relationship conflict and outcome inequality are expected to be *minimized*, compared to justice incongruence scenarios (i.e., Quadrants 3 and 4). We expect this effect to be stronger in face-to-face (vs. virtual) negotiations.	**Quadrant 3** *Lack of reciprocity* For justice incongruence scenarios (including this one), relationship conflict and outcome inequality are expected to be *maximized*, compared to justice congruence scenarios (i.e., Quadrants 1 and 2). We expect this effect to be stronger in face-to-face (vs. virtual) negotiations.

Notes. For parsimony, the term "interactional justice" is used; however, we examine interpersonal and informational justice separately using continuous measures.

Second, outcome equality reflects a highly salient norm and facilitates settlements because it represents a prominent solution and is likely to enhance parties' expectations for positive future interaction (e.g., "share and share alike", c.f., McLean Parks et al., 1996). Outcome inequality is also typically viewed as harmful, such that last impressions by one negotiator that they were 'beaten' or that they 'lost' the negotiation to the other side may set up 'conflict residues' (Pondy, 1967) that can make future negotiations more challenging than they should be. In regard to justice congruence vis-à-vis outcome inequality, if negotiators A and B treat each other with congruent levels of respect and

truthfulness, their individual payoffs are also likely to be similar. Whereas if A is respectful and truthful, and B is disrespectful and deceptive, "opportunistic behaviors may arise" (Luo, 2005, p. 695) such that A will be exploited and earn a smaller payoff than B. We operationalize outcome inequality as the absolute difference between negotiators' outcomes (Thompson et al., 1996).

The Moderating Role of Communication Medium

Justice perceptions are considered to be subjective (e.g., Colquitt et al., 2018) or in the eye of the perceiver. In our context of dyadic negotiations, interactional justice perceivers include two negotiators and the targets of their perceptions are each other. Negotiators are often tasked with reconciling their distinct perspectives in order to achieve an agreement or settlement (Jang et al., 2018). According to media richness theory, subjective information and divergent frames of reference are more efficiently processed with rich media, such as face-to-face communication, which has a greater capacity to transmit a larger range of cues, such as body language or vocal tone (Daft & Lengel, 1986). These cues "enable mutual understanding" between communicators (Treviño et al., 1987, p. 555). Because leaner media transmit fewer cues, communicators are less likely to develop a mutual understanding (Daft & Lengel, 1986). This suggests that face-to-face negotiators would be more likely to recognize whether interactional justice congruence occurs (i.e., whether their perceptions are reciprocated).

Although reciprocity facilitates social stability (Gouldner, 1960), it may not be effective in situations where misinterpretation of the counterpart's actions could occur (e.g., Van Lange et al., 2002), such as in virtual negotiations. Integrating reciprocity tenets with media richness theory would suggest that communication medium will moderate the effects of interactional justice congruence on dyadic relationship conflict and outcome inequality. When such treatment is congruent, face-to-face negotiators are expected to experience less relationship conflict, such that the greater the congruence in their interactional justice, the lower their relationship conflict.

In contrast, negotiators in virtual dyads experience less information richness (e.g., fewer social cues). Given this, we would expect virtual negotiators to have a reduced ability to perceive and accurately interpret their counterpart's behavior. That is, virtual negotiators may find it difficult to comprehend their counterpart's level of respect and truthfulness (i.e., interpersonal and informational justice, respectively, Greenberg, 1993), which impedes their ability to recognize whether interactional justice congruence occurs and respond in ways that minimize relationship conflict and outcome inequality. As such, we propose that the effects of interactional justice congruence will be weaker in virtual negotiation dyads. We specifically propose:

> ***H1.*** The effect of the interplay of negotiators' interpersonal justice perceptions on relationship conflict (i.e., the greater the congruence in their perceptions, the lower their relationship conflict) will be stronger in face-to-face dyads than in virtual dyads.

> ***H2.*** The effect of the interplay of negotiators' informational justice perceptions on relationship conflict (i.e., the greater the congruence in their perceptions, the lower their relationship conflict) will be stronger in face-to-face dyads than in virtual dyads.

Social exchange theory has argued that in addition to interpersonal stability, reciprocity encourages equality in benefits between exchange dyad members (Gouldner, 1960). Thus, we posit that communication medium will moderate the effects of interactional justice congruence on the inequality of outcomes between members of the negotiation dyad. Findings from negotiation and

justice literatures have suggested that individuals' shared perceptions affect their economic outcomes. For example, dissimilar justice perceptions between parties hindered resource sharing among dyadic alliances (Luo, 2005). In addition, research on dyadic similarity on Machiavellian (Mach) traits (i.e., distrustful of others, manipulative, and likely to behave amorally, Christie & Geis, 1970; Dahling et al., 2009) found that high Machs paired with low Machs in a face-to-face negotiation were less likely to reach a mutually beneficial outcome (Fry, 1985). This also connects with the finding that negotiators were more likely to exploit a "soft" opponent (Pruitt & Syna, 1985). These studies would suggest that negotiation dyads with justice incongruence experience higher outcome inequality. Turning to situations characterized by congruence, "when members agree on the quality of social interaction, even if they agree on a negative assessment, they produce higher-quality group work" (Jehn et al., 2010, p. 599; see also Mason & Griffin, 2003). Moreover, Kramer et al. (1993) found that negotiators' outcomes were more equal when "they feel more accountable to the person with whom they negotiate" (p. 637). Such accountability is expected to be present when dyadic congruence occurs. Together, this body of work has indicated that outcome inequality is minimized in dyadic negotiations that have justice congruence.

However, other research has shown that the effects of accountability by others depend on the social context (Tetlock, 1992). According to media richness theory, communication medium represents an important social context. For example, the theory has suggested that virtual communicators are less likely than face-to-face communicators to reach a mutual understanding (Daft & Lengel, 1986) and are more likely to miscommunicate and develop inaccurate social perceptions (Byron, 2008; Nadler & Shestowsky, 2006), because of less information richness inherent in the virtual medium (Fiol & O'Connor, 2005). Negotiators were less likely to be egocentric when communication between them encourages a "shared understanding of the situation" (Bazerman et al., 2000, p. 285), which may be more easily achieved in face-to-face contexts. In light of tenets from media richness theory, and similar to our predictions for relationship conflict, we posit that the effects of interactional justice congruence on outcome inequality will not be uniform across face-to-face and virtual negotiations.

We argue that face-to-face negotiators are able to more easily discern whether interactional justice congruence occurs (i.e., whether the respect and propriety exchanged between them is reciprocated). Whereas negotiation dyads with congruent perceptions would experience less outcome inequality, those with incongruent perceptions would be more inclined to experience a wider difference in their individual payoffs. Because of reduced information richness in virtual contexts, interactional justice may be difficult for virtual negotiators to ascertain. This should dull the benefits of reciprocity in perceptions of interactional justice on outcome inequality. We expect that for dyads negotiating face-to-face, the greater the congruence in their interactional justice perceptions, the less their outcome inequality. For dyads negotiating virtually, we would expect this effect to be weakened. We thus propose:

> ***H3.*** The effect of the interplay of negotiators' interpersonal justice perceptions on outcome inequality (i.e., the greater the congruence in their perceptions, the lower their outcome inequality) will be stronger in face-to-face dyads than in virtual dyads.

> ***H4.*** The effect of the interplay of negotiators' informational justice perceptions on outcome inequality (i.e., the greater the congruence in their perceptions, the lower their outcome inequality) will be stronger in face-to-face dyads than in virtual dyads.

Method

Samples and Procedure

Samples

After obtaining IRB approval, the data for this study were collected as part of a larger data collection effort that included two samples, findings from which have been previously published (DeRue et al., 2009; Wilson et al., 2016). Our current conceptual focus on dyadic interpersonal and informational justice congruence between negotiators and communication medium (face-to-face and virtual), as well as our theoretical foundation and analytic technique, differ considerably from both published articles and thus our findings have distinct implications for theory and practice.

Participants were comprised of two samples of undergraduate students in an upper-level management course at a large public university in the Midwestern United States. Students were invited to voluntarily participate to earn course credit. In total, 398 students participated; 51% were male, 80% were citizens of the United States, and their average age was 21.84 (*SD* = 1.73).

Procedure

Once they arrived at the lab, participants were given an orientation to the study and were randomly assigned to their negotiation role: Mountain or Pinnacle. Participants negotiated the "Mountain-Pinnacle" simulation, adapted from the "new recruit" negotiation (Conlon et al., 2002). The premise of the simulation was a merger or acquisition negotiation scenario in which participants represented one of two companies, Mountain or Pinnacle. Half of the participants were assigned to each company. Negotiators were asked to reach a settlement for seven human resource management issues for new hires, such as vacation time, salary, and start date. A 2 [integrative potential: low (distributive) or high (integrative)] x 2 [power: equal (merger) or unequal (takeover)] factorial design was used.[1] Because these variables were not essential for the current theory and hypotheses, they were included as control variables.

To encourage their motivation to negotiate, all participants were told the top 50% of negotiating dyads with the highest joint value (their combined scores) would receive $25, and of those dyads, the top 20% individual negotiators would earn $25 each. Participants were given between 30 and 40 minutes to prepare for the negotiation and read through the materials, and were then asked to confirm their understanding of the simulation and the point structures. Negotiation dyads were created by randomly assigning negotiators from the Mountain and Pinnacle roles. The face-to-face negotiation sample was comprised of 98 dyads and the virtual negotiation sample (who communicated via instant messaging from computers in separate rooms) consisted of 101 dyads. These two samples were combined in order to test the hypothesized moderating effects of communication medium. According to the theory, media richness is a function of four characteristics, including the variety of cues, potential for immediate feedback (i.e., degree of synchronicity), ability to

[1] Integrative potential was manipulated by varying the payoff structure, such that each party's points associated with the negotiation issues included either potential for tradeoffs (integrative) or were zero-sum and opposed to each other (distributive). Power was also manipulated using structural features of the negotiation, such that dyads were told they shared decision-making authority in the merger of their two companies (equal power) or that Mountain held ultimate decision-making authority as it was acquiring Pinnacle (unequal power).

transmit natural language, and personalization (Daft & Lengel, 1986). Of these four characteristics, the number of cues is the primary way in which face-to-face and instant messaging differ. Instant messaging lacks cues communicated face-to-face, such as vocal tone, facial expressions, and other body language. Emotional cues can be communicated through instant messaging to some extent, such as through words (Wilson et al., 2016) and, depending on the messaging software, emojis, which can act as a proxy for non-verbal cues in instant messaging (e.g., facial expressions) and therefore make instant messaging richer in this regard (Boutet et al., 2021; Erle et al., 2021). In our case, the instant messaging software was relatively lean in that emojis were not available, although it was possible for participants to use punctuation marks to express emotions (e.g., ":)" for a smile). Regarding synchronicity, the theory has suggested that instant messages are received and processed more slowly than face-to-face communication, although instant messaging has higher synchronicity than other text-based communication such as email (Dennis & Valacich, 1999). Both face-to-face and instant messaging had high personalization, given that negotiators were directly communicating with their counterpart and customized their communications to them, and both were similarly high in the capability to transmit natural language (Dennis & Kinney, 1998).

After achieving agreement on the seven issues in the simulation, participants in both samples individually completed a form recording their settlement outcomes and then completed a questionnaire measuring perceptions of their counterpart during the negotiation. In this survey, items assessing perceptions of the counterpart's interpersonal and informational justice and relationship conflict were embedded around other perceptual scales so that participants would be unable to deduce our research questions about justice and relationship conflict. A check of participant responses on our model variables revealed no unusual response patterns in the data, such as straight-line responses (Meade & Craig, 2012).

Measures

Interpersonal and Informational Justice

Negotiators rated their counterpart's justice using Colquitt's (2001) organizational justice measure (1 = *strongly disagree* and 7 = *strongly agree*), adapted to negotiations. This measure contained four items for interpersonal justice and five items for informational justice. An example interpersonal justice item was "The other negotiator treated me with respect" ($\alpha = .92$) and an example informational justice item was "The other negotiator was candid in communications with me" ($\alpha = .85$).

Relationship Conflict

Relationship conflict was measured using Jehn's (1995) 3-item scale, which was modified for negotiation contexts (1 = *not at all* and 7 = *to a very large extent*). An example item was "Was there relationship tension in your negotiation?" ($\alpha = .85$). Following recommendations to justify aggregation of lower-level data (Klein & Kozlowski, 2000; Woehr et al., 2015, see also LeBreton & Senter, 2008) (i.e., aggregating individual negotiators' responses to the dyadic level), the ICC(1) was significant, ICC(1) = .47, $F = 2.78$, $p < .001$, ICC(2) = .64, and $r_{wg} = .63$, which indicated moderate agreement. Thus, scores were aggregated to the dyadic level to represent the total relationship conflict in each dyad. This aggregation is consistent with our focus on the dyadic interplay of negotiators' justice toward each other as well as with research on dyadic negotiations (e.g., Wilson et al., 2016) and relationship conflict (Ren & Gray, 2009).

Outcome Inequality

Each of the seven issues in the negotiation simulation, reflected in the final settlement, represented a chance for negotiators to earn points. Outcome inequality was computed as the absolute difference in total points earned by members of the negotiating dyad.

Negotiation Medium

We coded negotiation medium using a dummy variable, such that 0 = face-to-face negotiating dyads and 1 = virtual negotiating dyads.

Control Variables

In addition to controlling for integrative potential and power as noted above, we controlled for gender (0 = male and 1 = female) given meta-analytic evidence showing gender differences in negotiation behaviors (Kugler et al., 2018; Mazei et al., 2015; Stuhlmacher & Walters, 1999). We also controlled for whether participants were U.S. citizens (0 = U.S. citizen and 1 = non-U.S. citizen) because this may be a proxy for national culture, which may influence how the negotiation unfolds (Gelfand et al., 2007).

Analysis

We tested our hypotheses using Edwards's (1996) procedures for moderated polynomial regression and response surface methodology. This approach simultaneously models both negotiators' justice perceptions of each other and allows us to examine the effects of congruence between their perceptions. Polynomial regression and response surface methodology is an increasingly common technique for examining the effects of dyadic congruence between two individuals' ratings on the same construct (e.g., Graham et al., 2018; Wilson et al., 2016). Hypotheses 1-4 were tested using Equations 1-4, respectively, which are presented below. These equations comprised the association between negotiators' ratings of one another's interpersonal or informational justice and their relationship conflict or outcome inequality, with communication medium as a moderator (for parsimony, control variables are not shown):

$$RC = b_0 + b_1N_m + b_2N_p + b_3N_m^2 + b_4N_mN_p + b_5N_p^2 + b_6V + b_7VN_m + b_8VN_p + b_9VN_m^2 + b_{10}VN_mN_p + b_{11}VN_p^2 + e \quad (1)$$

$$RC = b_0 + b_1F_m + b_2F_p + b_3F_m^2 + b_4F_mF_p + b_5F_p^2 + b_6V + b_7VF_m + b_8VF_p + b_9VF_m^2 + b_{10}VF_mF_p + b_{11}VF_p^2 + e \quad (2)$$

$$OI = b_0 + b_1N_m + b_2N_p + b_3N_m^2 + b_4N_mN_p + b_5N_p^2 + b_6V + b_7VN_m + b_8VN_p + b_9VN_m^2 + b_{10}VN_mN_p + b_{11}VN_p^2 + e \quad (3)$$

$$OI = b_0 + b_1F_m + b_2F_p + b_3F_m^2 + b_4F_mF_p + b_5F_p^2 + b_6V + b_7VF_m + b_8VF_p + b_9VF_m^2 + b_{10}VF_mF_p + b_{11}VF_p^2 + e \quad (4)$$

where RC represented dyadic relationship conflict; OI represented outcome inequality; N_m and N_p represented Mountain and Pinnacle ratings of their counterpart's interpersonal justice, respectively; F_m and F_p referred to Mountain and Pinnacle ratings of their counterpart's informational justice, respectively; and V represented negotiation medium (0 = face-to-face and 1 = virtual). Negotiators' ratings of their counterpart's interpersonal and informational justice were mean-centered prior to

computing higher-order terms (e.g, N_m^2, N_{mp}, and N_p^2) to minimize unnecessary collinearity and facilitate interpretation (Aiken & West, 1991). Support for the moderating effect of negotiation medium occurs if b_7, b_8, b_9, b_{10}, and b_{11} were significant as a set in predicting relationship conflict or outcome inequality beyond b_1, b_2, b_3, b_4, b_5, and b_6 (Edwards, 1996).

To test whether the form of the moderating effect was consistent with our hypotheses, we examined the response surfaces for face-to-face and virtual negotiations, comparing their curvatures of the incongruence lines. Consistent with recent research utilizing moderated polynomial regression (e.g., Graham et al., 2018; Vogel et al., 2016), we constructed a three-dimensional response surface plot, with each negotiator's ratings of their counterpart's interpersonal and informational justice (N_m and N_p or F_m or F_p) along the perpendicular horizontal (X and Y) axes and their dyadic relationship conflict (RC) or outcome inequality (OI) along the vertical axis (Z), to assist interpretation. Our hypotheses implied that the shape of the response surface along the incongruence line, which was used to test congruence effects (Edwards, 2002; Edwards & Parry, 1993), differed between face-to-face and virtual negotiation dyads (Edwards, 1996). Hypotheses 1-4 are supported if face-to-face dyads have a positive and significant curvature along the incongruence line (i.e., U-shape); that is, relationship conflict or outcome inequality are minimized along the congruence line (i.e., when both negotiators' ratings of their counterpart's interpersonal or informational justice are similar). For virtual dyads, we expect the shape of the response surface to be flatter, such that relationship conflict or outcome inequality are not minimized along the congruence line. The curvature along the incongruence line ($N_m = -N_p$ or $F_m = -F_p$) is calculated as ($b_3 - b_4 + b_5$) for face-to-face negotiating dyads and as ($b_3 - b_4 + b_5 + [b_9 - b_{10} + b_{11}]V$) for virtual dyads (Edwards, 1996; see also Vogel et al., 2016). We followed Vogel et al.'s (2016) approach for moderated polynomial regression by testing the significance of the curvature along the incongruence line using bootstrapping with 20,000 resamples and 90% bias-corrected confidence intervals, consistent with studies of directional hypotheses (De Jong & Dirks, 2012; Sumanth & Cable, 2011) and dyadic methods (e.g., Jones & Shah, 2016).

Results

Table 1 presents means, standard deviations, and correlations between study variables. An initial inspection of the correlations indicated that virtual negotiations were related to higher levels of relationship conflict, compared to face-to-face negotiations.[2] Non-U.S. citizenship for negotiators assigned to the Pinnacle role had a marginally significant correlation ($p < .10$) with their counterpart's informational justice perceptions and negotiation medium (see Table 1).

[2] As a supplemental analysis, to test the assumption from media richness theory that face-to-face communication offers greater mutual understanding than virtual communication, we used two items to measure participants' mutual understanding (α = .86). These items were "I understand the priorities of the other party well" and "I have good knowledge of what issues are important to the other party" (1 = *strongly disagree* and 7 = *strongly agree*). To assess dyadic mutual understanding, Mountain and Pinnacle ratings on these two items were aggregated to the dyadic level, as the ICC(1) was significant and supported aggregation, ICC(1) = .17, $F = 1.41$, $p = .008$, ICC(2) = .29, and $r_{wg} = .61$, which indicated moderate agreement (Woehr et al., 2015; see also LeBreton & Senter, 2008). Consistent with our assumptions from media richness theory, virtual negotiation dyads reported less mutual understanding ($M = 5.21$) than face-to-face negotiation dyads ($M = 5.63$), $t(198) = 3.10$, $p = .002$.

Results of confirmatory factor analysis (CFA) revealed that the measurement model of our perceptual variables fit the data well, each negotiator's interpersonal and informational justice, and their dyadic relationship conflict, χ^2 (240) = 474.29, $p < .001$, CFI (comparative fit index) = .94, RMSEA (root mean square error of approximation) = .070, SRMR (standardized root mean square residual) = .086, and all indicators significantly loaded onto their assigned factor. We tested our proposed model against all 15 possible constrained models in which any two factors were combined, which added significant misfit, $158.81 \leq \Delta \chi^2 s (2 \leq \Delta df \leq 4) \leq 958.34$. Polynomial regression results are presented in Tables 2 and 4 for relationship conflict and outcome inequality, respectively. Results of response surface tests are presented in Table 4 and corresponding response surface plots are shown in Figures 2 and 3 for relationship conflict and outcome inequality, respectively.

Prior to hypothesis testing, which focused the moderating role of negotiation medium, we examined the main effects of interpersonal and informational justice congruence on relationship conflict and outcome inequality. Accordingly, the polynomial regression models used to test these main effects included only the control variables and the polynomial terms (b_1, b_2, b_3, b_4, and b_5); they did not include the dummy variable for communication medium (b_6) nor the five moderating terms (b_7, b_8, b_9, b_{10}, and b_{11}). A positive and significant curvature along the incongruence line ($b_3 - b_4 + b_5$) using the coefficients from these models would indicate that relationship conflict and outcome inequality are minimized when congruence on interpersonal and informational justice occurs. For relationship conflict, the curvature along the incongruence line was positive and significant for interpersonal justice, 0.257, 90% CI [0.059, 0.454], and not significant for informational justice, 0.090, 90% CI [-0.110, 0.289]. For outcome inequality, the curvature along the incongruence line was not significant for interpersonal justice, 519.530, 90% CI [-64.576, 1103.636], and positive and significant for informational justice, 672.377, 90% CI [170.757, 1173.998]. This indicated that prior to accounting for communication medium, relationship conflict was minimized when interpersonal justice congruence occurred, and outcome inequality was minimized when informational justice congruence occurred.

Hypothesis Tests

Hypothesis 1 predicted that relationship conflict will be minimized when dyadic interpersonal justice congruence occurs, and that this effect will be stronger in face-to-face dyads, compared to virtual dyads. As shown in Table 2, Step 2 of Model 1, the set of 5 moderator terms for interpersonal justice were significant in incrementally predicting relationship conflict (b_7, b_8, b_9, b_{10}, and b_{11}), $\Delta R^2 = .02$, $F = 2.10$, $p = .034$, providing support for the moderating effect of negotiation medium. With respect to the form of this moderating effect, as seen in Table 3, Model 1, for face-to-face negotiating dyads, the curvature along the incongruence line (i.e., dotted line) was positive and significant (i.e., curved upward), calculated as ($b_3 - b_4 + b_5$) = .985, 90% CI [.521, 1.451]. Quadrant 1A of Figure 2 shows the response surface of both face-to-face negotiators' ratings of their counterpart's interpersonal justice and dyadic relationship conflict. In this quadrant of Figure 2, the surface along the incongruence line ($N_m = -N_p$) suggested a U-shape (from the back left to the front right corners of the plot); dyadic relationship conflict was minimized when interpersonal justice ratings were congruent ($N_m = N_p$). For virtual negotiating dyads, the curvature along the incongruence line was not significant, computed as ($b_3 - b_4 + b_5 + [b_9 - b_{10} + b_{11}]V$) = .171, 90% CI [-.504, .850] (see also Table 3, Model 1). In addition, quadrant 1B of Figure 2 did not indicate that relationship conflict was minimized along the congruence line (i.e., solid line) ($N_m = N_p$) for virtual dyads. Collectively, these results supported Hypothesis 1.

Hypothesis 2 proposed that relationship conflict will be minimized when dyadic informational justice congruence occurs, and that this effect will be stronger in face-to-face dyads. As shown in Table

Table 1

Means, Standard Deviations, and Correlations

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Integrative potential	.47	.50	—													
2. Power	.47	.50	.00	—												
3. Mountain gender	.50	.50	.12	-.05	—											
4. Pinnacle gender	.48	.50	-.01	-.11	.03	—										
5. Mountain non-U.S. citizen	.08	.26	.00	.00	.06	-.04	—									
6. Pinnacle non-U.S. citizen	.05	.22	.06	.01	.00	-.08	-.07	—								
7. Mountain-rated Pinnacle INJ	6.14	1.08	.04	-.02	-.04	-.05	-.07	-.11	(.79)							
8. Pinnacle-rated Mountain INJ	6.20	1.03	.11	-.02	.01	-.04	.03	-.02	.34*	(.92)						
9. Mountain-rated Pinnacle IFJ	5.54	1.12	.03	.06	.01	.08	-.11	-.14†	.66*	.26*	(.92)					
10. Pinnacle-rated Mountain IFJ	5.55	1.10	.13	-.07	.02	.04	-.07	-.08	.30*	.68*	.25*	(.93)				
11. Negotiation medium	.50	.50	.03	-.03	.10	-.14†	-.02	-.14†	-.30*	-.25*	-.33*	-.31*	—			
12. Relationship conflict	2.52	1.20	-.15*	.12	-.03	-.06	.02	.00	-.56*	-.58*	-.43*	-.51*	.42*	(.85)		
13. Outcome inequality	2687.04	2598.68	.02	.15*	-.11	-.05	-.02	-.09	.05	-.07	-.02	-.13†	.06	.06	—	
14. Mutual understanding	5.41	.97	-.05	.03	.01	-.12	.01	.01	.28*	.22*	.33*	.20*	-.21*	-.23*	.03	(.86)

Note. Integrative potential coded 0 = distributive; 1 = integrative. Power coded 0 = equal (merger) and 1 = unequal (takeover). Gender coded 0 = male; 1 = female. Citizenship coded 0 = United States (U.S.) citizen; 1 = Not U.S. citizen. Negotiation medium coded 0 = face-to-face; 1 = virtual. INJ = Interpersonal justice. IFJ = Informational justice. Coefficient alpha shown along diagonal.

† $p < .10$. * $p < .05$.

2, Step 2 of Model 2, the set of 5 moderator terms for informational justice were not significant as a set in predicting relationship conflict (b_7, b_8, b_9, b_{10}, and b_{11}), ΔR^2 = .03, F = 1.70, p = .068. In addition, the curvature along the incongruence line was not significant for either face-to-face dyads, calculated as ($b_3 - b_4 + b_5$) = .262, 90% CI [-.080, .562], or virtual dyads, calculated as ($b_3 - b_4 + b_5 + [b_9 - b_{10} + b_{11}]V$) = .061, 90% CI [-.397, .523] (see Table 3, Model 2). In quadrants 2A and 2B of Figure 2, neither plot indicated a U-shape along the incongruence line. Overall, we did not find support for a moderating effect of negotiation medium on the relationship between informational justice congruence and relationship conflict, nor for our hypothesized form. Thus, Hypothesis 2 was not supported.

Hypothesis 3 predicted that outcome inequality will be minimized when dyadic interpersonal congruence occurs, and that this effect will be stronger in face-to-face dyads. As shown in Table 4, Step 2 of Model 3, the block of 5 moderator terms for interpersonal justice was significant as a set in predicting outcome inequality (b_7, b_8, b_9, b_{10}, and b_{11}), ΔR^2 = .05, F = 2.21, p = .028, which suggests negotiation medium moderated the effects of negotiators' interpersonal justice on their outcome inequality. In terms of the form of this moderating effect, in face-to-face dyads, the curvature along the incongruence line was positive and significant (i.e., curved upward), calculated as ($b_3 - b_4 + b_5$) = 2693.00, 90% CI [1257.365, 4132.408] (see Table 3, Model 3). In Quadrant 3A of Figure 3, the surface along the incongruence line ($N_m = -N_p$) showed a U-shape (starting from the back left to the front right corners of the plot); outcome inequality was diminished when face-to-face negotiators' interpersonal justice ratings were congruent ($N_m = N_p$). For virtual dyads, the curvature along the incongruence line was not significant, computed as ($b_3 - b_4 + b_5 + [b_9 - b_{10} + b_{11}]V$) = 332.90, 90% CI [-1722.720, 2396.547]. Quadrant 3B of Figure 3 did not suggest a U-shape along the line of interpersonal justice congruence for virtual dyads. Taken together, Hypothesis 3 was supported.

Hypothesis 4 predicted that outcome inequality will be minimized when dyadic informational justice congruence occurs and that this effect will be stronger in face-to-face dyads. As shown in Table 4, Step 2 of Model 4, the set of 5 moderator terms for informational justice (b_7, b_8, b_9, b_{10}, and b_{11}) were significant as a set in predicting outcome inequality, ΔR^2 = .06, F = 2.34, p = .022, supporting the moderating effect of negotiation medium. Turning to the form of the moderation, as displayed in Model 4 of Table 3, the curvature along the incongruence line was positive and significant (i.e., curved upward) in face-to-face dyads, calculated as ($b_3 - b_4 + b_5$) = 1553.00, 90% CI [779.492, 2341.385]. In Quadrant 4A of Figure 3, the surface along the incongruence line ($F_m = -F_p$) was U-shaped (from the back left to the front right corners of the plot) such that outcome inequality was minimized when face-to-face negotiators' informational justice ratings were congruent ($F_m = F_p$). For virtual negotiation dyads, the curvature along the incongruence line was not significant, computed as ($b_3 - b_4 + b_5 + [b_9 - b_{10} + b_{11}]V$) = 117.60, 90% CI [-1074.419, 1318.621] (see Table 3). Quadrant 4B of Figure 3 suggests that outcome inequality was not reduced when virtual negotiators' informational justice ratings were congruent ($F_m = F_p$). In sum, Hypothesis 4 was supported.

Supplemental Analyses

We conducted several sets of post-hoc supplemental analyses (detailed results can be obtained from the first author upon request). First, although the hypothesized causal order was grounded in theoretical rationale, concerns may arise regarding the direction of effects. Thus, we tested and found support for the robustness of our hypothesized model compared to the reverse causal order. We used structural equation modeling (SEM) to compare our hypothesized causal order with the reverse causal model, in which relationship conflict and outcome inequality predicted each negotiator's

Table 2

Moderated Polynomial Regression Results of Interpersonal and Informational Justice Congruence on Relationship Conflict

Variables	Model 1: Interpersonal Justice						Model 2: Informational Justice					
	Step 1			Step 2			Step 1			Step 2		
	b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Constant	2.29*	(.16)	< .001	2.15*	(.18)	< .001	2.16*	(.18)	< .001	2.04*	(.20)	< .001
Controls												
Integrative potential	-.22*	(.12)	.034	-.20*	(.12)	.047	-.24*	(.14)	.045	-.23*	(.14)	.050
Power	.23*	(.12)	.026	.18	(.12)	.072	.30*	(.14)	.016	.25*	(.14)	.035
Mountain gender	-.12	(.12)	.148	-.12	(.12)	.147	-.06	(.14)	.324	-.03	(.14)	.425
Pinnacle gender	-.18	(.12)	.067	-.21*	(.12)	.043	.01	(.14)	.462	-.00	(.14)	.496
Mountain citizenship	.10	(.22)	.335	-.09	(.23)	.346	.18	(.27)	.254	-.29	(.27)	.148
Pinnacle citizenship	-.37	(.27)	.089	-.51*	(.28)	.033	-.46	(.31)	.073	-.48	(.32)	.067
Model Variables												
b_1 Mountain-rated Pinnacle justice (M)	-.28*	(.08)	< .001	-.47*	(.13)	< .001	-.26*	(.08)	< .001	-.44*	(.12)	< .001
b_2 Pinnacle-rated Mountain justice (P)	-.41*	(.09)	< .001	-.11	(.15)	.237	-.34*	(.07)	< .001	-.26*	(.11)	.010
b_3 M^2	.10*	(.04)	.004	.48*	(.18)	.004	.03	(.04)	.268	.31*	(.12)	.004
b_4 M × P	-.07	(.05)	.087	-.43*	(.17)	.006	.01	(.06)	.436	.03	(.10)	.381
b_5 P^2	.04	(.04)	.175	.08	(.14)	.279	.06	(.05)	.135	-.01	(.10)	.452
b_6 Negotiation Medium (V)	.51*	(.13)	< .001	.74*	(.19)	< .001	.56*	(.15)	< .001	.74*	(.21)	< .001
Moderator Terms												
b_7 M × V				.28*	(.17)	.049				.18	(.17)	.143
b_8 P × V				-.41*	(.20)	.019				-.17	(.16)	.135
b_9 M^2 × V				-.37*	(.18)	.023				-.30*	(.13)	.010
b_{10} MP × V				.36*	(.18)	.021				-.04	(.12)	.369
b_{11} P^2 × V				-.08	(.15)	.290				.05	(.12)	.330
F statistic				2.10*						1.70		
R^2	.57*		< .001	.59*		< .001	.42*		< .001	.45*		< .001
ΔR^2 for model variables (b_1-b_6)				.53*		< .001				.38*		< .001
ΔR^2 for moderator terms (b_7-b_{11})				.02*		.034				.03		.068

Note. Unstandardized coefficients and standard errors (in parentheses) are displayed. Coding of dummy variables: 0 = distributive; 1 = integrative potential; 0 = equal power and 1 = unequal power; 0 = male; 1 = female; 0 = U.S. citizen; 1 = Non-U.S. citizen; 0 = face-to-face and 1 = virtual.
* $p < .05$ (one-tailed).

Table 3

Response Surface Tests for Interpersonal and Informational Justice Congruence in Virtual and Face-To-Face Dyads

Response surface parameter		Equation for FTF Dyads	Equation for VIR Dyads	DV: Relationship conflict											
				Model 1: Interpersonal justice congruence						Model 2: Informational justice congruence					
				FTF			VIR			FTF			VIR		
				b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Incongruence line (*M* = *-P*)	Slope	*b1 – b2*	*b1 - b2 + (b7 - b8)*V	-.36	.22	.051	.33*	.16	.022	-.18	.17	.136	.17	.16	.147
	Curvature	*b3 – b4 + b5*	*b3 - b4 + b5 + (b9 - b10 + b11)*V	.99*	.36	.003	.17	.10	.052	.26	.17	.066	.06	.12	.310
Congruence line (*M* = *P*)	Slope	*b1 + b2*	*b1 + b2 + (b7 + b8)*V	-.58*	.17	.001	-.71*	.16	.000	-.70*	.15	.000	-.69*	.17	.000
	Curvature	*b3 + b4 + b5*	*b3 + b4 + b5 + (b9 + b10 + b11)*V	.14*	.08	.048	.05	.07	.254	.32*	.15	.017	.04	.11	.367

Note. FTF = Face-to-face negotiating dyads. VIR = virtual negotiating dyads. DV = Dependent variable. M = Mountain's ratings of Pinnacle's interpersonal/informational justice. P = Pinnacle's ratings of Mountain's interpersonal/informational justice. V = Negotiation medium, coded such that 0 = face-to-face and 1 = virtual negotiating dyads.

* $p < .05$ (one-tailed).

Table 3, Continued

Response Surface Tests for Interpersonal and Informational Justice Congruence in Virtual and Face-To-Face Dyads

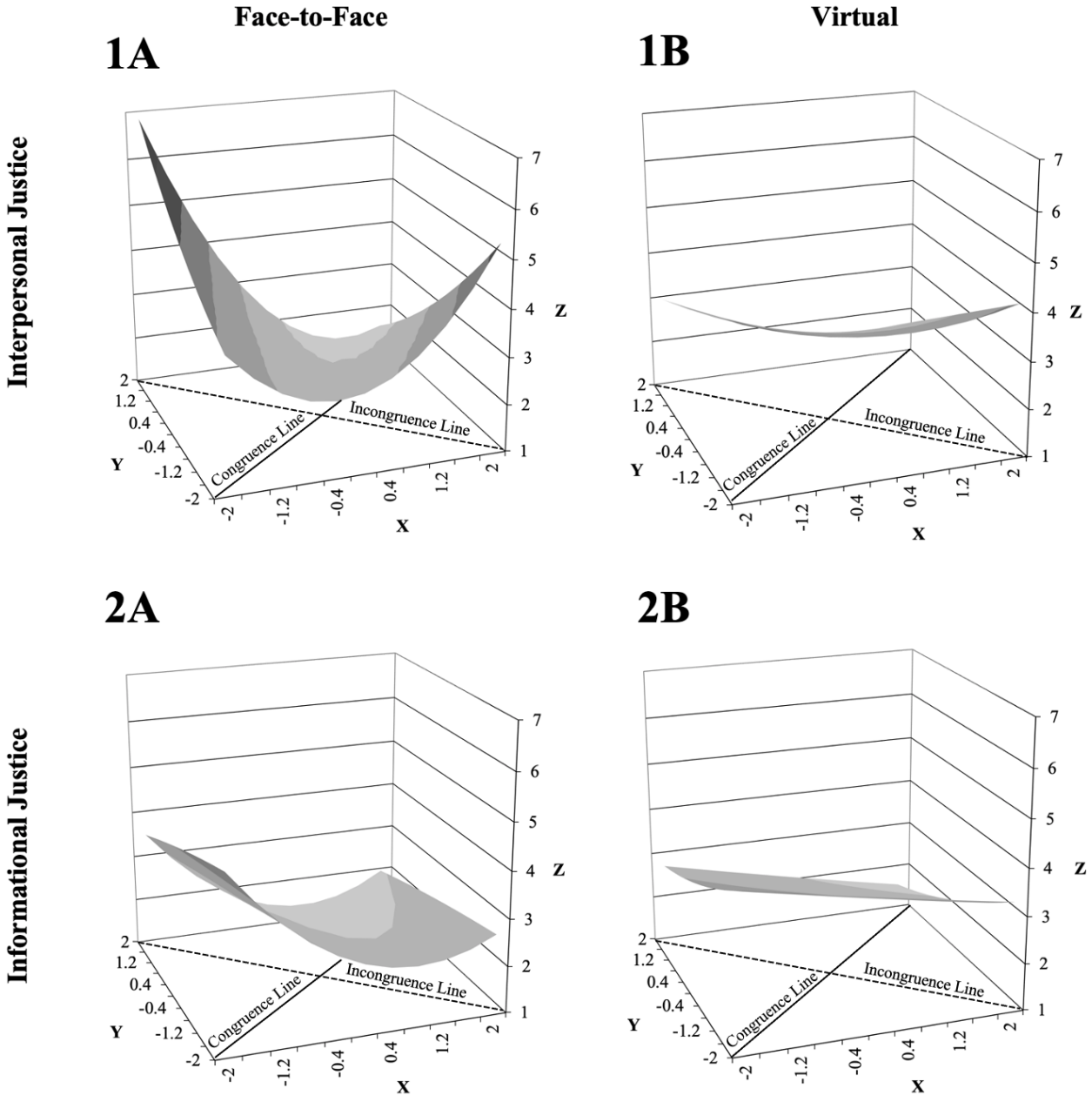
Response surface parameter		Equation for FTF Dyads	Equation for VIR Dyads	DV: Outcome inequality											
				Model 3: Interpersonal justice congruence						Model 4: Informational justice congruence					
				FTF			VIR			FTF			VIR		
				b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Incongruence line (*M = -P*)	Slope	*b1 – b2*	*b1 - b2 + (b7 - b8)*V	152.50	684.70	.206	-384.60	492.70	.109	434.60	431.90	.158	-160.10	409.60	.348
	Curvature	*b3 – b4 + b5*	*b3 - b4 + b5 + (b9 - b10 + b11)*V	2693.00*	1113.00	.004	332.90	321.60	.076	1553.00*	451.20	.000	117.60	308.00	.352
Congruence line (*M = P*)	Slope	*b1 + b2*	*b1 + b2 + (b7 + b8)*V	-64.65	533.68	.226	475.30	500.40	.086	-107.70	389.10	.391	-396.10	437.60	.184
	Curvature	*b3 + b4 + b5*	*b3 + b4 + b5 + (b9 + b10 + b11)*V	-107.40	248.30	.167	88.86	218.02	.171	-73.61	393.03	.426	-23.21	273.33	.466

Note. FTF = Face-to-face negotiating dyads. VIR = virtual negotiating dyads. DV = Dependent variable. M = Mountain's ratings of Pinnacle's interpersonal/informational justice. P = Pinnacle's ratings of Mountain's interpersonal/informational justice. V = Negotiation medium, coded such that 0 = face-to-face and 1 = virtual negotiating dyads.

* $p < .05$ (one-tailed).

Figure 2

Effects of Interpersonal and Informational Justice Congruence on Relationship Conflict Moderated by Negotiation Medium



Notes. X-axis is mean-centered Mountain negotiator ratings of Pinnacle negotiator's justice. Y-axis is mean-centered Pinnacle negotiator ratings of Mountain negotiator's justice. Z-axis is dyadic relationship conflict.

Table 4

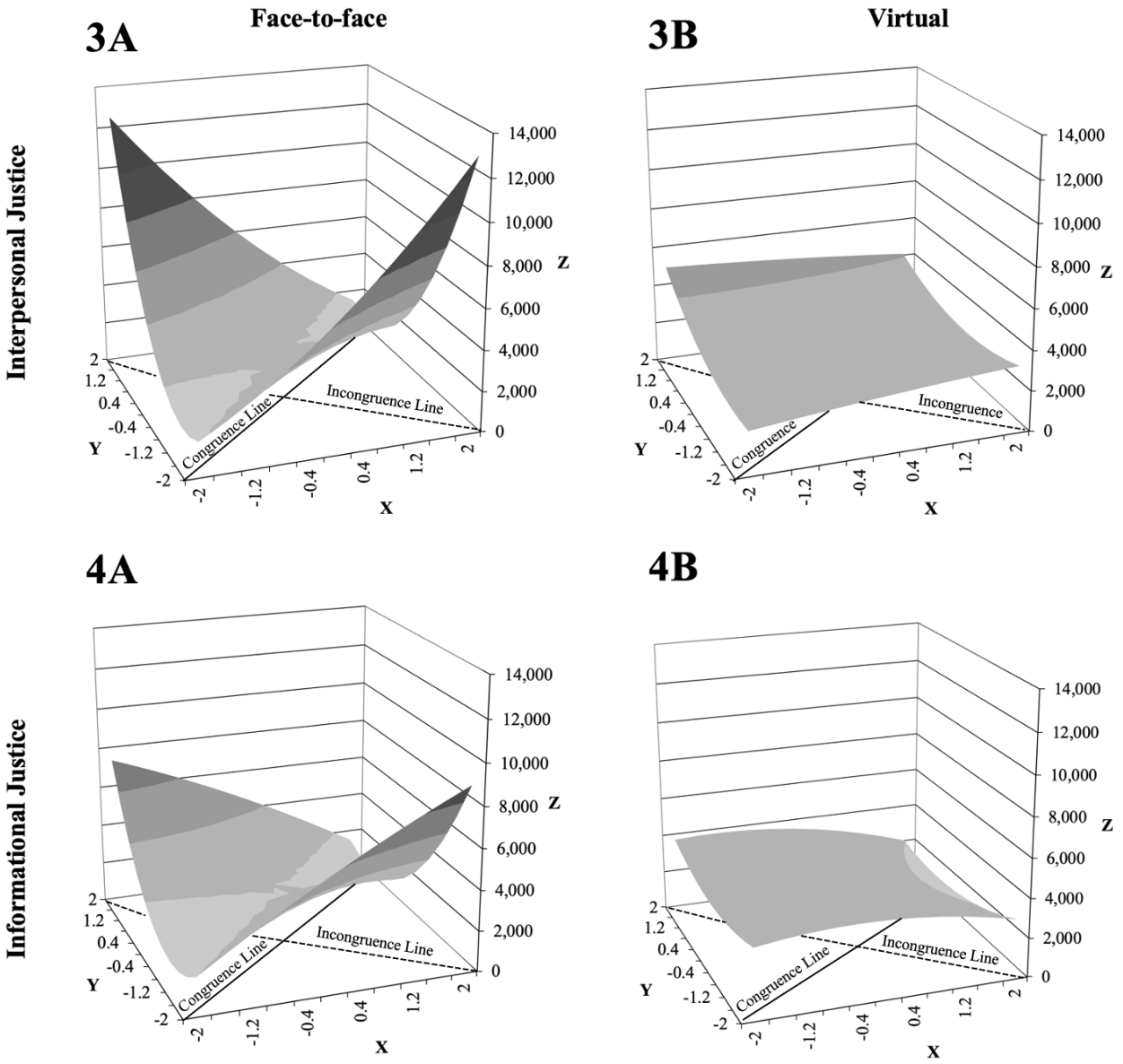
Moderated Polynomial Regression Results of Interpersonal and Informational Justice Congruence on Outcome Inequality

	Model 3: Interpersonal Justice						Model 4: Informational Justice					
Variables	Step 1			Step 2			Step 1			Step 2		
	b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Constant	2303.71*	(489.62)	<.001	2014.97*	(914.34)	<.001	2284.60*	(476.74)	<.001	1982.14*	(508.46)	<.001
Controls												
Integrative potential	297.38	(364.78)	.208	261.36	(360.51)	.235	238.69	(359.85)	.254	224.40	(354.55)	.264
Power	821.05*	(366.77)	.013	698.68*	(371.85)	.031	644.56*	(361.68)	.038	625.63*	(361.01)	.042
Mountain gender	-661.40*	(365.71)	.036	-765.64*	(362.41)	.018	-596.71*	(357.57)	.048	-720.96*	(354.56)	.022
Pinnacle gender	-27.64	(372.80)	.471	30.79	(370.92)	.467	-57.90	(362.23)	.437	-151.03	(359.82)	.338
Mountain citizenship	-177.42	(688.57)	.399	-215.05	(710.03)	.381	-434.46	(701.71)	.268	-378.05	(702.81)	.296
Pinnacle citizenship	-1155.07	(836.35)	.084	-1019.58	(846.59)	.115	-1173.87	(817.79)	.076	-1218.44	(818.50)	.069
Model Variables												
b_1 Mountain-rated Pinnacle justice (M)	-27.87	(253.25)	.456	43.95	(403.86)	.457	-161.06	(198.87)	.210	163.45	(300.85)	.294
b_2 Pinnacle-rated Mountain justice (P)	-24.52	(276.61)	.465	-108.60	(462.27)	.407	-209.72	(191.07)	.137	-271.11	(280.07)	.167
b_3 M^2	-0.54	(116.08)	.498	262.95	(550.54)	.317	-37.13	(114.88)	.373	-83.72	(297.52)	.389
b_4 M × P	-317.51*	(161.65)	.026	-1400.04*	(513.01)	.003	-347.76*	(147.95)	.010	-813.29*	(258.03)	.001
b_5 P^2	167.40	(115.96)	.075	1029.72*	(436.10)	.010	357.30*	(139.24)	.006	823.39*	(259.56)	.001
b_6 Negotiation Medium (V)	360.42	(402.29)	.186	758.75	(568.89)	.092	226.04	(394.43)	.284	916.76*	(538.72)	.045
Moderator Terms												
b_7 M × V				1.42	(514.20)	.499				-441.54	(427.31)	.151
b_8 P × V				538.57	(608.32)	.189				153.11	(406.85)	.354
b_9 M^2 × V				-283.16	(567.26)	.309				-76.24	(328.64)	.408
b_{10} MP × V				1278.02*	(545.46)	.010				742.91*	(322.37)	.011
b_{11} M^2 × V				-798.63*	(458.32)	.042				-616.26*	(318.13)	.027
F statistic				2.21*						2.34*		
R^2	.10*		.041	.15*		.012	.14*		.002	.20*		.001
ΔR^2 for model variables (b_1-b_6)				.04		.173				.09*		.005
ΔR^2 for moderator terms (b_7-b_{11})				.05*		.028				.06*		.022

Note. Unstandardized coefficients and standard errors (in parentheses) are displayed. Coding of dummy variables: 0 = distributive; 1 = integrative potential; 0 = equal power and 1 = unequal power; 0 = male; 1 = female; 0 = U.S. citizen; 1 = Non-U.S. citizen; 0 = face-to-face and 1 = virtual.
* $p < .05$ (one-tailed).

Figure 3

Effects of Interpersonal and Informational Justice Congruence on Outcome Inequality Moderated by Negotiation Medium



Notes. X-axis is mean-centered Mountain negotiator ratings of Pinnacle negotiator's justice. Y-axis is mean-centered Pinnacle negotiator ratings of Mountain negotiator's justice. Z-axis is outcome inequality.

ratings of their counterpart's interpersonal and informational justice. Because the degrees of freedom between the hypothesized and reverse causal order models were the same (i.e., the models were not nested), we followed Kline's (2011) recommendations and prior research comparing non-nested models (e.g., Matta et al., 2017). Specifically, we compared the fit of the hypothesized and reverse causal models using the Akaike information criterion (AIC) and the Bayesian information criterion (BIC) values; the model with the lower AIC

and BIC values demonstrates better fit to the data (Kline, 2011). Results of SEM analyses supported our hypothesized causal order, as it had smaller AIC and BIC values (AIC = 7486.02, BIC = 7567.847) compared to the reverse causal order (AIC = 7528.02, BIC = 7678.58).

Second, we examined the generalizability of our results to the other two dimensions of justice (distributive and procedural justice congruence) as well as to dyadic task conflict.[3] Testing the equivalent of Equations 1-4 with moderated polynomial regression revealed that the incremental variance associated with the set of five terms comprising the moderating effect of negotiation medium was not significant in any of these models. That is, we did not find a significant interaction between communication medium and procedural or distributive justice congruence in predicting relationship conflict or outcome inequality, nor did we find a significant interaction between communication medium and interpersonal, informational, distributive, or procedural justice congruence in predicting task conflict.

Third, while our hypotheses were oriented around congruence compared to incongruence, regardless of the level of justice, our data also lets us test congruence at each level of justice—that is, comparing positive and negative reciprocity scenarios from Figure 1 Quadrants 1 and 2. In supplemental analyses, we compared dyadic congruence on high justice with congruence on low justice in terms of their effects on relationship conflict and outcome inequality. This highlights when interactional justice congruence was most beneficial (i.e., when both negotiators' perceptions were low or high) and was tested by examining whether the slope along the congruence line, computed as ($b_1 + b_2$) for face-to-face dyads and [$b_1 + b_2 + (b_7 + b_8)$V] for virtual dyads, was negative and significant (Edwards, 1996; see also Edwards, 2002). For relationship conflict, as seen in Table 3 in Models 1 and 2, both face-to-face and virtual dyads had a negative and significant slope along the interpersonal and informational justice congruence lines. This effect can also be seen in all four quadrants of Figure 2, such that relationship conflict was higher in the left front corner of the plots (i.e., reciprocated low justice) compared to the back right corners (i.e., reciprocated high justice), regardless of medium. As such, across both face-to-face and virtual dyads, among dyads with congruent justice perceptions (i.e., negotiators' interpersonal and informational justice ratings that were low-low and high-high, or anywhere in between), those who were equally low in justice (i.e., low-low) toward each other had greater relationship conflict than those who were equally just (i.e., high-high). For outcome inequality, the results in Table 3 (Models 3 and 4) revealed that neither face-to-face nor virtual dyads had a significant and negative slope along the congruence line. This is also shown in all quadrants of Figure 3, where outcome inequality was not higher in the front left corners (i.e., congruence in low justice) than it was in the back right corners (i.e., congruence in high justice). Thus, dyads in which Mountain and Pinnacle were both disrespectful and deceptive (i.e., congruence on low interpersonal and informational justice) had equally low outcome inequality as dyads in which Mountain and Pinnacle were both respectful and truthful toward each other (i.e., congruence on high interpersonal and informational justice).

While Hypotheses 3 and 4 focused on outcome inequality, it is logical to ask whether joint gain (i.e., outcome quality in terms of mean points earned by the dyad) differed between dyads congruent on high interactional justice and dyads congruent on low interactional justice. Thus, in a fourth set of supplemental analyses, we examined this using polynomial regression and response surface methodology. A positive significant slope along the congruence line would indicate that among dyads with interactional justice congruence, congruent-and-high justice dyads earned more mean points than congruent-and-low justice

[3] We used Colquitt's (2001) subscales to measure distributive justice (α = .92) and procedural justice (α = .76). Jehn's (1995) 3-item task conflict scale was used (α = .79) and aggregated to the dyadic level similar to relationship conflict in the main analyses, given that ICC(1) for task conflict was significant, ICC(1) = .34, F = 2.05, p < .001, ICC(2) = .51, and r_{wg} = .53, which indicated moderate agreement (LeBreton & Senter, 2008; Woehr et al., 2015).

dyads. Among face-to-face dyads, the slope along the congruence line was positive and significant for interpersonal justice, ($b_1 + b_2$) = 210.60, p = .046, and informational justice, ($b_1 + b_2$) = 177.19, p = .034. Among virtual dyads, the slope along the congruence line was not significant for interpersonal justice, [$b_1 + b_2 + (b_7 + b_8)$V] = 78.34, p = .343, or informational justice, [$b_1 + b_2 + (b_7 + b_8)$V] = 67.22, p = .641. Although the results corresponding to Hypothesis 3 showed that outcome inequality was minimized in face-to-face dyads with congruence on interpersonal justice, this set of supplemental analyses shows that of congruent dyads, those high in interpersonal or informational justice had greater joint gain than those low in interpersonal or informational justice—but only in face-to-face dyads; for virtual dyads; joint gain did not differ between congruent-and-low and congruent-and-high dyads for either justice dimension.

Discussion

At the outset, we asked whether justice needs to be in the eyes of both beholders and whether this depends on communication medium. We explored these questions by integrating theory on reciprocity (Gouldner, 1960) with media richness theory (Daft & Lengel, 1986) to develop the notion of dyadic justice congruence. Our work illustrates the importance of interactional justice congruence in face-to-face dyadic negotiations. Findings from face-to-face and virtual negotiation samples revealed that face-to-face negotiators' relationship conflict and outcome inequality were minimized when perceptions of each other's interactional justice were reciprocated—even if they were both low. Specifically, negotiation medium moderated the effects of interpersonal justice congruence on relationship conflict and outcome inequality as well as the effects of informational justice congruence on outcome inequality, such that congruence effects were significant only in face-to-face negotiations. This highlights the importance of dyadic congruence in interactional justice perceptions for face-to-face negotiations. Results of our supplemental analyses ruled out the possibility of a general "halo" of justice as an explanation, as our effects occurred only with the more encounter-based forms of justice that are salient in communications (i.e., interpersonal and informational; Bies, 2005; Scott et al., 2007) and the "people-related" form of conflict (relationship conflict, Jehn, 1995).

Our consideration of interactional justice congruence and its effects across negotiation media makes several contributions. First, we contribute to the justice and social exchange literatures by using a dyadic approach to investigate reciprocity: examining justice congruence using polynomial regression and response surface methodology. In doing so, we examined how justice operates in dyads at each level of interactional justice, which revealed insights that challenge conclusions in the justice literature. Our approach stands in contrast to prior research that examined only one individual's perception of the exchange. We found that interactional justice congruence, even on low justice, is preferable for face-to-face negotiators' dyadic social-psychological and economic outcomes. This finding is novel to the justice literature, which has largely focused on individual-level perceptions and has concluded that high justice is generally preferable.

We also contribute to research on negotiation medium by blending reciprocity arguments with media richness theory (Daft & Lengel, 1986). Based on tenets of information richness theory and the capacity for mutual understanding across communication media, we theorized that face-to-face negotiators would benefit from justice congruence more than virtual negotiators. In other words, in virtual negotiations, even if interactional justice congruence was achieved, it may be less obvious to the negotiators and have little effect on their relational and economic outcomes. Indeed, our dyadic analyses using moderated polynomial regression and response surface methodology offered overall support for the notion that the benefits of reciprocity in justice perceptions were stronger in face-to-face negotiations than in virtual negotiations.

While congruence was usually better than incongruence in face-to-face negotiations, our supplemental analyses pointed to additional noteworthy findings. Specifically, relationship conflict perceptions were higher in dyads in which both negotiators' interactional justice perceptions were low,

compared to those in which both negotiators' perceptions were high. This is not surprising and is consistent with extant findings on the positive effects of justice on relationships (Colquitt et al., 2001, 2013; Rupp et al., 2014). Perhaps more surprising is that there was no difference between dyads with congruence on low or high justice in terms of outcome inequality. This finding is interesting and novel because prior justice research would suggest that higher justice is always better (Colquitt et al., 2001, 2013; Rupp et al., 2014). Challenging this assumption, we find that what matters most for negotiators' outcome inequality is dyadic reciprocity in justice perceptions, regardless of justice level.

Why would this be the case? In terms of relationship conflict, because both negotiators can see, feel, or interpret this information from the process they engaged in, they are likely aware of tension in their negotiation, particularly for face-to-face exchanges, consistent with media richness theory (Daft & Lengel, 1986). On the other hand, how well each party did in terms of outcomes (and whether an inequality exists between them) was more of a mystery to the negotiators. Although negotiators knew each other's settlement *positions*, they did not typically know how much *value* settlement positions provided to their opponent. Thus, the relative level of insight parties had about their relationship conflict, as opposed to settlement values, may explain the different patterns. While outcome inequality may be the same when comparing similarly high justice and similarly low justice dyads, high justice dyads in face-to-face negotiations collectively earned more mean points, suggesting that situations with respect and truthfulness still offered a greater opportunity for joint gain, which may be reassuring.

Practical Implications

Our findings suggest that negotiators should be deliberate in their selection of communication medium based on how likely they are to treat each other with similar levels of interactional justice, particularly if minimizing relationship conflict and outcome inequality are important. For instance, face-to-face negotiations would be preferable if dyad members are similar in ways that shape their respect or truthfulness toward the other party, such as similarity in the personality trait of straightforwardness (DeRue et al., 2009) or cultural background (Gelfand et al., 2002). These attributes could affect whether negotiators are inclined to be similarly truthful or respectful, whereas negotiating virtually may be best when two parties are unable or unlikely to treat each other equally fairly. Of course, learning about one's personality or culture-based characteristics may only occur over time, so it may be that effectively matching negotiation medium to the situation is difficult to do the first time people negotiate with each other. Once initial learning has occurred, it may be a more optimal strategy. Overall, our findings suggest that virtual negotiators might not experience the dyadic benefits of interactional justice congruence yet are more likely to avoid the costs of incongruence.

Moreover, our findings offer implications for negotiation training. Because we found that congruence in perceptions of respect and transparency in face-to-face dyads is associated with beneficial outcomes, negotiators can be trained to identify and reciprocate their counterpart's interactional justice, even if it is low. When faced with a counterpart low in justice, the most promising path forward is to adopt that counterpart's behavior to protect one's interests. While this may appear counterintuitive, it is consistent with the idea in the popular press that "when someone is arguing in bad faith, you cannot beat them by arguing in good faith" (Douglas, 2019). Likewise, negotiators who are paired with a just and reasonable counterpart would be advised to reciprocate this behavior, or risk experiencing harmful mutual outcomes. Importantly, our findings do not imply that organizations should blindly encourage mutually low justice or other negative behavior between employees, which may fuel a negativity spiral (Greco et al., 2019). Instead, our results add that in dyadic negotiations, it is important to closely monitor one's counterpart's behavior and its interplay with one's own. Virtual negotiators might also be trained to explicitly communicate to improve the clarity of their justice cues, which could also hold an added benefit of reducing deception (Schweitzer & Croson, 1999).

In the absence of a face-to-face option, perhaps a more information-rich virtual negotiation medium (e.g., video call) would be preferable over the leaner virtual communication medium of instant messaging.

Limitations and Future Research Directions

While our study offers multiple strengths, including the use of moderated polynomial regression and response surface methodology to examine dyadic justice congruence across negotiation media as well as our use of multiple sources and social-psychological and economic outcomes, it nonetheless presents limitations. First, one might question the generalizability of upper-level undergraduate business student samples. While participants might not have direct experience with the merger/acquisition scenario in the simulation, they were likely familiar with the concepts from their business courses and may have experience with negotiating salary or start date (examples of issues in the simulation) for an entry-level job (Babcock & Bear, 2017). Nevertheless, future research should test whether our findings hold across non-student samples and relational and cultural contexts outside the lab. One approach is to account for indicators of "socially embedded transactions" (Thompson et al., 2010, p. 500; see also McGinn & Keros, 2002), such as task interdependence, relational closeness, and potential future relationships (Hart & Schweitzer, 2020, 2022) that may influence the effects of justice congruence. Future research should examine whether negotiators in such contexts would still benefit from congruence on low justice when face-to-face, or alternatively, benefit from justice congruence in virtual settings. Another approach is to consider how the effects of justice congruence across communication media may unfold differently according to negotiators' cultural values, particularly collectivism-individualism, and unfold across intracultural (i.e., negotiators share the same cultural values) versus intercultural contexts (i.e., negotiators differ in their cultural values) (e.g., Brett & Thompson, 2016; Gelfand & Christakopoulou, 1999; Liu, 2019; Liu et al., 2012).

Second, justice was measured at the end of the simulation, reflecting negotiators' overarching justice perceptions from the entire set of deliberations. Given that this may elicit concerns about our hypothesized causal order, following prior research, we compared the hypothesized and reverse causal order using SEM (Kline, 2011; Matta et al., 2017), which supported our proposed ordering. However, future research is needed to further bolster this direction of effects. One fruitful approach is to conduct an experiment manipulating interactional justice congruence and negotiation medium (e.g., a 2x2x2 between-subjects design, where participants are assigned to virtual or face-to-face, instructed to enact low or high interactional justice, and paired with a confederate counterpart who enacts low or high interactional justice, resulting in congruence conditions mirroring the 4 scenarios outlined in Figure 1 across virtual and face to face settings). In addition, it is possible that interactional justice congruence could vary over the course of deliberations, such that congruence in negative perceptions would eventually take a toll. We encourage future research to adopt a dynamic, event-based approach to multi-issue negotiations with experience sampling methodology and dyadic samples by examining justice after each issue is concluded (e.g., Gabriel et al., 2019). Such an investigation could also explore how and why dyadic congruence in justice perceptions emerges. Congruence antecedents could be examined by integrating our findings with work on cognitive and affective justice motives (e.g., Scott et al., 2014) and the strategic use of fairness in bargaining (van Dijk et al., 2004). For instance, perhaps congruence arises from strategically calibrating reciprocity (more motivated by cognition) or from affect contagion (Barsade & Knight, 2015; Butt et al., 2005) between negotiators.

Third, although we compared two communication media (instant messaging and face-to-face) that are toward disparate ends of the information richness spectrum (Daft & Lengel, 1986; Purdy et al., 2000), we did not examine other media such as video and telephone calls, and encourage future research to pinpoint which specific cues (e.g., vocal tone, facial expressions, hand gestures) facilitate the effects we found. In terms of information richness, video-based communication is theorized to lie somewhere between text-based and face-to-face communication (Daft & Lengel, 1986; Rockmann & Northcraft, 2008). Virtual

communication, including instant messaging and other forms of text-based communication (Gajendran et al., 2022) and video-based communication through platforms such as Zoom and Microsoft Teams, have grown in recent years, largely due to the increase in remote work associated with the COVID-19 pandemic (Igielnik, 2022; Parker et al., 2020). However, recent research suggests that although it may be more information-rich, video communication introduces nonverbal cues that are more difficult to interpret, which contributes to the experience of "Zoom fatigue" and increased cognitive demands (Bennett et al., 2021; Shockley et al., 2021), which represent another important feature of negotiation medium to consider. Such increased cognitive demands of video-based communication may counteract benefits of increased information richness, particularly when processing complex social information such as interactional justice cues during negotiations and other relatively high stakes situations. Yet, video-based negotiations remain poorly understood, as so few articles using them have been published in recent years, further underscoring the importance of future research in this area.

Relatedly, we relied on media richness theory to propose how and why face-to-face and instant messaging would differ in their effects of justice congruence; however, we did not measure the four characteristics that determine the richness of these two communication media (synchronicity or velocity of information transmission, number of cues, natural language, and personalization; Daft & Lengel, 1986; Dennis et al., 2008). Recent research building from media theories has also shown that text-based communication, including instant messaging, is more cognitively difficult and has been associated with reduced motivation maintenance after the communication occurs (Gajendran et al., 2022). We encourage future work to explicitly measure these characteristics to more fully explain why dyadic negotiations conducted face-to-face and through instant messaging differ in their effects, and which characteristics are most conducive to the beneficial effects of dyadic interactional justice congruence.

At the outset, we theorized that a dyadic lens of justice would show that low and high justice are less harmful and beneficial, respectively, than currently conceptualized in the justice literature. To make our case, we focused on both relational and economic outcomes that are generally harmful at the dyadic level: relationship conflict and outcome inequality. Although our assumptions about the harmful nature of such outcomes were grounded in social exchange theory and prior research (e.g., de Wit et al., 2012), there exists a small body of research that has pointed to several relational boundary conditions to the harmful effects of relationship conflict on group outcomes (Rispens, 2014). For example, high task interdependence buffered the negative effect of relationship conflict on trust (Rispens et al., 2007) and high relational closeness buffered the negative effect of relationship conflict on helping behavior (Rispens et al., 2011). As another example, the conflict management literature has suggested the way conflict is handled (e.g., high collaboration and low avoidance) can determine whether it is ultimately harmful or beneficial (Kay & Skarlicki, 2020; Tjosvold et al., 2014). Similarly, to the degree that negotiations and the outcomes that result from them also carry important symbolic, processual, or relational outcomes that are not incorporated directly in the issues being discussed, the amount of inequality reflected in the negotiated settlement may be less important than other elements, such as a reaffirmation that the parties share power and make decisions with input from both sides (Hart & Schweitzer, 2022). Accordingly, we acknowledge that situations may exist where relationship conflict and outcome inequality are not as harmful as conceptualized in our model.

In conclusion, our findings show that both high and low justice can be beneficial when they are seen in the eyes of *both* beholders. We found that outcome inequality was minimized when face-to-face negotiators' perceptions of each other's interpersonal and informational justice are congruent, even on low justice. Relationship conflict was also minimized when interpersonal justice perceptions were congruent, with the caveat that dyads with congruence on high justice had lower conflict and greater joint value than those with congruence on low justice. Our dyadic approach identifies circumstances when justice in negotiations is constructive, and when it's not.

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Negotiation and Conflict Management Research

Qualities and Long-Term Effects of Mediation

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Abstract

To clarify the long-term effects and sustainability of mediation, we reviewed approaches and findings from mediation research, psychology, and counseling and therapy research. On this basis, we have developed a hypothetical model of mediation qualities that we tested in a prospective longitudinal study. To this end, we investigated the long-term effectiveness of mediation in 303 escalated civil disputes of various types. We refer to main findings that indicate there are long-term effects of antecedent *structural qualities* such as personal items of the participants, mediator qualifications, and as well as system and conflict issues, but also *process qualities* such as conduct of negotiations, explanation of all concerns and issues, and honesty of participants. *Outcome qualities* of the agreement also had long-term effects like contract compliance, or satisfaction. *Sustainability qualities* had long-term effects like time and cost savings, long-term fairness, relationship, and quality of life, satisfaction and conflict competence, and parties' attitudes toward mediation. Reflections on further research, practice and training conclude.

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The full research report, including all results and a detailed description of procedures and research methods, as well as additional information and data sets, are available from the first author.

This article summarizes our considerations and results from various German publications in an updated form in English.

Introduction

A mediation process is usually considered successful when it is concluded with an agreement. It remains questionable how completely and differentiated the existing problems have been worked through and how fair, satisfactory, and workable the negotiated arrangements are, how well and for how long the agreements are adhered to, how satisfied the participants are with them and whether their relationship, well-being, quality of life, and competence to deal with conflict have improved can only be seen after a longer period of time. However, we still know too little about these long-term effects and how they come about. To date, an empirically validated coherent psychological theory of mediation that also incorporates the full breadth of approaches and findings from psychological research in detail is rudimentary (Bickerdike & Littlefield, 2010; Donohue et al., 2016; Druckman & Herrman et al., 2017; Kalter et al, 2018; Kaiser, 2018; McNeece & Thyer, 2004; Wall, 2017; Wissler, 2017). Although mediation is a professional counseling process, approaches and findings from counseling and therapy research are underreported (for example, Norcross & Wampold, 2019; see below). Most of these findings and the procedures and strategies derived from them are relevant to *all* helping professions regardless of specific problem and application areas. We therefore used relevant approaches and findings from these disciplines to formulate a hypothetical model of mediation qualities. We were able to test this model for the first time in a longitudinal study. For reasons of space, we limit ourselves here to a brief literature review and main findings from our study.

Long Term Success of Family Mediation and Corporate Mediation

An agreement does not equate to lasting success of the mediation process (e.g., Johnson et al., 1985). In this section, we examine what conditions are decisive for long-term success in both family and organizational mediation. In doing so, characteristics of the different fields of activity, relationships, and role structures, as well as the conflicts themselves must be taken into account.

We start out with a review of relevant interdisciplinary research that relates to our project in order to provide a theoretical illustration of key variables of mediation success. Afterwards we describe our own empirical study in detail and how our database allows for testing our theoretical expectations regarding long-

term relationships in mediation processes. We then proceed to the results and conclude with a summary and discussion of our findings.

Family Mediation

In *family mediation*, a two-year follow-up of mediation with highly contentious couples, Johnston et al. (1985) found a significant reduction in parental conflict and hostility in 45% of cases. However, unfavorable antecedent *structural* qualities like *personality* traits, *parental disputes*, and *extended family* influences resulted in no improvement in 40%, and deterioration in 15% over the longer term.

In their longitudinal study, Pruitt et al. (1993) examined 73 mediation sessions that were recorded and analyzed. In addition, participants were interviewed immediately after the mediation and four to eight months later. They found correlations between *process qualities* like the *fairness* of the *negotiation process*, *complete resolution* of all issues, and long-term success. No correlation was found between the quality of the agreement and long-term effects such as *compliance*, improvement of *relationships* and avoidance of *new problems*.

Irving and Benjamin (1995), in their review of 51 studies of family mediation, reported that 22% of the parties had as a long-term outcome even *reconciled*. In the majority, divorcing couples honored agreements over time and, when circumstances warranted, made *new arrangements* by *mutual agreement* when necessary. This was accompanied by substantial positive changes in *parental cooperation*, as evidenced by *child satisfaction*, *parent-child relationships*, and more appropriate *child behavior* when the out-of-home parent visited. For these long-term effects, *structural qualities* like communication *competence,* and cooperativeness of the parties, and especially the mediator were important in helping the parties to *understand* their own and the other party's *feelings* as procedural qualities (see also Donohue et al., 1989). Kelly (2004) found similar results in her review of nine studies of family mediation in the public and private sectors, in voluntary and mandatory services, and at different stages of the conflicts described. Using a variety of methods, metrics, and large samples, mediation resulted in settlements in custody and access disputes, divorce, and child protection disputes. Settlement rates generally ranged from 50-90%. In follow-up surveys, 40-60% of respondents expressed satisfaction, felt negotiations and outcomes were fair, felt listened to, respected, were able to say what was important to them, were not pressured to reach agreement, were able to work together as parents, and felt their agreements were good for their children. Thus, greater process and outcome satisfaction appeared to contribute to long-term effects like better compliance with agreements in the long run, but also to better cooperation.

In the California Divorce and Mediation Project report, 76% of women and 62% of men said mediation helped them get along better, and 15-20% were dissatisfied with both the process and the outcomes. Thirteen percent felt *pressured by the mediator*. Men were more likely to feel that women had an *unfair advantage* in mediation. This suggested a lack of *neutrality, impartiality,* and *abstinence* on the part of the mediators (see below). Fifty-one percent of parties who did not reach agreement indicated that the *mediator's evaluations* or *court decisions* had negatively impacted their relationship (Kelly, 2004).

On the other hand, the U.S. Department of Health and Human Services (2002) found in studies of 125 parents in five states that 74% of those who reached agreement and as many as 59% of those who did not would *recommend mediation*. Some studies showed that 40-65% of the parties had made mutually agreeable changes to the agreements. Greater satisfaction was associated with more accurate *compliance* with agreements. Twelve years after divorce, fathers in mediation were more committed to their children and reached a better relationship than were litigation fathers. When mediators were sufficiently experienced and well trained, even success with angry clients and those with mental disorders and family problems was possible. At the same time, psychosocial functioning itself did not noticeably improve.

Risks to sustainable negotiation success included *mistrust* and *lack of fairness*, *anger* and *dissatisfaction*

with the divorce process and outcome, and a rather r*ushed* or *coercive* mediation process by untrained or inappropriate mediators (see also Bickerdike & Littlefield 2010). Some high conflict clients required more intensive *therapeutic* forms of mediation that lasted longer. These integrated individual and group sessions with counseling, parent coordination, and training (Cowan et al., 2019; Kelly 2004; Kline-Pruett & Johnston 2004).

Kline-Pruett et al. (2004) found long-term reductions in hostility and conflict in their study of divorce mediation. In 15% of the cases, conditions worsened after some time, as did the well-being of some children who were initially symptom-free after the intervention. In the opinion of the authors, longer psychological care, which could also be legally secured, would have been necessary here. In a long-term study over 12 years, Sbarra and Emery (2010) found significantly more *non-acceptance* of the end of their marriage among mediation clients than among couples who had gone through litigation. Fathers were more affected and reported less parental level conflict than mothers. Separation, after all, runs counter to the *basic need* for *attachment* anchored as a neuropsychic *schema in brain structures*. As we will see, one can separate from a partner, but not from one's own brain structures. The internal attachment persists even after a separation, which is why the attachment figure is sorely missed despite conflicts (Brisch, 2019; Cowan , 2019; Epstein, 2003; Grawe, 2004; Strauß & Schauenburg, 2016; see below). Because of these neuro-psychic contexts, intrapsychic and interpersonal conflicts can become malignantly intermingled, placing particular demands on participants and especially mediators.

The results of longitudinal research on family mediation show that the long-term effects varied widely and even deteriorated. *Structural qualities* such as personal characteristics of the partners, strong ties, and contentious relationships at the couple level were relevant for success. *Process qualities* that influenced long-term success were a conduct of negotiations that was experienced as fair and appreciative and that took into account all issues relevant to the participants and the associated emotions. It appeared to be a hindrance when poorly trained and less experienced mediators were not able to deal with the sometimes intense emotions of the parties or did not remain neutral and abstinent. Also relevant to success was how the extended family of the parties reacted to the mediation and its results. Long-term success was promoted by *outcome qualities* such as reconciliation of the conflicting parties and improvement in cooperation at the parental level, which enabled agreements to be adapted to changed circumstances if necessary. Long-term satisfaction was better the more closely the agreed arrangements were adhered to.

Corporate Mediation

The situation was somewhat different in Corporate Mediation. Here, the focus is less on kinship relationships than on economic goals and the roles and hierarchies they imply.

In the study of Poitras and Le Tareau (2009) with 207 employees and employers involved in workplace disputes mediated by 17 mediators, 74% of the participants reached an agreement. Respondents rated the extent of five dimensions, (a) *mediator's usefulness* (average of 4.90 of 6 points), (b) the *procedural justice* (average of 5.10 of 6), (c) *satisfaction with the agreement* reached (an average of 4.29 of 6), and (d) *confidence* in the contractual compliance of the other party (average of 4.94 of 6); (e) the participants were in average of 3.56 of 6. Only 29% of participants were *reconciled* with the other party a little. Reconciliation was apparently less important for many because ending the employment relationship and financial compensation were the main issues. If the relationship has also improved, the authors spoke of "value-added agreement" (Poitras & Le Tareau, 2009, p. 374). *Disappointing agreements* did produce poorer ratings of mediator's usefulness, and procedural justice, and did produce same satisfaction with the outcome than the no agreement group. Poitras and Le Tareau suspect that some mediators were not competent to handle relational conflicts or to reconcile parties.

In their study of workplace conflict, Kalter et al. (2018) surveyed 96 participants following their

mediation and one year later. They used Poitras and Le Tareau's (2009) five dimensions (see above). Hierarchical regression analyses showed that reconciliation after mediation also predicted lasting reconciliation after one year. Similarly, short-term satisfaction with the mediator and mediation also predicted long-term satisfaction after one year. Hierarchical position and trust in the mediation agreement predicted long-term trust in the other party's compliance to the contract (see also Riera Adrover et al., 2020).

In organizational mediation, *structural qualities* were characterized less by personal relationships or ties than by roles and hierarchies. *Process qualities* such as competent negotiation by the mediator, who responded to the concerns and emotions of the participants, were significant for long-term success. *Outcome qualities* relevant in the long term were agreements perceived as fair and trustworthy in the other side.

Key Factors of the Mediation Process

After a comprehensive research overview of the different mediation areas., Herrman et al. (2006) organized the empirical findings from a variety of different studies into a detailed formulated hypothetical framework. The authors considered in detail long-term effects of mediation processes as well as the preconditions responsible for them. They attribute *antecedent structural qualities* to personal characteristics, attributes and beliefs as well as to conflict features and system context. They identified empathy, fairness, neutrality and conduct of negotiations by the mediator as well as active participation and understanding by the parties, active negotiation, discussion of the problem aspects and the associated needs, and formulation of options as decisive *process variables*. Among the *short-term outcomes*, they summarized satisfaction with the legal system and the mediator, with the process and conduct of negotiations, with the content and fairness of the agreements, costs incurred, and improvement in relations. As *long-term effects*, they identified compliance with the agreed arrangements and, where appropriate, further litigation, reparation, reconciliation and security from attacks by the other side.

As has been shown, *prospective long-term studies* are indispensable for the development of an empirically based theory on the interrelationships of effects and sustainability of mediation processes. Here, the parties are *not* only asked about their experiences after the mediation, but one already records the situation *before* the mediation with the associated relevant pre-mediation variables or structural qualities. These can then be compared and related to process qualities of the procedure, mediation outcomes and relevant postmediation variables as outcome qualities as well as long-term effects of mediation (Bastine, 2014; Benjamin & Irving, 1995; Herrman et al., 2006; Montada & Kals, 2013).

Mediation could probably be even more effective and sustainable if more use were made of approaches and findings from empirical psychology.

Mediation-Relevant Findings from Psychological Research

Psychological approaches and findings provide an *evidence-based understanding* of conflict and negotiation. Findings from cognitive psychology on the *selectivity* and *perspectivity* of *perception* show how incompletely and biasedly people perceive and judge. Information may go unnoticed due to ignorance, sensory overload, or distraction, or it may be repressed or denied due to internal defenses (summarized by Bak, 2020; Gigerenzer, 2019; Koelsch, 2014; Seiffge-Krenke, 2017; Wendt, 2014). Due to faulty information processing, false conclusions and attributions occur, triggering corresponding emotions (see below). Parties and mediators should therefore ensure that all relevant information and its interrelationships are taken into account and misunderstandings are cleared up in order to minimize the risk of new conflicts and difficulties in negotiations.

Memory and Stress

Memory is also prone to errors, because different brain areas are active when remembering. When several simultaneous events have not been correctly classified or when the individual is later confronted with very different evaluations and versions of reports about them, it can unconsciously lead to incorrect linkages of information and momentous erroneous memories and false conclusions (Gigerenzer, 2019; Gruber, 2018; Shaw, 2016). Therefore, when appropriate, accurate reconstruction and evidence collection in mediation is useful for verifying proffered memories.

An often overlooked obstacle to reality-based information processing and remembering is *stress*. It is a psychophysiological syndrome that is set in motion by the alarm center in the brain when the individual feels threatened in his *basic needs* for *orientation/control, attachment/belonging, pleasure gain/unpleasure avoidance*, and *appreciation/self-affirmation* due to situational cues (Epstein, 2003). In all creatures, stress activates the organism for *flight, fight* or *freezing*. For this purpose, the energy supply to the cerebrum is reduced, which impairs perception, remembering, and thinking and can make one "headless" (e.g., Brunner, 2017; Epstein, 2003, Grawe, 2004; Koelsch, 2014). Therefore, it is useful to examine with regard to which basic needs the parties feel restricted and which *emotions* are triggered.

Emotions and Person Features

Emotions are psychophysic syndromes that are experienced as *sadness, disapproval/contempt, disgust, anger/rage, fear, surprise*, or combinations thereof, depending on the situation (Ekman, 2011). Subsequently, the brain actively seeks cue stimuli that confirm existing emotions and avoid dissonance experiences (Brunner, 2017; Gigerenzer, 2019; Radkiewicz & Korzeniowski, 2017). Different areas of the brain are responsible for the storage of facts and the emotional evaluation of experiences. By linking randomly occurring stimuli together, new stimulus-response patterns can arise unconsciously by way of conditioning and cause attributions can be derived from them. This happens, for example, in traumatic experiences with extreme stress, whereby schemata are formed in the brain that can lead to post-traumatic or panic reactions.

Emotions can be triggered by random stimuli and unpredictably often occur many years later and can be completely dysfunctional (Grawe, 2004; Linden, 2017). For example, current conflicts can trigger memories of very different earlier offenses and even lead to panic attacks through corresponding schema activation. Thus, the brain can *construct realities* according to its own non-conscious criteria. Triggered emotions run autonomously and can strongly influence behavior and experience (Sacchi et al., 2021).

Since people often *identify* with their emotions, mediators are well advised to always first address the emotions of the parties and in this way to detect related but partly *unconscious* or *unspoken* factual issues (see below). This is more easily accomplished by attentively observing *nonverbal signals* and directly verbalizing the associated emotions (Ekman, 2011; Grawe, 2004). If necessary, targeted stress management and calming measures are helpful (e.g., Schamber et al., 2020; Singer & Bolz, 2013; see below).

Personality traits such as neuroticism/emotional irritability, openness to new experiences, extraversion/introversion, conscientiousness, and agreeableness (Big Five; McCrae & Costa, 1999; Sandy, 2014). They are anchored in the brain structures as schemas and can be changed in the long term at best. Other behavioral and conflict determinants that are mostly unconsciously effective are also neuropsychically anchored *attachment schemas* that control *bonding relationships,* which are particularly relevant for success in family mediation (see above; Kelly 2004; Pruett & Johnston 2004; Cowan et al. 2019; Strauß & Schauenburg 2016). Bonding relationships can also be relevant in workplace mediation when *love relationships* or *kinship ties* are (often kept secret) conflict components.

Lack of *intelligence* (e.g., Deary et al., 2021; Katz & Sosa, 2015; Thomas, 2012), *coping styles*, *social skills*

(e.g., Braun, 2020; Stett, 2010; Thomas, 2012), as well as the common *mental disorders*, can also influence conflict vulnerability and conflict behavior (e.g., National Institute of Mental Health, 2021; Petermann et al., 2018).

Since such traits, schemas, and mechanisms influence susceptibility and behavior in conflicts and negotiations, mediators should take their significance and effects into account when analyzing conflicts and conducting negotiations (see above; Cowan et al., 2019; Kaiser, 2009; Kelly, 2004; Pruett & Johnston, 2004; Strauß & Schauenburg, 2016). Psychosocial impaired parties require special understanding and support in mediation negotiations in order to avoid disadvantages. Many findings and strategies from clinical psychology that have been studied in counseling and therapy research lend themselves here.

Mediation-Relevant Findings from Counseling and Therapy Research

In counseling and therapy research, differentiated studies has been conducted for decades on which *client*, *system*, and *counselor variables* interact in what way and contribute to what results and long-term effects (Benjamin & Irving 1995; Cowan et al., 2019, Howieson & Priddis, 2015; Morris et al., 2018; Norcross & Lambert, 2019; Rogers, 1957; Wampold et al., 2018). Applied to mediation, this means helping the parties to understand themselves, the conflict, and the other side as much as possible, and to find successful arrangements from which all parties can benefit in the long term (Bastine, 2014; Herrman et al., 2006; Kalter et al., 2018, among others). If the participants take into account each other's basic mental needs and their partially nonconscious implications (see above) in their behavior, the more trust and adherence can apparently develop in a working relationship that becomes more sustainable as a result (see also Grawe, 2004; Norcross & Lambert, 2019).

The current state of knowledge in counseling and therapy research has been compiled by the *Task Force on Evidence-based Relationships and Responsiveness*, commissioned by the American Psychological Association (APA), based on thousands of empirical studies and numerous meta-analyses which should also be considered in mediation proceedings (Norcross & Lambert, 2019; Norcross & Wampold, 2019). According to that evidence, the items that are consistently effective for lasting relationship and counseling success are as follows (see also Herrman et al., 2006; Riera Adrover et al., 2019): *Trust* in the mediator and offensive sensitive clarification of relationship breakdowns, misunderstandings, and transference processes to avoid strain on the cooperation mediator's *impartiality/neutrality* and *openness* to results, *self-congruence* in the context of *allegiance*. Doubts about the credibility of the mediator, the mediation, and its prospects for success should be addressed, even if expressed nonverbally, accurate *empathy* on the part of the mediator toward the participants and their emotions, including those expressed nonverbally (see also Katz & Sosa, 2015), *positive regard* and affirmation of a positive expectancy, which is highly significant given the usually battered self-esteem of those involved in conflict situations and reinforces hope for sustainable settlements (Farber et al., 2019), *client feedback* - regular surveys and consideration of client feedback to ensure process quality, rapport, and goal consensus at all times (Lambert et al., 2019), *managing countertransference*; what counselors perceive is influenced by their own psyche and experiences (Hayes et al., 2019; König, 2010). This issue is particularly important in mediation because neutrality and impartiality depend on it.

Structural qualities like unfavourable personality traits, competence deficits and mental disorders, chronic family and partnership conflicts, procedural qualities like insufficient empathy of the mediator, especially in dealing with emotional problems, and after mediation dissatisfaction with the procedure and outcome of mediation, lack of contractual compliance of the parties, have been shown to be *risks* for lasting success (Benjamin & Irving 1995; Herrman et al., 2006; Howieson & Priddis, 2015; Kelly, 2004; Pruitt et al. 1993). These conclusions about evidence-based practice in counseling and therapy also seem useful for mediation. We now turn to examine whether these findings can also be confirmed in mediation research.

The Prospective Kiel Longitudinal Study (PROKLOS)

Mediation can only achieve its goals in cooperation with the users. As a counseling procedure, mediation must be questioned about the quality of its foundations, processes, and results: 1) whether, how well and how permanently it is effective (effectiveness/sustainability); 2) how quickly and with what effort the parties are helped to a sustainable solution (efficiency); 3) how it works and which interrelationships of effects are relevant for a sustainable conflict settlement (mechanisms of action; Kaiser et al., 2017).

In order for the parties to achieve their goals and secure them in the long term, there is a need, in addition to antecedent *structural qualities/*preconditions, for *processual qualities* in the way the persons involved in the negotiation deal with each other. This system can be traced back to Donabedian, who proposed a model of quality of care as the "degree of correspondence between the goals ... and the care actually provided" to evaluate the services of the American health care system (Donabedian, 1966/1980, p. 80 ff; see Figure 1). In order to make progress in the development of a psychological theory of mediation and to determine conditions for lasting success and optimization possibilities of mediation, we have used this quality model in addition to the model of Herrman et al. (2006) for our longitudinal investigation presented below. The goal, as in medicine, is to advance the *evidence-based* nature of mediation (Sackett et al., 1996).

In addition to the quality model, we distinguished between *micro-, meso-* and *macro-level* variables according to the concept of *systemic multilevel analysis* (Kaiser, 2009). The applicable legal system and its structures were assigned to the macro level, family and institutional variables to the meso level, and individual variables to the micro level.

The extant literature indicates that the long-term success and sustainability of mediation are essentially determined by a set of complex interrelationships between different components as depicted in Figure 1. We will discuss the model by way of example and propose the key conceptual relations through the following hypotheses:

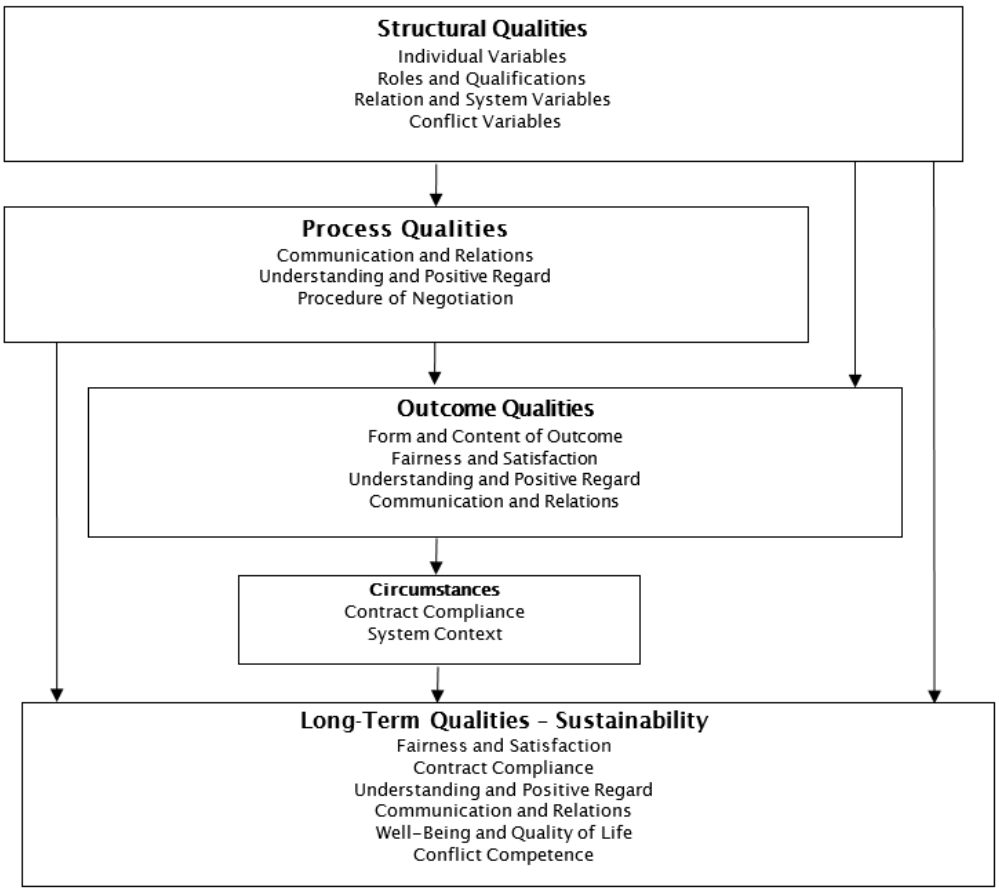
> ***H1.*** The sustainability of mediation is influenced by antecedent *structural qualities* like *traits, states,* and *roles* of the parties, and their *relationships*, the *qualification of mediators, case characteristics* (micro level)*,* and, in addition, of family and institutional *system contexts* (meso level) as well as macro-level conditions such as the *applicable legal system*.
>
> ***H2***. The sustainability of mediation is influenced by *process qualities* of the procedure like *communication,* and *relationships*, *understanding,* and *appreciation*, *fairness* of the conduct of negotiations in dealing with the problems, and the *satisfaction* of the participants with the course of the procedure.
>
> ***H3.*** The sustainability of the mediation is influenced by *outcome qualities* such as *agreements* reached, mutual *understanding* and *positive regard*, *fairness* of the arrangements and *satisfaction* with them, and improvements of *relations*.
>
> ***H4.*** Long-term success and sustainability of mediation are initially influenced by intervening variables (circumstances) such as interim compliance with the agreement and meso- and macrosystemic contexts.

The distinction between circumstances and long-term effects could only be made logically-conceptually and thus hypothetically, since both were collected simultaneously. In the long term, the sustainability of mediation is influenced by (a) time and cost savings, (b) lasting contract compliance, (c)

fairness of settlements, (d) relationship improvement, (e) improved quality of life including stress reduction, (f) lasting satisfaction with the agreements, and (g) increase in conflict competence (Figure 1). We assumed complex interactions among these variables (Appendix A).

Figure 1

Hypothetical Model of Mediation Qualities (Kaiser et al., 2017, p. 333; adapted from Donabedian, 1966/1980; Herrman et al., 2006)



Method

Sample

The study sample consisted of parties suing/being sued for civil disputes of different nature (see Table 2) at the district court and the regional court in Kiel/Germany. In 397 cases, judicial mediation according to the Harvard Model (Fisher et al., 2015) was proposed to these parties as an alternative to litigation. If they agreed, the court proceedings were suspended. Parties and their attorneys, as well as mediators, completed our questionnaires in 303 cases from fall 2009 to fall 2011 (see Tables 1 and 2). The mediators were 25 judges trained according to the Harvard Model who had already conducted an average of 111 mediation proceedings. The parties or their lawyers could (de)select specific mediators. Randomization was therefore not possible.

Variables and Measurements

We surveyed at T1, parties, attorneys, and mediators about antecedent variables and structural qualities (see H2, Table 1, Figure 1; Kaiser et al., 2014, 2017) immediately prior to mediation. These included questions about personal and professional characteristics as well as *success criteria*, *wishes* and *fears* in connection with the mediation process, their *system context,* their *role* as plaintiff or defendant, as well as *characteristics* of *relationships* of the parties and their previous history. To assess items of *personality items*, the parties received a modified personality questionnaire to the Big Five model (Gerlitz & Schupp, 2005; McCrae & Costa, 1999). At T1, we also identified characteristics of *qualification* and *system context* of mediators and lawyers as well as *case characteristics* such as *content, length* of time, *dispute value*, *difficulty*, and *complexity* (see Table 2).

At T2, all parties were asked directly after the mediation regarding the process qualities and short-term outcome of the mediations (see Table 1, Figure 1), to what extent their *success criteria* and *wishes* regarding, among other things, *conduct of negotiations*, *understanding*, *abstinence*, and *all-partiality* were fulfilled, to what *conclusion* the process came, and how they rated it (*fairness, satisfaction, encouragement* etc.; see H2, H3).

At T3, parties and lawyers were asked again about long-term effects/sustainability one year after, how *fair* they found the arrangements made, how well they were *adhered* to, how their *relationships*, *well-being*, and *quality of life* developed, and how *satisfied* they were with their mediation arrangements negotiated. We also asked the parties how they rated their *competence* to deal with conflict and their *willingness* to mediate again after one year (see H4, Tables 1 and 2, Figure 1).

At the three survey time points, we used eight questionnaires with a 11-point Likert-type rating scales for closed-ended questions. See Appendix A for the measurement items used for each variable. See Appendix B for the variable correlations based on the conceptual relations laid out in Figure 1.

Data Analyses

Data processing and analyses was performed content-analytically and inferentially statistically using IBM's SPSS software (Statistical Package for the Social Sciences; see also Kaiser, 2018). Because psychosocial processes are usually not linear and act in a multivariate and systemic networked manner (see Bertalanffy, 1968; Kriz, 2018), all variables of the different subject groups and survey time points were related to each other in order to gain evidence for differences and correlations both between subject groups and between antecedent variables (T1), course and outcome variables (T2), and long-term variables (T3). The variables within the individual survey time points were also examined for constellations of characteristics at the same survey time point (e.g., between outcome justice and outcome satisfaction at T2 and T3, respectively; see Figure 1). For this purpose, we used the usual descriptive, and inferential statistical procedures such as Spearman and canonical correlation, simultaneous regression analysis, and exploratory varimax factor analysis, as well as Mann-Whitney-U test, and Kruskall-Wallis test.

For the 73 parties that participated in the survey at all three time points, we also conducted a time series analysis (see Table 12). Due to space limitations, only the highly significant correlations to the theory-based hypotheses formulated here are reported in this paper. More detailed information on the analysis is available from the first author (see Kaiser, 2018; Kaiser et al., 2014, 2017).

Results

In the following, we will first discuss the return rates at the three survey dates, the types of cases heard and their settlement rates, and the data on the conflicts as well as proceedings (Tables 1-2). We then present results about the conditions of the long-term effects (Tables 3-11)

Return Rates

With a few exceptions, we will only deal with the responses of the parties in the following. 329 parties participated at T1, 232 at T2, and 245 at T3, 73 at all three survey time points. Parties, lawyers, and mediators did not participate in all surveys in equal numbers and answered all questions completely (see Table 1). In the Appendix, we provide an overview of results from respondents that answered all questionnaires at least partially.

Table 1

Return Rates at the Different Survey Times

	Parties	Lawyers	Mediators
Questionnaires	1 142	1 142	571
Response rate T1	329 (28.8%)	276 (24.2%)	303 (53.1%)
Response rate T2	232 (20.3%/70.5%*)	244 (21.4 %/88.4%*)	276 (48.3%/91.1%*)
Response rate T3	45 (21.5%/74.4%*)	233 (20.4 % / 84.4%*)	--

Note. Values marked with * refer to figures at T1.

Characteristics of Conflicts

There were studied mediations of *civil* conflicts, especially family, contractual, and neighborly conflicts, that had already escalated to the point of leading to lawsuits in the courts with jurisdiction over them (see Table 2). In the majority of cases (84.3%), the amount in dispute was up to € 50,000 (M = 1.81; SD = 1.01; n = 233).

According to the mediators, the duration of the conflicts averaged three years (M = 3.02; SD = 3.62; n = 276). Thirty three percent lasted up to one year, 30% one to two years, 14% two to three years, 13% of conflicts three to five years, and 5% of conflicts lasted five to eight years and 5% eight years or longer.

The time spent on mediation was based on the number of sessions and the time required for them. Ninety two percent of proceedings were completed in one session according to mediators (M = 1.11; SD = 0.57; n = 270), and 91.7% of sessions lasted three hours or less (M = 2.84; SD = 1.39; n = 267).

Interestingly, no correlation was found between the number of sessions, and the amount in dispute, and the long-term success of mediation. However, as will be shown, correlations emerged between the *thoroughness* with which the process was conducted and the long-term qualities.

Table 2

Conflict Items and Settlement Rates in the Mediation

	Agreement		Total	
	n	%	*n*	%
Marital property dispute	23	92	23	92
Dispute about children	5	100	5	100
Inheritance dispute	17	89.5	19	100
Non-marital partnership	3	100	3	100
Building/architect contract	22	84.6	28	100
Company law	5	100	5	100
Lease contract	24	92.3	26	100
Loan	7	70	10	100
Service contract	14	93.3	15	100
Neighbor dispute	10	83.3	12	100
Donation	9	90	10	100
Rental agreement	38	80.9	10	100
Medical liability	2	100	2	100
Liability dispute	9	100	2	100
Consultant liability	1	60	2	100
Labor law	2	100	2	100
Accident	2	80	5	100
Illicit act	4	80	2	100
Total	188	87	216	100

Note. In 13% of the cases, no information was provided on the subject of the conflict, which mainly occurred when several problem areas were negotiated.

Agreement as Short-Term Outcome

According to the court offices, 376 (94.7%) of the 397 mediation proceedings initiated at the District Court and 130 (75.3%) of the 173 mediation proceedings initiated at the Local Court ended successfully with a notarized mediation agreement. The average agreement rate at both courts was 85%, according to the parties 91% (T2; n = 223; SD = 0.6). The agreement rates in the various conflict areas are shown in Table 2.

If the overall balance was positive, it was now necessary to clarify on what the long-term compliance with the agreements depended and how they performed in the long term (see Bastine, 2014; Donabedian,

1966/1980; Kaiser, 2018).

Long-Term Time and Cost Savings

The *success criterion time saving* was important for 60.7% of the parties before the mediation (degree of fulfillment 6-10 on the 10-point rating scale; *M* = 7.49; *SD* = 2.91; *n* = 281), for 36.1% maximally important. After one year, 73.2% of the parties stated that *the success criterion of saving time (no further consultation with a lawyer, no compulsory enforcement of the agreement etc.)* was still fulfilled for them after the conclusion of mediation (fulfillment levels 6-10 on the 10-point rating scale; *M = 7.19*; *SD* = 3.16; *n* = 217). The item *time savings* loaded *r* = .52** (*p* < .01; *n* = 227) on the factor *Justice* of the mediation in the varimax factor analysis conducted.

The success criterion time saving was fulfilled for the parties in the long run the more pronounced the *structural qualities emotional irritability, inclination to artistic, aesthetic experiences* and *openness and sociability*, low *conflict duration* as well as the fewer *years of practice* the mediators had behind them (moderate correlations; see Table 3).

Table 3

Conditions of Sustained Time Savings

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Emotional irritability	.39**	54	Lawyer preparation	.58**	59	Comprehensive solution	.45**	62	Stress reduction	78**	150
Imaginative	.37**	81	Support for settlement [1]	.57**	144	Causes eliminated[1]	.45**	141	Cost saving	.66**	147
Aesthetic inclination	.35*	57	Fair procedure	.38**	64	No court decision	.42*	58	Compliance	.57**	148
Openness sociability	.28*	59	Legal advice	.37**	59	Fair results	.42**	64	Encouragement	.55**	148
Conflict duration	-.27*	59	Contribution appreciated	.37**	58	Relationship improved	.34**	59	Long-term satisfaction	.50**	149

Notes. Spearman´s ρ correlations ordered by level; *$p < .05$, **$p < .01$. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

Process qualities that promoted long-term time savings were *good preparation for the mediation process by the lawyer* and *support for an amicable settlement* (higher correlation; see Table 3), a *fair procedure*, *legal advice* by the lawyer, and *that one's own contribution to the conflict settlement was appreciated* (moderate correlations).

Outcome qualities impacting sustained time savings were *a comprehensive and sustainable solution, elimination of root causes*, a *comprehensive resolution*, no desire for a *court decision*, a *fair results*, and an *improved relationship* (medium correlations).

Long-term effects that affected sustained time savings were *reduced stress*, *cost savings*, *compliance* with agreements, *encouragement,* and long-term *satisfaction* (higher correlations).

Similar correlations were found for *cost savings* (see Table 4). *The success criterion cost savings* was

important for 74.3% of the parties before mediation (fulfillment levels 6-10 on the 10-point rating scale; *M* = 7.00; *SD* = 3.06*; n* = 280), and maximally important for 38.8%. The *success criterion cost savings continued to be fulfilled* for 70.3% of the parties one year *after completion of mediation (no further costs due to foreclosure measures, etc.*; fulfillment; level 6-10 on the 10-point rating scale; *M* = 7.05; *SD* = 3.28; n =216). The cost savings item loaded *r* = .68** (p < .01; n = 227) on the factor Satisfaction with mediation in the varimax factor analysis conducted.

Table 4

Conditions of Sustained Cost Savings

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Aesthetic inclination	.48*	57	Contribution appreciated	.50**	58	Relationship clarified	.47**	58	Stress reduction	.69**	150
Affability	.29*	59	Understanding	.48*	57	Time saving	.42**	62	Time saving	.66**	147
Mediation years M.	-.29**	69	Confidentiality	.47**	59	Comprehensive solution	.40**	62	Encouragement	.59**	139
Shy inhibited	-.26*	81	Lawyer prepared	.40**	55	Fair results	.40**	63	Confidentiality	.57**	140
Imaginative	.35**	80	No court decision	.39**	57	Stress reduction	.39**	62	Long-term satisfaction	.56**	147

Notes. Spearman´s ρ correlations ordered by level; **p* < .05, ***p* < .01. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

The success criterion cost savings was fulfilled for the parties in the long term the more pronounced the *structural qualities* inclination to artistic, aesthetic experiences, and affability, as well as and the less shy and inhibited the parties were, and the fewer *years of practice the mediators* had behind them (moderate correlations; see Table 4).

Process qualities that promoted long-term cost savings were that the parties felt their *contribution to problem solving was appreciated* and *understanding* from the other party, that the *confidentiality was maintained by the participants*, they had *good preparation for the mediation process* by the lawyer, and not *seeking a court decision* (medium to moderate correlations).

Outcome qualities with implications for sustained cost savings were *clarification of the relationship*, that they had *time saved*, a *just outcome*, *stress reduction*, *encouragement*, and *satisfaction* with outcomes (moderate correlations).

Long-term effects that had an impact on sustainable cost savings were that the parties experienced *less stress* and *saved time*, felt *encouraged* and that *confidentiality* was maintained, and that they were permanently *satisfied* (higher correlations).

According to the parties, the important conditions for time and cost savings were mainly psychosocial reasons that are not judicable and whose criteria must therefore be sensitively determined by mediators.

Long-Term Fairness

As a *criterion for success*, a *fair outcome* was important to 73.2% of the parties before mediation (strengths 6-10 on the 10-point rating scale; *M* = 7.69; *SD* = 2.68*; n* = 291). After mediation, 52.4% (fulfillment

levels 6-10 on the 10-point rating scale; *M* = 5.70; *SD* = 3.09; *n* = 221), and after one year, 52.7% considered the *success criterion of fair outcome* to be fulfilled (fulfillment levels 6-10 on the 10-point rating scale; *M* = 5.54; *SD* = 3.15; *n* = 210). Forty seven percent considered the success criterion of fair outcome to be still *less* fulfilled directly after the mediation and one year later (fulfillment levels 0-4 on the 10-point rating scale). The item *fair long-term outcome* loaded *r* = .79** (*p* < .01; *n* = 227) on the factor general *Fairness* of process and outcome in the varimax factor analysis performed.

The more pronounced the *structural qualities* of *shyness and inhibition (an item of the personality factor emotional irritability)*, *inclination to artistic, aesthetic experien*ces (an item of the personality factor openness to experiences) and *emotional irritability* as personality items, and the better their *information state* were, the more the parties were able to *fulfill the success criterion of a fair outcome* in the long term (medium to moderate correlations; see Table 5).

Table 5

Conditions of Long-Term Fairness of the Mediation Agreement

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Shy inhibited	.52**	57	Relationship clarified	.56**	57	Comprehensive solution	.63**	61	Goals enforced	.75**	144
Aesthetic inclination	.37**	54	Understanding mediator	.52**	60	Outcome satisfaction	.57**	60	Long-term satisfaction	.64**	145
Information state	.37**	132	Fair procedure	.52**	62	Confidentiality	.56**	58	Contribution appreciated	.62**	139
Emotional Irritability	.36**	54	Understanding	.48*	56	Fair results	.56**	62	Comprehensive solution	.61**	143
			Perspectives clarified	.46**	59	Security from attacks	.55**	59	Stress reduction	.60**	145

Notes. Spearman´s ρ correlations ordered by level; **p* < .05, ***p* < .01. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

Within the framework of the *process qualities* long-term fairness was also greater the more the parties were able to *clarify their relationships,* and the *fairer* they found *the process*, the better they felt *understood by the mediator* and the *other side* and were able *to clarify how the parties perceived the individual aspects of the conflicts* (medium to moderate correlations).

Outcome qualities that promoted long-term fairness were *sustainable comprehensive solutions*, when the mediation *agreement satisfied* them, *confidentiality* was maintained, their success criterion of having *fair results* and they were *secure from attack of the other side* (higher to medium correlations).

In the *long run*, the parties found the mediation results all the more just the more they had *achieved their goals*, the more *satisfied* they were after one year *with the mediation agreement*, the more they felt that their *contribution to solving the problem was appreciated*, and the more *comprehensive and sustainable the solution* found was, the *fewer stressed* they felt by the conflict *(higher to medium correlations)*.

It can be concluded from the results that mediators should repeatedly check which criteria the parties have for fairness in all phases of the process, especially in the case of difficult parties and contexts. Accordingly, mediators should ensure that both parties benefit sufficiently (Win-Win principle; e.g., Fisher et al., 2015) and repeatedly review the agreements reached for their long-term suitability or even develop

concepts with the parties for implementing them as reliably as possible in the future.

Long-Term Contract Compliance

Sustained compliance can only be seen after a longer period of time. We therefore asked our subjects again after one year to what extent *the criteria for success continued to be fulfilled* for them *after the conclusion of the mediation and the other party* ... has so far *kept to the agreements made in the mediation*. According to the parties, the mediation agreements have been well observed in the long term in 75.8% of cases, too little in 19.1%, and not at all in only 5.1% of cases. The parties rated the degree of compliance with the contract by the other side on average with 7.49 (assessment on a 10-point scale at T3; $M = 7.49$; $SD = 3.19$; $n = 227$), the lawyers even with 8.23 out of 10 points ($M = 8.23$; $SD = 2.68$; $n = 198$). The item Contract compliance loaded $r = .52^{**}$ ($p < .01$; $n = 227$) on the factor (general mediation) *Satisfaction* in the varimax factor analysis performed. In 21.8% of the cases, claims had to be enforced. On the basis of the mediation agreement, the parties were then able to achieve compliance after all with the help of lawyers.

In accordance with our theoretical model of mediation qualities, we now wanted to know how these findings could be explained.

Structural qualities that promoted sustainable compliance with the agreements were, the more pronounced *qualities* in the form of personality items *aesthetic inclination* and *imaginative richness (both items of the personality factor openness for experience), the* less *incompatible* the parties were, and the better the *relationship* between the parties before the mediation were, and the more hours of professional *training* the mediator had (moderate correlations; see Table 6).

Process qualities that promoted sustainable compliance with the agreements were , the better the *relationship with the opposing counsel* and the *mediator* was, the better the *mediator showed understanding* and did *not push for an agreement*, the the more the parties have made concessions to reach an agreement (moderate correlations; see Table 6).

Outcome qualities that promoted better compliance with agreements were the conclusion of a mediation *agreement* , *satisfaction with results*, *improvement in relationships* and *encouragement*, and the better *confidentiality* was maintained (moderate correlations; see Table 6).

Long-term qualities that promoted better compliance with the agreements were, especially if the resolution of problems was *comprehensive and sustainable*, *stress* levels were reduced, the parties *saved time* and *money,* and were *satisfied* in the long term (higher to moderate correlations).

It is therefore advisable to make sure that the parties are questioned in detail as to what *criteria* they apply to lasting and correct compliance with the contract. Then it should be clarified in more detail what is important in the longer term in terms of the practicability of the arrangements. Particularly in more complex cases, mediation agreements would have to be drawn up in corresponding detail and more differentiated concepts for implementation would have to be developed that also provide for ways of dealing with new life constellations (see also Kelly, 2004).

Table 6

Conditions of Long-term Contract Compliance

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Aesthetic inclination	.43**	59	Relation opp. counsel	.33*	52	Agreement	.41**	62	Comprehensive solution	.64**	149
Incompatible	.42*	57	Concessions	.32**	64	Outcome satisfaction	.36**	61	Stress reduction	.64**	150
Imaginative richness	.36**	47	Mediator urged	-.32*	52	Relationship improved	.35**	59	Time saving	.57**	148
Relationship	.39*	35	Session hours	-.30**	62	Encouragement	.34**	58	Trust in the other party	.57**	129
Training hours	.36**	73	Relation mediator	.30*	53	Confidentiality	.34**	59	Long-term satisfaction	.52**	149

Notes. Spearman´s ρ correlations ordered by level; *p < .05, **p < .01. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

Long-Term Improvement of the Relationship

Depending on the nature of the conflict, for example, in the case of contractual disputes, the relationship was over once the mediation was completed and the arrangements implemented. In other cases, such as family, neighborhood, or rental disputes, the parties had to continue to get along.

Whereas before mediation 77.7% of the parties thought their *relationship with the first counterparty* was poor, after one year the relationship was bad at only 54.4% (levels 6-10 on the 10-point scale). Before mediation, 10.4% had rated their relationship as medium poor; after one year, 31% did so, i.e., three times as many (level 5 on the 10-point scale; M = 5.96; SD = 3.57; n = 178). At the same time, after one year, 29.7% of the parties indicated that their *desire for the relationship between the parties to improve* had been *fulfilled as a result of this mediation process* (levels 6-10 on the 10-point scale; M = 4.20; SD = 3.16; n = 192). The relationship improvement item loaded r = .71** on the *Understanding* factor in the varimax factor analysis conducted (p < .01; n = 227). There were clear improvements in the relationships between the parties, but also disillusionment; the negativity of the relationship decreased in a highly significant way during the course of the process and was still stable after one year (Wilcoxon test; from Z = 9 at T1 to Z = 5 at T3; p < .01; n = 149).

After one year (T3), the more the *structural qualities* of *roughness* and *belligerence* were pronounced as personality items in the parties and the longer the *relationship* with the other party had existed, the more *complex the case*, and the less *evidence difficulties* were, the better the parties' *relationship* (medium to moderate correlations; Table 7). Thus, parties with unfavorable personality traits and complex conflicts benefited most from mediation.

Table 7

Conditions of Sustained Relationship Improvement

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Roughness	.54**	53	Support for settlement[1]	.46**	50	Perspectives clarified[1]	.54**	138	Long-term Satisfaction	.43**	137
Belligerence	.28**	57	Less left to advocate[1]	.30**	136	Goals clarified[1]	.54**	138	Fair outcome	.38**	143
Length of relationship	.48**	45	Activity in mediation[1]	.26**	132	Conflict cause eliminated[1]	.50**	135	Conflict insight	.34**	127
Case complexity	.50**	50	Relation opp. counsel[1]	.24**	132	Autonomous resolution[1]	.37**	132	Conflict competence	.34**	127
Evidence difficulties	-.38**	45				Comprehensive solution[1]	.36**	136	Confidelity	.34**	132

*Notes. Spearman´s ρ correlations ordered by level; *p < .05, **p < .01. Statements about process and outcome qualities collected at T2 or at T31 are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.*

In the context of the *process quality* of the procedure, the relationship with the other side in long term improved the more the parties *were supported in reaching an amicable settlement*, the *less they left it to* their *advocate* and the more *actively they participated* in the negotiations, the better their *relationship* with the *opposing lawyer* was (both retrospective data for T3; moderate correlations).

The *outcome quality* of the agreement improved the relationship in the long term, the better the *perspectives*, views of the *individual aspects of the problem* and the *goals* and *concerns clarified*, the better the *background* to the conflict was *eliminated*, the better the parties felt able to *resolve the conflict independently* and the more *comprehensive and sustainable* this had turned out to be (retrospective information on T3; medium to moderate correlations).

As a result of the *sustainability* of mediation, the relationship between the parties improved the more *satisfactory* and *fair* they found the mediation outcome after one year, the more conflict insight they gained by better *understanding the conflict and themselves*, and the more they were able to improve their *conflict competence* the more *confidentiality* was maintained by the participants (moderate correlations). The information provided by the parties showed how important it was for them to discuss everything that affected them and to understand relationships and - even many non-judicable - problem backgrounds more precisely. Parties with unfavorable personality items, long relationship histories and complex unclear problems were apparently able to benefit particularly from the skillful approach of experienced mediators. In this way, they were able to clarify their concerns and goals more easily and eliminate causes of conflict. That the relationship with opposing counsel was important to some parties points to the benefit of lawyers in mediation paying attention not only to the relationship with their own clients, but also to improving the relationship with the other side and their own contribution to it. Mediators are called upon here to help lawyers accomplish this task. It was questionable whether these aspects also affected well-being and quality of life after one year.

Sustainable Improvement in Quality of Life

An important motivation for mediation is to reduce stress, improve well-being and quality of life. The Win-Win principle and the deterrent possibility of losing in a dispute play important roles here.

I am currently satisfied with my own quality of life, said 75.9% before mediation (*M* = 5.83*; SD* = 2.90; *n*= 295), 74.5% after mediation, and 82% of the parties one year later (levels 6-10 on the 10-point scale; *M* = 7.70; *SD* = 2.59; *n* = 210). The item long-term improvement in *quality of life* loaded *r* = .76** (*p* < .01; *n* = 227) on the factor *Satisfaction* with mediation in the varimax factor analysis performed.

Table 8

Quality of Life One Year After Mediation

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Shy inhibited	.60**	58	Compromise	.40**	60	Conflict insight	.34*	49	Well-being	.60**	139
Well-being	.44**	62	Understanding[1]	.34**	130	Goals clarified[1]	.34**	140	Encouragement	.48**	143
Openness to experience	.32**	39	Urge mediator	-.34*	48	Comprehensive solution[1]	.31**	140	Confidence in compliance	.40**	127
Length of relationship	-.32*	149	Support for settlement[1]	.32**	139	Well-being	.25*	60	Long-term satisfaction	.38**	143
Relation lawyer	.26**	126	Contribution appreciated	.27*	58	Perspectives clarified[1]	.28**	139	Cost saving	.37**	145

Notes. Spearman´s ρ correlations ordered by level; *p < .05, **p < .01. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

After one year, the parties rated their quality of life higher, the less pronounced *structural qualities* such as *shyness* and *inhibition* (an item of the personality factor emotional irritability) , the better their personal *well-being* before the start of mediation. And, the more *open* they were *to experience* (a Big Five personality trait), the shorter the *relationship* with the other side had lasted, and the better their *relationship* with their *lawyer* (higher to moderate correlations).

Process qualities that had a long-term impact on the parties' quality of life were *compromise in favor of agreement* and *understanding* of the other side, if the mediator *supported* the parties *in reaching an amicable settlement* rather than *pushing* them *to reach an agreement*, and if *the parties were* appreciated *of their contribution to the conflict settlement* (moderate correlations).

Outcome qualities that promoted quality of life over the year were when the parties better *understood the conflict and themselves* after mediation, when the *goals and concerns of the parties were clarified*, when a *comprehensive and sustainable solution* to the problems was achieved, and when it was *clear how the parties perceived the different aspects of the problems* and when they *felt well* (moderate correlations).

In terms of *long-term qualities*, the more *comfortable* and *encouraged* the parties felt after a year, the more *confident* they were, the more *satisfied* they were over the year, and the more *costs and time* they had *saved* (higher to moderate correlations).

The parties' well-being and quality of life benefited significantly from the *reduction in stress* caused by mediation: .73.2% of parties reported after one year that their *success criterion of experiencing less stress from the conflict* continued to be met for them (levels 6-10 on the 10-point scale; *M* = 6.68; *SD* = 3.10; *n* = 220). The item permanent stress reduction loaded *r* = .71** (*p* < .01; *n* = 227) on the *Peace* factor in the varimax factor analysis conducted.

The stress level decreased over the course of the year, the more as *structural qualities* the items belonging to the personality trait openness to experience of *aesthetic inclination, and imaginativeness*, and the less the items of the personality factor emotional irritability *inhibition* and *shyness* were pronounced, and the better the *quality of life* and the *relationship* with the own *lawyer* were (moderate correlations; see Table

9).

Table 9

Stress Reduction after One Year

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Aesthetic inclination	.45**	59	Advocacy preparation	.49**	60	Causes eliminated	.56**	59	Time saving	.76**	150
Imaginative	.35**	83	Relationships clarified	.48**	59	Encouragement	.47**	60	Cost saving	.69**	150
Shy inhibited	-.35**	84	Understanding	.42**	58	Comprehensive solution	.47**	63	Comprehensive solution	.67**	150
Quality of life	.29*	62	Consultation lawyer	.34**	60	Outcome Satisfaction	.41**	63	Encouragement	.66**	141
Relation lawyer	.24*	84	Perspectives clarified	.32*	61	Confidence in compliance	.40**	59	Compliance	.64**	150

Notes. Spearman´s ρ correlations ordered by level; *p < .05, **p < .01. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

Process qualities that contributed to sustained reductions in stress levels were *good preparation for the proceedings* and *advice on legal consideration* of the problems by the *lawyer*, that *clarified relationships* in the proceedings, and *understanding* of the other side, and *clarification of how the parties perceive the individual aspects* of the problems (moderate to moderate correlations).

Outcome qualities that contributed to sustained stress reduction were that the parties were able to *eliminate the causes of the conflict*, felt *encouraged* by the mediation, achieved *a comprehensive and sustainable resolution* of the problems, were *satisfied* with the mediation outcome, and *trusted in the compliance of the other party* (medium to moderate correlations).

Sustainability qualities that influenced the sustainable reduction of stress were *time* and *cost savings*, a *sustainable and comprehensive solution* to the problems, *encouragement* and *compliance* with the agreements (higher correlations).

The numerous psychosocial indicators that are significant for quality of life and stress reduction show how important it was to deal with such non-judicable aspects of the conflicts in mediation and what significance this had for the sustainability of mediation. Mediators would thus do well to pay sufficient attention to these "soft" factors.

Long-Term Satisfaction

If directly after the mediation (T2) 58.8% of the parties said, *the mediation agreement satisfies me* (levels 6-10 of the 10-point scale), 9.8% moderately (level 5), and 38.8% less to none (levels 0-4; M = 5.99; SD = 3.12; n = 214), one year later as many as 64.4% of the parties were satisfied (levels 6-10 of the 10-point scale; M = 6.43; SD = 3.20; n = 213), 12.2% moderately satisfied (level 5), and 23.5% less satisfied (levels 0-4). The item long-term satisfaction loaded r = .62** (p < .01; n = 227) on the factor (overall) *Satisfaction* in the varimax factor analysis performed.

The parties' long-term satisfaction was higher the more pronounced as *structural qualities* personal items of *aesthetic inclination* and *openness for experience*, and *consideration, kindness* (an item of the

personality factor compatibility) were. Long-term satisfaction was also greater the more s*upervision* and *training* the mediators had completed (medium to moderate correlations; see Table 10).

Table 10

Conditions on Long Term Satisfaction

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Aesthetic inclination	.56**	59	Goals clarified[1]	.58**	145	Cause eliminated[1]	.45**	141	Fair outcome	.64**	145
Supervision hours	.40**	51	Support for settlement[1]	.56**	145	Stress reduction	.42**	63	Comprehen-sive solution	.60**	148
Training hours	.34*	52	Contribution appreciated[1]	.56**	143	Cost saving	.41**	60	Goals enforced	.60**	148
Openness to experience	r = .34**	38	Perspectives clarified[1]	.44**	144	Time saving	.37**	65	Time saving	.50**	149
Considera-tion kindness	.26**	79	Understanding[1]	.50**	134	Fair results	.32**	64	Stress reduction	.59**	150

Notes. Spearman´s ρ correlations ordered by level; *$p < .05$, **$p < .01$. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

Process qualities that promoted long-term satisfaction were *clarification of the parties' goals and concerns*, *support in reaching a mutually agreeable settlement*, that the parties felt *appreciated in their contribution* to this, that they *felt understood*, and *clarification of how the parties perceived the individual aspects* of the problems (comments on T3; higher to moderate correlations).

Outcome qualities that promoted long-term satisfaction were *elimination of the causes* of conflict (T3), *reduction of stress* levels, *savings in costs* and *time*, and a *fair mediation agreement* (moderate correlations).

Qualities of sustainability that promoted long-term satisfaction were a *fair mediation agreement*, *comprehensive and sustainable solutions* to the problems, that the parties were able to *achieved* their *goals*, *saving time*, and *reducing stress* (higher correlations).

Since satisfaction depends on attitudes towards the conflict, mediation, and corresponding satisfaction criteria, it would be useful to determine more precisely how differentially these are formulated (see also Kaiser, 2009). Next, we examine how mediation experiences affect conflict competence and attitudes towards mediation.

Attitudes Towards Conflict Competence and Mediation

Since the parties were all involved in escalated conflicts that were already pending in court and were experienced correspondingly, it was of interest to examine to what extent they were able to improve their appraisal of their conflict competence (*learned to deal with conflict*) in connection with the mediation process.

Table 11

Conflict Competence after One Year

Structural qualities	ρ	*df*	Process qualities	ρ	*df*	Outcome qualities	ρ	*df*	Sustainability qualities	ρ	*df*
Openness sociability	.45**	54	Goals clarified[1]	.43**	131	Causes eliminated[1]	.40**	126	Conflict insight	.63**	128
Relation opp. counsel	.44**	38	Perspectives clarified[1]	.39**	130	Goals enforced[1]	.38**	131	Encouragement	.56**	125
Supervision hours	.40**	51	Backgrounds clarified[1]	.37**	127	Conflict competence	.33*	55	Understanding	.40**	124
Well-being	.37**	56	Support for settlement[1]	.33**	129	Comprehen-sive solution[1]	.29**	130	Stress reduction	.39**	133
Training hours	.34*	52				Relationships clarified[1]	.23*	129	Confidence in compliance	.39**	121

Notes. Spearman´s ρ correlations ordered by level; *p < .05, **p < .01. Statements about process and outcome qualities collected at T2 or at T3[1] are noted in the associated columns. Because of the large number of results, only the five highest correlations are listed in each column, indicating the importance of different qualities for mediation sustainability.

After one year, 32,4% of the parties reported that they now *understand the conflict and themselves better* (levels 6-10 of the 10-point scale); 21.3% reported moderate progress (level 5) in this regard, and 53.7% reported little progress (levels 0-4*;* M = 4.31; SD = 3.03 n = 188).

Apparently, insights into conflicts and one's own part in them did not increase sufficiently over the course of the year. A total of 39.7% of the parties stated, that *the mediation process had taught … to deal with conflicts better* and to be more competent (level 6-10 on the 10-point scale; M = 4.83; SD = 3.04; n = 192). 22.9% were only moderately competent (level 5) and 37.5% less competent (levels 0-4). After one year, 29.7% were confident, *that in similar cases they would be able to settle the conflict with the other party without outside help in the future* (level 6-10 on the 10-point scale), 15.8% were moderately confident (level 5), and 54,4% were less confident (levels 0-4; M = 3.96; SD = 3.13; n = 171). The item lasting improvement in conflict competence loaded r = .53** (p < .01; n = 227) on the factor lasting *Conditions for Success* in the varimax factor analysis conducted.

Thus, only a minority of the parties report a sufficient increase in conflict competence. Given the short duration of mediation – usually one session of two to three hours – the competence enhancement is possibly also attributable to having been experiencing the conflict for longer and the lawyer's support.

The desire for improvement in conflict competence was more likely to be fulfilled for the parties in the long term the more pronounced the antecedent *structural qualities* of *openness and sociability* (an item of the trait extraversion), unencumbered *relationship with opposing counsel, hours of supervision* and *training* by the mediators, and good *personal well-being* (T1) were (moderate correlations; see Table 11).

Process qualities that promoted long-term improvements in conflict competence were *clarification of what the parties' goals and concerns* were and *how they perceived each aspect of the problems* (perspectives), that the *background of the problems* was *clarified,* and that the parties *received support in reaching an amicable settlement* (stated at T3; moderate correlations).

Outcome qualities that promoted long-term improvements in conflict competence were that *causes of the conflicts* were *eliminated,* the parties were *able to assert their goals* and increase their *conflict competence* already after mediation, they reached a *comprehensive and sustainable solution* to the problems, and they were *able to clarify their relationships* (feedback at T3; moderate correlations).

Long-term qualities that promoted the sustainable increase in *conflict competence* were that after one

year the parties *understood the conflict and themselves* better, *felt encouraged by the mediation,* experienced *understanding* from the other side, were able to reduce their *stress levels,* and had *confidence in the other side's compliance* with the agreements (higher to moderate correlations).

Most important for competence development, then, was the development of understanding of the conflict and one's own part in it, as well as a motivational boost from the experience of encouragement through mediation. Self-reflection and motivation for competence have also been shown to be important prerequisites for competence development in therapy research (Bandura, 1977; Grawe, 2004; Norcross & Wampold, 2019).

After one year, 84% of the parties would be keen use mediation again in similar conflicts. 44% now even preferred *out-of-court mediation*, 40% to repeat court mediation, and only 16% preferred litigation (M = 2.33; SD = 0.88; n = 177).

Contrary to fears that judicial mediation would threaten to displace out-of-court mediation, it now seemed more advantageous to the parties to have conflicts professionally mediated at an *earlier stage* in order to *avoid escalation*. Thus, they benefited not only in the current individual conflict case, but also in terms of conflict competence and intention to mediate in the future.

Last but not least, the appendix shows a comprehensive correlation pattern from those participants who provide responses to most items in all three questionnaires. The included variables illustrate the hypothesized model of mediation qualities based on repeated measures of the crucial outcome variables. Therefore, they capture the intertemporal dynamics of the mediation process. While some of the previous results become insignificant, we observe fairly robust evidence of a relationship between key mediation quality factors and long-term outcomes in the subsample.

Discussion and Conclusion

In the course of our long-term study, we found a wealth of conditions for the long-term success of mediation processes, of which we could only present a small selection here.

Although the average settlement rate at T2 was 85%, the sustainability of the mediation effects at T3 was significantly lower in some cases: (a) 70% of the parties were able to save costs and 72.3% time in the long run. (b) Compliance with agreements succeeded in more than 75% of cases, but coercive measures were required in 21.8%. (c) Permanently fair agreements were reached by only 52.7% of the parties. (d) Although relations improved significantly over time, only 29.7% of the parties spoke of improvement after one year. This depended on the nature of the conflict and the type of relationship. (e) Improved quality of life was reported by 82% of parties after one year, and less stress by 73.2%. (f) Satisfaction with outcomes was reported by 64.4% after one year. (g) Increased conflict competence by 39.7% of the parties.

Overall, the sustainability of mediation was found to be influenced by an *interplay* of structural qualities, process qualities, outcome qualities, and long-term qualities, supporting the model depicted in Figure 1.

The following *structural qualities* proved to be particularly beneficial: *Personal traits* such as *informedness* about mediation, *openness* to experience, and *cooperativeness* were found to be the most beneficial. *Emotional irritability* and *incompatibility* had a negative effect. If necessary, mediators should take appropriate measures (see above).

Training, experience, and *supervision* of the mediators (micro level) as well as *suppor*t from the presidency and colleagues in the institutional system context (meso level) proved to be relevant to success. Here, presidiums and ministries of justice could become even more involved.

In the long term, *conflict characteristics* such as the *duration* and *complexity* of the problem were also relevant to success and may require more differentiated attention in practice. Contrary to expectations, the *value of the dispute* had little influence.

As expected, *process qualities* such as *understanding* and *appreciation*, good *communication* and *relationships* among all participants forwarded to the sustainability of mediation. Surprisingly, this also affected opposing counsel. Significant importance for long-term success also had *active participation* in the negotiations, maintaining *confidentiality, honesty*, and *sincerity*. Long-term success was also more likely when negotiations were *fair* and *satisfactory*, and *all aspects* of the problems and their *backgrounds*, as well as the *goals, concerns*, and *relationship* of the parties were thoroughly *clarified*. The *support of an all-party* mediator was important in this regard. The results support a *facilitative* mediation style.

We were surprised to find that the number of *hours* had little, and the number of *sessions* had no long-term effect. Needs-based appreciative negotiation can save a lot of time if the parties feel more accepted and therefore express less emotional resistance and concern.

Outcome qualities such as *fair, workable*, and *satisfactory agreements* supported the sustainability of mediation. Long-term qualities were beneficial when the parties *achieved their goals*, improved their *self and conflict insight* and *understanding, communication*, and *relationships* by having more *positive regard* for each other.

Long-term qualities increased the sustainability of mediation in that the parties were able to clarify their conflicts in a more nuanced way through *improved communication* and achieved more *self and conflict insight, understanding,* and *c* for each other. This seemed to help them *achieve their goal*s more easily and develop more *comprehensive and sustainable arrangements* that they found *fair, workable*, and *satisfying*. Such arrangements also appeared to be easier to honor in the long run. As a result, the parties were more likely to *save time* and *money* and to *reduce or avoid stress*. Such *encouraging* experiences made it easier for the parties to *improve* their often strained relationships and their *conflict competence* and *quality of life*.

In sum, according to the findings, there was thus considerable scope for optimizing the effects of mediation, which may not have been exploited because the conditions for success discussed above were not sufficiently met. Discussions with some mediators showed that they did not feel responsible for deeper sustainable conflict management. They saw this more as tasks for extrajudicial mediation or therapy, who, however, usually did not involve them of their own accord.

Overall, correlation patterns between variables illustrated, the theory-based model of mediation qualities based on repeated measures of the crucial long-term outcome variables (Figure 1). The correlations captured the intertemporal dynamics of the mediation process. Thus, we found fairly robust evidence of a relationship between key mediation quality factors and long-term outcomes.

The findings are largely consistent with those of other research on the individual questions (e.g., Donohue et al., 2016, Kelly, 2004; Kline-et al., 2004; Herrman et al., 2006; Bickerdike & Littlefield, 2010; Pruitt, 2011; Kalter et al., 2018; see above), psychology (see also Gigerenzer, 2019; Kaiser, 2009) and further with counseling and therapy research (e.g., Grawe, 2004; Wampold et al., 2018; Cowan et al., 2019; Norcross & Lambert, 2019). Due to methodological limitations, our findings remain hypothetical in nature.

Limitations

Informative value of our results is limited in several ways: Since only judicial mediation proceedings led by experienced judge-mediators were involved in our study, it is unclear to what extent the results are transferable to in areas of conflict other than civil law or extrajudicial proceedings with differently trained or less experienced mediators in other countries and cultures. However, since we primarily examined psychologically relevant aspects and mechanisms, we assume that a hypothetical transferability is possible.

What remains open is the significance of questionnaires not previously checked for test quality, missing responses, and dropout of subjects in the course of the study ("cohort mortality"). Some participated in only one or two surveys, not at all three measurement times. So mostly only group comparisons were possible. This may have led to selection bias (Hogan et al., 2004; Deng et al. 2013 ; Kalter et al., 2018). Only

73 parties participated at all 3 measurement time points, which were directly comparable. The intertemporal analysis of this subsample (see the appendix) faces statistical limitations due to limited statistical power and possible differences between respondents and nonrespondents on important characteristics. We consider it a rather conservative robustness check of the previous results.

The non-experimental character of the natural research design and the statistical correlations found allow - as emphasized at the beginning - only hypothetical conclusions on possible systemic interaction relationships.

Since the results confirmed all our theory-based hypotheses in a highly significant way, we assume that the confirmation would have been even more convincing if the above-mentioned limitations had been omitted. Future research should include further survey procedures and other possibly relevant variables. It could also focus on identifying exogenous variations in mediation processes that generate quasi-experiments which would allow for a cleaner identification of causal relationships. Thus, the open questions await further clarification in future studies.

Directions for Future Research

We still know too little about what actually happens before and in mediation processes and what effects result from them in the longer term. To this end, video and other recordings of the behavioral, emotional, cognitive, and psychophysiological responses of the individuals involved before, during, and after mediation, as well as in follow-up studies, would be useful (for example, Ekman, 2011; Gottman & Schwartz-Gottman, 2017; Jakob et al., 2013). For example, it would be necessary to investigate in more detail which neuropsychic schemata are triggered in the context of transference/countertransference processes and what *nonverbal* signals the participants show and whether and how sensitive the others and the mediator react to them (Hayes et al., 2019; König, 2010). Perceptual sensitivity and cognitive-emotional processing are significant here, as are physiological responses like blood pressure, sweat secretion, hormonal and cerebral processes (for example, Brunner, 2017; Ekman, 2011; Gottman & Schwartz-Gottman, 2017; Jakob et al., 2013; see above). This context would also be useful to include the psychosocial and medical *health status* and *history* of parties and mediators in the analysis. Some of our findings suggest that the importance of *personal* traits, as well as *social skills* of parties and mediators should be investigated in more detail.

In all fields of mediation activity, there would also be a need to study more intensively what *risks* and *side effects* or even *harms* result from mediation processes for the parties in the longer term (Johnston et al., 1985; Kelly, 2004; Kline-Pruett & Johnston, 2004; Linden & Strauss, 2018; Upcounsel, 2020).

On the mediator side, *person features* such as personality traits, professional competencies, as well as role perception and sustainability orientation would need to be examined more closely for their influences on long-term mediation outcomes. This would also make it easier to determine in which areas our training programs for mediators should be optimized and who is *suitable* for training as a mediator in the first place and who should not work as a mediator for certain combinations of characteristics in order to *protect the users*.

Implications for Practice and Training

Practice and training should also be adapted to unfavorable initial conditions such as difficult clients and more complex cases. Parties with unfavorable personal items and social competence deficits, for example, require special support from the mediator in order to compensate when they feel threatened by the other party and in order to work through mistrust and learn to engage and express themselves better (see also Heister, 1985; Kline-Pruett & Johnston, 2004). Mediators should therefore learn in their training to recognize such disadvantaged parties in good time and to provide targeted support to those affected - if

necessary in cooperation with social workers, doctors and psychologists.

In order to ensure long-term compliance with the agreement, especially in more complex cases, the mediation agreement should be drawn up in a differentiated manner and provided with detailed instructions for implementation (e.g., Kaiser, 2009; Kelly, 2004; Morris et al., 2018). In this context, it would also be useful to specify who monitors the progress of the implementation of the regulations, in what way, and when. Here, experts or auditing organizations can provide useful services, if necessary. Compliance with the agreements should be monitored in the context of *catamneses* and ensured through long-term *follow-up*. Both would also be relevant for the quality management of mediation.

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Appendix A
Variables and Measures

The following variables and measures were examined using our questionnaires (wording in questionnaire in italics; see also Figure 1; all questionnaires are available from the first author).

Structural Variables (T1)

As structural variables, we examined what entered the conflict and the subsequent mediation process as initial conditions. These included:
- Person variables of the parties involved: *age, gender* and *marital status, number of children*, personality variables of the parties (Big Five questionnaire by Gerlitz & Schupp, 2005; McCrae & Costa, 1999) with 4-5 items each on the personality traits neuroticism, emotional irritability, openness to new experiences, extraversion/introversion, conscientiousness, and agreeableness.
- Role as *plaintiff/defendant*, mediator, or advocate.
- Level of information, attitude, *reason for consent*, and *prior experience* of parties and attorneys *regarding mediation*.
- Quality of life: state of *quality of life* and *well-being*, *burden of relatives*, *stressed when others argue in my presence* (conflict anxiety)
- Mediator variables: Number *of hours completed in mediation training*, *supervision*, number of *years practicing as a judge* and *as a mediator*, and number of *mediations conducted*.
- Relationship variables: *Type* and *duration of relationship*, quality of *communication* and *relationship between*

parties, lawyers, and *mediators*.
- Conflict variables: *Type, duration*, and *complexity, legal difficulty*, and *amount in dispute of conflicts* as assessed by mediators
- System context variables: Burden of relatives, *support* of mediator *by colleagues and Presidium*

Process Variables (T2)

- Length of process: *Number of meetings* and *hours*
- Relationship variables: *Communication* and *relationship clarified* and *improved*, *understanding* and *appreciation*, *protected from attacks by other participants* in the process, *confidentiality maintained by all participants*
- Negotiation variables: *one-on-one meetings*, *more room for maneuver than in court proceedings, active participation*, *compromising, consideration of all significant issues, clarification, …how the parties involved perceive the individual aspects of the conflict, the importance and impact of the individual aspects of the conflicts for the parties involved, the goals and concerns of the parties to the conflict, that the parties are supported in reaching a mutually agreeable settlement, fairness of the proceedings*
- Mediator variables: *Understanding, appreciation, encouragement to reach a mutually agreeable settlement, genuineness, neutrality/all-partiality*, abstinence, that the *mediator does not legally judge the matter in dispute, urging*
- Advocacy variables: *Appreciation, preparation and help to legally assess the matter in dispute, urging.*

Outcome Variables (T2)

- Conclusion and quality of agreement: *Assertion of own goals, justice, comprehensive resolution of conflict, elimination of causes of conflict, background of problems clarified, satisfaction*
- *Time* and *cost savings*
- Relationship variables: *Communication* and *relations between the parties clarified* and improved, *positive contribution to the resolution of the problem appreciated, honesty and sincerity of all parties involved*, *protected from attacks by other parties to the proceedings*
- Quality of life: Encouragement, stress reduction, conflict anxiety, *burden of relatives, satisfaction with well-being* and *quality of life*
- Compliance: Assessment of one's own and the opponent's *compliance with the contract*
- Attitude towards mediation: *In case of similar conflicts in the future, I will seek a court decision/judicial mediation extrajudicial mediation*
- Conflict ability: Conflict insight, competence awareness

Variables of the Circumstances (T3)

- Compliance: Own and opponent's *contractual compliance*
- Security: *Protected from attacks by other parties to the proceedings*

Sustainability Variables (T3)

- Long-term quality of agreement: *Justice, comprehensive resolution of conflict (no relapse), elimination of causes of conflict, enforcement of my goals, background of problems clarified, satisfaction*

- Retrospective assessment of the conduct of negotiations: *Compromising, active participation, consideration of all essential issues, clarification, …how the parties involved perceive the individual aspects of the conflict, the goals and concerns of the conflict participants*
- Mediator variables in retrospect: *Impartiality, assisting the parties in reaching a mutually agreeable settlement.*
- *Time* and *cost savings (no need for lawyer to consult again, no need to force agreement to be enforced, etc.)*
- Relationship variables: *Communication* and *relationships between parties clarified* and *improved*, *positive contribution to resolution of problem appreciated*, *honesty and sincerity of all parties, protected from attacks by other parties to proceedings*
- Lasting quality of life: *Feeling of well-being, encouragement, less stress caused by the conflict,* fear of conflict, *burden of relatives*
- Lasting compliance: Assessment of own and adversary's *previous and future contractual compliance, agreements reached had to be enforced by force (reminder by lawyer, bailiff, penalty payment)*
- Attitude towards mediation: *In case of similar conflicts in the future I will seek a court decision/judicial mediation extrajudicial mediation*
- Conflict competence: Conflict insight, *understand the conflict and myself better,* competence awareness, *through the mediation process I have learned to deal with conflicts better.*

Appendix B
Intertemporal Correlations of Key Variables in the Subsample (df = 72)

	Time saving 3	Cost savings 3	Fair Outcome 3	Compliance	Relation.A better 3	Quality of life 3	Satisfaction	Stress Reduction 3	Confl. competence
df	71	68	70	70	62	65	71	70	58
Structural Qualities									
Emotional irritability	.12	.06	.06	.03	.20	-.05	-.09	.08	.05
Shyness, Inhibition	.17	.05	.34*	.18	.24	.01	.13	.13	.07
Imaginative	.07	.01	.01	.05	.11	.07	.04	.02	.15
Aesthetic inclination	.21	.18	.16	.19	.18	.12	.18	.16	.14
Openness Sociability	.14	.01	.11	.22	.30*	.08	.01	.22	.10
Roughness	-.10	.20	.26*	.29*	.40**	.27*	.26*	.21	.21
Belligerence	.02	.10	.22	.12	.06	.28*	.10	.16	.28
Relationship Attorney	.17	.13	.19	.18	.08	.24	-11	.24	.10
Quality of Life1	.20	.23	.16	.29*	.08	.01	.16	.23	.10
Duration of conflict	.12	.01	-.03	-.05	-.25	-.03	.17	-.08	.20
Complexity of Case	.01	.08	-.11	.11	-.01	-.01	-.07	.00	.09
Relationship1	.02	.18	.00	.18	.09	.05	.05	.09	.05
Mediation years	.24*	.32**	.14	.26*	.04	.04	.16	.22	.20
Training hours	.25*	.30*	.00	.36**	.03	.12	.18	.19	.10
Supervision hours	.19	.16	.01	.23	.05	.10	.12	.08	.20
Process Qualities									
Fair procedure	.17	.28*	.21	.21	.02	.16	.23	.20	-.13
Good information	.05	.05	.13	.13	.09	.10	.11	.01	.05
Encouragement	.07	.10	.07	.00	.22	.03	.01	.05	.18
Conflict competence	.09	.06	.16	-.13	.11	.13	.05	.07	.05
Preparation by lawyer	.03	.00	.04	.12	.03	.04	.10	.05	.03
Urging the mediator	.00	.01	.04	-.08	-.04	-.14	-.01	.02	-.26
Understanding Conflict	.04	.15	.22	.24	.28	.04	.20	.18	.12
Number of sessions	.00	.03	-.04	.06	-.21	.04	.17	.02	.10
Agreement	.04	.07	.20	.03	.07	.08	.10	.06	.16
All issues	.05	.06	.17	-.10	.01	.20	.01	.01	.30*
No court decision	.17	.43*	.17	.05	.12	.05	.15	.02	.23
Outcome Qualities									
Time saving 2	.06	.15	.11	.02	.12	.04	.12	.04	.10
Cost saving 2	.10	.26*	.18	.04	.03	.24	.14	.11	.22
Fair outcome 2	.11	.21	.31**	.13	.02	.05	.21	.24*	.21
Wellbeing	.02	.03	.00	.10	.03	.16	.00	.14	.00
Autonomous resolution	.12	.08	.26	.02	.01	.02	.01	.15	.00
Stress avoidance 2	.07	.14	.22	.03	.04	.00	.11	.04	-.05
Sustainability									
Time saving	1.00	.64**	.40**	.59**	.33**	.18	.42**	.78**	.19
Cost saving	.64**	1.00	.46**	.54**	.41**	.27*	.54**	.63**	.13
Long-term fairness	.40**	.46**	1.00	.36**	.49**	.25*	.61**	.49**	.16
Compliance	.59**	.54**	.36**	1.00	.32*	.32**	.57**	.70**	.12
Relationship better	.33**	.41**	.49**	.32*	1.00	.28*	.37**	.46**	.34*
Quality of life	.18	.27*	.25*	.32**	.28*	1.00	.35**	.26*	.30*
Well-being3	.42**	.43**	.35**	.57**	.27*	.51**	1.00	.48**	.12
Stress reduction	.78**	.63**	.49**	.70**	.46**	.26*	.56**	1.00	.32*
Conflict competence	.19	.13	.16	.12	.34*	.30*	.26*	.32*	1.00

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Your Cost or My Benefit? Effects of Concession Frames in Distributive Negotiations

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Abstract

Reaching agreement in distributive negotiations often requires making concessions, in which one side incurs a cost to provide a benefit to the other party. Although these two aspects, conceder-cost and receiver-benefit, coexist in any concession, past work has not disentangled the potentially differential effects of concessions framed as conceder-cost versus receiver-benefit on negotiation processes and outcomes. In this paper, we document that concession-givers use conceder-cost frames more frequently and expect them to be more believable than receiver-benefit frames. However, receivers of concessions that emphasize conceder-cost are more skeptical of this frame and perceive their counterpart to be more manipulative than receivers of concessions that emphasize benefit. These negative perceptions, in turn lead them to make lower counteroffers compared to receivers of concessions that emphasize benefit, which ultimately help their economic outcomes.

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Concessions, which are an integral component of any negotiation (Benton et al., 1972; Komorita & Esser, 1975), entail giving something up to benefit another party. For example, when selling a used car, the seller might want $5,000, while the buyer might only want to pay $4,000. To close the gap, the seller could reduce the price by $300—a concession that is both costly to the seller and beneficial to the buyer. In this paper, we ask: Would it affect the negotiation process and outcome if, when the seller reduced the price, they described it to the buyer as them incurring a $300 cost versus describing it as a $300 benefit to the buyer? And if yes, in what way and why?

In a distributive negotiation where one negotiator's gain is the other's equivalent loss, all concessions are, by definition, as costly to the conceder as they would be beneficial to the receiver[1]. However, in this research, we propose that concession-givers and concession-recipients utilize and respond differently to *concession frames* that emphasize conceder-cost versus receiver-benefit. We argue that concession givers are more likely to emphasize the costliness of their concessions when presenting a concession to their counterpart because they will be seen as more believable. However, in contrast to that expectation, we predict that concession-recipients view conceder-cost frames with more skepticism than receiver-benefit frames and thus reciprocate them less in return. Subsequently, receivers of concessions that emphasize cost obtain better economic outcomes compared to those of concessions that emphasize receiver-benefit.

The present research makes a number of contributions. First, we depart from prior research on concessions, which has largely focused on understanding the antecedents of concession-making and the impact of concession size (or magnitude) on negotiation outcomes (Carnevale & Lawler, 1986; Komorita, 1973; Kwon & Weingart, 2004). Instead, by exploring the impact of how equivalent concessions are described—as costly to the self or beneficial to one's counterpart—we add to the literature on framing effects in negotiations. Importantly, our effects also highlight the impact of language choices on interpersonal dynamics, as concession frames describe equivalent concessions, but from the vantage point of the concession-giver versus the concession-recipient. Finally, our research answers a growing call for more research on rhetorical strategies used in negotiations, as negotiations can be seen, fundamentally, as a phenomenon involving persuasion and influence.

Framing Effects in Negotiations

Framing effects have a long history in the literature on behavioral decision-making. Perhaps the most well-known research in this domain that has been extended to negotiations is prospect theory (Budescu & Weiss, 1987; Kahneman & Tversky, 1979). According to prospect theory, people make decisions based on a reference point, such that outcomes that are worse than the reference point are encoded as losses and those that are better than the reference point are encoded as gains. More importantly, losses are experienced more negatively than gains of equal magnitude, thus leading to a discrepancy in how aversive a potential loss is experienced, as compared to how alluring a potential gain of equivalent size is experienced. These effects have been replicated in the negotiations domain, such that negotiators whose outcomes are

[1] This research examines only the distributive negotiation context for two reasons. 1.To our knowledge, we are the first to explore concession frames in negotiation and as such, we wanted to start with the simple paradigm, 2. We base our theorizing on concession frames on the original framing literature, in which an objective statement is made in contrasting ways. A distributive negotiation allows us to be clear that a concession on part of the concession-maker, is indeed objectively equivalent to the benefit provided to the concession-recipient.

framed as losses focus more on their own outcome (De Dreu et al., 1992b) and concede less (De Dreu et al., 1994; De Dreu & McCusker 1997; Lim & Carnevale, 1995). That is, because "losses loom larger" than equivalent gains, negotiators focused on potential loss are more intractable and less likely to see the perspective of the other side.

In contrast to this prior work, which has focused on the effects of framing one's outcome as a loss or a gain, our work examines highlighting an interaction partner's gain versus one's own loss (De Dreu et al., 1992b; De Dreu et al., 1994; Lim & Carnevale, 1995). Put differently, by studying how equivalent concessions can be described in terms of its effects on the self versus the other, concession frames can be seen as a way individuals address interpersonal relationships through their discourse (as opposed to a purely cognitive phenomenon). Indeed, other work has shown the impact of language used during negotiations on behavior. For example, receivers of proposals framed as "requests" view them less favorably and are less willing to concede than receivers of equivalent proposals framed as "offers" (Majer et al., 2020; Trötschel et al., 2015).

The present research builds on this prior work on framing by focusing specifically on concessions and how the description of concessions of equivalent magnitude can influence the negotiation process. We take as our starting point that a concession has been made, and focus on the fact that it can be described in a way that emphasizes the costliness of the concession to the conceder or the benefit provided to the receiver of the concession.

In studying how concessions themselves are framed, we add to a growing literature documenting the profound effect of rhetorical strategies in negotiation. For example, the way in which offers are made (Ames & Mason, 2015; Bhatia & Gunia, 2018; Loschelder et al., 2014; Mason et al., 2013) or questions are asked (Bitterly & Schweitzer, 2018; Minson et al., 2018) have been shown to influence not just negotiators' economic outcomes but also the perceptions they form of each other. In a similar way, our work extends this recent interest in rhetorical strategies to studying how the rhetoric around concessions can impact negotiator perceptions and lead to divergent outcomes.

Differentiating Conceder-Cost and Receiver-Benefit

Though there are a multitude of frames negotiators can use to explain their concessions, we focus on conceder-cost and receiver-benefit, as they are inherent aspects of any negotiation. That is, any concession brings an inevitable cost to its giver but also a benefit to its receiver, as demonstrated in our opening car sale example. The question for us is: Which of these co-existing aspects of a concession will be responded to more positively? Although past work on negotiations is mute on this exact question, evidence from related domains suggest the receiver-benefit frame may be more effective in eliciting positive responses than those focusing on conceder-cost.

In a distributive negotiation, concessions help the other party because any concession negotiators make in this context is a direct benefit to the receiving party (and a direct cost to the granting party). We therefore draw from literature on helping behavior to develop our theorizing of how concession frames may impact perceptions and reactions to concessions. This line of work suggests that it is the perceived desire to help, rather than the perceived cost of helping that will be a larger driver of help recipients' responses. For example, people's likelihood of reciprocating help is based on their perception of the amount of help they have received (Batson & Powell, 2003; Gouldner, 1960). Similarly, social exchange (Kelley &Thibaut, 1978) and equity perspectives (Adams, 1965) predict that fairness exists when an individual's response to being helped is proportional to the amount of help they received. In addition, many economic models of altruism predict that reciprocity is determined by perceptions of a helper's kindness (Falk & Fischbacher, 1999; Rabin, 1993), defined as the amount of help beneficiaries received. In none of these perspectives is a help-recipient's response associated with the amount of cost incurred by the help-giver.

In perhaps the closest empirical examination of the question of how concession frames might be

perceived by the concession-recipient, Zhang and Epley (2009) find that help-givers' expectations of reciprocity are driven by their perceptions of how costly it was to provide the help, whereas help-receivers reciprocated to the extent that they perceived themselves to have benefitted from the help. Notably, for our purposes, this research shows that it is the amount of benefit experienced from the help, rather than the cost borne by the help-giver, that is a stronger predictor of how help-recipients (or, in our case, concession-recipients) respond. Taken together, the evidence from the helping literature indicates that benefit is a more likely driver of individuals' experience of and response to help than the cost incurred by the help-giver. We therefore predict that frames highlighting such benefit will have a more positive effect on reciprocity than concessions that emphasize the costliness to the conceder.

If this is true, then the next question is: why? In the following section, we argue that these effects are driven by the focus of negotiators on different information in the negotiation, which impacts their perceptions of the concession-givers' intentions in the negotiation.

Effects of Concession Frames on Perceptions of the Concession-Maker

Recall our car negotiation example, in which a concession of $300 has been made. When the buyer receives a $300 concession, the fact that they have received $300 of help is quite visible to them. Notably, whether the $300 concession is actually costly to the seller is not necessarily clear. That is, from a concession-recipient's point of view, the amount of benefit provided is immediately clear and available. The amount of cost borne by the other party, however, is opaque; is $300 a large sum for the seller or just a pittance used to make the concession seem like more of a big deal than it actually is? This example highlights a critical feature of any interpersonal interaction, but is particularly true in negotiations: there is inherent information asymmetry about one's own and the counterpart's position (Samuelson & Bazerman, 1984). That is, individuals always have more information about themselves than they do about others.

We argue that the concession frame leads concession recipients to differentially notice this inherent information asymmetry. As laid out in the preceding example, while recipients of a concession can easily assess whether and how much a concession benefits them, the actual costliness of the concession to the conceder is more opaque because most negotiators lack information regarding the overall resources available to the conceder. Thus, when concession-givers point to how the concession benefits the concession-recipient, this assertion is easily verifiable for them. Yet when concession-givers lament how costly the concession is for them to give up, this assertion is not easily verifiable for concession-recipients, thereby highlighting the information asymmetry inherent in negotiations. We therefore predict that concession frames emphasizing cost makes salient to the receiver the paucity of information available regarding the concession-giver's actual position. In contrast, receiver-benefit frames draw receivers' attention to their own position and knowledge of their own resources.

Evidence from the communication literature supports the prediction that language can shift attention and highlight information asymmetry. Specifically, work comparing communication that uses "I" versus "you" pronouns finds that the former focuses listeners on the speaker whereas the latter focuses listeners on themselves. Consequently, listeners respond to communication using "you" with more personal stories and examples, whereas they respond to "I" communication with more hypothetical examples (Cline & Johnson, 1976). This finding suggests that different messages lead listeners to focus on different information and is consistent with our contention that concession frames can make receivers more or less attentive to the information asymmetry inherent in a negotiation.

Noticing a lack of information about the counterparty could lead to skepticism, for example, in the forms of doubt or disbelief, toward a particular piece of information (Obermiller & Spangenberg, 1998). In this case, if recipients of a conceder-cost frame are skeptical about the actual costliness of a concession, they might wonder, "Is the concession *really* as costly as the other party is claiming it is?" We argue that concession

receivers' skepticism about the costliness of the concession will manifest as the perception that the use of this frame is strategic behavior intended to manipulate them. On the other hand, the receiver-benefit frame should not induce such skepticism because it does not lead concession-recipients to pay attention to the position of the concession-giver. Because the concession's benefit is readily observable to them, concession-recipients do not question the veracity of the frame, leading them to be less likely to perceive the frame as being used to manipulate them.

If what drives concession-recipient skepticism of a concession-cost frame is the salience of their lack of information about the true degree of costliness of the concession to the concession-giver, then the provision of such information should attenuate this effect. In determining whether a concession is indeed costly, concession-recipients must consider the overall pool of resources available to the conceder and the value of the concession relative to the overall pool. However, this information is often not known. For example, when a car seller presents a $300 concession as being very costly, the receiver typically does not know whether this concession represents a large or a small proportion of the conceder's resource pool. A concession of $300 might indeed be quite costly for a student who has little to no income. In contrast, that same concession might be a pittance to a professional who is gainfully employed. Because of the uncertainty regarding the true cost to the conceder, we predict that negotiators receiving concession frames emphasizing cost will view their counterparts as more manipulative than those using the receiver-benefit frame. However, we also predict that information about the overall pool of resources available to the conceder that confirms the costliness of the concession will eliminate such perceptions of manipulativeness.

Effects of Concession Frames on Negotiation Outcomes

Being perceived as being manipulative impacts how people behave in negotiation. Prior work indicates that perceptions that one's counterparty is manipulative can engender competitiveness in negotiation (Boles et al., 2000), leading to behaviors such as withholding concessions (Schurr & Ozanne, 1985) or not reciprocating them. Conversely, positive perceptions of the concession-maker lead to more cooperation in decision-making contexts (Barsade, 2002) and less contentious behaviors in negotiation (Carnevale & Isen, 1986). We expect, then, that receivers of concession frames emphasizing conceder-cost, as compared to those receiving concession frames emphasizing receiver-benefit, will perceive their counterparts as more manipulative, and will respond by reciprocating less in the negotiation. This reduction in reciprocal concessions, in turn, will increase individual economic outcomes for receivers of frames highlighting conceder-cost.

Overview of Research

Taken together, we expect concession frames emphasizing conceder-cost to be met with skepticism, manifested as an increase in perceptions of concession-giver manipulativeness compared to frames emphasizing receiver-benefit. Such perceptions of manipulativeness should decrease concession-recipients' reciprocal concessions, leading to higher individual economic outcomes for receivers of frames highlighting conceder-cost. Furthermore, we expect the provision of information about conceders' overall resources, presumably offering evidence of the costliness of the concession, should eliminate perceptions of manipulativeness associated with the cost frame. Figure 1 depicts this theoretical model.

We tested these predictions in five studies. In Study 1a, we explored the frequency by which negotiators spontaneously use conceder-cost or recipient-benefit frames. Study 1b examined how negotiators expect their partners will respond to different frames. In Study 2, we documented the effects of concession frames on economic outcomes. In our last two studies, we delved into the mechanism

responsible for negotiated outcomes to examine perceptions of manipulativeness and subsequent decreases in reciprocal concessions (Study 3a). We further showed evidence that receivers' perceptions of manipulativeness are driven by information asymmetry by providing information about conceders' resources (Study 3b).

Studies 1a and 1b

In these first two studies, we explored whether negotiators use conceder-cost and receiver-benefit frames without explicitly being prompted to do so, as well as what outcomes they expect from their frame use. To do so, in Study 1a, participants read about a negotiation situation and developed a concession strategy. We then coded their responses for frame use. In Study 1b, participants read about a negotiation where a concession was made using either a receiver-benefit or a conceder-cost frame. They then answered questions on how they thought a negotiation counterpart would respond to these frames.

Study 1a Method

Participants

One hundred and fifty participants from Prolific Academic, an online data collection website, were recruited for the study. Data from 151 participants (M_{age}=35.04, SD_{age}=13.16, 86, 49.3% women) were collected. Participants were paid $1.00 for their participation.

Procedure

The study contained only one, open-ended measure. Participants were told to imagine that they were selling some old furniture, as they were moving into a new apartment. One of these pieces of furniture was a three-seater sofa, which they had advertised online for $100. Participants were then told that they had received a $70 offer from an interested buyer. However, they (the seller) did not want to reduce the price so much. Participants were told to imagine that they had decided to respond to the potential buyer with a $10 concession, and in doing so, would also have to provide a justification to the buyer for the concession. Specifically, they read: "Please type out the email response you would send to the buyer, telling them that you can reduce the price by only $10 and explaining why."

Two coders then coded these responses for the type of explanation that participants provided when making their concession (coding procedure described below).

Results and Discussion

To code the responses, the following coding procedure was used. The two coders separately coded the entire response by each participant for the dominant argument used in the response. That is, if a participant expressed multiple arguments as part of the response, the most salient one was used for coding. Following this procedure, the coders compared their evaluations to assess interrater reliability, which was estimated to be α =.80. After this initial evaluation, the coders reconciled their differences to create a final set of codes. This analysis yielded seven distinct categories of explanations. These explanations focused on: Conceder-cost (39.3% of responses), the (good) condition of the negotiated item (20.7%), references to other interested buyers (10.0%), the fair price being asked (10.0%), receiver-benefit (4.7%). A sixth coding category was "no explanation given" where participants restated the concession amount without giving an explanation (13.3%) Finally, there were a few responses that did not fit any of these categories and were thus

categorized as "other." (2.0%). An example of a statement that would be coded as conceder-cost is, "Thank you for your interest in this item. The lowest I can go is $90. I bought this item for a lot more than 90 so I am taking a huge loss." An example of receiver-benefit is, "Hi there, thanks for your interest. To help you out, I can reduce the price to $90, but I can't go any lower than that at the moment."

As these results show, the dominant explanation for a concession included a discussion of the cost to the conceder. This was mentioned more than any other type of explanation, including referencing the positive qualities of the couch being sold or referring to the fairness of the pricing. In addition, although some participants did mention the benefit provided to concession-recipients, the proportion of people who did so spontaneously was quite small, suggesting that receiver-benefit frames are not as prevalent as conceder-cost frames.

Why is the conceder-cost frame so prevalent, especially relative to recipient-benefit? One possibility is that negotiators think that highlighting the costliness of the concession is more believable than highlighting its benefits to the recipient. We explore this possibility in Study 1b.

Study 1b Method

Our goal in this study was to gauge negotiators' expectations regarding their partners' perceptions of the concession as a result of concession frame use. The study had one manipulated variable: concession frame (conceder-cost vs. receiver-benefit) and we measured participants' perceptions of the concession explanation's believability and manipulativeness.

Participants

Data were collected from 150 participants on Prolific Academic (M_{age}=31.72, SD_{age}=10.91, 49.3% women), who were paid $1.00 for their participation.

Manipulated and Measured Variables

Concession Frame Manipulation. All participants read that they were selling their car online and that they were making a $1,000 concession from their initial asking price of $14,500 to an interested buyer. Then, participants in the conceder-cost condition read, "You think $1,000 is quite a concession and that you are taking a hit by reducing the price in this way. So, you say 'I will reduce the price but you should know that I am taking quite a hit by doing so. This is costly to me but I will reduce the price to $13,500.'" Participants in the receiver-benefit condition read, "You think $1,000 is quite a concession and that you are helping the buyer out by reducing the price in this way. So, you say 'I will reduce the price but you should know that I am trying to provide a benefit to you by doing so. To help you out, I will reduce the price to $13,500.'"

Predicted Perceptions of Believability. Concession believability was measured by asking participants to answer the following question: "You told the buyer that you are taking a hit (conceder-cost condition) [helping them out (receiver-benefit condition)]. How believable will the buyer think this statement to be?" (1=not at all believable, 7=very believable)

Predicted Perceptions of Manipulativeness. To examine predicted perceptions of manipulativeness, we asked participants the extent to which the buyer would view them as manipulative, misleading, disingenuous and deceitful (1=not at all, 7=very much, α=0.86).

Attention Check. We embedded a question that participants were prompted not to answer to check if they were paying attention.

Results and Discussion

Two participants failed the attention check question and were removed from further data analysis.

Predicted Perceptions of Believability

To test the effect of concession frame on participants' expectations regarding believability, we first coded the concession frame variable as receiver-benefit = -1, conceder-cost = 1. We then conducted a one-way Analysis of Variance (ANOVA) test with the concession frame variable as the independent and perceptions of believability as the dependent variable. Results indicated that participants expected the conceder-cost frame to be significantly more believable than the receiver-benefit frame, $M_{\text{conceder-cost}} = 4.17$, $SD_{\text{conceder-cost}} = 1.65$, $M_{\text{receiver-benefit}} = 3.17$, $SD_{\text{receiver-benefit}} = 1.60$, $F = 6.28$, $p = 0.01$, $d = 0.41$.

Predicted Perceptions of Manipulativeness

To see whether participants thought concession frame use would influence how manipulative their partners perceived them to be, we re-estimated the above ANOVA on perceptions of manipulativeness. Results were not significant, $F = 0.000$, $p = 1.00$.

Results of this study suggest that people expect the conceder-cost frame to be more believable than the receiver-benefit frame. Despite this difference, they do not appear to believe that these two frames will influence perceptions of manipulativeness differentially. Taken together, our initial two studies suggest that people are more likely to use conceder-cost than receiver-benefit frames in negotiations and that they think the cost frame is more believable than the receiver frame. In our next two studies, we test how these lay perceptions fare in actual negotiations.

Study 2

In Study 2, we explored the effect of concession frames on negotiation outcomes. We predicted that receivers of concession frames that emphasize conceder-cost will obtain better outcomes than those of frames that emphasize receiver-benefit. To test this prediction, we conducted an experiment with one manipulated variable: concession frame (conceder-cost vs. receiver-benefit), and observed the final outcomes of a distributive negotiation.

Method

Participants

One hundred and eighty-two participants with ages ranging from 19 to 56 ($M = 27.20$, $SD = 9.83$, 45.7% women) completed the study in the laboratory and received $10 for their participation. Participants were recruited from a general population research participant pool maintained by a mid-Atlantic university of individuals interested in participating in studies for pay.

Procedure

Participants completed the study in pairs. Once participants arrived at the laboratory, they were told that they would be negotiating over the sale of a biotechnology plant and that they would be randomly assigned to the role of either the buyer or the seller. They were then provided with their role materials (which, for sellers, included the manipulation materials, described below), taken into separate rooms, and given 15 minutes to prepare for their role.

A total of 91 negotiating dyads were randomly assigned to either the conceder-cost or receiver-benefit concession frame conditions. All negotiation sessions were audiotaped and transcribed for process analysis (described below). The negotiation task was adapted from the exercise Synertech-Dosagen (Greenhalgh, 1993) and included one distributive issue: the sale price of the plant[2]. This sale price constituted the economic outcome measure.

Manipulated and Measured Variables

We manipulated concession frames through an "Important Message for the Seller" and through participant coaching.

Concession Frame Manipulation. The manipulation was introduced as an "Important Message for the Seller." All sellers first read: "Concessions are reductions that a negotiator makes during the course of a negotiation. Most negotiations require that parties make at least some concessions. As part of your strategic planning for the negotiation, you should think carefully about how to present your concessions to the other party."

Sellers in the *conceder-cost* condition then read: "According to negotiation experts, **you should emphasize to the other party that your concessions have been *costly to you*.** Whenever you make a concession, **remind the other party *what you are giving up*** by agreeing to concede" (bolded and italicized words included in manipulation materials).

Sellers in the *receiver-benefit* condition read: "According to negotiation experts, **you should emphasize to the other party that your concessions have been *beneficial to them.*** Whenever you make a concession, **remind the other party *that you are helping them out*** by agreeing to concede."

Materials in both conditions also included some example phrases that sellers could use for their concession frames such as "OK, I will reduce the price but this really hurts me," or "I am trying to provide some benefit to you by reducing the price."[3]

In addition to these written materials, about halfway through the preparation session, sellers also received verbal instructions from the experimenter to increase the probability that the concession frame manipulation would be correctly implemented. Specifically, the experimenter asked participants if they knew

[2] We removed the compatible issue of workforce so that the scenario was purely distributive.

[3] We tested the realism of the conceder-cost versus receiver-benefit frames with a study conducted on Amazon Mturk with 80 participants (M_{age}=37.21, SD_{age}=12.61, 52.0% women). In this study, participants were told to imagine that they were negotiating over the sale price of a used car. After reading about the seller's concession (which included our manipulation of concession frame), they were asked, "The seller emphasized that he is taking a hit by reducing the price (conceder-cost condition [that he is trying to help you out by reducing the price (receiver-benefit condition). In your opinion, how likely is a negotiator to use this type of argument in face-to-face negotiations?" (1=Not at all likely, 7=Very likely). Results suggest participants found both frames likely to be used in negotiation as manifested by means above the midpoint of the scale ($M_{conceder\text{-}cost}$=5.68, $SD_{conceder\text{-}cost}$=1.49, $M_{receiver\text{-}benefit}$=5.16, $SD_{receiver\text{-}benefit}$=1.77) and also that the conceder-cost frame would be more likely to be used than the receiver-benefit frame, (F=3.97, p=.05). Interestingly, they also reported the cost frame to be less believable than the benefit frame, providing some initial evidence that the cost frame is seen as manipulative (F = 7.34, p < .01, $M_{conceder\text{-}cost}$ = 3.83, $SD_{conceder\text{-}cost}$ = 1.86, $M_{receiver\text{-}benefit}$ = 4.62, $SD_{receiver\text{-}benefit}$ = 1.76).

what a concession is, and then gave them a standard definition regardless of whether they answered yes or no. Then, the experimenter told them that the purpose of the study is to discover the best strategy to use when talking about one's concessions in a negotiation, and asked them to, every time they made a concession, emphasize how costly it had been to them (conceder-cost condition) or how beneficial it had been to the counterpart (receiver-benefit condition). The experimenter then pointed out the sample phrases provided in the manipulation materials as examples of how participants could implement this strategy. Following these instructions by the experimenter, participants were asked whether they would be willing to use the mentioned strategy. All participants agreed to use concession frames and also practiced how to do so with the experimenter using the sample phrases described above.

Participants in the buyer role did not receive additional instructions beyond those provided about their role. After preparing their respective roles, the dyads were then brought back into the same room and negotiated for the sale price of the plant.

Concession Magnitude. To measure the extent to which buyers (the receiver of the concession) conceded in total, we used the transcribed audiotapes to document their first offers and the final settlement price for the negotiation. We subtracted buyers' first offer from the final settlement price to use as our measure of overall concession magnitude. Thus, this measure indicates the total amount of concessions that recipients of the frames made over the course of the entire negotiation. For example, if a buyer first offered $11 million for the plant, and the final sale price was $15 million, our measure of $15 million – $11 million (yielding $4 million) captured the magnitude of all concessions made over the course of the negotiation by the buyer.

Economic Outcome. Economic outcome was measured as the final sale price for the plant.

Results and Discussion

It should be noted that all studies reported in this paper from this point forward examine the effects of concession frames on concession receivers. Therefore, the analyses and results are from the perspective of the receiver of the concession, which are, in this study, the negotiators in the role of the buyer. Means, standard deviations, and zero-order correlations of variables used in the main analysis are reported in Table 1.

Preliminary Analyses

Manipulation Check. To ensure that the sellers actually implemented the manipulation, a research assistant transcribed all audiotapes of the negotiations. The first author then identified every instance of concession frame use in the negotiation. That is, we checked both that a frame was used and that the correct frame, according to assigned condition, was used.

Eight sessions in which frames were never used were excluded from further analyses. In addition, two dyads went off the negotiation script by including issues that were not a part of the negotiation[4]. Thus, ten dyads were dropped from our sample and we conducted our main analyses on the remaining 81. Exclusion did not differ by condition, $N_{\text{conceder-cost}} = 6.00$, $N_{\text{receiver-benefit}} = 4.00$, $F < 1$.

Seller First Offers. We first checked to make sure the concession frame did not influence first offers set by sellers, that is, the conceders in the study. It is plausible that sellers that received instructions to

[4] Including these two dyads in the analyses does not influence any of the results.

emphasize the costliness of their concessions might start off with higher first offers to make up for the losses to be incurred by conceding, as compared to sellers that received instructions to emphasize benefit. To test this possibility, we used the transcriptions to record the first offers made by the sellers. We conducted an Analysis of Variance (ANOVA) with the concession frame as the independent variable and sellers' first offers as the dependent variable. Results showed that sellers' first offer did not differ by condition, $M_{\text{conceder-cost}}$ = 28.41, $SD_{\text{conceder-cost}}$ = 10.45, $M_{\text{receiver-benefit}}$ = 27.33, $SD_{\text{receiver-benefit}}$ = 6.07, F = .45, p = 0.51. Means are reported in units of millions of dollars.

Table 1

Means, Standard Deviations, and Zero-Order Correlations of Variables in Study 2

Variable	*M*	*SD*	Concession frame	Concession magnitude	Economic outcome
Concession frame	0.07	0.86	_		
Concession magnitude	2.32	2.28	- .30*	_	
Economic outcome	22.27	3.32	- .24*	.30**	_

Note: N = 81. Concession frame is coded as receiver-benefit = -1, conceder-cost = 1.
* $p < 0.05$, ** $p < 0.01$.

Main Analyses

Concession Magnitude. We predicted that negotiators who received concessions (i.e., buyers in this study) emphasizing conceder-cost would concede less in return over the course of the negotiation, compared to those who received concessions emphasizing receiver-benefit. To test this hypothesis, we conducted an ANOVA with concession frame as the independent variable and the magnitude of receivers' concessions as the dependent variable. Results indicated that receivers of frames emphasizing conceder-cost made significantly smaller concessions in the negotiation as compared to receivers of frames emphasizing receiver-benefit ($M_{\text{conceder-cost}}$ = 1.68, $SD_{\text{conceder-cost}}$ = 2.00, $M_{\text{receiver-benefit}}$ = 3.06, $SD_{\text{receiver-benefit}}$ = 2.39), F (1, 68) = 6.55, p = 0.01, d = 0.63[5].

Economic Outcome. We predicted that negotiators who received concession frames emphasizing conceder-cost would obtain higher economic outcomes compared to those who received frames emphasizing receiver-benefit. To test this hypothesis, we re-estimated the above ANOVA with economic outcome, that is, the sale price, as the dependent variable. As predicted, we found that recipients (i.e., the buyers) of the conceder-cost frame paid significantly less for the plant, and thus obtained significantly better economic outcomes (M = 21.48, SD = 3.35), compared to those of the receiver-benefit frame (M = 23.07, SD =

[5] Including sellers' first offer as a covariate in this analysis did not influence significance of the results, p = 0.02.

3.18), F (1, 79) = 4.79, p = 0.03, d = .49[6].

In line with our predictions, Study 2 showed that receivers of concessions that emphasize the costliness of the concession concede less in return and thus obtain better economic outcomes than receivers of concessions that emphasize benefits to the recipient in a face-to-face negotiation. In our next two studies, we investigate the mechanism behind this effect.

Studies 3a and 3b

Our overall theoretical argument is that receivers of concessions that emphasize conceder-cost will be less likely to believe the frame and thus view their counterparts as more manipulative than receivers of the benefit frame. These negative perceptions will in turn lead them to reduce the size of their reciprocal concessions. We further theorize that the provision of information verifying the costliness of the concession will eliminate concession-recipients' skepticism towards the conceder-cost frame.

We tested these predictions in Studies 3a and 3b. In Study 3a, we manipulated the frame given for a concession and measured its effects on concession-recipients' perceptions of the concession-giver's manipulativeness. We also included a control condition to measure concession-recipients' baseline perceptions of concession behavior. In Study 3b, we used a moderation-of-process design (Spencer et al., 2005) to test the prediction that the provision of more information about the conceder's resources reduces the uncertainty about the costliness of the concession, thereby eliminating the skepticism that a conceder-cost frame might normally elicit. Specifically, if a conceder is known to have high resources, their claim of costliness will be rightfully viewed with disbelief. However, if the conceder is known to have low resources, their claim of costliness should be believed, thereby attenuating the negative perceptions that lead to lower reciprocal concessions. Thus, information verifying the costliness of a concession to the conceder should eliminate perceptions of manipulativeness associated with the conceder-cost frame. Furthermore, as a robustness check of our previous results, we again tested the relationship between concession frames, perceptions of manipulativeness, and counteroffers.

Study 3a Method

We conducted an experiment with one manipulated variable: concession frame (conceder-cost vs. receiver-benefit vs control), and measured its impact on concession-recipients' perceptions of the concession-givers' manipulativeness and recipients' concession behavior.

Participants

We recruited 300 participants on Prolific Academic and collected data from 302 participants with ages ranging from 18 to 75 (M = 31.08, SD = 10.86, 48.0% women). They were paid $0.85 for their participation.

Manipulated and Measured Variables

All participants were asked to imagine that they wanted to buy a used car online, and that they had narrowed their search to a particular car with an asking price of $14,500. They were told that they had exchanged emails with the seller and were now meeting to negotiate in person.

Concession Frame Manipulation. Our manipulation was embedded as an audio file of the seller's

[6] Including the buyers' first offer as a covariate did not influence significance of the results, p = 0.01.

first offer. We chose to deliver the manipulation via audio to control for differences in how participants might imagine the expression of the concession in terms of tone of voice and gender of the speaker. The seller was a male speaking in standard American English.

Participants in the conceder-cost condition heard the seller say: "OK, I can take a hit here. I can reduce the price to $13,500. I am willing to take a hit by going down to $13,500." Participants in the receiver-benefit condition heard: "OK, I can help you out here. I can reduce the price to $13,500. I am willing to help you by going down to $13,500." Participants in the *control* condition heard: "OK, I prefer not to spend a lot of time on this. I can reduce the price to $13,500. I am willing to go down to $13,500." We added the portion about time to make sure our control condition was comparable to the experimental conditions in terms of length and in terms of containing more than just the numerical offer.

Perceptions of Manipulativeness. We measured participants' perceptions of how manipulative the conceder was by asking them to indicate the extent to which they thought the seller's behavior was disingenuous, deceitful, manipulative, and misleading (1 = Not at all, 7 = Very much, α = .94).

Counteroffer. Participants were asked to provide a counteroffer to the seller.

Manipulation Check. At the end of the study, participants were asked to respond to a multiple-choice question that asked them to indicate what the seller had said in the audio.

Results and Discussion

Means, standard deviations, and zero-order correlations of variables used in the analysis are reported in Table 2.

Table 2

Means, Standard Deviations, and Zero-Order Correlations of Variables in Study 3a

Variable	*M*	*SD*	Concession frame	Perceptions of manipulativeness	Counteroffer
Concession frame	0.01	0.82	_		
Perceptions of manipulativeness	2.84	1.44	.14*	_	
Counteroffer	13,082.74	400.14	.02	-.26**	_

Note: N = 294. Concession frame is coded as receiver-benefit = 1, control = 0, conceder-cost = 1. * $p < 0.05$, ** $p < 0.01$.

Preliminary Analysis

Manipulation Check. Eight participants failed the manipulation check question and were excluded from further analysis, leaving us with a total of 294 participants. Exclusion did not differ by condition, $N_{\text{conceder-cost}} = 1.00$, $N_{\text{control}} = 4.00$, $N_{\text{receiver-benefit}} = 3.00$, $F(2, 299) = 0.50$, $p = 0.61$.

Main Analyses

Counteroffer. To test the effects of concession frames on the counteroffer, we conducted a one-

way ANOVA with concession frame as the independent variable and counteroffer as the dependent variable. Surprisingly, this analysis did not yield a significant result, F (2, 294) = 0.04, p = 0.96 (Means and standard deviations are reported in Table 3 below).

Perceptions of Manipulativeness. To test our prediction about perceived manipulativeness, we computed the above ANOVA on this variable again, which yielded a significant effect, F (2, 294) = 5.96, p = 0.003. Planned contrast tests revealed that participants in the conceder-cost condition perceived their counterparts to be more manipulative than those in the receiver benefit, t = 2.33, p = 0.02, d = 0.32 and control conditions, t = -3.37, p = 0.001, d = 0.47. However, there was no difference between the receiver-benefit and control conditions in terms of how manipulative the counterpart was seen, t = 1.03, p = 0.30 (Means and standard deviations are reported in Table 3 below.)

Table 3

Main Effects as a Function of Concession Frame in Study 3a

Main effects between subjects	*Receiver-benefit*	*Control*	Conceder-cost
	Mean (SD)	*Mean (SD)*	*Mean (SD)*
Counteroffer	13,077.06 (438.01)[a]	13,079.38 (385.06)[a]	13,091.50 (379.40)[a]
Perceptions of manipulativeness	2.75 (1.31)[a]	2.54 (1.30)[a]	3.22 (1.61)[b]

Note: N = 294. Different letters within the same row indicate significant differences at $p < .05$.

Mediation Analysis[7]. We predicted that receivers of concession frames emphasizing conceder-cost would view their counterparts as more manipulative and would subsequently make lower counteroffers compared to receivers of concession frames emphasizing receiver-benefit. We were agnostic as to whether this mechanism would occur in the control condition. This prediction amounts to a mediation model where the relationship between the concession frame and the counteroffer is mediated by perceptions of manipulativeness in the two concession frame conditions.

Because the independent variable has three levels, we followed the recommendations of Hayes and Preacher (2014) for testing mediation models with multi-categorical independent variables. We used PROCESS V3.1 by Hayes (2018) to conduct the analysis, which allows for a number of different ways in which the three conditions can be coded. As our main interest is comparing the conceder-cost condition to receiver-benefit and control conditions separately, we used unweighted effects coding and created two dummy variables. The comparison between the conceder-cost and control conditions was represented by X_1 and that between conceder-cost and receiver-benefit was represented by X_2. In order to test the possible indirect effect of perceptions of manipulativeness on the relationship between concession frame and the

[7] There is growing consensus among statisticians that a main effect is not a necessary condition to test for mediation (Hayes, 2009; Shrout & Bolger, 2002). In addition, our theorizing suggests that a decrease in counteroffers occurs only through perceptions of manipulativeness, implying that statistically a main effect does not need to be present.

counteroffer, we used 10,000 bootstrapped resamples. In this analysis, significant mediation is present if the 95% confidence intervals do not include zero.

Results indicated that the relative indirect effect for the first contrast comparing the *conceder-cost* to the *control* condition was significant [95% CI: 05.07, 44.59] as was the second contrast comparing the *conceder-cost* and *receiver-benefit* conditions [95% CI: -55.94, -08.52]. Thus, the difference in concession magnitude between those in the *conceder-cost* and *receiver-benefit* conditions appears to be driven by the perceptions of their counterpart as being manipulative. Figure 2 depicts this mediation model.

Study 3b

In this study, we manipulated perceptions of the concession-maker's resources by providing information about his/her profession. We pretested the viability of manipulating seller profession as a proxy for resources by asking 75 participants from Mturk (M_{age}=33.21, SD_{age}=11.32, 56% female) to indicate whether they thought a doctor or a graduate student, on average, has more money, more financial resources, and whether a doctor or graduate student, on average, is richer. 100.0% of participants indicated that a doctor has more money and is richer than a graduate student. 92.2% indicated that a doctor, on average, has more financial resources than a graduate student. We therefore use profession as a way to manipulate beliefs about the seller's resources.

If, as we predict, concession frames impact concession-giving behavior via perceptions of manipulativeness resulting from skepticism regarding the conceder's true position, information that verifies that the concession is indeed costly (e.g., when the seller is a graduate student) should attenuate the negative impact of a conceder-cost frame. To test these predictions, we conducted an experiment with a 2 (concession frame: conceder-cost vs. receiver-benefit) x 2 (conceder resources: high vs. low) design.

Method

Participants. We advertised the study for 400 participants on Prolific Academic and collected data from 403 participants (M_{age}= 33.33, SD_{age} = 11.68, 38% women). Participants were paid $0.85 for their participation.

Procedure. The procedure was identical to Study 3a with three exceptions: 1. We manipulated the profession of the negotiator making the concession, using profession as a proxy for conceder resources (described below), 2. We did not include a control condition, as our main focus was the comparison between the conceder-cost and receiver-benefit frames, and 3. We included an additional manipulation check question for our conceder resources variable.

Manipulated and Measured Variables.

Concession Frame, Perceptions of Manipulativeness and Counteroffer. These variables were manipulated or measured in the same way as in Study 3a.

Conceder Resources. Our manipulation of the conceder's resources was embedded into a description of the email exchanges about the car. Participants in the High Resources condition read: "During this exchange, you also find out that the seller is a doctor." Participants in the Low Resources condition read: "During this exchange, you also find out that the seller is a graduate student."

Conceder Resources Manipulation Check. We asked participants to indicate the profession of the seller in an open-ended format.

Results and Discussion

Means, standard deviations, and zero-order correlations of variables used in the analysis are reported in Table 4.

Preliminary Analysis.

Manipulation Check. Fourteen participants failed the concession frame manipulation check question. Thirty participants failed the conceder resources manipulation check question. Six of these participants failed both manipulation check questions, leading to 38 unique participants that failed one or both questions. We excluded these participants from further analysis, leaving us with a sample of 365. Exclusion did not differ by the concession frame, $N_{\text{conceder-cost}}$ = 12.00, $N_{\text{receiver-benefit}}$ = 2.00, p = *0.*35 or conceder resources conditions, $N_{\text{high-resources}}$ = 20.00, $N_{\text{low-resources}}$=10.00, p = *0.*70.

Main Analyses.

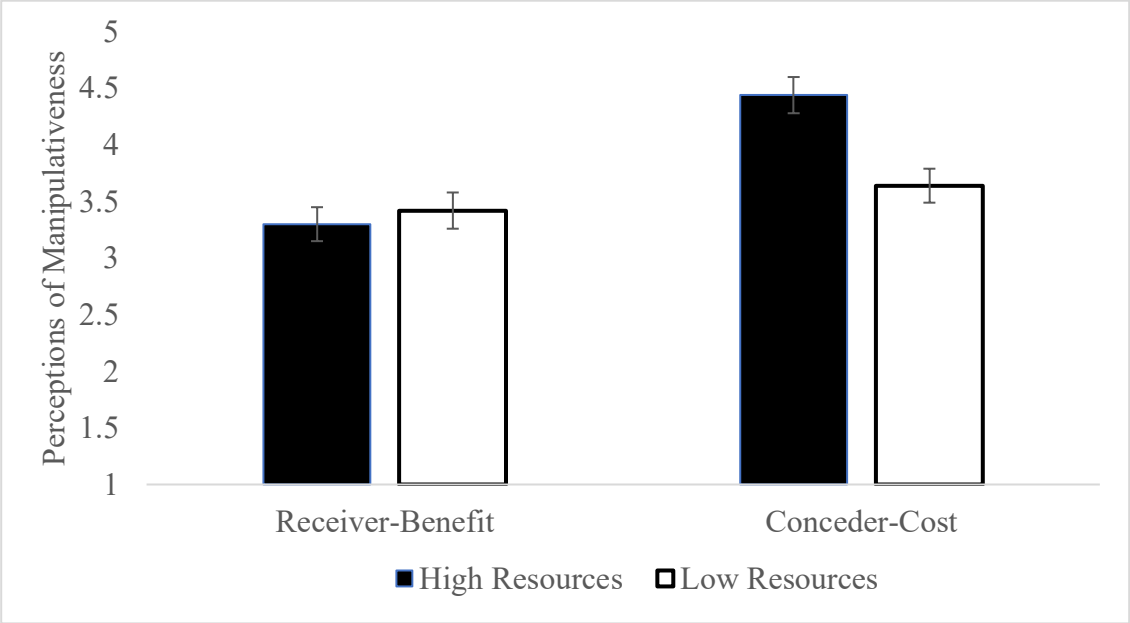
Counteroffer. To test the effects of our manipulations on the counteroffer, we conducted a two-way ANOVA with the concession frame and conceder resources conditions as the independent variables and the counteroffer as the dependent variable. Results indicated only a marginal effect of the conceder resources variable, F (1, 361) = 2.84, p = *0.*09, d = 0.18, such that participants, in the role of buyers, made more generous counteroffers to the negotiator with low resources, $M_{low\ resources}$ = 13,109.72, $SD_{low\ resources}$ = 441.37; $M_{high\ resources}$ = 13,026.24, $SD_{high\ resources}$ = 495.74.

Perceptions of Manipulativeness. We predicted that once concession-receivers have information about the resources available to the concession-giver, they would no longer be skeptical of the conceder-cost argument and thus would not view a negotiator using this frame as being more manipulative than one using a receiver-benefit frame. In this study, this prediction means there should be no difference between the conceder-cost and receiver-benefit conditions on perceptions of manipulativeness in the low resources condition. However, in the high resources condition, conceder-cost frames should increase perceptions of manipulativeness relative to receiver-benefit frames. Statistically, this prediction amounts to an interaction between the concession frame and conceder resources variables on perceptions of manipulativeness.

To test this interaction, we re-computed the above ANOVA on our perceptions of manipulativeness variable. This test yielded two significant main effects and an interaction. First, in a replication of the finding from Study 3a, we observed that receivers of concessions emphasizing cost viewed their counterparts as more manipulative ($M_{\text{conceder-cost}}$ = 4.04, $SD_{\text{conceder-cost}}$ = 1.49) than those that received concessions emphasizing benefit ($M_{\text{receiver-benefit}}$ = 3.35, $SD_{\text{receiver-benefit}}$ = 1.53), F (1, 361) = 19.16, p < .0001, d = 0.46. Though unanticipated, consistent with prior work on social class (Piff et al., 2012), participants also viewed the conceder with the high resources ($M_{high\ resources}$= 3.86, $SD_{high\ resources}$ = 1.82) to be more manipulative than the one with the low resources ($M_{low\ resources}$= 3.53, $SD_{low\ resources}$ = 1.45), F (1, 361) = 4.83, p = *0.*03, d = 0.22. More importantly, the interaction between these two variables was also significant, F (1, 361) = 8.73, p = *0.*003. Simple effects tests to decompose this interaction showed that in the high resources condition, conceder-cost frames elicited significantly higher perceptions of manipulativeness than receiver-benefit frames, $M_{\text{conceder-cost}}$ = 4.44, $SD_{\text{conceder-cost}}$ = 1.49, $M_{\text{receiver-benefit}}$ = 3.64, $SD_{\text{receiver-benefit}}$ = 1.48), F (1, 361) = 27.24, p < .0001, d = 0.54. However, in the low resources condition, this difference disappeared, F (1, 361) = 0.10, p = *0.*36. Figure 3 depicts this interaction.

Figure 3

Interaction Between the Concession Frame and Conceder Resources Variables on Perceptions of Manipulativeness in Study 3b



Note: N = 365.

Moderated Mediation Analysis. Our overall prediction is that the conceder-cost frame is seen as more manipulative due to information unavailability about the conceders' resources. Statistically, this prediction amounts to a moderated mediation where the relationship between concession frames and counteroffers mediated by perceptions of manipulativeness is moderated by conceder resources.

To test this model, we used PROCESS V3.1 Model 7 (Hayes, 2013). In support of the predicted model, the confidence interval for the indirect effect of perceptions of manipulativeness did not include zero in the high resources condition (95% CI: -54.74, -9.88) but did include zero in the low resources condition (95% CI: -20.08, 5.37). Additionally, the confidence interval for the overall model did not include zero (95% CI: -50.58, -5.67), providing support for the predicted pattern of moderated mediation. Figure 4 depicts these results.

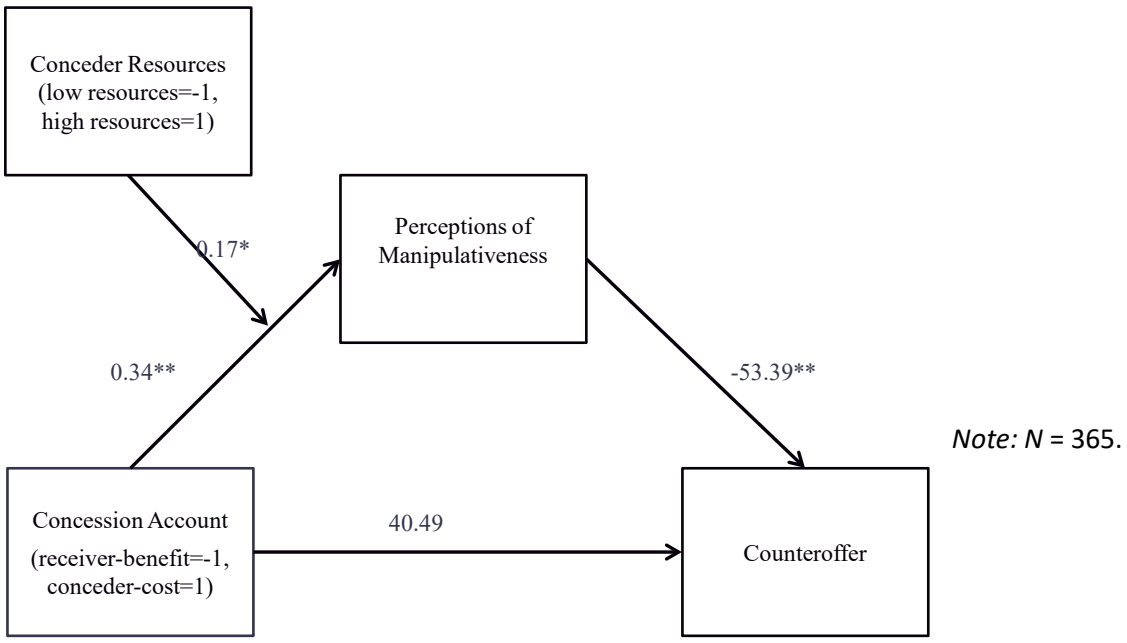
Discussion

Studies 3a and 3b explored the reasons behind why concession frames affect negotiation outcomes and found that negotiators perceive counterparts using frames emphasizing cost to be more manipulative than those using frames emphasizing benefit. We argue these increased perceptions of manipulativeness in response to conceder-cost frames are driven by negotiators' inability to verify this argument. In Study 3a, we found evidence that concession-recipients perceive concession frames with an emphasis on conceder-cost to be more manipulative than those who emphasize receiver-benefit, with subsequent effects on concrete negotiation behaviors, such as counteroffers. Study 3b manipulated the resources of the concession-maker to provide further evidence that this effect occurs due to the salience of information asymmetry when frames emphasize conceder-cost. Consistent with our predictions, once concession-recipients are provided with information that alleviates the ambiguity around the true position of the concession-maker and validates the claimed costliness of the concession, negotiators that use the conceder-cost frame are seen as no more manipulative than those using the receiver-benefit frame.

Despite having documented that recipients of concessions framed as conceder-cost do, indeed, view their counterparts as being more manipulative, and that these perceptions of manipulativeness do indeed impact the size of their counteroffers, it was puzzling that we did not find a significant effect of our manipulations on counteroffers. One possibility is that the size of the concessions possible in this scenario were not large enough to enable us to capture the impact of the concession frames. This is quite plausible when considered in conjunction with the results of Study 2 where we did observe a main effect of concession frames on concession magnitude and economic outcomes using a scenario with a large bargaining zone.

Figure 4

Moderated Mediation Analysis with Concession Frame as the Independent, Conceder Resources as the Moderating, Perceptions of Manipulativeness as the Mediating and Counteroffer as the Dependent Variable in Study 3b



General Discussion

Our primary argument is that how concessions are framed—as conceder-cost or receiver-benefit—will influence negotiators' experiences and outcomes. In Study 1, we showed that negotiators use conceder-cost frames more frequently than receiver benefit-frames and expect them to be more believable. In Study 2, concession-recipients were less likely to reciprocate a concession framed as conceder-cost than one framed as receiver-benefit, which subsequently increased their economic outcomes in a distributive negotiation setting. In Studies 3a and 3b, we documented the mechanism underlying this effect, namely a perception that the conceder is using the cost frame to manipulate, brought on by information asymmetry. Taken together, these results suggest that the way a concession is framed can have significant impact on the negotiation process, as well as negotiators' economic outcomes.

To our knowledge, this research is the first to examine the impact of concessions without changing the magnitude of the concession or other structural elements in the negotiation. In this way, our approach to concessions contributes to research on interpersonal influence and persuasion tactics in negotiation,

defined as "the effort to positively influence another party's attitude toward a given idea or proposition without changing the incentives or objective information set of the other party" (Malhotra & Bazerman, 2008, p. 512). This framework focuses on how negotiation moves of equal objective value can lead to divergent outcomes depending on the arguments made to support them, rather than on the economic or structural elements of the bargaining process. In other words, the interpersonal influence perspective focuses on persuasion tactics that impact the negotiation process without changing objective values, such as framing concessions to emphasize conceder-cost versus receiver-benefit.

Furthermore, our findings advance the rich literature on framing effects in negotiation which have been built on prospect theory (De Dreu et al., 1994; Neale & Bazerman, 1985; Neale et al., 1987). Thus far, this literature has predominantly examined the effect of framing an outcome as a loss versus a gain, which is driven by differential valuations of gains versus losses and shifting risk preferences. Our findings depart from this work and extend the theory on framing by showing that specific negotiation behaviors, such as making a concession, can also be framed in loss (i.e. conceder-cost) versus gain (i.e. receiver-benefit) terms, with attendant downstream consequences. In addition, whereas traditional loss/gain research might have predicted that negotiators would be more responsive to a loss (i.e., conceder-cost) framing, we find, instead, that emphasizing gains from a concession is more effective at curbing negative perceptions in the negotiation. A possible reason for this divergent finding might be that the traditional gain/loss frames both describe one's own outcomes, whereas concession frames contrast one's own gain outcome to another person's loss outcome in an interdependent decision-making context.

Our findings also contribute to the literature on negotiator cognition by suggesting that in distributive bargaining, negotiators' default assumption is that their counterparts have ample resources. For example, in Study 3a, when participants were not given information about their counterpart's resources, they found concessions framed as cost more manipulative. This pattern was also found when, in Study 3b, participants faced a counterpart known to have greater resources, suggesting that negotiators' default assumptions are that their counterparts are rich in resources. This finding presents yet another reason why trust building is such a challenge in negotiations (Lewicki & Stevenson, 1997), particularly in a distributive context. In distributive negotiations, the parties' goal is to divide a fixed resource, which makes competition and lack of trust an inherent component of such interactions. Despite this, our findings demonstrate one way in which the distributive negotiation process can become more positive: by emphasizing how one is trying to help one's counterpart with one's concessions. While most of the negotiation literature focuses on the magnitude of concrete negotiation behaviors that can help or derail trust building, such as offer patterns (Osgood, 1962; Pillutla et al., 2003), our results demonstrate that rhetorical strategies can be critical drivers of this process as well.

Future Directions and Limitations

We would be remiss if we did not acknowledge several limitations to the present work. First and foremost, while we captured all the "steps" of our theoretical model, we do not have a study in which all components of the model are present in a naturalistic laboratory study in which a negotiation was conducted to conclusion. The drawback of this approach is particularly evident in the lack of effect of our manipulations on counteroffers in Studies 3a and 3b. As we argued previously, we believe that this difference may have been driven by the smaller size of concessions possible in these studies. If this is true, then one might expect that effect sizes across negotiation studies are impacted by the size of the concessions possible. That is, are the effect sizes found for negotiation researchers using scenarios in which millions of dollars are at stake different from those using scenarios in which hundreds of dollars are at stake? This seemingly small methodological choice might well have implications for how robust researchers' findings are, with attendant implications for replication efforts.

A second limitation is also one that is an opportunity. Here, we examined the effect of concession framing in the context of distributive negotiations. We began with the distributive negotiation context because it enables us to demonstrate that the very same concession, described in different ways, engenders different responses from the concession-recipient. In an integrative context, it may or may not be true that a concession is beneficial to the recipient is in fact costly to the concession-giver. Yet, our findings suggest that even though people tend to see negotiation in terms of fixed-pie (i.e., as distributive, Thompson & Hastie, 1990), underneath this competitive veneer is the intuition that concessions can be integrative in nature. This understanding, however, only seems to be elicited when concessions are made in a way that highlights the information asymmetry inherent to negotiations. These are intriguing findings that point to the importance of future researchers further exploration of concession-framing effects in integrative contexts. Indeed, for example, the skepticism engendered by describing concessions as costly to the conceder could work in a way that benefits both parties. Specifically, past work documents that suspicion in negotiations with integrative potential leads to more information seeking, which improves value creation (Sinaceur, 2010). Similarly, it is possible that the suspicion associated with conceder-cost frames may lead negotiators to seek information about the costliness of the concession, which may result in the discovery of useful information to facilitate trade-offs. Thus, the negative effects of this type of frame in distributive negotiations may play out differently in the integrative domain. We see this as a particularly fruitful avenue for future research.

Third, while methodological rigor compelled us to constrain our participants' exposure to only one frame at a time, in reality, it is also possible to combine these frames. For example, one may say "Although this is costly to me, I will reduce the price by $100 to help you out." It is an empirical question how negotiators will respond to this combination of frames. One possibility is that they may attend to the portion that is self-referential, that is, receiver-benefit. Another is that recency (Sunstein & Zeckhauser, 2011) may play a role and they will attend to the part of the combination of the frame that came last. Thus, our research raises the question of not only whether concession frames impact negotiator perceptions and behaviors, but also whether specific combinations or configurations of frames might outperform single frames.

Similarly, our theory and empirical investigation focused on perceptions of manipulativeness, brought on by information asymmetry, as the main reason behind our effects. It is, of course, also possible that there may be other perceptions that operate in tandem with perceptions of manipulativeness, such as warmth and competence, which have been studied extensively in social psychology (Fiske et al., 2002). For example, receivers of cost frames may refuse to reciprocate concessions because they see their negotiation counterpart as manipulative but also because the conceder-cost frame creates the perception of a cold and competent partner. Similarly, the receiver-benefit frame may increase perceptions of warmth, leading receivers to reciprocate more to this frame than a cost frame. Future research should investigate how different perceptions engendered by concession frames may influence subsequent negotiation behavior.

Finally, we note that all our studies were conducted in the Northern American context. It is an open question as to whether the effect of concession frames extends beyond this individualistic cultural context. It is possible that emphasizing conceder-cost, which we found to be perceived as manipulative, may not be received as negatively in other cultures. In collectivistic cultures, engaging in self-sacrifice for the good of the group is seen as honorable and desirable (Triandis, 2001). Also, in such cultures, relationship building in negotiation is as paramount a concern as obtaining a good economic outcome for the self. Following this logic, it is quite possible that people from collectivistic cultures may have more positive perceptions of a negotiator who emphasizes the costliness of the concession, as compared to one who emphasizes the benefit of the concession to the concession recipient, because such behavior is acceptable, and even desirable, in working towards a good relationship between the negotiating parties. Thus, the negative perceptions resulting from conceder-cost frames in individualistic cultures may not occur in collectivistic cultures.

Conclusion

Our findings hold particular practical import for negotiators in distributive negotiations. Specifically, concessions that emphasize receiver-benefit, as compared to concessions that emphasize conceder-cost, lead to less negative perceptions of the conceder. However, this decrease in negative perceptions appears to have an adverse effect on economic outcomes, as receivers of concessions that are framed as benefit fare significantly worse than receivers of concessions framed as cost. In this way, concession frames may be a useful tool for concession-makers. By describing their concession in a way that emphasizes the benefit provided for their counterpart, they not only increase their counterparty's positive perceptions of them, which is critical for future interactions and building a good reputation (Tinsley et al., 2002), but also they obtain more desirable economic outcomes for themselves.

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Negotiation and Conflict Management Research

Negotiating Through the Night: How Sleep Deprivation Can Affect Negotiation Processes and Outcomes

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Abstract

Sleep deprivation is highly prevalent in negotiations, but little is known about how sleep deprivation may affect negotiation processes and outcomes. We present a theoretical framework for understanding and investigating effects of sleep deprivation on a range of negotiation outcomes, particularly joint economic outcomes, individual economic outcomes, social perceptions, and impasses. With an emphasis on integrative negotiations, we identified cognitive capacities and epistemic motivation as highly relevant psychological processes negatively affected by sleep deprivation, as these impairments hamper effective information exchange and downregulate or bias information processing in negotiations. This, in turn, reduces the quality of (integrative) agreements. Regarding impasses, our model predicts that impaired cognitive capacities and sleep deprivation-induced negative emotions (e.g., anger) could increase the likelihood of non-agreements. Moreover, sleep deprivation-induced negative emotions should have a negative effect on social perceptions. Finally, we discuss potential moderators on the task, the individual, and the inter-individual level and show how sleep deprivation-induced impairments can be compensated for. In sum, our analysis advances the understanding of how and when sleep deprivation might have an effect on negotiation outcomes.

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Many high-stakes negotiations in the political world and in business are conducted under severe sleep deprivation. Think, for example, of negotiations at international summits (e.g., the Conference of the Parties [COP26] in Glasgow negotiating climate-related measures in 2021 or the Greek debt negotiations in 2015) or forming a government (e.g., after the federal elections 2013 and 2017 in Germany). In such negotiations, sleep deprivation is very likely to occur, because these negotiations often a) span several days with long working hours, b) extend deep into the night, c) are scheduled at short notice due to urgency, and d) are affected by jet lag in the case of international negotiations. Table 1 provides some examples of high-stake negotiations conducted under sleep deprivation.

But what are the consequences of lack of sleep on negotiation outcomes? Surprisingly, although the effect of sleep loss in negotiations is highly relevant from an applied perspective (and also from a theoretical perspective as we will show in this article), we are aware of only one empirical manuscript and no theoretical accounts on this topic. Although negative outcomes may intuitively be expected, it is still unclear whether and to what degree, as well as through which mechanisms, sleep deprivation may affect negotiation outcomes. If severe negative effects invariably unfold, negotiating under sleep loss should not be seen as a viable option due to its general ineffectiveness. However, the prevalence of sleep deprivation in high-stakes negotiations emphasizes the need to understand the potential mechanism and moderators of the relationship between sleep deprivation and negotiation outcomes. The first pertinent manuscript (Halfmann et al., 2022) showed in several studies that sleep deprivation does not necessarily result in worse negotiation outcomes, but could be compensated for by different measures. These measures are located at different levels (e.g., individual or inter-individual level). We will discuss potential moderation and compensation in this paper.

The key objective of this paper is to present a framework for understanding and investigating the potential effects of sleep loss in negotiations. In view of the vast lack of empirical studies directly testing such effects, we review previous empirical findings on the psychological effects of sleep deprivation that can play a role in negotiations. We built our framework on an analysis of specific psychological and cognitive processes that are, on the one hand, highly prone to being affected by sleep deprivation and, on the other hand, shape negotiation outcomes. Technically speaking, such processes are potential mediating mechanisms linking sleep deprivation to negotiation outcomes. Specifically, in our analysis, we will focus on the joint economic outcomes in bilateral negotiations and show that *cognitive capacities* and *epistemic motivation* (i.e., the motivation to exert cognitive effort to obtain an accurate understanding of things) are likely to play a crucial role for this negotiation outcome when negotiating under sleep deprivation. These mediation paths point to a general prediction of why sleep deprivation should negatively affect joint economic outcomes. In addition to joint economic outcomes, we will address a range of negotiation outcomes potentially affected by sleep deprivation, including individual economic outcomes, socio-emotional outcomes, and impasses (i.e., non-agreements). Here we will also discuss sleep-deprivation-induced emotions as a process linking sleep deprivation to socio-emotional outcomes and impasses. Furthermore, we will discuss reasons for why no uniform negative effects on joint economic outcomes should be expected and we focus here on potential compensatory mechanisms. When doing so, we will present conditions on the task, the individual, and the inter-individual level under which the negative effects should be less likely to occur.

Table 1

Examples of Prolonged and Late-Night Negotiations

Year	Negotiation topic	Negotiating parties	Location
1991	Maastricht Treaty	European Communities	Maastricht; Netherlands
1997	French truck driver strike	Union & employer's group	Paris; France
2000	COP6-Climate Change Conference	United Nations	the Hague, Netherlands
2008	Wall street bailout	U.S. Congress	Washington, D.C.; U.S.A.
2012	Arms Trade Treaty	United Nations	New York; U.S.A.
2013	German coalition negotiation	German political parties CDU/CSU & SPD	Berlin; Germany
2015	Greek government debt bailout	Eurozone head of states	Brussels; Belgium
2015	Iran Nuclear Deal Framework	Iran Foreign Minister, P5+1l, EU	Lausanne; Switzerland
2015	Minsk II – war in Ukraine	Heads of state of Ukraine, Russia, & OSCE	Minsk; Belarus
2015	COP21-Climate Change Conference	United Nations	Paris; France
2017	German coalition negotiation	German political parties SPD, FDP, & Green Party	Berlin; Germany
2019	Party merge and change of leadership	Union of right wing parties in Israel	Tel Aviv; Israel
2019	Collective bargaining	Union & B.C. Maritime Employers Assoc.	Vancouver; Canada
2019	Brexit negotiations	U.K. & EU	Brussels; Belgium
2019	Execution of death row inmate	U.S. Supreme Court	Washington, D.C.; U.S.A.
2019	U.S. federal government shutdown	U.S. Congress & President Trump	Washington, D.C.; U.S.A.
2019	COP25-Climate Change Conference	United Nations	Madrid, Spain
2020	Collective bargaining	Vida trade union & Laudamotion airline	Vienna; Austria
2020	COVID-19 Pandemic Crisis Support	EU finance ministers	virtual
2020	Reform of Agricultural Policy	EU Ministers of Agriculture	Luxembourg
2021	COP26-Climate Change Conference	United Nations	Glasgow; U.K.
2021	COVID-19 Lockdown	German Federal Minister-presidents	Berlin; Germany
2022	Collective bargaining after strike	Transport unions & Jammu/Kashmir admin.	Jammu; India
2022	Fossil fuels car ban	EU environmental ministers	Luxembourg
2022	12th WTO Ministerial Conference	Members of WTO	Geneva; Switzerland

Note. List of illustrative examples of late- or all-night negotiations (sometimes over several days) that may have resulted in acute and chronic sleep deprivation among negotiators.

Our paper integrates research on sleep deprivation with research on negotiations. To the best of our knowledge, our analysis is the first to theoretically examine how sleep deprivation can affect negotiations. Although earlier theoretical accounts targeting the impacts of sleep deprivation on human functioning also emphasize the 'social side' of sleep, these earlier accounts are a broader collection of potentially relevant social contexts (Gordon et al., 2017), or specific to the contexts of group performance (Faber et al., 2017) or group decision making (Barnes & Hollenbeck, 2009). Hence, they do not account for relevant processes in inter-personal negotiations and do not allow specific predictions to be derived on this type of social interaction. Our theoretical model contributes to the literature in both fields, sleep research and negotiation research. Regarding sleep deprivation research, it provides new insights into the yet under-examined social

effects of sleep in organizations (cf. Christian & Ellis, 2011; Faber et al., 2017). Regarding negotiation research, with the introduction of sleep deprivation, we contribute to the literature by spotlighting a—yet neglected—prevalent and potentially powerful context factor.

Sleep Deprivation

Insufficient sleep is highly prevalent in modern societies, and has therefore been dubbed a public epidemic by the U.S. Centers for Disease Control and Prevention (2015). Sleep deprivation refers to a state of insufficient sleep, either acute (also termed *total sleep deprivation*), in which individuals are usually awake for more than 24 hours, or chronic, which means less-than-normal sleep for several consecutive nights. Generally, the psychological effects of acute and chronic sleep deprivation are similar (Banks & Dinges, 2007). In our analysis, we therefore refrain from distinguishing between both forms of sleep deprivation. Sleep deprivation has been found to have impairing effects on human functioning, on the individual level (i.e., the cognitive level; for a review, see Alhola & Polo-Kantola, 2007) as well as on the inter-individual level (i.e., the social level; for a review, see Gordon et al., 2017)—clearly, impairments on both levels are highly relevant for negotiations.

Negotiations

Negotiations are interactions between at least two parties in which the common goal is to achieve an agreement concerning a (perceived) conflict of interest (e.g., Pruitt & Carnevale, 1993). A negotiation is therefore characterized as a mixed-motive situation because, on the one hand, each party is motivated to act competitively to realize own interests ("claiming value"), while on the other hand, there are also incentives to be cooperative and realize not only the own, but also the other party's interests to accomplish the mutual task of coming to an agreement ("creating value"; Hüffmeier et al., 2019). A useful and commonly accepted distinction has been made between distributive and integrative negations (Walton & McKersie, 1965). Whereas distributive negotiations are zero-sum situations (i.e., any gain for one party corresponds to an equivalent loss for the other party), in integrative negotiations, joint outcomes can, for instance, be increased by mutual concessions building on different priority structures (i.e., between-issue valuation) and/or identical preference structures (i.e., within-issue valuation) of the negotiation partners. Integrative solutions can only emerge if a negotiation provides possibilities to expand the total amount of dividable resources, benefiting all negotiation parties (e.g., Thompson & Hastie, 1990).

Joint Outcomes in Integrative Negotiations

Most negotiations contain at least some degree of integrative potential (Raiffa, 1982; Thompson & Hastie, 1990). In such negotiations, the joint economic outcomes, that is, the mutual pay-off the negotiation partners receive based on the achieved agreement, are an important indicator of the success of a negotiation. Joint outcomes are the crucial measure of how integrative or mutually advantageous, in other words, objectively good, an agreement is. As the interests of both parties are at least partly compatible in integrative negotiations, it is possible to create additional value if the *integrative potential* is unlocked via recognizing the (partial) compatibility of the parties' interests and then using this knowledge. Making use of a negotiation's integrative potential to increase joint outcomes requires the exchange and processing of information, which can occur via three different approaches.

First, by using a heuristic trial-and-error approach, negotiators can draw inferences regarding the interests of the negotiation partner from an unsystematic exchange of offers and reactions to these offers (Pruitt & Lewis, 1975; Yao et al., 2021). These inferences can help to uncover the negotiation's integrative

potential even without a direct and trustful information exchange about the parties' interests. For example, if a negotiation partner is highly reluctant to concede on a specific issue, the other negotiation partner could infer that this specific issue is of high priority for the negotiation partner.

Second, the integrative potential can also be tapped by using multi-issue offers, which can range from two to all negotiation issues (Weingart et al., 1999; Yao et al., 2021). When negotiators make a series of multi-issue offers and receive answers to these offers from their counterparts, all parties can glean information on the respective interests (Pruitt, 1981; Yao et al., 2021). For example, one could infer that negotiators have different priorities towards certain issues if they are willing to concede on one, but not on another issue in such a package offer.

The two aforementioned approaches can be effective in gaining valuable insights into the partner´s priorities and preferences. However, in addition to information exchange, these approaches require systematic information processing and a valid interpretation to identify underlying priorities and preferences. As a third approach, negotiation parties can also engage in *interest-related information exchange* by directly providing interest-related information and by asking interest-related questions to unlock the integrative potential (Bazerman & Neale, 1982; Pruitt & Lewis, 1975; Thompson, 1991). For example, a negotiator could tell the other negotiator that a specific issue in the negotiation is more important to them than another issue.

All three approaches illustrate that the processing and exchange of information is crucial to understand and unlock the integrative potential of a negotiation and therefore is the key for optimizing joint outcomes (Fairfield & Allred, 2007; Thompson, 1991; Zerres et al., 2013). Any type of information exchange increases the likelihood to detect a negotiation's integrative potential, but the exchange of interest-related information most directly enables negotiators to understand the underlying priorities and preferences of the negotiation partner, as it explicitly provides relevant information. A correct understanding of the underlying priorities and preferences in turn can be used for *log-rolling*, that is, a systematic trade-off of low- and high-value issues (Froman & Cohen, 1970) and for exploiting compatible preferences (Thompson & Hrebec, 1996), thereby increasing the joint economic outcomes.

Effects of Sleep Deprivation on Joint Economic Outcomes

Negotiations are complex and multi-faceted social interactions with a multitude of relevant outcomes (e.g., Cai et al., 2000; Curhan et al., 2006; De Dreu & Carnevale, 2003; Thompson, 1990). In this article, we put an emphasis on the joint economic outcomes of negotiation partners in integrative negotiations. In such negotiations, processing large amounts of inter-related information is the key to arriving at optimal joint economic outcomes. A useful theoretical lens to understand the depth of information exchange and information processing in negotiations is dual-process models (e.g., Petty & Wegener, 1999). According to such dual-process models, individuals, or in our case negotiators, operate in two distinct modi operandi regarding information processing: Automatic and fast processing, using heuristics and routines (System-1 processing) versus slow and deliberative processing, using systematic and more complex approaches (System-2 processing). System-2 processing is cognitively effortful and presupposes a motivation for deep processing (Stanovich et al., 2014). Thus, if negotiators lack sufficient skills (cognitive capacities) and sufficient will (motivation) required for System-2 processing in a certain situation, they will not engage in systematic processing of interest- related information, or will fail to induce this type of information from the unsystematic exchanges of offers and counteroffers or multi-issue offers.

Based on theory and research on cognitive and motivational impairments due to sleep deprivation and as explained in detail below, we predict that sleep deprivation should be negatively related to information exchange and effective information processing in negotiations. We argue that this, in turn,

should impair joint economic outcomes in integrative negotiations (see the *Propositions* 1.1 and 1.2 below and Figure 1).[1] Thus, we put forward the following general proposition:

Proposition 1. Sleep deprivation should reduce joint economic outcomes in integrative negotiations.

In the following, we will provide theoretical arguments and empirical findings that back up and specify this proposition. In particular, taking the dual-process perspective, we identified impaired *cognitive capacities* and reduced *epistemic motivation* as crucial psychological pathways linking sleep deprivation to negotiation outcomes (see Figure 1). Each of these two broad pathway comprise different specific mediation mechanisms, which we will outline in detail below.

Effects of Sleep Deprivation on Cognitive Capacities in Integrative Negotiations

We expect that acute sleep deprivation will impair cognitive capacities that are relevant for exchanging and processing information in integrative negotiations, which reduces the likelihood of (fully) integrative joint economic outcomes. Because negotiations are cognitively taxing tasks involving the processing of a large amount of information (e.g., data, documents, terms, schedules, verbal information, non-verbal information; Bazerman et al., 1999; De Dreu et al., 2006; Neale & Bazerman, 1991), they strongly claim cognitive processes such as working memory functions (Sharma et al., 2013).

By disrupting the executive functioning of the prefrontal cortex, acute sleep deprivation negatively affects various cognitive processes. Sleep deprivation, for instance, has a strong negative effect on vigilance and attention (d = -0.76, see Lim & Dinges, 2010, for a meta-analysis). These processes are, as Lim and Dinges (2008) argue, fundamentally important for all more complex forms of cognition. In particular, *working memory (WM)*, the "maintenance and manipulation of relevant information over a brief period" (Lim & Dinges, 2010; p. 381), is impaired. In a pertinent meta-analysis by Lim and Dinges (2010), aggregated moderate effects of g = -0.56 for WM accuracy and g = -0.52 for WM speed were reported, with a clear dose-effect relationship evident in increasing effect sizes with more hours awake (see also Philibert, 2005). The parietal cortex and other brain regions associated with verbal working memory show a decreased cortical response under sleep deprivation (Mu et al., 2005), suggesting that sleep-deprived individuals have less cognitive resources for paying attention to verbal cues.

Processing of verbal information is crucial in negotiations. Particularly, cues that are related to interest-related information are highly relevant for negotiations. Thus, the decreased cortical response represents an obvious obstacle to effective information processing. This notion is confirmed by a meta-analysis (Sharma et al., 2013), which found cognitive abilities (r = 0.20) to be significantly predictive of joint economic outcomes. Moreover, it has been argued that WM functioning should be positively related to better negotiation outcomes (e.g., Fulmer & Barry, 2004). Hence, when cognitive capacities are impaired due to sleep deprivation, negotiations may result in suboptimal agreements. This is because sleep-deprived negotiators would be less effective in exchanging information and in drawing valid inferences from this information, which impairs unlocking a negotiation's integrative potential.

In addition to attention and working memory, several other cognitive functions that are relevant for information processing in negotiations are impaired due to sleep deprivation. The ability to incorporate new

[1] In purely distributive negotiations (i.e., zero-sum negotiations), joint economic outcomes are fixed, and therefore, by definition, sleep deprivation (as with any other factor) cannot have an impact on joint outcomes in this type of negotiation. However, in such negotiations, sleep deprivation should still have an impact on individual economic outcomes and impasses via different processes as we will show below.

information into existing mental representations of a situation (*information updating*) is also impaired by sleep deprivation (Durmer & Dinges, 2005; Lim & Dinges, 2010; Killgore et al., 2006). Moreover, it has been found that the ability to abandon previously optimal and now suboptimal problem solving strategies (*cognitive flexibility*, see Luchins, 1942) as well as the ability to generate new ideas is lower for severely sleep-deprived compared to well-rested participants (Frings, 2011; Horne, 1988).

In negotiations, common misconceptions are assumptions of incompatible interests and the fixed-pie-perception (e.g., De Dreu & Carnevale, 2003; Thompson & Hastie, 1990). Negotiators with a fixed-pie-perception assume that negotiations are—in general—zero-sum situations, thereby possibly overlooking a negotiation's integrative potential and many negotiators enter a negotiation with this misperception (Thompson & Hastie, 1990). Cognitive inflexibility and increased persistence of mental representations due to sleep deprivation should prevent such dysfunctional assumptions from being revised. In other words, even if relevant new information is made available through information exchange in the course of a negotiation, sleep-deprived negotiators may not (fully) revise their initial assumptions. Thus, a more correct representation of the underlying conflict of interest would not result (i.e., the negotiation would still be perceived as fixed-sum even though it is variable-sum).

Finally, we further predict that sleep deprivation should impair perspective taking, and reduced perspective taking should limit the exchange and processing of (interest-related) information, thereby decreasing joint outcomes. Perspective taking (Davis, 1983) is defined as the cognitive process of considering the world from another person's viewpoint, which allows reasoning about beliefs, intentions, and thoughts of others as well as anticipating their behavior and reactions (Galinsky et al., 2008). Taking another person's perspective is a cognitively complex and effortful procedure (Epley & Caruso, 2008) and it is therefore likely to be affected by sleep deprivation. In line with this, research outside the negotiation domain provides tentative evidence for the idea that sleep deprivation impairs perspective taking, for example, in spatial perspective taking (Deliens et al., 2018) or sarcasm detection (Deliens et al., 2015).

With respect to negotiations, perspective taking has been argued to be an antecedent of the exchange and processing of interest-related information, because perspective taking is crucial to arrive at valid inferences regarding the other party's—potentially divergent—interests (e.g., Neale & Bazerman, 1983; Kemp & Smith, 1994). Supporting this theoretical notion, Trötschel et al. (2011) found that inducing a perspective-taking mindset in negotiations alleviates the risk of partial impasses and improves joint outcomes. These results are in line with Galinsky et al.'s (2008) findings that perspective taking helps to reach higher joint economic outcomes as compared to a focus on the own perspective.

With regard to cognitive capacities, we put forward the following proposition:

> ***Proposition 1.1.*** The negative effect of sleep deprivation on joint economic outcomes should be partially mediated via impaired cognitive functions, which result in a less effective exchange and processing of information and a higher proneness to the fixed-pie-perception.

More specifically, we state that the most crucial impaired cognitive functions acting as concrete potential mediating mechanisms are a) working memory capacities, b) cognitive flexibility, c) information updating, and d) perspective taking.

Effects of Sleep Deprivation on Epistemic Motivation in Integrative Negotiations

In addition to cognitive impairments, *motivational effects* of sleep deprivation can also negatively influence information exchange and processing, thereby jeopardizing joint economic outcomes. We predict specifically that sleep deprivation should impair epistemic motivation. Epistemic motivation is the motivation to obtain an accurate and comprehensive understanding of an issue or a situation, and the willingness to

exert cognitive effort to achieve this goal (e.g., De Dreu et al., 2008; Kruglanski & Webster, 1996). Epistemic motivation is conceptualized as a state variable and is therefore susceptible to situational factors like fatigue (e.g., De Dreu, 2003; Webster et al., 1996). Generally, when sleep deprived, individuals show a reduced willingness to engage in cognitively demanding tasks and are less motivated to systematically process complex information (e.g., Odle-Dusseau et al., 2010; see Engle-Friedman, 2014, for a review). Although we are not aware of any direct empirical tests of the effects of sleep deprivation on epistemic motivation there is good reason to assume a negative impact. First, sleep deprivation has been found to curb motivation in general (Engle-Friedman, 2014). Second, for the specific case of epistemic motivation, it has been found that mental fatigue reduces epistemic motivation (Webster et al., 1996); and sleep deprivation is typically accompanied by mental fatigue (Durmer & Dinges, 2005).

Successful negotiations and especially fully integrative agreements require high levels of epistemic motivation (Brett & Thompson, 2016; De Dreu et al., 2008). Epistemic motivation contributes to joint outcomes in integrative negotiations, because negotiators have to be motivated to systematically exchange and process information that is relevant to priorities and preferences in a negotiation (for a related argument, see De Dreu et al., 2000, and Faber et al., 2017). In line with dual-process accounts, when epistemic motivation is low, however, information search is generally reduced and less systematic and the available information is processed more heuristically.

In line with this theoretical argument, negotiators with high epistemic motivation have been found to show a better understanding of the negotiation situation and the underlying conflict of interest, and they reached better joint outcomes (e.g., Ten Velden et al., 2010). Conversely, De Dreu et al. (1999) showed that low dispositional epistemic motivation leads to a heightened use of heuristics in negotiations.

In light of the eroding effects of sleep deprivation on the motivation to exchange and process complex information, we propose a negative effect of sleep deprivation on joint outcomes via reduced epistemic motivation:

> ***Proposition 1.2.*** The negative effect of sleep deprivation on joint economic outcomes should be partially mediated via epistemic motivation: Sleep deprivation is negatively related to negotiators' epistemic motivation, which reduces the systematic exchange and processing of information, which in turn decreases joint economic outcomes.

Sleep Deprivation and Economic Outcomes in Distributive Negotiations

In integrative negotiations, joint economic outcomes can be considered as an objective benchmark for success. As, by definition, joint economic outcomes are the combined individual outcomes of the negotiation partners, psychological processes negatively affecting integrative solutions also reduce individual outcomes. In distributive negotiations, however, the joint outcomes are fixed (by definition), and therefore individual economic outcomes are of central interest. We argue that sleep deprivation further affects individual outcomes in such purely distributive contexts, due to increased heuristic processing, as a consequence of decreased cognitive capacities and epistemic motivation.

When lacking the skill and will for systematic information processing, people tend to operate in System-1 and rely more on automatic processing, routines and heuristics. In line with this, it has been found that sleep-deprived individuals use more heuristic information processing (Ghumman & Barnes, 2013; McKenna et al., 2007). Heuristic information processing can, in turn, play out in negotiations by biasing the evaluation of offers or requests. With respect to negotiations, heuristic processing in terms of anchoring is of particular interest (Galinsky & Mussweiler, 2001, Gunia et al., 2013). Anchoring is defined as the assimilation of a judgement to a relevant or arbitrary value (anchor) that is externally provided prior to judgement (Tversky & Kahneman, 1974). Anchors have been found to have strong effects on judgement and

decision making in diverse domains, such as probability estimates, legal judgements, purchasing decisions or forecasting (see Furnham & Boo, 2011, for an overview). In negotiations, first offers made by the negotiation partner can be powerful anchors. In three experiments, Galinsky and Mussweiler (2001) for instance found consistent evidence that first offers had an even stronger impact on final agreements than the subsequent concessions from both parties and that the negotiator who made the first offer obtained the better outcome (see also Moran & Ritov, 2002; Yukl, 1974, for related findings). This first-mover advantage is particularly pronounced in distributive negotiations, where the offer provides merely a numerical anchor without implying priority-related information (Loschelder et al., 2016).

As noted above, from a theoretical perspective, the role of anchoring in negotiations can be best understood through the lens of dual-process models (Kahneman, 2011). The presentation with an anchor (first offer) at least initially results in automatic processing of this anchor (System 1 - processing), using simple comparative strategies ("Is the offer too high?") and activation or generation of anchor-consistent knowledge ("How is this offer justified?"; Mussweiler & Strack, 2000). Moreover, it signals a range of plausible agreements and sets the stage for the final agreement (Galinsky & Mussweiler, 2001).

Hence, by increasing susceptibility to anchoring, sleep deprivation should have negative effects on individual economic outcomes for the receiver of the first offer. In contrast, for the provider of the first offer, sleep deprivation may even increase individual economic outcomes. Because sleep deprivation reduces inhibition and self-regulatory capacities (Welsh et al., 2014), sleep deprived negotiators might be bolder in setting their own anchors. This in turn can increase their final individual economic outcome, particularly if the negotiation partner shows increased proneness to anchoring due to sleep deprivation.

In sum, we argue that sleep deprivation should increase the susceptibility to anchoring, by impairing cognitive capacities and epistemic motivation. Thus, when negotiating under sleep deprivation, first offers are likely to have an even stronger impact compared to negotiating under well-rested conditions. Thus, we propose:

> ***Proposition 2.*** Sleep deprivation should increase the proneness to anchoring, thereby increasing the first-mover advantage. Therefore, the negotiation partner making the first offer should realize higher individual economic outcomes, whereas the receiver of the first offer should realize lower individual economic outcomes.

Sleep Deprivation and Emotions in Negotiations

Beyond cognitive functioning and motivation, emotions may play a crucial role in negotiations under sleep deprivation. In fact, the effects of sleep deprivation on mood seem to be even more pronounced as compared to the effects of sleep deprivation on cognitive performance (see Pilcher & Huffcutt, 1996, for a meta-analysis). In negotiations under sleep deprivation the role of emotions should be two-fold with a need to differentiate between a) emotions as processes, and b) emotions as outcomes.

Emotions as Processes: Other-Related Emotions and Emotional Responsiveness

There is a plethora of studies showing negative effects of sleep deprivation on socio-emotional processing, with sleep deprivation altering the likelihood and intensity of negative emotions and reducing emotional responsiveness (see Ben Simon et al., 2020, for a recent review). Sleep deprivation is also associated with increased emotional instability and irritability (Minkel et al., 2012).

For negotiations, the inter-individual functions of emotions are of particular interest, because they most likely have an impact on interactions during the negotiation. In other words, emotion expression and

emotional responsiveness is altered as a consequence of sleep deprivation, which in turn affects the negotiation process and ultimately negotiation outcomes.

Particularly, sleeping poorly can induce feelings of anger (Short & Louca, 2015). In line with this, in an experimental study with a manipulation of sleep loss (restricted sleep over two days), Krizan and Hisler (2019) found that sleep loss can also intensify anger and prevent anger reduction over time. Moreover, sleep deprivation is related to reduced emotional intelligence, for example, expressed in reduced empathy for others (e.g., Killgore et al., 2008). Sleep-deprived individuals are less accurate at identifying emotions such as happiness or anger in other people's facial expressions (van der Helm et al., 2010). Sleep deprivation has also been found to influence emotional expressivity (i.e., fewer emotional words but a higher ratio of negative affective expressions are uttered, see Beattie et al., 2015, for a systematic review). In sum, as compared to well-rested individuals, sleep deprived individuals tend to show more negative other-related emotions, reduced accuracy in emotion perception and reduced emotional responsivity (cf. Ben-Simon et al., 2020).

In light of these findings, it seems likely that in negotiations under sleep deprivation negotiators would also be more likely to express negative other-related emotions, such as anger and would be less responsive to emotions expressed by the other party. Anger, accuracy of emotion perception, and responsiveness to emotions should affect socio-emotional outcomes of negotiations, that is, social perceptions of the negotiation and the negotiation partner (see below). Moreover, as we will show in the next section, negative other-related emotions should also increase the likelihood of impasses.

Emotions as Outcomes: Social Perceptions

In addition to 'hard' outcomes (i.e., the agreement detailing, for instance, the division of resources or mutual obligations), 'soft' outcomes of negotiations, such as social-emotional consequences, should also be taken into account (Curhan, et at., 2006; Thompson, 1990). In a seminal paper, Thompson (1990) argues that to arrive at a more holistic understanding of negotiations, the exclusive focus on objective economic outcomes is detrimental, because it tends to overlook relevant outcomes of negotiations—especially social perceptions. These social perceptions include the evaluation of and satisfaction with the negotiation process, the agreement, the negotiation partner, and the self (cf. Curhan et al., 2006).

Curhan et al. (2006) emphasize the importance of better accounting for the affective evaluations of the final agreement, and obviously, the mood and satisfaction of the negotiators are important outcomes in their own right. In addition, these *post-negotiation* social perceptions can foreshadow future negotiations, determining the economic outcomes of the negotiations to come (even when controlling for the economic outcomes of the first negotiation; Curhan et al., 2010). In line with this, aversive feelings regarding the interaction and the negotiation partner can reduce the willingness to cooperate in future negotiations (Kopelman et al., 2006). Reduced willingness to cooperate may jeopardize establishing effective long-term negotiation relationships, such as vendor-buyer relationships, political coalitions or romantic relationships.

We argue that social perceptions and feelings regarding *the process* and *the negotiation partner* are most likely to be influenced by sleep deprivation: Due to reduced emotion expression and impaired responsiveness the subjective interaction quality is likely to be less satisfying and the negotiation partner should appear less likable and sociable. Moreover, amplified anger in sleep-deprived negotiators should on the one hand negatively bias the own perception of the interaction and the negotiation partner (cf. *feelings-as-information theory*; Schwarz, 2010). On the other hand, hardline bargaining such as expressing anger when rejecting offers should also produce more negative social perceptions in the negotiation partner (Hüffmeier et al., 2014).

Taken together, with respect to emotions as processes and outcomes in negotiations, we state:

Proposition 3. Sleep deprivation should result in more negative social perceptions, that is, feelings and evaluations regarding the interaction and the negotiation partner.
More specifically, this effect is mediated by sleep deprivation-induced a) anger, and b) reduced emotional responsiveness.

Sleep Deprivation and Impasses

We predict that sleep deprivation increases the risk of impasses through impaired cognitive flexibility and perspective taking as well as sleep deprivation-induced anger. Impasses emerge when the negotiating parties fail to reach a mutual agreement and, thus, the negotiation is terminated without the conflict of interest being solved (Tripp & Sondak, 1992). Knowledge about impasses is currently still limited (e.g., Cotter & Henley, 2017; Tuncel et al., 2016), but some factors have been discussed to help avoid impasses and deadlock negotiations. With respect to our model, it is interesting to note that the likelihood of impasses does not differ as a function of epistemic motivation (Ten Velden et al., 2010; van der Schalk et al., 2010). However, cognitive capacities may play a crucial role in whether or not an agreement is reached. In particular there are two relevant cognitive processes that have been found to contribute to the likelihood of impasses: cognitive flexibility in the bargaining process (Druckman & Mitchell 1995; Spector, 1995) and perspective taking (Galinsky et al., 2008; Trötschel et al., 2011). Cognitive inflexibility should lead to more rigid representations of the conflict of interests and reduced perspective taking should prevent the understanding of the negotiation partner's interests and therefore reduce the possibility of making mutually beneficial concessions. Because—as laid out earlier—cognitive flexibility and perspective taking are likely to be impaired by sleep deprivation, sleep deprivation should increase the danger of non-agreements.

Furthermore, it has been found that the likelihood of impasses increases due to negative other-directed emotions, particularly anger (Adam & Brett, 2018; Yip & Schweinsberg, 2017). Thus, as an additional mediation pathway, sleep deprivation should increase the likelihood of impasses through sleep deprivation-induced and intensified anger (Krizan & Hisler, 2019; Short & Louca, 2015).

Taken together, our theoretical analyses suggest that in addition to a reduced quality of negotiation agreements and socio-emotional outcomes, sleep deprivation should also increase the likelihood that no agreement is reached at all. Hence, we state:

Proposition 4. Sleep deprivation should increase the likelihood of impasses in negotiations.

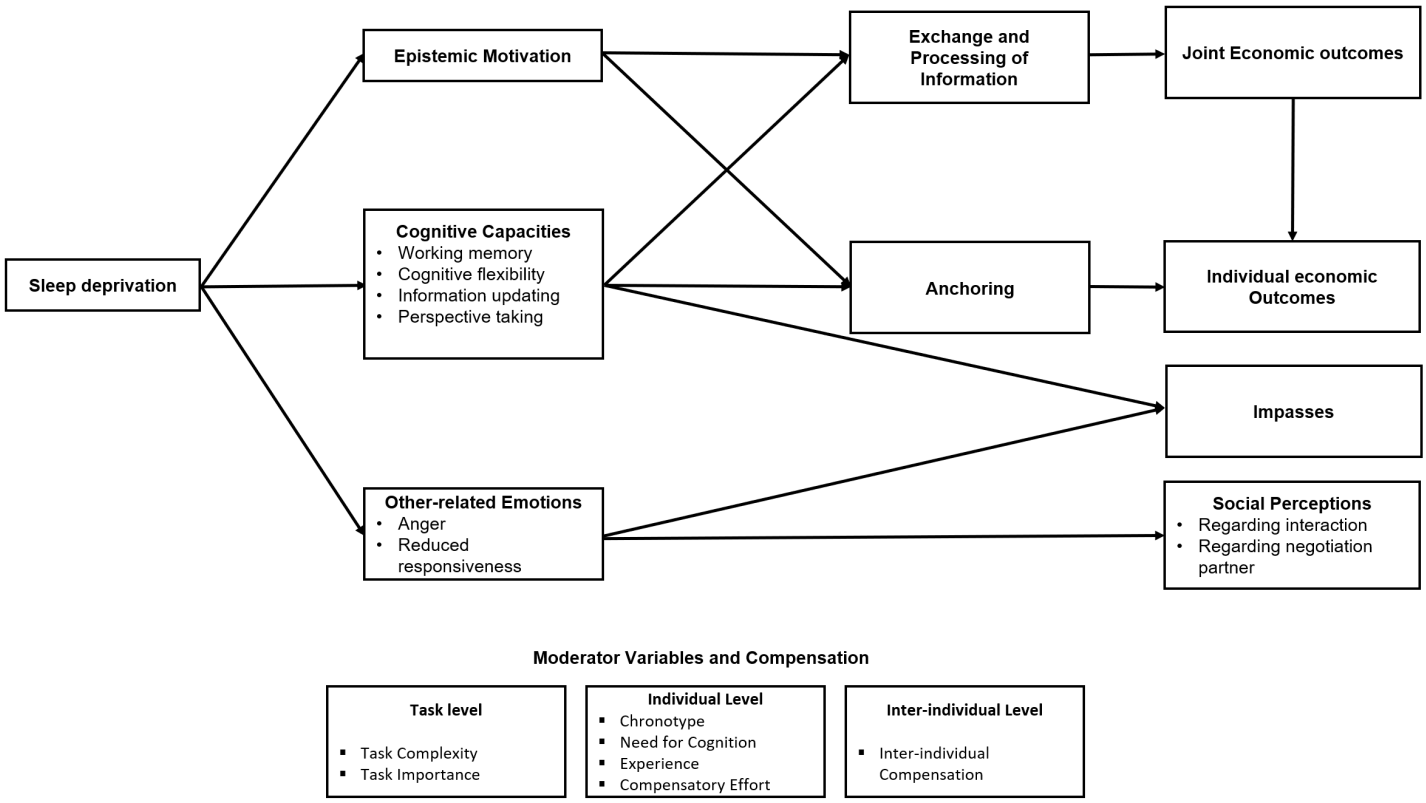
More specifically, this effect is mediated by a) cognitive flexibility, b) perspective taking, and c) anger.

Discussion

In our theoretical framework we identified three focal mechanisms–cognitive capacities, epistemic motivation, and emotions–through which sleep deprivation should influence negotiation outcomes. Our theoretical analysis has revealed a coherent picture: Sleep deprivation should generate negative effects in negotiations. Specifically, we posit that it decreases joint economic outcomes (and thereby also individual joint outcomes), produces more negative social perceptions, and increases the danger of impasses.

Figure 1

Conceptual Model of Proposed Links Between Sleep Deprivation and Negotiation Processes and Outcomes



Moderators and Compensation of Sleep Deprivation[2]

Although in general we expect negative effects of sleep deprivation on joint economic outcomes, we acknowledge that the occurrence and extent of these negative effects might not be uniform and robust, but is also a function of specific characteristics of (i) the negotiation task, (ii) the involved individual negotiator(s), and (iii) the interaction between the negotiators. To be clear here, we do not expect any positive effects of sleep deprivation on negotiation outcomes, but identify conditions under which sleep deprivation is *less* likely to produce negative effects, and thus, could be compensated for.

The idea that the negative effects of sleep deprivation on joint negotiation outcomes can be compensated for by different mechanisms is also reflected in the first empirical manuscript on the topic (Halfmann et al., 2022). In two experiments, in which participants performed a dyadic integrative negotiation task either well-rested or after a night of total sleep deprivation, sleep-deprived negotiators did not achieve worse joint outcomes than well-rested negotiators. Moreover, in a third experiment, using a sleep restriction manipulation, sleep-deprived individuals also did not propose inferior agreements after observing a videotaped negotiation. However, in these studies, there was consistent indication of compensatory efforts

[2] Note that some of the variables conceptualized in our model as a moderator (e.g., task complexity) likely have a direct effect on our proposed mediators (e.g., epistemic motivation), but also on some of the outcomes (e.g., economic outcomes). Although we acknowledge such potential relationships, we refrain from including them in our model for reasons of parsimony, because these relationships should occur independently of sleep deprivation and thus do not inform about our key research question, that is, how negation outcomes are influenced by sleep deprivation.

by sleep-deprived negotiators. Furthermore, as a result of a further, qualitative interview study, experienced politicians reported their compensatory strategies to counteract negative effects of sleep deprivation in real-life political negotiations.

Moderators and Potential for Compensation at the Task Level

A task characteristic that potentially moderates the impact of sleep deprivation in negotiations is *task complexity*. With an increasing number of negotiable issues, the potential for integrative bargaining does expand (Geiger & Hüffmeier, 2020), but at the same time a higher number of negotiable issues means that the task becomes more complex and requires more cognitive effort (Geiger & Hüffmeier, 2020; van der Schalk et al., 2010). Generally, and perhaps somewhat contra-intuitively, for tasks outside the negotiation domain, it has been found that the impact of sleep deprivation is typically stronger and more stable in simple compared to more complex tasks (see Harrison & Horne, 2000; Horne, 2012, for a discussion). For example, rather basic cognitive functions (e.g., psychomotor vigilance) are more susceptible to sleep deprivation as compared to higher cognitive functions (e.g., short-term memory; Lim & Dinges, 2010).

One reason for this finding might be that the potential to compensate for deficits induced by sleep deprivation should increase as a function of complexity, as in highly complex tasks outcomes are determined multi-causally and different approaches can be applied to reach an outcome. In contrast, in tasks low in complexity, the potential for compensation is restricted, as outcomes are determined by fewer factors, and the variety in ways to approach the task is limited. Moreover, Harrison and Horne (2000) argue that higher task complexity intrinsically motivates sleep-deprived individuals to show compensatory effort. With such increased efforts, sleep deprivation-related deficits can be counteracted and performance can be maintained over time (e.g., Horne & Pettitt, 1985; Hsieh et al., 2010).

A second characteristic of negotiations that should produce compensatory effort is the *(subjective) importance of the negotiation*. Given the nature of negotiations as a means to solve social conflicts, many negotiations are of high individual importance (e.g., union-employer negotiations). Thus, negotiators should be inclined to perform well and to accept additional effort to optimize negotiation outcomes. We suppose that particularly those negotiations that are carried out under sleep deprivation are typically high-stakes negotiations, with far-reaching consequences for either the negotiators and/or their constituents, further stakeholders, or even the broader public at large (think of, e.g., international political summits, union-employer negotiations, or negotiations during hostage-takings). Even under sleep deprivation, high subjective importance should translate into increased effort to meet the demands of the situation, allowing for compensating sleep deprivation-induced impairments (cf. Deliens et al., 2015, Faber et al., 2017).

Taken together, we argue that if task characteristics allow for and are likely to elicit compensatory effort (as in complex situations or in important negotiations) negative effects of sleep deprivation are likely to be alleviated by active compensatory efforts.

Moderators and Potential for Compensation at the Individual Level

Between-person differences can influence if sleep deprivation unfolds its effects in a negotiation or could be compensated for. Generally, some people are more resilient to sleep deprivation than others. They are more effective in coping with sleep loss (Saksvik et al., 2011). The knowledge on the foundations of these between-person differences in terms of personality and cognitive styles is still sparse (see Horne, 2012, for a discussion), but accumulating evidence has emphasized the role of chronotype as a moderator. Chronotype describes between-person differences in the circadian 24-hour cycle of physiological and psychological functioning (e.g., Horne & Östberg, 1976; Monk et al., 1997). Chronotype is approximately normally distributed, but extreme morning types ('larks') and extreme evening types ('owls') do exist

(Roenneberg et al., 2007). These extreme types show specific wake-sleep patterns (larks: early to bed and early to rise; owls: late to bed and late to rise) and performance peaks over the course of the day (larks: morning; owls: late afternoon/evening). There is also evidence that evening types are better in adjusting to sleep loss and in compensating for the negative effects of sleep deprivation than morning types (Saksvik et al., 2011; Taillard et al., 2011). Hence, we predict that late types are better in compensating for sleep deprivation and should therefore perform better in negotiations under sleep deprivation compared to morning types.

Although there is still a lack of research regarding the role of personality traits in shaping the effects of sleep deprivation, there is preliminary evidence that *need for cognition* may serve as a buffer of negative effects of sleep deprivation. Need for cognition describes a trait characterized by high motivation and enjoyment when performing cognitive tasks (Cacioppo & Petty, 1982; Cacioppo et al., 1996). Kobbeltvedt et al. (2005) argue that individuals high in need for cognition should show more compensatory effort to counteract sleepiness and maintain cognitive performance when being sleep-deprived. In line with this prediction, they found that, when sleep-deprived, cadets scoring high in need for cognition performed better in planning a military operation than cadets low in need for cognition.

In the context of between-person differences, it has also been argued that experience matters when coping with sleep deprivation (Horne, 2012). Hence, in life domains in which high-stakes negotiations under sleep deprivation are common (e.g., in the political arena), the involved negotiators should be better able to compensate for the negative effects of sleep deprivation due to experience and habituation. Even a survival bias is possible: Individuals who are resilient to sleep loss are more likely to arrive at positions where they have to negotiate through the night on a regular basis (Häusser, 2017).

Taken together, individual negotiators can compensate for negative effects of sleep deprivation by taking measures to fight sleepiness or increase effort. Some individuals (i.e., late types, those scoring high in need for cognition, those who are highly experienced) should be more effective in doing so.

Moderators and Potential for Compensation at the Inter-Individual Level

As we discussed earlier, negotiations are interpersonal mixed-motive situations, where the motivation of the individual negotiator is to optimize their individual outcome, while at the same time the negotiators have the collective goal to reach a mutual agreement. In this sense, negotiations show similarity with some tasks, which are often used in studies on group dynamics and performance. In negotiations, the insight that a partial compatibility of interests exists is the key to tapping into the integrative potential and to optimizing joint economic outcomes. Hüffmeier et al. (2019) argue that this task is of a eureka-type, which makes integrative negotiations similar to disjunctive group tasks (cf. Steiner, 1972). Particularly, Hüffmeier at al. (2019) show that an integrative solution in negotiations is sufficiently demonstrable and intuitively plausible for negotiators, as they immediately recognize that this solution would increase the achieved economic outcomes. Hence, due to the sufficient demonstrability (cf. Laughlin & Ellis, 1986) of integrative solutions, it can suffice if one negotiation partner identifies the partial compatibility of interest to unlock the integrative potential (see, however, Zerres et al., 2013).

For the case of negotiations under sleep deprivation, this would mean that compensation on the inter-individual level is possible: Due to the disjunctive nature of integrative negotiations, compensation on the inter-individual level can counteract negative effects of sleep deprivation. Research on group performance under fatigue has shown that groups engage in group monitoring (Frings, 2011), that is, the individual impairments of the group members are monitored by the group and accounted for when working together. Hence, in integrative negotiations, if at least one negotiation partner effectively copes with sleep deprivation, for example, due to compensatory effort or experience, the negative effects of sleep deprivation on joint economic outcomes can be diminished.

Practical Implications

Our theoretical analysis reveals that sleep deprivation has the potential to negatively affect negotiation processes and outcomes in several ways. Although these negative effects can be compensated for, particularly by increased individual or collective effort, there is no good reason to assume that negotiations under sleep deprivation should produce any *better* outcomes as compared to negotiations under well-rested conditions. In other words, the best outcome that should emerge is that no bad consequences occur. That said, the high prevalence of sleep-deprived negotiations in economy, politics, close relationships, or in the labor market appears somewhat disturbing.

Of course, there are situations that are highly critical in time, such as negotiations between conflict parties at the brink of an armed conflict or in hostage-taking situations (see Mertes et al., 2020). However, in other cases, the perceived need to "sit it out" all night and to arrive at an agreement no matter how long it takes is often self-inflicted. A clear-cut practical recommendation based on our analysis would be to refrain from negotiations under sleep deprivation whenever possible.

Our analysis highlights the crucial role of two psychological pathways, namely cognitive capacities and epistemic motivation for negotiations in general and for negotiations under sleep deprivation in particular. Hence, from a practical perspective, it seems to be wise to account for impairments of these two processes whenever our recommendation to refrain from negotiations under sleep deprivation cannot (or will not) be followed. Specifically, we advise creating conditions that allow for compensation of sleep deprivation induced impairments. It has been found that sleep deprived individuals are aware of their sleep deprived impairments (Baranski, 2007) and readily use decision aids to compensate for these impairments (Häusser et al., 2016).

For negotiations, that would mean measures must be taken that support the exchange and processing of information. For example, as cognitive capacities of the negotiators are likely to be decreased, the cognitive load produced by the negotiation task should be reduced. Several decision aids to reduce cognitive load in negotiations have been shown to be effective. For example, providing a negotiation structure with explicit phases of information accumulation and information assessment supports accurate judgements in negotiations (Arunachalam & Dilla, 1995). Additionally, graphical presentations of negotiation-relevant information can reduce cognitive load (see Gettinger & Koeszegi, 2014, for a review). Another effective approach to support the negotiation process is third party mediation as it should compensate for impaired cognitive capacities by promoting the flow of information and supporting uncovering underlying interests (Carnevale & Pruitt, 1992).

Moreover, specific measures can be taken to increase epistemic motivation. For example, introducing higher levels of accountability, reducing environmental noise, or reducing time pressure have been found to increase epistemic motivation in social mixed-motive situations (see De Dreu et al., 2008, for an overview).

Concluding Remarks

In an extensive theoretical analysis, we examined the potential effects of sleep deprivation on negotiation processes and outcomes. Based on our analysis, we conclude that sleep deprivation is likely to have negative effects on joint and individual economic outcomes, socio-emotional outcomes, and impasses. The driving forces behind most negative effects are impairments in cognitive capacities and epistemic motivation. These impairments in turn reduce or bias information processing and hamper effective information exchange necessary to arrive at optimal agreements. Although the expected negative effects

are highly likely to occur, a compensation of these impairments on the task level, the individual level, and the inter-individual level is possible, and thereby negative effects may be reduced or even fully alleviated.

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